



Guru Gobind Singh Indraprastha University

(A University Established by Govt. of NCT of Delhi)

ABSTRACTS OF RESEARCH PAPERS Compendium (2012-2016)

- ✿ UNIVERSITY SCHOOL OF INFORMATION, COMMUNICATION & TECHNOLOGY (USIC&T)
- ✿ UNIVERSITY SCHOOL OF MANAGEMENT STUDIES (USMS)
- ✿ UNIVERSITY SCHOOL OF CHEMICAL TECHNOLOGY (USCT)
- ✿ UNIVERSITY SCHOOL OF BIOTECHNOLOGY (USBT)
- ✿ UNIVERSITY SCHOOL OF ENVIRONMENT MANAGEMENT (USEM)
- ✿ UNIVERSITY SCHOOL OF ARCHITECTURE AND PLANNING (USAP)
- ✿ UNIVERSITY SCHOOL OF BASIC & APPLIED SCIENCES (USBAS)
- ✿ UNIVERSITY SCHOOL OF HUMANITIES & SOCIAL SCIENCES (USHSS)
- ✿ UNIVERSITY SCHOOL OF LAW AND LEGAL STUDIES (USLLS)
- ✿ UNIVERSITY SCHOOL OF EDUCATION (USE)
- ✿ UNIVERSITY SCHOOL OF MASS COMMUNICATION (USMC)
- ✿ CENTRE FOR DISASTER MANAGEMENT STUDIES (CDMS)





**ABSTRACTS OF RESEARCH PAPERS
COMPENDIUM
(2012-2016)**

**GURU GOBIND SINGH INDRAPRASTHA UNIVERSITY
DWARKA, NEW DELHI – 110078**

FOREWORD



Hon'ble Vice Chancellor **Guru Gobind Singh Indraprastha University**

It gives me immense pleasure to present the two compendiums of abstracts of research articles published by the faculty members of the University Schools of Study and Centres in the Dwarka campus in the last decade. These compendiums comprise of abstracts of research articles published during the periods 2012-2016 and 2017-2022. Knowledge, learning and research acquires a greater meaning when the people, the community, the country and the world benefits. New frontiers of research open up avenues for new discoveries – fascinating marvels that a human mind can unravel and make new inventions and innovations possible. Universities are the fertile ground for nurturing novel ideas and talents. The compendium is a kaleidoscope of the multidisciplinary research being undertaken by the University faculty. It is a window to the depth and diversified range of issues undertaken and the scholarship displayed in pursuit of knowledge. I am glad that the research output of the University faculty has been steadily increasing over the years in national and international journals, both in terms of quantity and quality. This is one of the many ways in which the University is making its mark, and contributing towards the growth of knowledge and research in different areas, as well as attaining eminence in some fields. This is a vindication of the various policies and initiatives of the University to fully realize the research potential of our faculty members and research training of our students. I would like to assure you that the University would continue to take all the necessary steps to further promote the research ecosystem in the campus. I am hopeful that in the future, our University will keep up the research momentum in all areas, and also strive to become a cradle for research excellence for the benefit of all in the society.

Wishing all the very best,

A handwritten signature in blue ink that reads "Mahesh Verma". The signature is stylized with a long horizontal stroke at the end.

Prof. (Dr.) Mahesh Verma

From the desk of the Director, Research and Development Cell



Prof. Nimisha Sharma

Research is an integral component of any institution of higher learning. It becomes especially important in Universities, where a seamless amalgamation of research and teaching activities can excite, engage and train students in new upcoming areas of research. Guru Gobind Singh Indraprastha University is committed to providing all the requisite support to encourage its faculty members to attain greater heights in their research pursuits. This is being provided through enabling policies for smooth implementation of extramural as well as intramural projects, annual faculty research grants, student fellowships, travel grants and publishing grants, apart from infrastructural support for research to the best possible extent. These inputs are best justified by the outputs they produce. The compendiums not only reflect the quantity and quality of research output, but also provide a glimpse into the available expertise and the nature of research undertaken by the faculty members of the various University Schools of Study and Centres in the Dwarka campus.

These compendiums are a fruitful culmination of the efforts of the ‘compendium team’ who took over this arduous task of putting together the abstracts of research articles published by faculty of various University Schools of Study in the last decade. I take this opportunity to thank this entire team, Mr Lalit Kumar from USICT, Mr Pawan from Directorate of Students’ Welfare as well as all the faculty members for sharing their research articles. A very special thanks to Prof. Biswajit Sarkar for taking care of the final proofreading of both the compendiums. We have incorporated all the information that was received, and carefully looked at all the details. However, if there are any errors, they were completely unintentional. At the end, my sincere thanks to our Hon’ble Vice Chancellor, Padma Shri, Prof. (Dr.) Mahesh Verma, head of the GGSIPU family, for all his support and encouragement towards the completion of this herculean task.



Nimisha Sharma

PREFACE



Prof. Varun Joshi
Chairman, Compendium Committee

I am extremely delighted to introduce the third volume of the compendium of research articles published by faculty members of the University School of Studies (USS) during years 2012 to 2016. The preceding edition (Second volume) compendium the research articles published by the faculty members during 2007 to 2011. The present compendium includes the papers published in the peer reviewed national and international research journals. All additional research contributions of the faculty members e.g., articles published in conference proceedings, book chapters, short communications, and news paper could not be included in the compendium due to space constrains. All sincere efforts have been made to incorporate the information provided by all University Schools of Studies until the proof was finalized.

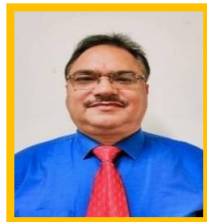

I would like extend my acknowledgement to all the Deans, Centre Director and faculty members of the University School of Studies for providing information related to their publications. My sincere gratitude to all the committee members (Prof. Biswajit Sarkar, Prof S. Dhingra, Dr. Rajesh Kumar, Dr. Rahul Johari, Dr. Yogesh Kumar, Dr. Sanjay K. Das, Dr. Sweta Singh, Dr. Vandana Singh) and our special invitees Prof. N.C. Gupta and Prof. Nimisha Sharma for their contributions in compilation and edition of this compendium of research papers. I will also like to extend my special thanks to Dr. Rahul Johari for taking lots of pain in integrating the data of all USS, formatting the research papers and designing the cover page. The help extended by Mr Pawan, Directorate of Students' Welfare and Mr Lalit Kumar, Lab Assistant, USICT in compiling and formatting of data is duly acknowledged. I also wish to acknowledge all the research scholars who have helped faculty members in esteem lining the research articles.

I believe that the present compendium of research papers will serve as a ready document for various stakeholders and reflects the dimensions of research being conducted by the faculty of USS.



Varun Joshi

COMPENDIUM COMMITTEE

| S.No | FACULTY | USS | PHOTOGRAPH |
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**UNIVERSITY SCHOOL OF
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(USIC&T)**

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USIC&T- 1.01

Paper Title: Multi-objective optimization of electric-discharge machining process using controlled elitist NSGA-II

Author(s): Bharti, P.S.¹, Maheshwari, S.² and Sharma, C.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²MPAE Division, Netaji Subhas Institute of Technology, Delhi-110078; ³Department of MAE, Indira Gandhi Institute of Technology, Delhi-110006

Source: Journal of Mechanical Science and Technology, Vol. 26(6), (2012), pp 1875-1833

ISSN No.: 1738-494X.

Abstract: Parametric optimization of electric discharge machining (EDM) process is a multi-objective optimization task. In general, no single combination of input parameters can provide the best cutting speed and the best surface finish simultaneously. Genetic algorithm has been proven as one of the most popular multi-objective optimization techniques for the parametric optimization of EDM process. In this work, a controlled elitist non-dominated sorting genetic algorithm has been used to optimize the process. Experiments have been carried out on die-sinking EDM by taking Inconel 718 as a work piece and copper as tool electrode. Artificial neural network (ANN) with back propagation algorithm has been used to model EDM process. ANN has been trained with the experimental data set. Controlled elitist non-dominated sorting genetic algorithm has been employed in the trained network and a set of pareto-optimal solutions is obtained.

USIC&T- 1.02

Paper Title: Multi-objective optimization of die-sinking electric discharge machining

Author(s): Bharti, P.S.¹, Maheshwari, S.² and Sharma, C.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²MPAE Division, Netaji Subhas Institute of Technology, Delhi-110078; ³Department of MAE, Indira Gandhi Institute of Technology, Delhi -110006

Source: Applied Mechanics and Materials, Vol. 26(6), (2012), pp 1875-1883

ISSN No.: 1662-7482

Abstract: Parametric optimization of electric discharge machining (EDM) is a challenging task. Many researchers have employed different multi-objective optimization techniques for the same. This work employs multi-response signal-to-noise (MRSN) technique to find the optimum factor/level combination of input parameters. Experiments have been conducted on die-sinking EDM by taking heat treated D2 steel as work piece and copper as tool electrode. Experiments have been designed as per Taguchi's L36 orthogonal array. Two cases v.i.z. high cutting efficiency and high surface finish have been taken. Analysis of variance (ANOVA) is employed to indicate the level of significance of machining parameters in both the cases. Finally, results have been verified experimentally and a significant improvement in material removal rate and surface roughness is observed.

USIC&T- 1.03

Paper Title: Effect of tool material on surface roughness in electrical discharge machining

Author(s): Bharti, P.S.¹, Payal, H.² and Maheshwari, S.²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²MPAE Division, Netaji Subhas Institute of Technology, Delhi-110078

Source: Journal of Production Engineering, Vol. 19(1), (2016), pp 7-30

ISSN No.: 0944-6524

Abstract: H11 die steel is widely used in forging dies, aircraft landing gears and shafts. Electric discharge machining (EDM) is one of the most suitable processes to shape this material. This work demonstrates the effect of pulse-on-time (Ton) on surface roughness during EDM of H11 tool steel by taking three different tool electrode materials. Experiments have been conducted by varying Ton in four steps (10 μ s, 20 μ s, 30 μ s, 40 μ s) while keeping the values of other variables fixed. On the basis of experimental results, it is concluded that tool properties of electrode play a vital role in machining characteristics of die-sinking EDM process. The results demonstrate that Copper-tungsten electrode offers the best surface finish followed by graphite and copper electrode in EDM of H11 tool steel.

USIC&T- 1.04

Paper Title: Parametric optimization of EDM using multi-response signal-to-noise ratio technique

Author(s): Bharti, P.S.¹, Payal, H.², and Maheshwari, S.²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²MPAE Division, Netaji Subhas Institute of Technology, Delhi-110078

Source: Journal of Production Engineering, Vol. 19(2), (2016), pp 33-37

ISSN No.: 0944-6524

Abstract: The performance of electrical discharge machining (EDM) is dependent on the selection of factor/levels combinations of input parameters. The optimization of EDM process is a multi-objective optimization problem on account of the contradictory behaviour of performance measures like metal removal rate and surface roughness (MRR, SR). Many optimization techniques are used for the parametric optimization of EDM that require a good amount of computational facility. In this paper, multi-response signal-to noise ratio technique has been employed to find the optimal combination of input parameters owing to its simplicity and less mathematical computation. Experiments have been designed by Taguchi's L36 orthogonal array. In this work, two cases are considered and the parametric level/combinations have been obtained for both the cases. Analysis of variance (ANOVA) has also been employed to find the dominant parameters and finally experimentation verification has also been performed for the validation of results obtained.

USIC&T-2.01

Paper Title: A robust fingerprint matching system using orientation features.

Author(s): Chandra, P.¹, Kumar, R.², and Hanmandlu, M.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Dept. of Computer Science and Engineering, Ansal Institute of Technology, Gurgaon 122001; ³Dept. of Electrical Engineering, Indian Institute of Technology, Haus-Khas Delhi 110006

Source: Journal of Information Processing Systems, Vol.12(1), (2016), pp 83-99

ISSN No.: 2092-805X

Abstract: The latest research on the image-based fingerprint matching approaches indicates that they are less complex than the minutiae-based approaches when it comes to dealing with low quality images. Most of the approaches in the literature are not robust to fingerprint rotation and translation. In this paper, we develop a robust fingerprint matching system by extracting the circular region of interest (ROI) of a radius of 50 pixels centered at the core point. Maximizing their orientation correlation aligns two fingerprints that are to be matched. The modified Euclidean distance computed between the extracted orientation features of the sample and query images is used for matching. Extensive experiments were conducted over four benchmark fingerprint datasets of FVC2002 and two other proprietary databases of RFVC 2002 and the AITDB. The experimental results show the superiority of our proposed method over the well-known image-based approaches in the literature.

USIC&T-2.02

Paper Title: Review and extension of fault class hierarchy for testing Boolean specification

Authors: Chandra, P.¹, Singh, R.K.² and Singh, Y.¹

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Information Technology, Indira Gandhi Delhi Technical University For Women, Kashmere Gate, Delhi-110006

Source: International Journal of Computer Applications in Technology, Vol. 52(1), (2015), pp 29-38

ISSN No.: 1741-5047.

Abstract: Fault hierarchy specifies the inter-relationships amongst various fault classes in terms of their fault detection capability. Kuhn has developed a fault hierarchy for Boolean expression in disjunctive normal form which was complemented by Tsuchiya and Kikuno. Lau and Yu extended the fault hierarchy by adding more fault classes in the hierarchy. In this paper, we give the fault detection criteria for clause disjunction fault (CDF) and associative shift fault (ASF) and further extend the fault hierarchy by adding these fault classes in the fault hierarchy.

USIC&T-2.03

Paper Title: An empirical evaluation of rotation invariance of LDP feature for fingerprint matching using neural networks

Authors: Kumar, R.¹, Hanmandlu, M.² and Chandra, P.³

Affiliation(s): ¹Dept. of Computer Science and Engineering, Ansal Institute of Technology, Gurgaon 122001; ²Department of Electrical Engineering, Indian Institute of Technology, Delhi-110016; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computational Vision and Robotics, Vol. 4(4), (2014), pp 330-348

ISSN No.: 1752-914X

Abstract: Fingerprint-based individual authentication has been the most trusted and tested biometric among the biometrics traits. In the past two decades, many methods have been developed for fingerprint matching, but still there is a huge scope of improvement. This paper presents the rotation invariant fingerprint matching method, which is based on local directional pattern (LDP) features computed directly from grey values of a fingerprint image. For matching the extracted LDP histogram features, we have used single hidden layer feedforward neural networks (SLFNN). Six training algorithms namely, resilient propagation (RP), scaled conjugate gradient (SCG), gradient decent with all four variants [GD, GDM, GDA, GDX (refer to Table 2 for details)] are used for evaluating the matching performance and convergence time. The results show that the proposed features are invariant to the rotation and also suitable for fingerprint matching using SLFNN. The results also demonstrate that RP is better in performance than other investigated algorithms.

USIC&T-2.04

Paper Title: Identifying influential metrics in the combined metrics approach of fault prediction

Authors: Goyal, R., Chandra, P. and Singh, Y.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: SpringerPlus, Vol. 21(1), (2013), pp 1-8

ISSN No.: 2193-1801

Abstract: Fault prediction is a pre-eminent area of empirical software engineering which has witnessed a huge surge over the last couple of decades. In the development of a fault prediction model, combination of metrics results in better explanatory power of the model. Since the metrics used in combination are often correlated, and do not have an additive effect, the impact of a metric on another i.e. interaction should be taken into account. The effect of interaction in developing regression-based fault prediction models is uncommon in software engineering; however two terms and three term interactions are analyzed in detail in social and behavioral sciences. Beyond three terms interactions are scarce, because interaction effects at such a high level are difficult to interpret. From our earlier findings (Softw Qual Prof 15(3):15-23) we statistically establish the pertinence of considering the interaction between metrics resulting in a considerable improvement in the explanatory power of the corresponding predictive model. However, in the aforesaid approach, the number of variables involved in fault prediction also shows a simultaneous increment with interaction. Furthermore, the interacting variables do not contribute equally to the prediction capability of the model. This study contributes towards the development

of an efficient predictive model involving interaction among predictive variables with a reduced set of influential terms, obtained by applying stepwise regression.

USIC&T-2.05

Paper Title: A constructive algorithm with adaptive sigmoidal function for designing single hidden layer feedforward neural network

Authors: Sharma, S.K.¹ and Chandra, P.²

Affiliation(s): ¹Ansal Institute of Technology, Gurgaon 122001; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Advanced Materials Research, Vol. 403, (2012), pp 3867-3874

ISSN No.: 1662-8985

Abstract: In this paper we propose a constructive algorithm with adaptive sigmoidal function for designing single hidden layer feedforward neural network (CAASF). The proposed algorithm emphasizes on architectural adaptation and functional adaptation during training. This algorithm is a constructive approach to building single hidden layer neural networks dynamically. The activation functions used at non-linear hidden nodes are belonging to the well-defined sigmoidal class and adapted during training. The algorithm determines not only optimum number of hidden nodes, as also optimum sigmoidal function for the non-linear nodes. One simple variant derived from CAASF is where the sigmoidal function used at the hidden nodes is fixed. Both the variants are compared to each other on five regression functions. Simulation results reveal that adaptive sigmoidal function presents several advantages over traditional fixed sigmoid function, resulting in increased flexibility, smoother learning, better convergence and better generalization performance.

USIC&T-2.06

Paper Title: Cascading neural networks using adaptive sigmoidal function

Authors: Sharma, S.K.¹ and Chandra, P.²

Affiliation(s): ¹Ansal Institute of Technology, Gurgaon 122001; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Advanced Materials Research, Vol. 403-408, (2012), pp 858-865

ISSN No.: 1662-8985.

Abstract: This paper presents cascading neural networks using adaptive sigmoidal function (CNNASF). The proposed algorithm emphasizes on architectural adaptation and functional adaptation during training. This algorithm is a constructive approach to building cascading architecture dynamically. The activation functions used at the hidden layers 'node are belonging to the well-defined sigmoidal class and adapted during training. The algorithm determines not only optimum number of hidden layers 'node, as also optimum sigmoidal function for them. One simple variant derived from CNNASF is where the sigmoid function used at the hidden layers 'node is fixed. Both the variants are compared to each other on five regression functions. Simulation results reveal that adaptive sigmoidal function presents several advantages over traditional fixed sigmoid function, resulting in increased flexibility, smoother learning, better convergence and better generalization performance.

USIC&T-2.07

Paper Title: Fingerprint matching based on orientation feature

Authors: Kumar, R.¹, Hanmandlu, M.² and Chandra, P.³

Affiliation(s): ¹Dept. of Computer Science and Engineering, Ansal Institute of Technology, Gurgaon 122001; ²Department of Electrical Engineering, Indian Institute of Technology, Delhi-110016; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Advanced Materials Research, Vol. 403-408, (2012), pp 888-894

ISSN No.: 1662-8985.

Abstract: This paper presents a fast and reliable algorithm for fingerprint verification. Our proposed fingerprint verification algorithm is based on image-based fingerprint matching. The improved orientation feature vector of two fingerprints has been compared to compute the similarities at a given threshold. Fingerprint image has been aligned by rotating through an angle before feature vector is computed and matched. Row and Column variance feature vector of orientation image will be employed. The algorithm has been tested on the FVC2002 Databases. The performance of algorithm is measured in terms of GAR and FAR. At a threshold level of 1.1 % and at 5.7% FAR the GAR observed is 97.83%. The improved Feature vector will lower imposter acceptance rate at reasonable GAR and hence yields better GAR at lower FAR. The proposed algorithm is computationally very efficient and can be implemented on Real-Time Systems.

USIC&T-3.01

Paper Title: Software Maintainability Prediction using Machine Learning Algorithms

Author(s): Malhotra, R.¹ and Chug, A.²

Affiliation(s): ¹Department of Software Engineering, Delhi Technological University, Delhi 110042; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Software Engineering: An International Journal, Vol. 2(2), (2012), pp 19-36

ISSN No.: 2249-9342.

Abstract: Software maintainability is one of the most important aspects while evaluating quality of the software product. It is defined as the ease with which a software system or component can be modified to correct faults, improve performance or other attributes or adapt to a changed environment. Tracking the maintenance behaviour of the software product is very complex. This is precisely the reason that predicting the cost and risk associated with maintenance after delivery is extremely difficult which is widely acknowledged by the researchers and practitioners. In an attempt to address this issue quantitatively, the main purpose of this paper is to propose use of few machine learning algorithms with an objective to predict software maintainability and evaluate them. The proposed models are Group Method of Data Handling (GMDH), Genetic Algorithms (GA) and Probabilistic Neural Network (PNN) with Gaussian activation function. The prediction model is constructed using the above said machine learning techniques. In order to study and evaluate its performance, two commercial datasets UIMS (User Interface Management System) and QUES (Quality Evaluation System) are used. The code for these two systems was written in Classical Ada. The UIMS contains 39 classes and QUES datasets contains 71 classes. To measure the maintainability, number of "CHANGE" is observed over a period of three years. We can define CHANGE as the number of lines of code which were added, deleted or modified during a three year maintenance

period. After conducting empirical study, performance of these three proposed machine learning algorithms was compared with prevailing models such as GRNN (General Regression Neural Network) Model, ANN (Artificial Neural Network) Model, Bayesian Model, RT (Regression Tree) Model, Backward Elimination Model, Stepwise Selection Model, MARS (Multiple Adaptive Regression Splines) Model, TreeNets Model, GN (Generalized Regression) Model, ANFIS (Adaptive Neuro Fuzzy inference System) Model, SVM (Support Vector Machine) Model and MLR (Multiple Linear Regressions) Model which were taken from the literature. Based on experiments conducted, it was found that GMDH can be applied as a sound alternative to the existing techniques used for software maintainability prediction since it assists in predicting the maintainability more accurately and precisely than prevailing models.

USIC&T-3.02

Paper Title: Agile Testing with Scrum - A Survey

Author(s): Malhotra, R.¹ and Chug, A.²

Affiliation(s): ¹Department of Software Engineering, Delhi Technological University, Delhi 110042; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Advanced Research in Computer Science and Software Engineering, Vol. 3(3), (2013), pp 452-459

ISSN No.: 2277-128X .

Abstract: Agile testing deals in carrying out work rapidly and successively in small iterations. As against other traditional approaches like waterfall model where testing used to take place very late after coding, this approach is more flexible and practically adaptable as here testing start as early as requirement and planning phase. Scrum attempts to build the work in short iterations where each iteration consists of short time boxes. Automation can serve to be very fruitful at many phases of scrum methodology. It can benefit not just at the time of test execution but at the time of managing the various activities of scrum. It can serve to provide the solution rapidly by increasing reliability, repeatability, comprehensiveness and efficiency which is the soul of agile. This paper reviews several papers on agile, its methodologies including the testing aspects of it and also automation in agile and various techniques to it. Survey concludes that Automation is a viable solution in Agile and its methodologies including Scrum due to its very iterative nature. This paper will help researchers get a view of automation in agile testing, various techniques in which it can be done, scrum incorporated with agile testing in an easy and effective manner.

USIC&T-3.03

Paper Title: A Survey on Modeling and Simulation of Cloud Computing Environments

Author(s): Gupta, G. and Chug, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Advanced Research in Computer Science, Vol. 4(4), (2013), pp 252-257

ISSN No.: 0976-5697.

Abstract: Cloud computing is a recent advancement in era of technologies wherein IT infrastructure, software, resources and applications are provided as “services” to the end-users under a pay-per-use based payment model. Based on the customer requirements, not only services can be offered to them but their dynamic needs can

also be fulfilled. It basically provides an opportunity to dynamically scale the computing resources for applications. The application services which are hosted under Cloud computing model have various complex provisioning, composition, configuration, and deployment requirements. With the cloud computing ability to provide users dynamically scalable applications, providing the platform to share resources over the internet and avoid large expenses, cloud computing has recently emerged as a promising hosting platform. In this study an effort has been made to survey and explore various complexities and features in the field of cloud computing.

USIC&T-3.04

Paper Title: IXSCRUM - A Framework Combining Scrum and XP

Author(s): Malhotra, C. and Chug, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Scientific & Engineering Research, Vol. 4(7), (2013), pp 1322-1328

ISSN No.: 2229-5518.

Abstract: Scrum approach being developed for managing the software development process gives no idea about how to engineer the software product. In order to adapt to the agile environment, it is desirable to construct a framework that boasts of the engineering aspect of individual approaches of software project development. XP is an iterative, lightweight, adaptive approach of agile methodology which helps to engineer a software project. In order to build quality in a product and to satisfy customer requirement on timely and efficient basis it is desirable to have a solution which uses the advantages of both the approaches of XP and Scrum. In our research we have proposed a framework that combines this integration. This model has the engineering approach of XP along with the management approach of scrum. The suitability of this approach has been verified and validated by a case study.

USIC&T-3.05

Paper Title: Prediction of Software Maintainability using Neural Networks

Author(s): Bhutani, S. and Chug, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Science & Communication Networks, Vol. 5(2), (2015), pp 92-95

ISSN No.: 2249-5789.

Abstract: Software maintenance is an important aspect of software quality as it is most expensive activity in the development lifecycle of a software. Hence, in the recent past many researchers have shown an increasing interest in predicting the most accurate model for maintainability of a software. In this paper, the three models have been proposed which are quantitatively compared to each other. The proposed models are Group Method of Data Handling (GMDH), General Regression Neural Network (GRNN) and Probabilistic Neural Network (PNN). In this study, an open source software with two versions was used in order to calculate the CHANGE which is defined as the number of lines of code which are modified, added or deleted from version 1 to version 2 of the software. Based on this study, it was concluded that General Regression Neural Network (GRNN) is the best neural model for prediction of software maintainability. Hence, it can be used as an alternative to the

other existing models by the companies to maintain their software as it predicts software maintainability more accurately than other alternative neural networks.

USIC&T-3.06

Paper Title: CFS based Feature Subset Selection for Software Maintenance Prediction

Author(s): Manchanda, S. and Chug, A.

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Source: International Journal of Advance Foundation and Research in Computer, Vol. 2(5), (2015), pp 13-23

ISSN No.: 2348-4853.

Abstract: Feature subset selection is the process of picking a subset of significant features for use in model Construction. Software engineers use numerous software metrics to analyze the characteristics of software for utilizing them in categorization and prediction. All metrics do not carry equal significance and utilizing all of them for analysis will not only affect budget but a lot of time and effort will be wasted. In this study our main concern is to reduce the number of metrics needed to predict change required to improve structural quality using feature subset selection technique. To analyse the results of feature subset selection techniques and identify the best technique in various circumstances, several machine learning algorithms are used. The impact of all the combinations of various feature subset selection techniques and machine learning algorithms is also compared for best results. This paper will help software engineers to predict the change requirement to improve the structural quality of the software using a small set of relevant software metrics.

USIC&T-3.07

Paper Title: Improving Software Maintainability Through Refactoring - An Empirical Study.

Author(s): Chug, A., Manchanda, S., and Khosla, P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Advances in Electronics and Computer Science, Vol. 2(4), (2015), pp 88-93

ISSN No.: 2393-2835.

Abstract: Refactoring is the process of changing the internal structure of the existing code of the software to improve the design without affecting its external behavior. In this paper, we empirically examine the impact of Refactoring on Software Maintenance using Object Oriented (OO) Metric. To carry out the empirical study, the source code of an open source project ORDrumbox hosted by Sourceforge.net is obtained. Five refactoring techniques Extract Class, Use Super Type, Extract Method, Extract Super Class and Extract Interface are applied and their effects are observed. OO Metrics of the software are collected before and after the application of refactoring and Change in their values are further mapped to maintainability. This helps us in determining how these refactoring techniques affect maintainability. This paper reflects that refactoring techniques improve maintainability with a long term planning by improving the design of the code. This paper will help the software professionals in taking the decision regarding which refactoring method should be applied and when it should be applied, in order to optimize the cost involved in the software system design.

Paper Title: **Software Maintainability: Systematic Literature Review and Current Trends**

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Source: International Journal of Software Engineering and Knowledge Engineering, Vol. 26(8), (2016), pp 1221-1253

ISSN No.: 0218-1940

Abstract: Software maintenance is an expensive activity that consumes a major portion of the cost of the total project. Various activities carried out during maintenance include the addition of new features, deletion of obsolete code, correction of errors, etc. Software maintainability means the ease with which these operations can be carried out. If the maintainability can be measured in early phases of the software development, it helps in better planning and optimum resource utilization. Measurement of design properties such as coupling, cohesion, etc. in early phases of development often leads us to derive the corresponding maintainability with the help of prediction models. In this paper, we performed a systematic review of the existing studies related to software maintainability from January 1991 to October 2015. In total, 96 primary studies were identified out of which 47 studies were from journals, 36 from conference proceedings and 13 from others. All studies were compiled in structured form and analyzed through numerous perspectives such as the use of design metrics, prediction model, tools, data sources, prediction accuracy, etc. According to the review results, we found that the use of machine learning algorithms in predicting maintainability has increased since 2005. The use of evolutionary algorithms has also begun in related sub-fields since 2010. We have observed that design metrics is still the most favored option to capture the characteristics of any given software before deploying it further in prediction model for determining the corresponding software maintainability. A significant increase in the use of public dataset for making the prediction models has also been observed and in this regard two public datasets User Interface Management System (UIMS) and Quality Evaluation System (QUES) proposed by Li and Henry is quite popular among researchers. Although machine learning algorithms are still the most popular methods, however, we suggest that researchers working on software maintainability area should experiment on the use of open source datasets with hybrid algorithms. In this regard, more empirical studies are also required to be conducted on a large number of datasets so that a generalized theory could be made. The current paper will be beneficial for practitioners, researchers and developers as they can use these models and metrics for creating benchmark and standards. Findings of this extensive review would also be useful for novices in the field of software maintainability as it not only provides explicit definitions, but also lays a foundation for further research by providing a quick link to all important studies in the said field. Finally, this study also compiles current trends, emerging sub-fields and identities various opportunities of future research in the field of software maintainability.

USIC&T-3.09

Paper Title: Benchmarking Framework for Maintainability Prediction of Open Source Software Using Object Oriented Metrics

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Source: International Journal of Innovative Computing, Information and Control. Vol. 2(2), (2016), pp 615-634

ISSN No.: 1349-4198

Abstract: Software maintainability is measured as the ease with which the existing software could be modified and often predicted during the development stage on the basis of some measurable design characteristics. Controlling the software maintainability and understandability of any open source software (OSS) system is extremely challenging because it is written and constantly modified by the developers located all over the world. The current study analyzes the effectiveness of machine learning (ML) techniques for the maintainability prediction of OSS systems. In this work large-scale empirical comparisons of thirteen classifiers over seven open source datasets were conducted followed by extensive statistical tests and post hoc analysis to establish the confidence on the performance of one ML technique over another. The results show two important findings: firstly, we observed that overall good prediction accuracy is achieved by almost all ML techniques; secondly the prediction models using genetically adaptive learning ML technique and group method of data handling (GMDH) technique perform better than the other ML techniques in the context of OSS systems. The outcome of this investigation would be helpful for developers in order to predict maintenance behavior of the software at the earlier stages of software development lifecycle (SDLC). Accordingly, they can optimize their resource allocations, prioritize maintenance tasks and produce high-quality low maintenance software systems. Additionally, it also has numerous other applications such as schedule planning, cost estimation, quality assurance testing, software debugging, budget preparation, and software performance optimization.

USIC&T-3.10

Paper Title: Agile Methodologies in Software Maintenance: A Systematic Review

Author(s): Tarwani, S. and Chug, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Informatica, Vol. 40(4), (2016), pp 415-426

ISSN No.: 0350-5596

Abstract: Agile Methodologies has been gaining popularity since 2000. The Software Maintenance phase of software lifecycle is the most expensive and tedious in nature and use of Agile methodologies helps in maintaining software over time in flexible and iterative manner. This study reviews several papers with different case studies to evaluate the performance and quality of software using agile methodologies. In this study, more than 30 research studies are investigated which are conducted between 2001 and 2015 and have been categorized according to the publication year, datasets, tools, type of techniques etc. This will be the first review paper on the use of Agile in software maintenance which will help the researchers and encourage companies and beginners to adopt these methodologies to gain software quality. It can be concluded

that by adopting agile methodologies it is guaranteed that there will be continuous improvement, greater productivity and enhanced quality of the software. It will also help the software development team to finish their work within real time constraints. This study would be helpful to professional academicians also so that they can identify the current trends and future gaps in the field of agile methodologies

USIC&T- 4.01

Paper Title: A novel requirements engineering approach for designing data warehouses

Author(s): Kumar, M.¹Gosain, A.² and Singh, Y.²

Affiliation(s):¹Ambedkar Institute of Advanced Communication Technologies & Research, Delhi;²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of System Assurance Engineering and Management Vol. 7, (2016), pp 205–221

ISSN No.: 0975-6809

Abstract: Most of the requirements engineering (RE) approaches for data warehouse (DW) do not distinguish the early and late RE phase unlike recent RE approaches for transactional systems. They captured information requirement instead of decision requirement which is the main focus of this article. In this paper we present a novel RE approach for DW consisting of three phases namely; (i) early RE (ii) late RE, and (iii) conceptual design. The early RE phase captures 'whys' that underlies decision requirements and the late RE phase captures 'what' the DW system should do. The conceptual design evolves through the early and late requirements. All the models produced (early requirements model, late requirements model and multi dimensional conceptual model) are interlinked, thus, support traceability among each other. Finally, the proposed approach has been demonstrated by a case study of a typical Indian public sector bank and supported by a CASE tool.

USIC&T- 4.02

Paper Title: Bi-temporal schema versioning in bi-temporal data warehouse.

Author(s): Saroha, K., and Gosain, A.

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Source: CSI Transactions on ICT, Vol. 3, (2015), pp 135–142

ISSN No.: 2277-9078.

Abstract: The data warehouse (DW) data as well as its schema is known to evolve continually with time to incorporate new requirements. In order to preserve complete history, the DW systems need to manage the evolution of schema with time through schema versioning and also have to provide support for evolution of data defined in different schema versions. However, the existing multidimensional DW are able to manage revisions in transaction data (measures/facts) but do not (or partially) manage evolutions in dimension data. In this paper, we propose an approach which allows not only to manage revisions of schema and dimension data but also track retroactive and proactive updates in DW using both valid-time and transaction-time. The main objective of this work is to propose an evolution model for bi-temporal DW using bi-temporal schema versioning.

USIC&T- 4.03

Paper Title: Empirical validation of metrics for object oriented multidimensional model for data warehouse

Author(s): Gosain, A.¹, and Mann, S².

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Maharaja Surajmal Institute of Technology, GGSIPU, New Delhi-110006

Source: International Journal of System Assurance Engineering and Management Vol. 5, (2014), pp 262–275

ISSN No.: 0975-6809.

Abstract: Metrics have been popularly used to guide designers to develop quality data models. Researchers have proposed metrics for multidimensional models for data warehouses. These metrics need to be empirically validated to prove their practical utility. This paper presents the empirical validation of the metrics for multidimensional models for data warehouses at conceptual level. Quality attributes namely, understandability and efficiency are evaluated through various combinations of metrics. Multiple linear regression analysis has been used in this paper for predicting the multidimensional models quality. The results show that these metrics may be considered as solid indicators for quality of multidimensional data models. Finally, accuracy of our models in predicting the multidimensional models 'quality is evaluated.

USIC&T- 4.04

Paper Title: Empirical validation of structural metrics for predicting understandability of conceptual schemas for data warehouse

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Source: International Journal of System Assurance Engineering and Management Vol. 5, (2014), pp 291–306

ISSN No.: 0975-6809

Abstract: Data warehouse (DW) quality depends on its data models (conceptual, logical and physical model). Multidimensional (MD) modeling has been widely recognized as the backbone of data modeling for DW. Recently, some of the authors have proposed a set of structural metrics to assess quality of MD conceptual models. They have found the significant relationship between metrics and understandability of DW conceptual schemas using various correlation analysis techniques such as Spearman's, Pearson etc. However, advanced statistical and machine learning methods have not been used to predict effect of each metric on understandability. In this paper, our focus is on predicting the effect of structural metrics on understandability of conceptual schemas using (i) statistical method (logistic regression analysis) that include univariate and multivariate analysis, (ii) machine learning methods (Decision Trees, Naive Bayesian Classifier) and (iii) compare the performance of these statistical and machine learning methods. The results obtained show that some of the metrics individually have a significant effect on the understandability of MD conceptual schema. Further, few of the metrics have a significant combined effect on understandability of conceptual schema. The results also show that the performance of Naive Bayesian Classifier prediction method is better than logistic regression analysis and Decision Trees methods.

USIC&T- 4.05

Paper Title: Privacy preservation in big data

Author(s): Gosain, A., and Chugh, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Applications Vol. 100(17),(2014),pp 44-47

ISSN No.: 0975 – 8887

Abstract: Big data has brought a revolution in the world of data analytics. Data that was discarded a few years back is now considered a powerful asset. Big data is now being extensively used for knowledge discovery by all sectors of society. It is produced by almost all digital processes and is stored, shared on web. This reliance of big data on web model poses serious security concerns. Traditional security methods cannot be applied to big data due to its large volume, variety and volume. Also since big data contains person specific information, privacy is a major security concern. The three important privacy preservation methods are: data anonymization, notice and consent and differential privacy. In this paper we discuss these privacy preservation methods for big data and how differential privacy is a better solution for big data privacy.

USIC&T- 4.06

Paper Title: New Design Principles for Effective Knowledge Discovery from Big Data

Author(s): Gosain, A. and Chugh, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Applications, Vol. 96(17), (2014), pp 19-23

ISSN No.: 0975 – 8887

Abstract: Big data is creating hype in IT industry. Knowledge discovery from big data can allow organizations to have deeper insights, look at the bigger picture and project big returns. There are various principles that have been presented for knowledge discovery from big data by ORNL (Oak Ridge National University), USA. These are: (i) support a variety of analysis methods, (ii) one size doesn't fit all, (iii) make data accessible. However timeliness and security still pose great challenges in the knowledge discovery process. Timely analysis of big data is essential because data is being produced at a very high velocity. Security of big data is difficult to ensure since big data solutions were not developed with security in mind. In this paper, we give a view of various big data dimensions and present two new principles based on security and timely analysis for knowledge discovery from big data.

USIC&T- 4.07

Paper Title: Theoretical and empirical validation of comprehensive complexity metric for multidimensional models for data warehouse.

Author(s): Nagpal, S.¹, Gosain, A.², and Sabharwal, S.³

Affiliation(s): ^{1,3}Netaji Subhas Institute of Technology, New Delhi; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of System Assurance Engineering and Management Vol.4(2), (2013), pp 193–204

ISSN No.: 0975-6809

Abstract: Structural complexity metrics have been widely used to assess quality of an artefact. Researchers in past have defined complexity metrics to assess the quality of multidimensional models for data warehouse. These metrics have been defined considering various elements like facts, dimensions, dimension hierarchies etc., but have not taken into account the relationships among these elements of the models. In our previous work, a comprehensive complexity metric for multidimensional models for data warehouse has been proposed which not only considered complexity due to the elements but also structural complexity due to relationships among these elements. However, the proposal lacks theoretical and empirical validation of the metric. Hence, practical utility of the metric could not be established. This paper validates the proposed metric theoretically as well as empirically. The theoretical validation using Briand's framework shows that the proposed metric satisfies most of the properties required for a complexity measure. Empirical validation is carried out to observe the relationship between the complexity metric and understandability-a sub-characteristic of maintainability of multidimensional models. The results show that the metric has significant positive correlation with understandability of multidimensional models. Predictive model based on Ordinal Regression proposed in this work indicates that the proposed complexity metric may act as objective indicator for understandability as accuracy of the model is 86.3 % which is quite high.

USIC&T- 4.08

Paper Title: Validating dimension hierarchy metrics for the understandability of multidimensional models for data warehouse

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Source: IET software, Vol. 7(2), (2013), pp 93-103

ISSN No.: 1751-8806

Abstract: Structural properties including hierarchies have been recognised as important factors influencing quality of a software product. Metrics based on structural properties (structural complexity metrics) have been popularly used to assess the quality attributes like understandability, maintainability, fault-proneness etc. of a software artefact. Although few researchers have considered metrics based on dimension hierarchies to assess the quality of multidimensional models for data warehouse, there are certain aspects of dimension hierarchies like those related to multiple hierarchies, shared dimension hierarchies among various dimensions etc. which have not been considered in the earlier works. In the authors' previous work, they identified the metrics based on these aspects which may contribute towards the

structural complexity and in turn the quality of multidimensional models for data warehouse. However, the work lacks theoretical and empirical validation of the proposed metrics and any metric proposal is acceptable in practice, if it is theoretically and empirically valid. In this study, the authors provide thorough validation of the metrics considered in their previous work. The metrics have been validated theoretically on the basis of Briand's framework – a property-based framework and empirically on the basis of controlled experiment using statistical techniques like correlation and linear regression. The results of these validations indicate that these metrics are either size or length measure and hence, contribute significantly towards structural complexity of multidimensional models and have considerable impact on understandability of these models.

USIC&T- 4.09

Paper Title: A robust kernelized intuitionistic fuzzy c-means clustering algorithm in segmentation of noisy medical images

Author(s): Kaur, P.¹, Soni, A.K.² and Gosain, A.³

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Source: Pattern Recognition Letters, Vol. 34(2),(2013), pp 163-175

ISSN No.: 0167-8655

Abstract: This paper presents an automatic effective intuitionistic fuzzy c-means which is an extension of standard intuitionistic fuzzy c-means (IFCM). We present a model called RBF Kernel based intuitionistic fuzzy c means (KIFCM) where IFCM is extended by adopting a kernel induced metric in the data space to replace the original Euclidean norm metric. By using kernel function it becomes possible to cluster data, which is linearly non-separable in the original space, into homogeneous groups by transforming the data into high dimensional space. Proposed clustering method is applied on synthetic data-sets referred from various papers, real data-sets from Public Library UCI, Simulated and Real MR brain images. Experimental results are given to show the effectiveness of proposed method in contrast to conventional fuzzy c-means, possibilistic c-means, possibilistic fuzzy c-means, noise clustering, kernelized fuzzy c-means, type-2 fuzzy cmeans, kernelized type-2 fuzzy c-means, and intuitionistic fuzzy c-means.

USIC&T- 4.10

Paper Title: Robust kernelized approach to clustering by incorporating new distance measure

Author(s): Kaur, P.¹, Soni, A.K.² and Gosain, A.³

Affiliation(s): ¹Department of Information Technology, Maharaja Surajmal Institute of Technology, New Delhi 110058; ²Department of Computer Science, Sharda University, Greater Noida, Uttar Pradesh; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Engineering Applications of Artificial Intelligence, Vol. 26(2),(2013),pp 833-847

ISSN No.: 0952-1976

Abstract: A new data clustering algorithm Density oriented Kernelized version of Fuzzy c-means with new distance metric (DKFCM-new) is proposed. It creates noiseless clusters by identifying and assigning noise points into separate cluster. In an earlier work, Density Based Fuzzy C-Means (DOFCM) algorithm with Euclidean distance metric was proposed which only considered the distance between cluster centroid and data points. In this paper, we tried to improve the performance of DOFCM by incorporating a new distance measure that has also considered the distance variation within a cluster to regularize the distance between a data point and the cluster centroid. This paper presents the kernel version of the method. Experiments are done using two-dimensional synthetic data-sets, standard data-sets referred from previous papers like DUNN data-set, Bensaid data-set and real life high dimensional data-sets like Wisconsin Breast cancer data, Iris data. Proposed method is compared with other kernel methods, various noise resistant methods like PCM, PFCM, CFCM, NC and credal partition based clustering methods like ECM, RECM, CECM. Results shown that proposed algorithm significantly outperforms its earlier version and other competitive algorithms.

USIC&T- 4.11

Paper Title: Space and Time Analysis on the Lattice of Cuboid for Data Warehouse.

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Source: International Journal of Computer Applications, Vol.77(3), (2013),pp 47-52

ISSN No.: 0975 – 8887.

Abstract: Multidimensional analysis requires the computation of many aggregate functions over a large volume of collected data. To provide the various viewpoints for the analysts, these data are organized as a multi-dimensional data model called data cubes. Each cell in a data cube represents a unique set of values for the different dimensions and contains the metrics of interest. The different abstraction and concretization associated with a dimension may be represented as lattice. The focus is to move up and drill down within the lattice using an algorithm with optimal space and computation. In the lattice of cuboids, there exist multiple paths for summarization from a lower to an upper level of cuboid. The alternate paths involve different amounts of storage space and different volume of computations. Thus objective of this paper is to design an algorithm for formal analysis leading towards detection of an optimal path for any two given valid pair of cuboids at different levels. Algorithm is proposed based on branch and bound method for selection of optimal path. Experimental results in the last show that the solution obtained by the algorithm gives the optimal solution in terms of space and time computation.

USIC&T- 4.12

Paper Title: Non-Functional Requirement Classification for Service-Oriented Data Warehousing

Author(s): Gosain, A.¹, Sabharwal, S.² and Gupta, R.³

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Source: International Journal of Scientific and Research Publications,(2013), pp1-6

ISSN No.: 2250-3153.

Abstract: Recently, Data Warehouse has proven to be a powerful technology for the integration of heterogeneous data into a multidimensional repository for decision-support analysis. The complex ETL (extraction, transformation and loading) process and the aggregation-intensive queries are affected by a sequence of domain specific NFRs (Non Functional Requirement). This advocates the use of service oriented NFR approach for building a data warehouse specification. However, the specification and classification of service oriented systems and service oriented data warehousing (DW) systems have not been addressed to the appropriate level as attempted for non service-oriented systems. In this paper, we propose a new framework for the classification of NFR (Non-functional requirements) with respect to engineering service oriented and service oriented data warehousing systems. In addition, this proposed classification is supposed to be of significance in terms of NFRs classification for service engineering and service-oriented DW engineering.

USIC&T- 4.13

Paper Title: Robust new distance kernelized approach to distributed clustering.

Author(s): Singh, D. and Gosain, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering Science & Advanced Technology, Vol.3(4), (2013), pp 165-169

ISSN No.: 2250-3676

Abstract: Clustering has become one of the most widely used tasks in analyzing the vast amount of data. In clustering the given datasets are grouped in similar sets where the data points of one group are dissimilar to the data points belonging to other groups. Fuzzy clustering is based on the clustering process which forms the soft clusters. The clustering algorithm DKFCM-new identifies outliers by using density of points in the data-set before creating clusters. It is a density oriented kernelized technique to fuzzy c-means algorithm based on new distance measure. But all these algorithms are traditional clustering algorithms. Traditional clustering algorithms require all the data sets to reside at the single location In today's business scenario data sets usually resides at different data locations, for this distributed clustering algorithms are implemented. This paper presents a distributed version of DKFCM-new algorithm named as robust new distance kernelized approach to distributed clustering.

USIC&T- 4.14

Paper Title: Image segmentation of noisy digital images using extended fuzzy C-means clustering algorithm

Author(s): Kaur, P.¹, Soni, A.K.² and Gosain, A.³

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Source: International Journal of Computer Applications in Technology, Vol. 47(23), (2013), pp 198-205

ISSN No.: 0952-8091

Abstract: Fuzzy C-Means algorithm fails to segment the noisy image properly. In this paper, we present an algorithm called Extended Fuzzy C means (EFCM), which pre-processes the image to reduce the noise effect and then apply FCM algorithm for

image segmentation. Pre-processing of image is influenced by the direct eight neighbourhood pixels of every pixel of an image under consideration. Proposed algorithm has least execution time and it yields regions more homogeneous than those of other techniques. It removes noisy spots and is less sensitive to noise. The proposed technique is a powerful method for noisy image segmentation compared to other image segmentation techniques.

USIC&T- 4.15

Paper Title: On completeness and traceability metrics for data warehouse requirements engineering

Author(s): Kumar, M.¹, Gosain, A.² and Singh, Y.³

Affiliation(s): ¹Ambedkar Institute of Advanced Communication Technologies & Research, Delhi; ^{2,3}University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computational Systems Engineering, Vol.1(4), (2013), pp 229 – 237

ISSN No.: 2046-3391

Abstract: Due to increased complexity of data warehouse (DW), continuous attention must be paid for evaluation of quality throughout its design and development. The quality of models is one of the main factors that influence information quality of DW. In some earlier works, metrics or guidelines to assure the quality of conceptual, logical and physical models for DW were proposed. To the best knowledge of the authors, there is no significant work found in the literature that may assure quality of DW requirements model. In this paper, we present requirements completeness and traceability metrics to monitor the progress of DW requirements engineering (RE) products (i.e., requirements model) while using a particular approach. Here, in our case, our existing approach is being used for capturing DW requirements, in which, we capture requirements in terms of organization model, decision model and information model. We have successfully applied our proposed metrics to these DW requirements models for a typical banking organization.

USIC&T- 4.16

Paper Title: A comprehensive study of view maintenance approaches in data warehousing evolution

Author(s): Jain, H. and Gosain, A.

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Source: ACM SIGSOFT Software Engineering Notes Vol. 37, (2012), pp 1-8

ISSN No.: 0163-5948.

Abstract: A data warehouse mainly stores integrated information over data from many different remote data sources for query and analysis. The integrated information at the data warehouse is stored in the form of materialized views. Using these materialized views, user queries may be answered quickly and efficiently as the information may be directly available. These materialized views must be maintained in answer to actual relation updates in the different remote sources. One of the issues related to materialized views is that whether they should be recomputed or they should be adapted incrementally after every change in the base relations. View maintenance is the process of updating a materialized view in response to changes to the underlying data is called view maintenance. There are several algorithms developed by different authors to ease the problem of view maintenance for data

warehouse systems. In this paper, we have provided a comprehensive study on research works of different authors related to DW view maintenance considering various parameters and presented the same in tabular way.

USIC&T- 4.17

Paper Title: Implementing schema evolution in data warehouse through complex hierarchy semantics
Author(s): Talwar, K.¹ and Gosain, A.²
Affiliation(s): ¹Manav Rachna University Faridabad; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: International Journal of Scientific & Engineering Research, Vol. 3(7), (2012), pp 917-922
ISSN No.: 2347-3878
Abstract: Data in a data warehouse is collected from several heterogeneous data sources under a unified format, which aims to provide strategic outcomes to the decision makers and facilitate pattern and trend analysis. These data sources are dynamic in nature, due to ongoing transactions in an organization and ever changing requirements. This dynamic nature of the data warehouse has to be dealt with evolution in the data warehouse schema in order to incorporate all the new changes and requirements. In data warehouse systems, the hierarchies play a very important role in processing and monitoring information. So in order to handle complex hierarchies in case of data warehouse evolution, we have proposed evolution operators and certain constraints that need to be fulfilled for ensuring data integrity and schema correctness. This schema correctness in case of evolution is ensured through triggers. In this paper, we have considered a formal metamodel to model the constructs in data warehouse. Also the constraints and operators are defined using the Uni-level Description.

USIC&T- 4.18

Paper Title: Quality-oriented requirements engineering approach for data warehouse
Author(s): Kumar, M.¹, Gosain, A.² and Singh, Y.²
Affiliation(s): ¹Ambedkar Institute of Advanced Communication Technologies & Research, Delhi; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: International Journal of Computational Systems Engineering Vol. 1(2), (2012), pp 127-138
ISSN No.: 2046-3391
Abstract: Data warehouse (DW) quality depends on the quality of its requirements, conceptual, logical and physical models. Some of the authors have proposed guidelines and metrics to assure the quality of conceptual, logical and physical models for DWs. However, there is a lack of guidelines for the requirements analyst to obtain a quality requirements model for DW. In this paper, we propose a quality-oriented requirements engineering approach for DW, where existing agent-goal-decision-information (AGDI) model is extended with the notion of perspective to capture intentions of the agents based on proposed model of (1), DW requirements are captured through various modelling activities namely; organisation modelling, decision modelling and information modelling in order to assure quality of requirements model, various guidelines are proposed that must be followed by the analyst while performing various requirements modelling activities of (2). The

proposed approach is illustrated for capturing DW requirements through a running example of a public sector banking organisation.

USIC&T- 4.19

Paper Title: Predicting quality of data warehouse using fuzzy logic

Author(s): Gosain, A.¹, Sabharwal, S.² and Gupta, R.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ^{2,3}Netaji Subhas Institute of Technology, Delhi University, Delhi

Source: International Journal of Business and Systems Research Vol. 6(3), (2012), pp255-268

ISSN No.: 1751-200X

Abstract: Due to strategic importance of data warehouse (DW) as decision support systems, it has become crucial to guarantee that these repositories should provide quality information to the decision makers. Quality of data warehouse multidimensional model has significant effect on data warehouse quality and in turn on the information quality. Few authors have suggested metrics to assess the quality of data warehouse multidimensional models. Empirical validation using statistical techniques like correlation analysis, univariate and multivariate regression techniques, etc., indicated that these metrics are significantly related to the quality of multidimensional models for data warehouse. But these techniques are not able to model non-linear relationship between the metrics and quality of multidimensional model. In this paper, model based on fuzzy logic approach is proposed to approximate non-linear relationship between the metrics and the quality of multidimensional models. In order to empirically evaluate the effectiveness of the proposed approach, validation is done on the published data and results indicate that the proposed model is able to predict the output with significant accuracy.

USIC&T- 4.20

Paper Title: Predicting the quality of object oriented multidimensional (OOMD) model of data warehouse using fuzzy logic technique.

Author(s): Babar Ali, K.B. and Gosain, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering Science & Advanced Technology Vol. 2(4),(2012),pp 1048-1054

ISSN No.: 2250–3676.

Abstract: Data warehouse is a powerful tool which makes decision faster and reliable in organizations where 'information' is the main asset of primary concern. It is very necessary to assure the information quality of the data warehouse. Information quality depends on multidimensional model quality of data warehouse. In the last few years 'different authors have suggested several approaches to access the quality of multidimensional models of data warehouse. However empirical validation of these metrics has been made using statistical technique like correlation analysis, univariate and multivariate regression technique etc. But all these technique are not capable to model non linear relationship between the metrics and the quality of multidimensional model. In this paper we firstly proposed a model based on fuzzy logic technique to model nonlinear relationships between the metrics and the quality of object oriented multidimensional (OOMD) model. Then empirically evaluate the effectiveness of the proposed model, result of fuzzy based model compared with the

result of controlled experiment conducted by us and result shows that the proposed fuzzy logic based model is capable to predict the output with considerable accuracy.

USIC&T-5.01

Paper Title: Identifying influential metrics in the combined metrics approach of fault prediction

Author(s): Goyal, R., Chandra, P. and Singh, Y.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Springer Plus, Vol. 2(1),(2013), pp 1–8

ISSN No.: 2193-1801

Abstract: Fault prediction is a pre-eminent area of empirical software engineering which has Witnessed a huge surge over the last couple of decades. In the development of a fault prediction model, combination of metrics results in better explanatory power of the model. Since the metrics used in combination are often correlated, and do not have an additive effect, the impact of a metric on another i.e.interaction should be taken into account. The effect of interaction in developing regression based fault prediction models is uncommon in software engineering; however two terms and three term interactions are analyzed in detail in social and behavioral sciences. Beyond three terms interactions are scarce, because interaction effects at such a high level are difficult to interpret. From our earlier findings (Softw Qual Prof 15(3):15-23) we statistically establish the pertinence of considering the interaction between metrics resulting in a considerable improvement in the explanatory power of the corresponding predictive model. However, in the aforesaid approach, the number of variables involved in fault prediction also shows a simultaneous increment with interaction. Furthermore, the interacting variables do not contribute equally to the prediction capability of the model. This study contributes towards the development of an efficient predictive model involving interaction among predictive variables with are duced set of influential terms, obtained by applying stepwise regression.

USIC&T-5.02

Paper Title: Disk scheduling using a customized discrete firefly algorithm

Author(s): Singh, A., Thapar, S., Bhatia, A., Singh, S. and Goyal, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Cogent Engineering, Vol. 2(1),(2015), pp 1011929(1-12)

ISSN No.: 2331-1916.

Abstract: This study empirically investigates the usage of a customized discrete firefly algorithm (DFA) for ordering the disk requests to minimize the total access time. The procedure simulates the movement of each firefly within a population towards others using a variation of edge-based mutation. The Algorithm was applied to randomized standard disk sequences with varying length of input disk requests. Owing to the greater impact of seek time in the determination of access time for a disk having sizable number of tracks, this has been taken as the primary performance factor in the sched-uling of tasks. The analysis of the results obtained establishes the relative advantage of using the firefly optimization method over the traditional disk scheduling algorithms.

USIC&T-5.03

Paper Title: A Hybrid Autonomic Computing-Based Approach to Distributed Constraint Satisfaction Problems

Author (s): Bhatia, A., Singh, A. and Goyal, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Computers, Vol. 4(1),(2015),pp 2–23

ISSN No.: 2073-431X.

Abstract: Distributed constraint satisfaction problems (DisCSPs) are among the widely endeavored problems using agent-based simulation. Fernandez et al. formulated sensor and mobile tracking problem as a DisCSP, known as SensorDCSP. In this paper, we adopt a customized ERE (environment, reactive rules and entities) algorithm for the SensorDCSP, which is otherwise proven as a computationally intractable problem. An amalgamation of the autonomy-oriented computing (AOC)-based algorithm (ERE) and genetic algorithm (GA) provides an early solution of the modeled DisCSP. Incorporation of GA into ERE facilitates auto-tuning of the simulation parameters, thereby leading to an early solution of constraint satisfaction. This study further contributes towards a model, built up in the NetLogo simulation environment, to infer the efficacy of the proposed approach.

USIC&T-5.04

Paper Title: On the role of evangelism in consensus formation: a simulation approach

Author(s): Sharma, I., Chourasia, B., Bhatia, A. and Goyal, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Complex Adaptive Systems Modeling, Vol. 4(1),(2016),pp 1-21

ISSN No.: 2194-3206

Abstract: Purpose: Opinions continuously evolve in society. While conservative ideas may get replaced by a new one, some views remain immutable. Opinion formation and innovation diffusion have witnessed lots of attention in the last decade due to its widespread applicability in the diverse domain of science and technology. We analyse these scenarios in which interactions at the micro level results in the changes in opinions at the macro level in a population of predefined ideological groups.

Methods: We use the Bass model, otherwise well known for understanding innovation diffusion phenomena, to compute adoption probabilities of three opinion states zealot, extremists and moderates. Thereafter, we employ cellular automata to explore the emergence of opinions through local and overlapped interactions between agents (people). NetLogo environment has been used to develop an agent-based model, simulating different ideological scenarios.

Results: Simulation results validate a critical proportion of committed individuals as a plausible basis for ideological shifts in societies. The analysis elucidates upon the role of moderates in the population and emergence of varying opinions. The results further delineate the role of evangelism through social and non-social methods in propagating views.

Conclusion: The results obtained from these simulations endorse the conclusions reported in previous studies regarding the role of a critical zealot population, and the preponderance of non-social influence. We, however, use two-phase opinion model with different experimental settings. Additionally, we examine global observable, such as entropy of the system to reveal common patterns of adoption in the views and evenness of population after reaching a consensus.

USIC&T- 6.01

Paper Title: An approach for improving quality of Emotion Transformation for Hindi

Author(s): Jain, A.¹, Agrawal, S.S.² and Prakash, N.³

Affiliation(s): ^{1,3}University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²NLP department, C-DAC, NOIDA (UP)

Source: C.S.I. Journal of Computing, Vol.1(2), (2012), pp 7:60-7:66

ISSN No.: 2277-7091

Abstract: Speaking Style is an important cue to express the feeling of one's expression and also an important factor in expressive speech synthesis. To understand the semantic of an utterance, it must be in proper option otherwise semantically, utterance will give wrong meaning. Keeping the facts in view, an algorithm is proposed to improve the quality of transformed expressive utterance. The transformation adopts the concept of Linear Modification Model (LMM) model and improves the output using proposed word boundary detection algorithm. The parameters used in the study are F0, Segmental duration and Intensity from the acoustic distribution analysis. For target emotions- sadness, happiness, anger and surprise are considered. In the experiment, Segmental duration and F0 contours of neutral emotion are modified to desired target emotion using the TD-PSOLA approach. The modification is applied on each and every word segment (using Word Boundary Detection method) of utterances.

USIC&T- 6.02

Paper Title: Transformation of emotion based on acoustic features of Intonation patterns for Hindi speech and their perception

Author(s): Jain, A.¹, Agrawal, S.S.² and Prakash, N.³

Affiliation(s): ^{1,3}University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²NLP department, C-DAC, NOIDA (UP)

Source: IETE Journal of Research, Vol. 57(4),(2012), pp 318-324

ISSN No.: 0377-2063

Abstract: Change in Intonation patterns may convey not only different meaning, but also different emotions even if the sequence of speech segments is the same in a sentence. On the basis of the analysis on intonation, an algorithm has been proposed for emotion conversion's accuracy of Perception test on transformed emotions was found out to be 93.2% for surprise, 91.6% for sadness, 83% for happiness and 95.3% for anger.

USIC&T- 6.03

Paper Title: Anti-Phishing Techniques: A Review

Author(s): Gaurav, Mishra, M. and Jain, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering Research and Applications, Vol.2(2), (2012),pp 350-355

ISSN No. : 2248-9622

Abstract: Phishing is an attack that deals with social engineering methodology to illegally acquire and use someone else's data on behalf of legitimate website for own benefit

(e.g. Steal of user's password and credit card details during online communication). It is affecting all the major sectors of industry day by day with a lot of misuse of user credentials. To protect users against phishing, various anti-phishing techniques have been proposed that follows different strategies like client side and server side protection. In this paper we have studied phishing in detail (including attack process and classification of phishing attack) and reviewed some of the existing anti-phishing techniques along with their advantages and disadvantages.

USIC&T- 6.04

Paper Title: A Preventive Anti-Phishing Technique Using code word.

Author(s): Gaurav, Mishra, M. and Jain, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Sci. and Info. Tech., Vol.3(3),(2012), pp 4248-4250

ISSN No.: 0975-4660

Abstract: The technique used to perform online theft/stealing of user credentials is termed a phishing in cyber world. It is affecting all the major sectors of industry day by day with a lot of misuse of user credentials. To stop phishing many detection and prevention techniques has been made with their own advantages and disadvantages respectively, but phishing has been eradicated completely. Seeing the fact that phished pages generally asks for entering and submitting the credentials but is not able to retrieved any user known data, here we propose a preventive anti-phishing technique avoid to be victims of phishing attacks

USIC&T-7.01

Paper Title: CONCOR: context-aware community-oriented routing for intermittently connected network

Author(s): Johari, R.¹, Gupta, N.² and Aneja, S.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ^{2,3} Delhi University.

Source: EURASIP Journal on Wireless Communications and Networking, No.1, (2015),pp 1-13

ISSN No.: 1687-1499

Abstract: Delay-Tolerant Networks (DTNs) are characterized by time-varying and partially connected network topology. In such networks, mobility of node may be by virtue of its carrier. Social beings such as humans may act as a carrier of mobile nodes, and therefore mobility pattern of node follows a social-based movement model. Due to intermittent connectivity, end-to-end path between source and destination is rare and therefore message delivery is a challenge in such networks. In this paper, we present a new routing approach, context-aware community-oriented routing (CONCOR) that exploits the community and the context awareness of nodes, efficient message delivery. Nodes with a common point of interest form a dynamic community. We have identified a set of node's attribute (context) and formulated a utility function to determine its capability to deliver a message. CONCOR is a multi hop routing approach exploiting the nodes as message relays (store-carry-forward). Through simulation, we validated the effectiveness of node's attributes in estimation of message delivery probability. The simulations were done for our approach using the social movement-based data set on Opportunistic Network Environment (ONE) simulator. We compared our approach with dynamic social grouping (DSG)-based

routing and context-aware routing(CAR) on three metrics viz. message delivery ratio, message traffic ratio and average message delay. We found that the results of our approach outperforms the DSG and CAR on all the three metrics.

USIC&T-7.02

Paper Title: POSOP routing algorithm: a DTN routing scheme for information Connectivity of health centres in Hilly State of North India

Author(s): Johari, R.¹, Gupta, N.² and Aneja, S.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind SinghIndraprastha University, Dwarka, New Delhi-110078; ^{2,3} Delhi University.

Source: International Journal of Distributed Sensor Networks, Vol. 11(6),(2015),pp 376861

ISSN No.: 1550-1477

Abstract: We explore the application of partitioned network for providing health services in difficult terrain where fixed communication infrastructure is not cost-effective due to low population density and very high cost of setting up a permanent infrastructure. We propose a hybrid routing which is persistent, on-demand, scheduled, opportunistic, and predicted (POSOP) routing algorithm, that exploits various types of contacts existing in a partitioned, hybrid, and sparse network. Such networks may be used to provide guidance from specialist doctors to junior doctors working in primary health centres. We present a scenario from Uttarakhand (a state in hilly region of North India), where POSOP routing algorithm may be used to provide improved health services. Using simulations, we evaluate the performance of POSOP routing algorithm on three metrics, messages delivered, average delay suffered by the delivered messages, and average message traffic. We compare the performance of POSOP routing algorithm with two routing schemes, namely, epidemic and spray and wait on the three metrics. Our approach outperforms both the routing schemes.

USIC&T-7.03

Paper Title: Analysis of Social Network: A Community Oriented Case Study

Author(s): Pal, D. and Johari, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Applications, Vol.110(15), (2015),pp 29-37

ISSN No.: 0975-8887

Abstract: To begin with, the network that enables millions of people to remain connected with each other irrespective of the caste, color and creed online is the Social Network. Social network is the boundary less network which had gained immense popularity in the last couple of years as more and more people are becoming wired. Interest of people is increasing in social networks and so is the usage of it. All this has resulted in manifold increase in the network traffic thereby draining network resources such processing power, server storage space and bandwidth and has also posed big challenge in terms of security of the naïve users on the web. In the current work analysis of the issues in the Social network and the relationships between the users of a social network in terms of network theory is done. Investigation on how one can form relations among different communities, explore property of connectedness - among and within them, impact of mobility of users (active nodes/passive nodes), betweenness and centrality etc is shown. The objective of the work is also to analyze how different communities are fractioned on the social network, what are the relationships between them, on what factors are they connected? Further it is also shown how a message reaches from user of one community to user of another

community taking minimum distance and time. Whether is it possible for the message to reach from a particular community to another community and if it is then what route it takes, how much nodes it covers, in how much time it reaches and what number of nodes are affected by this. To achieve it various Social network analysis tools were explored such as GraphInsight, Gephi, Social Network Visualizer (SOcNetV) and NetMiner etc. and the proposed work/simulation is exhibited using the Gephi tool.

USICT-7.04

Paper Title: Secure Encryption Technique ForAlphamumeric Data Over Web Based Applications

Author(s): Ruby, L. and Johari, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering Research & Technology, Vol.3(8),(2014),pp 8-11

ISSN No.: 2278-0181

Abstract: In today's scenario of cyber-attacks like phishing, man in the middle attacks And system compromises, it is difficult to ensure the secure data transfer. In order to ensure confidentiality there is a requirement to encrypt the data. Various techniques have been proposed by the researchers over a period of time regarding the encryption of data and it's subsequent transmission over the web. But in our literature survey we didn't across a technique which is able to encrypt and decrypt the Alphabets , Numbers and Alphanumeric data in minimum span of time with minimum lines of code. The designed logic has been tested successfully by writing modules coded using open source JAVA programming language with the file containing plain text in the form of only alphabets, numbers and alphanumeric characters . Since the logic implemented is custom made, there is remote possibility of breaking the encryption by an intruder, since the logic will be a secret known only within the organization.

USIC&T-7.05

Paper Title: Experimental evaluation of routing schemes for intermittently connected wireless mobile networks

Author(s): Johari, R.¹, Gupta, N.² and Aneja, S.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ^{2,3}Delhi University

Source: Wireless Personal Communications, Vol. 87(3), (2016),pp 897-921

ISSN No.: 0929-6212

Abstract: Several routing schemes have been proposed for intermittently connected wireless mobile networks. The effectiveness of these routing schemes is mostly evaluated using the metrics: messages delivered, message traffic and delay suffered by delivered messages. These metrics provide very limited evaluation of routing schemes. Even very simple and well known attributes like time and space complexity of routing schemes were not measured for evaluating the quality and applicability of routing schemes. Therefore, many significant aspects such as, resource utilization, efficiency in terms of space and time, quality of service parameters and security aspect etc. of routing schemes get overlooked. In this paper, we present the results of experimental evaluation, through simulation, of routing schemes for intermittently connected wireless mobile networks such as Delay Tolerant Network. We evaluated four routing schemes, based on different principles, namely First contact, Epidemic,

Spray and wait and Dynamic Social Grouping, on parameters, such as, resource utilization, efficiency, performance and security. We found Spray and wait routing scheme performed better than others, both in terms of resource utilization and efficiency (time and space).

USIC&T-7.06

Paper Title: Delay Tolerant Network: Routing Issues and Performance (DRiP)

Author(s): Afreen, F. and Johari, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Autonomic Computing, Vol. 2(2), (2016),pp 99-113

ISSN No.: 1741-8569

Abstract: Delay tolerant networks (DTNs) are deployed in long distance data communications where delay is permissible like in interplanetary networks (IPNs). For the transfer of messages in a DTN, various routing schemes have been proposed but there has not been an umpteen amount of work related to their comparisons. Therefore, a study of the routing techniques, issues in DTN connectivity and performance analysis of routing algorithms in DTN have been showcased in the current work. This analysis would help the researchers in identifying the most efficient routing scheme amongst well known routing algorithms.

USIC&T-8.01

Paper Title: A Hybrid Technique using Grey Relational Analysis and Regression for Software Effort Estimation using Feature Selection

Author(s): Nagpal, G.¹, Uddin, M.² and Kaur, A.³

Affiliation(s): ¹Computer Science Department, National Institute of Technology, Jalandhar, Punjab; ²Delhi Technological University, Delhi; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Soft Computing and Engineering, Vol.1(6), (2012),pp 20-27

ISSN No.: 2231-2307

Abstract: Software Estimation Techniques present an inclusive set of directives for software project developers, project managers and the management in order to produce more accurate estimates or predictions for future developments. The estimates also facilitate allocation of resources 'for Software development. Estimations also smooth the process of re-planning, prioritizing, classification and reuse of the projects. Various estimation models are widely being used in the Industry as well for research purposes. Several comparative studies have been executed on them, but choosing the best technique is quite intricate. Estimation by Analogy(EbA) is the method of making estimations based on the outcome from k most analogous projects. The projects close in distance are potentially similar to the reference project from the repository of projects. This method has widely been accepted and is quite popular as it impersonates human beings inherent judgment skill by estimating with analogous projects. In this paper, Grey Relational Analysis(GRA) is used as the method for feature selection and also for locating the closest analogous projects to the reference project from the set of projects. The closest k projects are then used to build regression models. Regression techniques like Multiple Linear Regression, Stepwise Regression and Robust regression techniques are used to find the effort from the closest projects.

USIC&T-8.02

Paper Title: Implementation and analysis of the bee colony optimization algorithm for fault based regression test suite prioritization

Author(s): Kaur, A. and Goyal, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Applications, Vol. 41(14), (2012), pp 1-9

ISSN No.: 0975 – 8887

Abstract: Regression Testing is an important maintenance phase testing activity. The importance of this activity lies in the fact that it imparts confidence and accuracy in the modified code, as well as keeps a check on the unmodified parts, if they are affected or not. But there is a severe requirement to reorder the development testing test suite because of the constrained software development budget, time and effort. So techniques have to be developed to prioritize test cases to reduce budget, time and effort constraints effectively. In this paper implementation and analysis of an existing fault based regression test suite has been done. The prioritization algorithm is based on the nature inspired algorithm called Bee Colony Optimization (BCO) algorithm. The algorithm is a two step procedure which maps the food foraging behavior of scout bee and forager bee one after the other to reach to the solution. The analysis of the examples using the code developed indicates that the two step BCO algorithm is able to produce results which are comparable to optimal results.

USIC&T-8.03

Paper Title: Systematic literature review on regression test prioritization techniques

Author(s): Kaur, A., Suri, B. and Singhal, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Informatica, Vol. 36, (2012), pp 379–408

ISSN No.: 0350-5596

Abstract: The purpose of regression testing is to validate the modified software and detect whether the unmodified code is adversely affected. Regression testing is primarily a maintenance activity. The main motivation behind this systematic review is to provide a ground for advancement of research in the field of Regression Test Prioritization. The existing techniques were compared along with their collected empirical evidence to find if any particular approach was superior to others. 65 papers reporting 50 experiments and 15 case studies were identified. A total of 106 techniques were evaluated for regression test prioritization. Also, a rigorous analysis of the techniques was performed by comparing them in terms of various measures like size of study, type of study, approach, input method, tool, metrics etc. Encouragingly, SLR yielded that almost half of the techniques for regression test prioritization are independent of their implementation language. While on the other hand the future research should focus on bridging the large gaps that were found existing in the usage of various tools and artifacts. During the course of research, a preliminary literature survey indicated that to the best of our knowledge, no systematic review has been published so far on the topic of regression test prioritization.

USIC&T-8.04

Paper Title: A Comparative Study of Estimation by Analogy using Data Mining Techniques

Author(s): Nagpal, G.¹, Uddin, M.², and Kaur, A.³

Affiliation(s): ¹Dept. of Computer Science and Engineering, National Institute of Technology, Jalandhar, Punjab; ²Delhi Technological University, Delhi; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Autonomic Computing, Vol. 8(4), (2012), pp 621-652

ISSN No. : 1741-8569

Abstract: Software Estimations provide an inclusive set of directives for software project developers, project managers, and the management in order to produce more realistic estimates based on deficient, uncertain, and noisy data. A range of estimation models are being explored in the industry, as well as in academia, for research purposes but choosing the best model is quite intricate. Estimation by Analogy (EbA) is a form of case based reasoning, which uses fuzzy logic, grey system theory or machine-learning techniques, etc. for optimization. This research compares the estimation accuracy of some conventional data mining models with a hybrid model. Different data mining models are under consideration, including linear regression models like the ordinary least square and ridge regression, and nonlinear models like neural networks, support vector machines, and multivariate adaptive regression splines, etc. A precise and comprehensible predictive model based on the integration of GRA and regression has been introduced and compared. Empirical results have shown that regression when used with GRA gives outstanding results; indicating that the methodology has great potential and can be used as a candidate approach for software effort estimation.

USIC&T-8.05

Paper Title: Validation of object-oriented metrics using open source software system: an empirical study

Author(s): Johari, K.¹ and Kaur, A.²

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Source: ACM SIGSOFT Software Engineering Notes, Vol.37, (2012), pp 1-4

ISSN No. : 0163-5948

Abstract: In today's environment the relevance of Free Open Source Software Systems is understood and appreciated both in academia and research. The debate about the pros and cons of the open source vis-à-vis proprietary software has been raging from ages ever since Richard Stallman founded the Free Software Foundation in 1985. With the changing trends in the domain of Object Oriented Systems there is a need to measure the fault predictability of software metrics on open source software systems. In this paper we present the results of empirical study which was conducted using open source software, JHotDraw 7.5.1. We computed the object oriented metrics, proposed by Chidamber and Kemmerer, and performed bug- class mapping for the software under study. We also studied the relationship between the revisions made to open source software and its software metrics measure

USIC&T-8.06

Paper Title: Analysis of Three Formal Methods-Z, B and VDM.

Author(s): Kaur, A., Gulati, S. and Singh, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering Research & Technology, Vol. 1(4), (2012),pp 1-5

ISSN No. : 2278-0181

Abstract: Formal methods provide a much needed solid software engineering foundation for the 'art' of programming computers. Formal specifications can be used to provide an unambiguous and consistent supplement to natural language descriptions and can be rigorously validated and verified leading to the early detection of specification errors. Most of the software is delivered with some bugs, with lack of complete functionality and sometimes with cost overrun. Formal methods can be a silver bullet for software industry for solving these problems. This paper compares and contrasts the strengths and weaknesses of the model oriented formal specification languages such as Z, B and Vienna Development Method (VDM) basis of various factors.

USIC&T-8.07

Paper Title: Impact of class attributes on cognitive complexity

Author(s): Johari, K.¹ and Kaur, A.²

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Source: International Journal of System Assurance Engineering and Management, Vol. 3(4), (2012), pp 284-299

ISSN No. : 0975-6809

Abstract: Understanding, an internal process of human beings, is difficult to measure but not impossible. Therefore attempts have been made to measure the understand ability of software system in terms of its complexity. Understandability of source code can be measured in terms of its cognitive complexity which is also called psychological complexity. This paper presents a metrics for measuring understandability of a class integral to Object Oriented Software System. The manuscript proposes metrics for measuring cognitive complexity of class due to its attributes. The proposed metrics takes into consideration the complexity introduced by data types of attributes that forms data elements of a class. The primitive, system defined and user-defined data types, used for defining the attributes have been weighted to measure the cognitive complexity of a class. Also an empirical study has been performed to gain insight on the correlation between the proposed measure and the understandability of the program. The results show the significance of measuring contribution of attributes towards cognitive complexity of a class. A metrics meant to measure cognitive complexity of a class should consider weighted measure of complexity introduced by different attributes of a class.

USIC&T-8.08

Paper Title: Systematic review of automatic test case generation by UML diagrams

Author(s): Kaur, A. and Vig, V.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering Research and Technology, Vol.1(7), (2012),pp 1-17

ISSN No. : 2278-0181

Abstract: Software testing is an important activity in the Software Development Life Cycle. To cut down the time and cost of manual testing and to increase the reliability of the software, researchers and practitioners have proposed various tools and techniques for automation of software testing. A great deal of research effort has been spent on finding efficient methods for different aspects of test case automation. Many researchers have proposed various techniques on automatic test case generation and it still remains an area of interest for them. This paper presents a systematic survey of the work done in the field of automatic generation of test case particularly related to UML based automated test case generation.

USIC&T-8.09

Paper Title: Mobile metrics: Measuring Accessibility of Web Contents on Mobile Handsets

Author(s): Johari, K.¹ and Kaur, A.²

Affiliation(s): ¹Centre for Development of Advanced Computing, CDAC, NOIDA(UP); ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Software Quality Professional, Vol. 15(2), (2013), pp 16-26

ISSN No. : 1522-0540

Abstract: The advancements in mobile communication technology have made access to the Internet on Internet-enabled mobile handsets much simpler. Therefore, it is important to measure the accessibility of Web contents, designed for desktop machines, on mobile handsets. The accessibility of Web contents on a mobile handset is one of the parameters for measuring its quality. In this article, the authors present the metrics formulated for measuring the accessibility of Web contents on a mobile handset. They measured the accessibility of Web contents on mobile devices in terms of the difference in the display between desktop-based browsers and mobile-based browsers. They also used time to download as one of the measures of accessibility. As the measures of difference in display and the time to download the Web contents on mobile devices increase, the accessibility of the Web contents decreases. The novel metrics have been validated with the help of an empirical study. The results of the study are reported in this article.

USIC&T-8.10

Paper Title: Some Interoperability Issues In The Designing Of Web Services: Case Study On Credit Card

Author(s): Johari, K¹ and Kaur, A.²

Affiliation(s): ¹Centre for Development of Advanced Computing, CDAC, NOIDA(UP); ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal on Web Service Computing, Vol. 4(4), (2013), pp 11-20

ISSN No. : 1545-7362

Abstract: In today's environment most of the commercial web based project developed in the industry as well numerous number of funded project/and studies taken as part of research oriented initiatives in the academia suffer from major technical issues as to how design, develop and deploy the Web Services that can run in variety of heterogeneous environments. In this paper we address the issues of interoperability between Web Services, the metrics which can be used to measure the interoperability and simulate the Online shopping application by developing the Credit Card Verification Software using Luhn's Mod 10 algorithm having Java Client written in NetBeans and the BankWebService in C# .NET.

USIC&T-8.11

Paper Title: The Web Navigability Structure of E-Banking in India

Author(s): Kaur, A.¹ and Dani, D.²

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Source: International Journal of Information Technology and Computer Science, Vol. 5(5), (2013), pp 29-37

ISSN No. : 2091-1610

Abstract: The recent exponential growth of Internet has made the online banking very popular. It has become integral part of life for many people. But still the majority of people have probably not even tried it yet possibly because the websites of the banks are too complicated to understand and navigate. It has therefore become important to evaluate the quality of the banking websites. Most of the studies in the literature on banking websites have focused on evaluating the quality of services of these websites. In this paper we have investigated the structural properties of the websites with emphasis on navigability study of these business sites. Also evaluated the correlation between the navigability, popularity and importance of the Web sites.

USIC&T-8.12

Paper Title: Analyzing software effort estimation using k means clustered regression approach

Author(s): Nagpal, G.¹, Uddin, M.² and Kaur, A.³

Affiliation(s): ¹National Institute of Technology, Jalandhar, Punjab; ²Delhi Technological University, Delhi University; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: ACM SIGSOFT Software Engineering Notes, Vol.38(1), (2013), pp 1-9

ISSN No. : 0163-5948

Abstract: Software estimation is an area where more assurances have been broken than in any other area of software development. Numerous studies attempting new and reliable software effort estimation techniques have been proposed but no consensus as to which techniques are the most appropriate has been reached so far. Due to the intangible nature of “software”, effort estimation with a high level of accuracy remains a dream for developers. It is unlikely to expect very accurate estimates of development effort because of the inherent uncertainty in software projects and the complex and dynamic interaction of factors that impact software development. Heterogeneity exists in software engineering datasets because data is obtained from diverse sources. This can be reduced by defining certain relationships between the data values by classifying them into different clusters. This study focuses on how the combination of clustering and regression techniques can reduce the potential problem in effectiveness of predictive efficiency due to heterogeneity of the data. Using a clustered approach creates subsets of data having a degree of homogeneity that enhances prediction accuracy. It was also observed in this study that ridge regression performs better than other regression techniques. Another key finding is that by selecting a subset of highly predictive attributes using Grey relational analysis a significant improvement in prediction can be achieved

USIC&T-8.13

Paper Title: Statistical Comparison of Modeling Methods for Software Maintainability Prediction.

Author(s): Kaur, A.K.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Software Engineering and Knowledge Engineering, Vol.23(6), (2013),pp 1-32

ISSN No. : 0218-1940

Abstract: The objective of this paper is statistical comparison of modelling methods for software maintainability prediction. The statistical comparison is performed by building software maintainability prediction models using 27 different regression and machine learning based algorithms. For this purpose, software metrics datasets of two different commercial object oriented systems are used. These systems were developed using an object oriented programming language Ada. These systems are User Interface Management System (UIMS) and Quality Evaluation System (QUES). It is shown that different measures like MMRE, RMSE, Pred(0.25) and Pred(0.30) calculated on predicted values obtained from leave one out (LOO) cross validation produce very divergent results regarding accuracy of modelling methods. Therefore the 27 modelling methods are evaluated on the basis of statistical significance tests. The Friedman test is used to rank various modelling methods in terms of absolute residual error. Six out of the ten top ranked modelling methods are common to both UIMS and QUES. This indicates that modelling methods for software maintainability prediction are solid and scalable. After obtaining ranks, pair wise Wilcoxon Signed rank test is performed. Wilcoxon Sign rank test indicates that the top ranking method in UIMS data set is significantly superior to only four other modelling methods whereas the top ranking method in QUES data set is significantly superior to 11 other modelling methods. The performance of instance based learning algorithms — IBk and Kstar is comparable to modelling methods used in earlier studies.

USIC&T-8.14

Paper Title: A comparative study of models for predicting fault proneness in object-oriented systems

Author(s): Singh ,Y., **Kaur, A.** and Malhotra, R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Application in Technology, Vol.49(1), (2014), pp 22-41

ISSN No. : 9528091

Abstract: Demand for quality software has undergone rapid growth during the last few years. This is leading to an increase in development of metrics for measuring the properties of software such as coupling, cohesion or inheritance that can be used in early quality assessments. Quality models that explore the relationship between these properties and quality attributes such as fault proneness, maintainability, effort or productivity are needed to use these metrics effectively. This study reflects the relevance of quality models to industrial practices and the maturity of research in developing these models. In this paper we summarise the results of empirical studies done so far to assess the applicability of fault proneness models across object-oriented software. We perform a systematic study of these to identify general conclusions drawn from them. This work recommends the research methodology that should be followed to predict fault proneness models.

USIC&T-8.15

Paper Title: Grey Relational Effort Analysis Technique Using Regression Methods for Software Estimation

Author(s): Nagpal, G.¹, Uddin, M.² and **Kaur, A.**³

Affiliation(s): ¹National Institute of Technology, Jalandhar, Punjab; ²Delhi Technological University, Delhi University; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Arab Journal of Information Technology, Vol. 11(5), (2014),pp 437-446

ISSN No. : 1683-3198

Abstract: Software project planning and estimation is the most important confront for software developers and researchers. It incorporates estimating the size of the software project to be produced, estimating the effort required, developing initial project schedules, and ultimately, estimating on the whole cost of the project. Numerous empirical explorations have been performed on the existing methods, but they lack convergence in choosing the best prediction methodology. Analogy based estimation is still one of the most extensively used method in industry which is based on finding effort from similar projects from the project repository. Two alternative approaches using analogy for estimation have been proposed in this study. Firstly, a precise and comprehensible predictive model based on the integration of Grey Relational Analysis (GRA) and regression has been discussed. Second approach deals with the uncertainty in the software projects, and how fuzzy set theory in fusion with grey relational analysis can minimize this uncertainty. Empirical results attained are remarkable indicating that the methodologies have a great potential and can be used as a candidate approaches for software effort estimation. The results obtained using both the methods are subjected to rigorous statistical testing using Wilcoxon signed rank test.

USIC&T-8.16

Paper Title: Banking websites in India: an accessibility evaluation

Author(s): Kaur, A. and Dani, D.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Inderprastha Engineering College, Ghaziabad, UP

Source: The SI Transactions on ICT ,Vol. 2(1), (2014), pp 23-24

ISSN No. : 2277-9086

Abstract: Accessibility refers to making websites usable for people of all types of abilities and disabilities, regardless of what browsing technology they are using. Since the web is an important resource of information for millions of people at all levels, accessible websites can help people with disabilities too to participate and contribute more actively in society. The objective of this study is to analyze the status of accessibility of banking websites as it allows people with disabilities to be independent and more in control of their own financial requirements. Web Content Accessibility Guidelines (WCAG) are universally accepted guidelines for website accessibility evaluation. The automatic evaluation tool is used to evaluate the website accessibility based on WCAG 1.0 and WCAG 2.0 guidelines. To further assess the reasons for accessibility barriers, complexity score was calculated. The accessibility score of different disability was also computed. The difference between the mean accessibility errors of public and private sector banks in India was also computed. The correlation of accessibility with the popularity and importance of the web sites was also evaluated. It was found that none of the websites that were evaluated were completely accessible to people with disabilities, i.e., there were no web sites that had no violations of web accessibility guidelines. There was no significant difference found in the accessibility of public and private sector banking websites in India. A framework to categorize the websites into fully accessible, partially accessible and inaccessible was also proposed.

USIC&T-8.17

Paper Title: Grey Relational Effort Analysis Technique using Robust Regression methods for Individual Projects

Author(s): Nagpal, G.¹, Uddin, M.², Kaur, A.³

Affiliation(s): ¹National Institute of Technology, Jalandhar, Punjab; ²Delhi Technological University, Delhi University; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computational Intelligence, Vol.3(1), (2014), pp 40-73

ISSN No. : 1875-6891

Abstract: Efficient development of software requires accurate estimates. It is unlikely to expect very accurate estimates of software development effort because of the inherent uncertainty in software development projects and the complex and dynamic interaction of factors that impact software development. In this study, two analogy methods based on integration of Grey Relational Effort Analysis Technique using Robust Regression Methods with and without feature subset selection have been proposed. In the previous, Grey Relational based effort estimation studies, GRA is used to assess similarity between projects with m features and effort is estimated from k most similar projects. In the proposed methodologies, the effort of the reference project is estimated by applying regression techniques to k most similar

projects obtained using GRA as the similarity metric. Empirical results obtained are statistically significant, indicating that the methodology has great potential and can be used as a candidate approach for software effort estimation.

USIC&T-8.18

Paper Title: Performance Measurement and Analysis of High-Availability Clusters

Author(s): Kaur, A. and Verma, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: ACM SIGSOFT Software Engineering Notes, Volume 40(2), (2015), pp 1-7

ISSN No. : 0163-5948

Abstract: High-availability clusters are groups of servers that provide a reliable framework for applications to achieve a minimum downtime and quick recovery time without any human intervention and yet are completely opaque to the users. Almost all industries are continuously pursuing the goal to minimize their critical application downtimes by using various techniques such as fault tolerance, redundancy, mirroring and clustering. During downtime, applications become unavailable to end users, which can lead to financial, reputation and regulatory business impacts. High-availability clusters provide a mechanism to migrate complete applications or services from one server to another seamlessly without any human intervention at the time of failure of any critical component or the complete server. Hence, an application would start on a healthy server, without end users realizing this failover. In this work, key features and aspects of two cluster products, 'Symantec Veritas Cluster Suite' and 'Red Hat Cluster' were compared against each other based on various parameters. A simulated environment was created to perform a comprehensive analysis of performances of both products. In this work, measurement of average failover time was taken and compared as the key reliability and serviceability attribute. Thus, based on this experimental work, it is concluded that in a controlled test environment running a simple web-server application, Red Hat cluster gives a better failover performance as compared to Veritas Cluster Suite. However, in a large-scale environment, if we consider factors like operating system compatibility, supported applications, compatibility with volume managers, hardware compatibility, reliability, fault tolerance, predictive failure, self-healing etc., then the Veritas Cluster Suite comes out as the winner.

USIC&T-8.19

Paper Title: M-DART based Asynchronous File Sharing Scheme in VANET

Author(s): Kaur, P.¹, Bali, R. S.² and Kaur, A.³

Affiliation(s): ¹Department of Computer Science and Engineering, Chandigarh University, Gharuan, Mohali, Punjab; ²Department of Computer Science and Engineering, Thapar University, Patiala, Punjab; ³University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Procedia Computer Science, Vol. 57, (2015), pp 288-295

ISSN No. : 1877-0509

Abstract: Increasing need for people to remain connected while they are mobile poses several interesting challenges for today's Wireless Networks. Information sharing among vehicles can be considered as one of the most popular medium for exchanging safety and entertainment messages between mobile users. Recently data sharing has also started receiving increased attention from researchers. This paper proposes a Distributed Hash Table based File Sharing Scheme for Vehicular Ad hoc Networks

using multipath routing protocol. The scheme guarantees multi-path forwarding due to its underlying property of reactivity and its application of proactive routing protocol. The packets are transferred to distant nodes with assistance of created Distributed Hash Tables which store information about identities of sender's as well as receiver nodes. By using Multi-path Dynamic Address Routing the algorithm utilizes the best available path until it fails to switch to the next best available route in the network. Simulation results show that the proposed scheme achieves realistic performance of file delivery and also has comparative performance with the existing protocols.

USIC&T-8.20

Paper Title: Integrating firefly algorithm in artificial neural network models for accurate software cost predictions

Author(s): Kaushik, A., Kumar, D., Yadav, K.T. and Kaur, A.

Affiliation(s): Department of IT, Maharaja Surajmal Institute of Technology, New Delhi; ²Department of Computer Science, Indira Gandhi Delhi Technical University for Women, Delhi; ³Department of IT, Indira Gandhi Delhi Technical University for Women, Delhi; ⁴University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Software: Evolution and process, Vol. 28(8,) (2016), pp 665-688

ISSN No. : 1532-060X

Abstract: Human effort is one of the main resources of software cost estimation. A successful software project development primarily relies on accurate effort prediction at an early stage of development. There are many effort prediction models in the literature. Deciding which model to choose is a challenge for the project managers. This paper investigates whether it is possible to improve the accuracy of software cost estimations by coupling firefly algorithm with the existing artificial neural network (ANN) models used in software cost predictions. The firefly algorithm is one of the recent evolutionary computing models inspired by the behaviour of fireflies in nature. This is compared with particle swarm optimization used already in literature for software cost estimations. The ANN models examined in this work include radial basis function network and functional link artificial neural networks models. The experimental results show that ANN models perform extremely well by incorporating firefly algorithm and intuitionistic fuzzy C-means for data preprocessing. The proposed approach is empirically validated through a statistical framework.

USIC&T-8.21

Paper Title: An empirical evaluation of classification algorithms for fault prediction in open source projects.

Author(s): Kaur, A. and Kaur, I.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of King Saud University-Computer and Information Sciences, Vol. 30(1),(2016), pp 2-17

ISSN No. : 1319-1578

Abstract: Creating software with high quality has become difficult these days with the fact that size and complexity of the developed software is high. Predicting the quality of software in early phases helps to reduce testing resources. Various statistical and machine learning techniques are used for prediction of the quality of the software. In

this paper, six machine learning models have been used for software quality prediction on five open source software. Varieties of metrics have been evaluated for the software including C & K, Henderson & Sellers, McCabe etc. Results show that Random Forest and Bagging produce good results while Naïve Bayes is least preferable for prediction.

USIC&T-8.22

Paper Title: Mining software repositories for empirical validation of laws of software evolution for Java projects

Author(s): Kaur, A. and Vig, V.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computational Systems Engineering, Vol 2(3), (2016),pp 115-173

ISSN No. : 2046-3391

Abstract: Mining of software repositories for the study of software evolution and its laws have been studied extensively for procedural languages like C but very few studies have verified these laws for object-oriented (OO) languages like Java despite the fact both follow a completely different paradigm. Also, most of the earlier studies done for Java projects do not employ statistical tests to prove or refute these laws. This paper attempts to statistically validate the Lehman's eight laws of software evolution for 11 Java projects containing 493 official releases. The study validates three: law of continuing change, self-regulation and continuing growth, out of the eight laws of software evolution. The study found that statistical tests tend to refute the law even if they have passed graphically indicating the importance of these tests and suggests reinstatement or addition of new laws with precise definitions and metrics for better analysis of the laws.

USIC&T-8.23

Paper Title: A Multilevel Quantitative Analysis of Distribution of Defects in Open Source Software

Author(s): Kaur, A. and Vig, V.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Software Quality Professional, Vol. 19, (2016),pp 30-41

ISSN No. : 1522-0540

Abstract: Organizations encounter numerous problems that impede the growth of quality software systems. Defects can be detected and prevented by efficient study of their distribution in the systems. The Pareto principle is studied and applied in many fields of management and research, and it is widely used to study the distribution of defects in software systems as well. However, there is no study that analyzes defect distribution from the very first release until the end for open source software (OSS). This study provides a multilevel quantitative analysis of distribution of defects in OSS. The study explores the existence of the Pareto principle for 137 releases spread across seven open source Java data sets. The study found: 1) changes due to defects are more prevalent than changes due to any other issues in the OSS repository; 2) defect distribution in OSS follows the Pareto principle at the combined release level, at the project level, and at the individual release level; 3) defect persistence exists for

all subsequent releases and components, with the maximum number of defects having the maximum number of blocker and critical defects in the system.

USIC&T-8.24

Paper Title: **Reasons for Non-Applicability of Software Entropy Metrics for Bug Prediction in Android**

Author(s): **Kaur, A.** and Chopra, D.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer, Electrical, Automation, Control and Information Engineering, Vol. 10 (6), (2016), pp 1170-1175

ISSN No. : 2088-8708

Abstract: Software Entropy Metrics for bug prediction have been validated on various software systems by different researchers. In our previous research, we have validated that Software Entropy Metrics calculated for Mozilla subsystem's predict the future bugs reasonably well. In this study, the Software Entropy metrics are calculated for a subsystem of Android and it is noticed that these metrics are not suitable for bug prediction. The results are compared with a subsystem of Mozilla and a comparison is made between the two software systems to determine the reasons why Software Entropy metrics are not applicable for Android.

USIC&T-9.01

Paper Title: **Statistical Comparison of Modelling Methods for Software Maintainability Prediction**

Author(s): Kaur, A., **Kaur, K.**

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Software Engineering and Knowledge Engineering, Vol. 23(6), 2013, pp743-774

ISSN No.: 0218-1940

Abstract: The objective of this paper is statistical comparison of modelling methods for software maintainability prediction. The statistical comparison is performed by building software maintainability prediction models using 27 different regression and machine learning based algorithms. For this purpose, software metrics datasets of two different commercial object-oriented systems are used. These systems were developed using an object oriented programming language Ada. These systems are User Interface Management System (UIMS) and Quality Evaluation System (QUES). It is shown that different measures like MMRE, RMSE, Pred(0.25) and Pred(0.30) calculated on predicted values obtained from leave one out (LOO) cross validation produce very divergent results regarding accuracy of modelling methods. Therefore the 27 modelling methods are evaluated on the basis of statistical significance tests. The Friedman test is used to rank various modelling methods in terms of absolute residual error. Six out of the ten top ranked modelling methods are common to both UIMS and QUES. This indicates that modelling methods for software maintainability prediction are solid and scalable. After obtaining ranks, pair wise Wilcoxon Signed rank test is performed. Wilcoxon Sign rank test indicates that the top ranking method in UIMS data set is significantly superior to only four other modelling methods whereas the top ranking method in QUES data set is significantly superior to 11 other modelling methods. The performance of instance

based learning algorithms — IBk and Kstar is comparable to modelling methods used in earlier studies.

USIC&T-10.01

Paper Title: Analysis of tree-based multicast routing in wireless sensor networks with varying network metrics

Author(s): Krishna, M.B.¹ and Doja M. N. ²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Computer Engineering, JMI Central University, New Delhi,

Source: International Journal of Communication Systems, Vol. 26(10), (2013),pp 1327–1340

ISSN No.: 1099-1131

Abstract: Wireless ad hoc and sensor networks are emerging with advances in electronic device technology, wireless communications and mobile computing with flexible and adaptable features. Routing protocols act as an interface between the lower and higher layers of the network protocol stack. Depending on the size of target nodes, routing techniques are classified into unicast, multicast and broadcast protocols. In this article, we give analysis and performance evaluation of tree-based multicast routing in wireless sensor networks with varying network metrics. Geographic multicast routing (GMR) and its variations are used extensively in sensor networks. Multicast routing protocols considered in the analytical model are GMR, distributed GMR, demand scalable GMR, hierarchical GMR, destination clustering GMR and sink-initiated GMR. Simulations are given with comparative analysis based on varying network metrics such as multicast group size, number of sink nodes, average multicast latency, number of clusters, packet delivery ratio, energy cost ratio and link failure rate. Analytical results indicate that wireless sensor network multicast routing protocols operate on the node structure (such as hierarchical, clustered, distributed, dense and sparse networks) and application specific parameters. Simulations indicate that hierarchical GMR is used for generic multicast applications and that destination clustering GMR and demand scalable GMR are used for distributed multicast applications.

USIC&T-10.02

Paper Title: Multi-Objective Meta-Heuristic Approach for Energy-Efficient Secure Data Aggregation in Wireless Sensor Networks

Author(s): Krishna, M.B.¹ and Doja M. N. ²

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Source: Journal of Wireless Personal Communications, Vol. 81(1), (2015),pp 1-16

ISSN No.: 1572-834X

Abstract: Energy consumption in the sensor network is primarily due to the switching states of radio transceivers and long busy states of sensor nodes in the network. Data aggregation techniques reduce the number of transmissions and improve the bandwidth utilization. Secure data aggregation and energy-efficient routing protocols establish the secure channel, and reduce the communication overhead in the network. Multi-objective optimization methods based on the weighted sum method, the utility method and meta-heuristic search methods enhance the

performance of meta-heuristic algorithms. This article proposes multi-objective meta-heuristic approach for energy-efficient secure data aggregation (MH-EESDA) protocol in wireless sensor networks. The proposed protocol uses divide-and-conquer approach to form the secure clusters and perform the secure data aggregation in energy-efficient route paths of the network. The protocol functions in three phases. In the first phase, the clusters are formed, in the second phase, the secure nodes are selected and in the third phase, energy efficient data aggregation is performed across the secure route paths of the network. The sensor node energy and data aggregation rate are evaluated for (1) minimum degree of intrusions (2) threshold-based degree of intrusions and (3) maximum degree of intrusions in the network. Simulation results illustrate significant improvements in the proposed MH-EESDA protocol.

USIC&T-10.03

Paper Title: Core Network Assisted Multicast Routing Protocol for Wireless Sensor Network

Author(s): Krishna, M.B.

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Source: International Journal of Wireless Sensor Systems, IET, Vol. 5(4),(2015), pp 175-182

ISSN No.: 2043-6394

Abstract: Multicast routing protocols improve the network performance by optimising the parameters such as bandwidth, channel utilisation and throughput rate. In wireless sensor network, the primary multicast routing protocol is geographic multicast routing. This study proposes core network supported multicast routing (CNSMR) protocol, a stateful-based distributed multicast routing protocol for sensor networks. The proposed protocol comprises of heterogeneous nodes such as cluster head (CH) nodes, core nodes (CNs) and sensor nodes (SNs). The distinct set of nodes known as CNs have computing, storage and energy resources more than the SNs. CH nodes and CNs form the core network, and CNs with core network and SNs form the core network supported multicast tree. SNs participate in multicast routing supported by the core network and thus save the node energy. Multicast routing in the proposed core network supported multicast trees balance the load in the network and improve the network performance as compared to the existing WSN multicast routing protocols. The proposed CNSMR protocol is compared with the existing WSN multicast routing protocols such as DCME-MR, IntelligentMR, H-GMR and OnDemand-MR. Simulation results indicate improvements in delay latency, energy save ratio, throughput rate, end-to-end packet delay, multicast control overhead ratio and packet delivery ratio for the proposed protocol.

USIC&T-10.04

Paper Title: Product Authentication Using QR Codes: A Mobile Application to Combat Counterfeiting

Author(s): Krishna, M. B., and Dugar, A

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Wireless Personal Communications, Vol. 90(1), (2016), pp 381–398

ISSN No.: 1572-834X

Abstract: Counterfeiting is one of the biggest challenges for the authenticity of genuine products. An estimated average of 8–9 % trade consists of counterfeit goods that create a loss of revenue. To combat this situation, the product manufacturers use

hologram and barcodes. The issue of genuine product remains the primary challenge in the market. With emerging trends in mobile and wireless technology, Quick Response (QR) codes provide a robust technique to fight the practice of counterfeiting the products. Apart from being used extensively in marketing and information transfer applications, the QR codes and encrypted QR codes are primarily used in security and privacy applications. Many web applications use QR codes for secure login where the user need not remember his/her login ID and password. The encrypted unique user ID is verified at the server using QR codes. Our proposed approach uses QR codes based on 2-dimensional codes (such as 19 Aztec, Data Matrix, etc.) to authenticate the product. This approach simplifies the size of QR code, and minimizes the complexity of encoding and decoding in QR code.

USIC&T-11.01

Paper Title: A systematic analysis and comparison of the dispersion curves of Hypocycloid land elliptical Bragg wave guide using very simple analytical method

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Source: American Journal of Electromagnetics and Applications, Vol. 2(1), (2014),pp 1-10

ISSN No.: 2376-5968

Abstract: In this paper we have analyzed the modal dispersion characteristics of two unconventional Bragg waveguides namely hypocycloidal and elliptical Bragg waveguide by the use of very simple matrix method. We are using matrix equation which replaces the boundary condition. We obtained the characteristic equation analytically. In both cases all the outputs are showing in the form of dispersion curves and we are also trying to compare their dispersion characteristics. It is seen that in case of hypocycloidal Bragg waveguide the cut off frequency increases with the decrease of cladding layers. But in case of elliptical Bragg waveguide, when the cladding layer decreases from six layered to four layered the cutoff frequency increases and from four layer to two layer the cutoff frequency become decreases.

USIC&T-11.02

Paper Title: Design of an All Optical 3-Bit modulo Eight Asynchronous Up Counter

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Source: American Journal of Electromagnetics and Applications, (2015), pp12-15

ISSN No.: 2376-5968.

Abstract: The paper presents an all-optical 3 bit up counter with complete Boolean functionality as a representative circuit for modeling and optimization of monolithically integrated components. Here, the proposed logic unit design is based on nonlinear effects in semiconductor optical amplifiers (SOA). These equations are first solved to generate the pump, probe and conjugate pulses in a SOA. The pulse behavior are analyzed and applied to realize behavior of all-optical NAND gate. Next, the logic is used to implement All-Optical D Flip-Flop logic, and its function is verified with the help of truth table. Finally with the help of three D Flip-Flops, a 3-bit up counter is proposed.

USIC&T- 12.01

Paper Title: A Framework for SPARQL Query Processing, Optimization and Execution with Illustrations

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Source: International Journal of Computer Information Systems and Industrial Management Applications, Vol. 4, (2012), pp 208-218

ISSN No.: 2150-7988

Abstract: The vision of Semantic web is to allow intelligent description and interchange of integrated data from various distributed web resources. A structure for this metadata on the web is known as Resource Description Framework (RDF) where data is in the form of XML (Extended Markup Language). A query language is used to retrieve such large RDF data effectively and efficiently which is known as SPARQL (Standard Protocol and RDF Query Language) which involves Query Processing, Optimization and Execution. In this paper, we propose a framework for SPARQL Query Processing, Optimization and Execution with various SPARQL illustrations in Twinkle and Jena ARQ. A "Furniture RDF" has been illustrated with "Filtering RDF using Twinkle" and "Filtering RDF using Jena ARQ on Eclipse" based on Java source code obtained after executing Eclipse.

USIC&T-13.01

Paper Title: Analysis of frequency selective surfaces for radar absorbing material.

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Source: Progress In Electromagnetics Research B, Vol. 38, (2012), pp 297-314

ISSN No.: 1937-6472

Abstract: Nowadays, applications of Frequency Selective Surfaces (FSS) for radar absorbing materials (RAM) are increasing, but it is still a challenge to select a proper FSS for a particular material as well as the dimensions of FSS for optimized absorption. Therefore, in this paper an attempt has been made to optimize the dimensions of FSS for microwave absorbing application using Genetic Algorithm (GA) approach. The considered frequency selective surfaces are composed of conducting patch elements pasted on the ferrite layer. FSS are used for filtration and microwave absorption. In this work, selection and optimization of FSS with radar absorbing material has been done for obtaining the maximum absorption at 8{12 GHz frequency. An equivalent circuit method has been used for the analysis of different FSS, which is further used to design fitness function of GA for optimizing the dimensions of FSS. Eight different available ferrite materials with frequency dependent permittivity and permeabilities have been used as material database. The GA optimization is proposed to select the proper material out of eight available materials with proper dimensions of FSS. The optimized results suggest the material from database and dimensions of FSS. The selected material is then mixed with epoxy and hardener, and coated over the aluminium sheet. Thereafter, all five

FSS were fabricated on ferrite coated Al sheets using photolithographic method followed by wet etching. The absorption was measured for all FSS using absorption testing device (ATD) method at X-band. Absorption results showed that significant amount of absorption enhanced with the addition of proper FSS on radar absorbing coating.

USIC&T- 14.01

Paper Title: A Comparative Study of Spread Spectrum Technique Based on Various Pseudo Random Codes

Author(s): Nath, V. and Kumar, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Researches in Engineering, Vol.12(6), (2012), pp 71-76

ISSN No.: 2249-4596

Abstract: This paper presents a comparative study of Frequency Hopping Spread Spectrum and Direct Sequence Spread Spectrum techniques. The Transmitter and Receiver have been implemented using MATLAB. Maximum-length sequences, Gold Sequences and Walsh Codes have been used as the pseudo random codes for transmission. Finally received signal have been evaluated on the basis of Bit Error Rate for all the used codes.

USIC&T- 14.02

Paper Title: Comparative Study of Bloom Filter Architectures

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Source: Global Journal of Researches in Engineering, Vol.12(4), (2012), pp 5-9

ISSN No.: 2249-4596

Abstract: Hardware based virus protection systems are required for identifying the malicious content and further removing it from network streams. Network Intrusion Detection System (NIDS) is needed to protect the end user machines from threats. An effective NIDS is therefore a network security system capable of protecting the end user machines well before a threat affects. NIDS requires a space efficient data base for detection of threats in high speed conditions. Bloom Filters are one of the security filters that consume significant power to detect and then filter out malicious content. A Bloom filter is a space efficient randomized data structure for representing a set in order to support membership queries. The aim of this paper is to compare the different architectures of Bloom filter like Standard Bloom filter, pipelined bloom filter, counting Bloom filter and parallel processing architecture of bloom filter in terms of their merits and demerits by using algorithmic and architectural techniques.

USIC&T- 14.03

Paper Title: A Carrier Based Compact Model for Long Channel Undoped and Doped Body Symmetric Double Gate MOSFETS

Author(s): Nath, V.¹ and Goel, N.¹

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Source: International Journal of Scientific and Research Publications, Vol. 2(6), (2012), pp 1-4

ISSN No.: 2250-3153

Abstract: Double gate MOSFET is widely used for sub-50nm technology of transistor design. They have immunity to short channel effects, reduced leakage current and high scaling potential. The single gate Silicon-on-insulator (SOI) devices give improved circuit speed and power consumption. But as the transistor size is reduced the close proximity between source and drain reduces the ability of the gate electrode to control the flow of current and potential distribution in the channel. To reduce SCE we need increase gate to channel coupling with respect to source/drain to channel coupling. This paper deals with the compact modeling of long channel undoped and doped symmetric double-gate MOSFET. The formulation starts with the solution of Poisson's equation which is then coupled to the Pao-Sah current equation to obtain the analytical drain-current model in terms of carrier concentration. The performance analysis will be done by using the model.

USIC&T- 14.04

Paper Title: Performance Analysis of Various coding Techniques in Optical Code Division Multiple Access System

Author(s): Jain, N. and Nath, V.

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Source: International Journal of Emerging Technologies in Computational and Applied Sciences, Vol. 4(1), (2013), pp 77-82

ISSN No.: 2279-0055

Abstract: Optical code division multiple access system (OCDMA) exploits the advantages of CDMA and Optical communication. It has been gaining importance with increasing demands of high speed and large capacity for communication in optical networks. OCDMA encoding/decoding process provides a high level of security which is directly implemented in the physical layer. In OCDMA, type of coding technique plays a major factor that influences its performance. This paper presents performance analysis of two important OCDMA coding techniques namely – 1-D and 2-D codes. Firstly performance analysis of various 1-D codes namely Walsh Hadamard codes (WHC), Optical orthogonal codes (OOC) and Zero cross correlation (ZCC) has been carried out. Secondly performance analysis of 2-D Wavelength/Time (W/T) codes has been carried out. The performance metrics on which the various codes performance has been measured are: different data formats (NR and RZ), increasing fiber distance, amount of received power, increasing the bit rate and number of simultaneous active user. Simulated results show that among 1-D codes ZCC codes provides the best overall performance over OOC and WHC. 1-D codes provide low bit error rate (BER) but they possess high temporal length. To overcome this, 2-D codes have been used which have higher cardinality than 1-D code.

USIC&T- 14.05

Paper Title: Effect of Fiber Distance on Various SAC-OCDMA Detection Techniques.

Author(s): Dogra, S., Nath, V. and Jain, N.

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Emerging Technologies in Computational and Applied Sciences, Vol. 2(3), (2013), pp 77-82

ISSN No.: 2319-1163

Abstract: Optical code division multiple access system (OCDMA) has been gaining importance with increasing demands of high speed and large capacity for communication in optical networks. OCDMA system is totally asynchronous, that does not require any clock signals for synchronization in the network. Therefore, OCDMA provide a network that is simpler and offers the potential for scalability to higher levels of connectivity. OCDMA encoding /decoding process also provides a level of security directly implemented in the physical layer. Using OCDMA technique high spectral efficiency is achieved, hence fiber bandwidth is used very efficiently with throughput in excess of Tbit/s. Among several kinds of OCDMA systems, spectra amplitude coding (SAC) scheme attracts increasing interest because multiple access interference (MAI) can be eliminated and preserve the orthogonality between users in the system. This paper presents comparison of three important SAC-OCDMA detection techniques, namely - Direct detection, Complementary subtraction and AND subtraction. The design of encoder and decoder modules for SAC-OCDMA system used in this paper is based on Fiber Bragg Gratings (FBGs). Here conventional single mode fiber (SMF) is used as the transmission link and the performance metric studied is Quality factor (Q) in multiple access environments of various user systems for these three detection techniques. Finally Effect of increasing number of fiber distance on the direct detection technique using NRZ and RZ data formats have been studied. Simulated results show that AND subtraction technique gives better Quality-factor (Q) than the complementary subtraction and direct detection techniques for the signal with same power.

USIC&T- 14.06

Paper Title: Performance Analysis of One stage and Two stage Parallel Interference Cancellation for Optical Code Division Multiple Access System

Author(s): Nath, V. and Dogra, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Emerging Technology and Advanced Engineering, Vol. 3(6), (2013), pp 65-69

ISSN No.: 2250-2459

Abstract: Code division multiple access (CDMA) is a powerful multiplexing scheme which is very suited to the optical domain with its broad spectrum. Optical code division multiple access (OCDMA) technique allows multiple users to share the same transmission media by assigning different codes and is a very promising technique for the broadband communication. OCDMA networks can provide all customers with upstream data rates of Gigabits/seconds with inherent flexibility. In the optical domain, the traditional method to recover the data at the receiving end of an optical CDMA system is to use an optical correlator followed by a photo detector and a decision device. However as the number of simultaneous users increases the capacity of the system is limited by Multiple Access Interference (MAI) and various detection

noises. There are many reception techniques like decorrelation receiver, Minimum Mean Square error, Interference Cancellation etc. which are very efficient for multiuser detection in Radio frequency (RF) communication. Their success in RF domain has inspired usage in OCDMA. Interference Cancellation techniques are any technique or combination of techniques that allow an existing receiver to operate with higher levels of co-channel interference. This paper presents the effect of MAI, using parallel interference cancellation (PIC) techniques for incoherent OCDMA which is non-linear multiuser detector. One stage and two stage PIC, have been simulated for various data rates and fiber lengths. Simulated results show that two stage PIC shows better performance than Direct detection technique and one stage PIC.

USIC&T- 14.07

Paper Title: Development and Integration of 1-D and 2-D Electromagnetic Band Gap Structures with Sierpinski and Minkowski Microstrip Fractal Antenna

Author(s): Kumar, M. and Nath, V.

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Source: Journal Computational Intelligence & Electronic Systems, Vol. 3(3), (2014), pp 168-176

ISSN No.: 2326-3008

Abstract: A novel approach of integrating Sierpinski carpet into Minkowski fractal antenna along with 1-D and 2-D EBG structures is presented in this paper. In this paper, basically 3 approaches are analyzed. Firstly, the effect of making antenna fractal has been studied. Secondly, effect of 1-D and 2-D EBG structures has been analyzed. In last, both effects are analyzed after integrating them on the same substrate. First of all, the original antenna is designed and simulated using a finite-element-methodbased high frequency structure simulator Ansoft HFSS (ver.12.0). Simulation results show that it can work on 10.315 GHz to 9.639 GHz ($S_{11} < -10$ dB) frequency band, with the gain of 4.384 dB, and fractional bandwidth of 6.787% which is suitable for numerous X-band applications like aeronautical navigation, defence systems, radiolocation (civil), weather monitoring, air traffic control, terrestrial broadband etc. After that, fractalization of original microstrip patch antenna is performed upto 3rd iteration for both Minkowski and Sierpinski fractal shapes. The resonant behavior and effect of size reduction for both fractal shapes is also analyzed. Then, various arrays of 1-D (defected ground plane) electromagnetic band gap structures are analyzed. Similarly, 2-D (mushroom type) EBG structures are also analyzed. At last, both structures i.e., proposed fractal shaped microstrip antenna and 1-D and 2-D EBG structures are integrated and simulated. Analysis and comparison among all structures is demonstrated on the basis of return loss, fractional bandwidth, gain, directivity, axial ratio, radiation efficiency, front-to-back ratio values. The simulated results reveal that bandwidth and gain both can be enhanced by using EBG structures as these structures help in suppressing surface wave propagation.

USIC&T- 14.08

Paper Title: Numerical Modeling of Subthreshold Region of Junctionless Double Surrounding Gate MOSFET (JLDSG)

Author(s): Rewari, S.¹, Haldar, S.², Nath, V.³, Deswal, S.S.⁴ and Gupta, R.S.⁵

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Source: Superlattices and Microstructures, Vol. 90, (2016), pp 8-19

ISSN No.: 0749-6036

Abstract: In this paper, Numerical Model for Electric Potential, Subthreshold Current and Subthreshold Swing for Junctionless Double Surrounding Gate (JLDSG) MOSFET has been developed using superposition method. The results have also been evaluated for different silicon film thickness, oxide film thickness and channel length. The numerical results so obtained are in good agreement with the simulated data. Also, the results of JLDSG MOSFET have been compared with the conventional Junctionless Surrounding Gate (JLSG) MOSFET and it is observed that JLDSG MOSFET has improved drain currents, transconductance, output conductance, Transconductance Generation Factor (TGF) and Subthreshold Slope.

USIC&T- 14.09

Paper Title: Analysis of low mutual coupling compact multi-band microstrip patch antenna and its array using defected ground structure

Author(s): Kumar, M. and Nath, V.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Engineering Science and Technology, an International Journal, Vol. 19(2), (2016), pp 866-874

ISSN No.: 2215-0986

Abstract: In this paper, a simple microstrip patch antenna and a two-element E-plane coupled microstrip antenna array employing a defected ground structure are investigated. Without defected ground structure, the antenna has an impedance bandwidth of 675 MHz (6.78% at the center frequency of 9.955 GHz) and a gain of around 4.38 dB. The performance of the microstrip antenna in terms of impedance bandwidth, matching performance, gain and return loss can be improved by introducing a defect in the ground plane. As a result of which, bandwidth of 1.652 GHz (16.42% at the center frequency of 10.06 GHz) and a gain of 8.96 dB along with 5 different other operating bands are achieved. After integrating the microstrip antenna with the proposed defected ground structure, effective footprint of the antenna is reduced up to 66.95%. When integrated with proposed DGS array, the same antenna array structure shows miniaturization up to 78.97%. The proposed defected ground structure when compared to other techniques shows an exceptionally lower mutual coupling between two Eplane coupled microstrip antenna elements.

USIC&T- 14.10

Paper Title: Improved analog and AC performance with increased noise immunity using nanotube junctionless field effect transistor (NJLFET)

Author(s): Rewari, S.¹, Haldar, S.², Nath, V.³, Deswal, S.S.⁴ and Gupta, R.S.⁵

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Source: Applied Physics A, Vol. 122(12), (2016), pp1-10

ISSN No.: 1432-0630

Abstract: In this paper for the first time, the noise immunity and analog performance of nanotube junctionless field effect transistor (NJLFET) has been investigated. Small signal AC performance metrics namely Scattering parameters (S-parameters) have been analyzed along with analog parameters to validate the suitability of NJLFET for RFIC design. NJLFET performance is examined by comparing its performance with junctionless gate-all-around (JLGAA) MOSFET. It has been inferred that NJLFET has improved I on/I off ratio directing improved digital performance at higher channel lengths, reduced channel resistance (R_{ch}) which enables the MOSFET to provide a low resistance path to current and improved early voltage (V_{EA}) which shows the capability for high-gain amplification and higher g_m/g_d directing high intrinsic dc gain. Higher f_{Tmax} for NJLFET has been observed posing its potential for terahertz applications. Higher gain transconductance frequency product makes NJLFET an ultimate device for high-speed switching applications. Higher maximum transducer power gain in NJLFET implies higher power gain than JLGAA MOSFET. Also, NJLFET exhibits lower harmonic distortion and it has been explained by significant reduction in third-order derivative of transconductance, g_{m3} . Reduction in g_{m3} shows that NJLFET provides better linearity over JLGAA and is more suitable for RFIC design. Also the Sparameters namely S_{11} , S_{12} , S_{21} and S_{22} have been analyzed to verify the small signal performance. A lower magnitude for reflection coefficients S_{11} and S_{22} depicts minimum reflection and higher matching between ports in NJLFET than JLGAA MOSFET. Higher voltage gains S_{12} and S_{21} are present in NJLFET than its counterpart which shows the higher gains that can be achieved using nanotube architecture. The noise metrics which are noise figure and noise conductance show significant reduction for NJLFET justifying its noise immunity.

USIC&T-15.01

Paper Title: Soft Computing approach towards localization in wireless sensor networks: A Survey

Author(s): Payal, A., Rai, C.S., Reddy and B.V.R.

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Source: International Journal of Information Technology, Communications and Convergence, Vol. 2(4), (2013), pp 353-367

ISSN No.: 2042-3217

Abstract: A wireless sensor network (WSN) is playing a vital role in monitoring a wide variety of real-world phenomenon. Capability of WSNs is further enhanced by the efficient localisation algorithms. Location information is essential for integrating the various applications of WSNs. Localisation is the process by which a sensor node determines

its own location after deployment. Soft computing techniques are gaining popularity in evolving new localisation algorithms that are capable of optimising various parameters of WSNs. In this paper, a comprehensive review is presented to understand the role of fuzzy logic, genetic algorithm, and neural network in localisation of nodes in WSNs.

USIC&T-15.02

Paper Title: Analysis of some feedforward artificial neural network training algorithms for developing localization framework in wireless sensor networks

Author(s): Payal, A., Rai, C.S., Reddy and B.V.R.

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Source: Wireless Personal Communications, Vol. 82(4),(2015), pp 2519-2536

ISSN No.: 11277-015-2362-x

Abstract: Wireless sensor networks (WSNs) have gained global attention of both, the research community and various application users. Localisation in WSN plays a crucial role in implementing myriad of applications such as healthcare management, disaster management, environment management, and agriculture management. Localization algorithms have become an essential requirement to enhance the effectiveness of WSNs demonstrating relative estimation of sensor node position of anchor nodes with their absolute coordinates. We have done a comprehensive performance evaluation of some feedforward artificial neural networks (FFANNs) training algorithms for developing efficient localization framework in WSNs. The proposed work utilizes the received signal strength observed by anchor nodes by means of some multi-path propagation effects. This paper aims for best training algorithm output while comparing results of different training algorithms. The FFANNs is designed with 3-dimensional inputs and one hidden layer with variable neurons and two outputs. For hidden layer tansigmoid transfer function while for output layer linear transfer function is used. The best training algorithm of FFANNs based model can provide better position accuracy and precision for the future applications. We have analysed and proposed the usage of training algorithms that improves the accuracy and precision of localization algorithms. The simulation results demonstrate the effectiveness and huge potential in optimizing hardware for localization module in sensor nodes.

USIC&T-16.01

Paper Title: An Improved Framework for Incident Handling

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Source: Information Security Journal: A Global Perspective, Vol. 22(1), (2013),pp 1-9

ISSN No.: 1939-3547

Abstract: Information is regarded as a resource with the highest organizational value. Every organization needs a secured way to transmit information over the network. When the network grows, the security becomes a major concern. As a result, a traffic monitoring framework is required to understand the security risks, to handle the security breaches, to design the security policy, and to provide an effective business continuity plan in case of cyber disasters. In this paper, an Internet traffic monitoring

framework has been proposed which handles incidents in a better way and consists of three interdependent layers. Layer1 comprises the stakeholders involved in implementing the framework. Layer 2 is the core layer which provides the mechanism for its implementation, and Layer 3 shows the outcomes of the Internet Traffic Monitoring Framework. The proposed framework has been designed to ease the work of the Internet Service Provider and to provide a reliable and systematic way of incident handling by monitoring the Internet traffic to combat cybercrimes, cyber terrorism, and cyber disasters in the Republic of Mauritius. This framework also provides a foundation for the overall security management at Computer Emergency Response Team (CERT), Mauritius.

USIC&T-16.02

Paper Title: Effort Estimation Approach for Integrated Medical Warehouses

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Source: International Journal of Computer Applications, Vol. 48(11), (2012), pp32-39

ISSN No.: 0975-8887

Abstract: Medical warehouses are architectural construct of an information system that provides users with current and historical decision support information. But medical warehouse projects suffer from overestimation of resources because of improper estimation approaches which do not suit well on poorly defined architecture of medical warehouses. In this paper, we have first proposed a framework for an integrated medical warehouse that covers the different aspects of health care management. Then we proposed an effort estimation approach based on this framework which is designed to be used at the very early stage of requirement analysis. The data from the three different set of data warehousing projects are studied and the linear regression approach is used to finalize the model. Final effort is estimated using the project size and the different adjustment factors. For analytical estimation of project size and its complexity, extended function point analysis is used and identified object are categorized and their complexity weight age is determined. The proposed approach is validated by studying three different set of projects having different level of complexity. First set contains eight business data warehousing projects completed in different domains. Second set contains medical OLAP projects, and third set has clinical data marts. A set of questionnaires is used to estimate the complexity of the project, which has to be filled by the developers after completing the initial requirement analysis. The proposed effort estimation model shows a great improvement as compared to the earlier models used in effort estimation of medical warehousing projects.

USIC&T-16.03

Paper Title: Vertical handoff decision algorithm for improved QoS in heterogeneous wireless networks

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Source: International Journal of Computer Applications, Vol. 6(1),(2012), pp211-223

ISSN No.: 1751-8636

Abstract: Fourth-generation networks are expected to integrate heterogeneous wireless technologies. To ensure seamless mobility across disparate wireless technologies, efficient handoff schemes are required to enhance quality of service (QoS) and offer reliable ubiquitous computing environment. This study reviews classical and existing fuzzy approaches adopted for vertical handoff to ensure seamless mobility across overlaid heterogeneous networks. A neuro-fuzzy multi-parameter-based vertical handoff decision algorithm (VHDA) is proposed. The proposed VHDA considers six parameters and applies rule based system for vertical handoff decision. The number of vertical handoffs measured in a simulated environment shows that average number of vertical handoffs for the proposed VHDA reduces by 13.3 and 29.8% for the existing fuzzy technique and the classical technique, respectively. Further, reduction in number of unnecessary vertical handoffs in the proposed algorithm shows reduction in ping-pong effect by 15.9%, improvement in end-point service availability (ESA) and throughput by 16.57 and 5.97%, with respect to existing fuzzy technique leading towards improved QoS. Finally, the results of performance assessment, carried out using handoff quality indicator (used to quantify QoS) which is dependent upon ping-pong effect, ESA and throughput, show that the proposed VHDA offers better QoS than existing vertical handoff techniques.

USIC&T- 17.01

Paper Title: A fast block motion estimation algorithm using dynamic pattern search

Author (s): Purwar, R. K. and Rajpal, N.

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Source: International Journal of Signal Image and Video Processing, Vol. 7, (2013), pp 151-161

ISSN No.: 1863-1703

Abstract: In block-based motion estimation algorithms, it has always been desired to reduce search point computation with quality as good as full-search algorithm. A number of such algorithms like diamond search (DS) and hexagon search (HS) have been proposed in literature, which use fixed-size search patterns for finding motion vectors. The drawback with these fixed-size search pattern-based algorithms is that they may suffer from oversearch/undersearch problem depending on the magnitude of the motion vector. In this manuscript, a dynamic pattern search-based algorithm (DPS), which uses spatial and temporal coherence among blocks and dynamically adapts its search pattern for a candidate block, has been proposed. The proposed algorithm has been compared with various motion estimation algorithms like DS, HS, adaptive rood pattern search (ARPS) and full search in terms of various performance parameters. Experimental results show that proposed DPS has a speed gain of 1.18 over ARPS, whereas it is nearly 1.94 and 1.33 over DS and HS algorithms in terms of average search points/block. Further, in terms of peak signal-

to-noise ratio (PSNR) (dB)/frame, DPS produces almost same average value than ARPS and HS, whereas it is only 1% inferior to DS. A modified version of DPS has also been proposed, which increases its speed gain by 1.39 times with negligible decrease in PSNR. In terms of another time parameter— average execution time per frame (s)—for DPS, it is 0.66 s, whereas this time is 0.71, 0.77 and 1.06 for ARPS, HS and DS algorithms, respectively.

USIC&T- 17.02

Paper Title: A multilevel distortion measure for block based motion estimation using integral Frames

Author (s): Purwar, R. K., and Rajpal, N.

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Source: International Journal of Circuits, Systems and Computers, Vol. 22(2),(2013),pp 1250084(1-10)

ISSN No.: 0218-1266

Abstract: Motion estimation is used to remove interpixel redundancy in video data and block based motion estimation algorithms are widely used for it. Computation in these algorithms is reduced by limiting the number of candidate search points within the search window or simplifying the distortion measurement criterion. In literature, there are integral frame based block motion estimation algorithms which drastically reduce computation cost. However, these algorithms have a serious drawback of spurious block matching possibility, leading to poor quality results. In this manuscript, a multilevel block matching criterion based on integral frame concept is proposed to minimize this drawback. Experimental results show that an increase up to 12% in terms of PSNR (dB) has been achieved than integral frame based sum of absolute difference block sum criterion (SAD BS) with almost same execution time. Further, in terms of quality/computation ratio, proposed method has 25_26% gain over SAD BS.

USIC&T-18.01

Paper Title: An optimized prioritized load balancing approach to scalable routing (OPLBA)

Author(s): Singh, J. and Rai, C.S.

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Source: Wireless Networks, Vol. 22(1), (2016),pp 319-334

ISSN No.: 1572-8196

Abstract: Mobile Ad hoc networks (MANETs) are self organized multi-hop networks, without any infrastructure such as base stations or access points. Due to the mobility and absence of any central administration, the resources of MANETs are limited. If there is any congestion in the network, it puts a great strain on the already scarce resources and severely affects the performance of such networks. Multi path routing is considered as advantageous over single path routing, due to the many benefits it offers. However, these benefits do not come without their associated costs. In this paper, we propose a general metric to define scalability of a routing method. We further propose and implement a new load-balancing routing protocol, which retains the benefits of multiple paths, while at the same time keeping the overheads of routing, as close to single path routing, as possible. The proposed scheme dynamically distributes traffic through different available paths, so that no single path is flooded. Priority is assigned to available paths and paths with higher priority

(better routes) are used more often than those with lower priorities. To keep our method light-weight and scalable, we control the Degree of Distribution (DoD) value (number of alternate paths used), to reap maximum benefits at minimum cost. To further reduce the overheads and decrease access time, optimized insertion and path selection are provided. An index to the RouteList table has been added, which reduces the access and insertion time to $O(m + nd)$ and $O(m)$ respectively, which is within a constant difference of Single path routing methods. Simulation results demonstrate that the proposed solution shows significant improvements in network metrics such as packet loss ratio, end to end delay, throughput and packet delivery, without any increase in routing overheads. Results also verify that this model is very efficient and scalable.

USIC&T-18.02

Paper Title: Blind source separation with conjugate gradient algorithm and kurtosis maximization criterion

Author(s): Jain, S.N.¹ and Rai, C.S.²

Affiliation(s): ¹Department of Electronics and Communication Engineering S.J.J.T. University, Vidyanagar, Rajasthan- 333001; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering and Technology, Vol. 8(1), (2016), pp 64-74

ISSN No.: 0975-4024

Abstract: Blind source separation (BSS) is a technique for estimating individual source components from their mixtures at multiple sensors. It is called blind because any additional other information will not be used besides the mixtures. Recently, blind source separation has received attention because of its potential applications in signal processing such as in speech recognition systems, telecommunications and medical signal processing. Blind source separation of super and sub-Gaussian Signal is proposed utilizing conjugate gradient algorithm and kurtosis maximization criteria. In our previous paper, ABC algorithm was utilized to blind source separation and here, we improve the technique with changes in fitness function and scout bee phase. Fitness function is improved with the use of kurtosis maximization criterion and scout bee phase is improved with use of conjugate gradient algorithm. The evaluation metrics used for performance evaluation are fitness function values and distance values. Comparative analysis is also carried out by comparing our proposed technique to other prominent techniques. The technique achieved average distance of 38.39, average fitness value of 6.94, average Gaussian distance of 58.60 and average Gaussian fitness as 5.02. The technique attained lowest average distance value among all techniques and good values for all other evaluation metrics which shows the effectiveness of the proposed technique.

USIC&T-18.03

Paper Title: Intrusion detection systems and techniques: A review

Author(s): Bhati, B.S. and Rai, C.S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Critical Computer-Based Systems, Vol. 6(3),(2016), pp 173-190

ISSN No.: 1757-8787

Abstract: In the modern age of technology, we can transmit data from one place to another in very small amounts of time. Network, in computer science is the telecommunication network that provides ways to pass data from one computer to another. This type of technology has become one of the most important aspects of different work areas. With the advancement of the network technology, networks have become vulnerable to different types of attacks. A lot of work has been done to detect these attacks, but they are unable to detect novel attacks. In this paper, we are presenting a brief survey on different types of intrusion detection systems (IDS). A number of efficient techniques have been proposed by many leading researchers in this field. This survey has been done to take a comprehensive view of the various IDS and techniques.

USIC&T-18.04

Paper Title: Performance Evaluation of IEEE 802.11 DCF in Single Hop Ad Hoc Networks

Author(s): Gupta, N.¹ and Rai C.S.²

Affiliation(s): ¹School of Engineering and Technology, CSE Department, K.R. Mangalam University, Gurgaon; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Wireless Personal Communications, Vol. 79(3), (2014), pp 2171-2193

ISSN No.: 1572-834X

Abstract: The mathematical modeling of IEEE 802.11 CSMA/CA has received considerable attention in the past few years. However there is lack of significant work considering the presence of buffer in wireless networks. Also most of the work has not followed IEEE specifications regarding inclusion of retry limits. This paper presents a new analytical model for performance evaluation of IEEE 802.11 single hop networks. The work presented here takes into consideration the presence of first order memory buffer along with the effect of traffic arrival which obeys Poisson distribution. In addition, we have considered the short retry limit to accommodate IEEE 802.11 specifications. On one hand, lack of buffering leads to high delays and under utilization of the channel. Also the absence of short retry limit tends to overestimate the throughput. By accommodating both the shortcomings, it has been proved that our model predicts the behaviour more accurately. We have been carrying out extensive simulations to validate results of our model. We have presented the performance evaluation of both the access mechanisms present in 802.11 MAC protocol.

USIC&T-19.01

Paper Title: Improved accuracy in initial search center prediction to fasten motion estimation in h. 264/AVC.

Author(s): Arora, S.M.¹, **Rajpal, N.**², Khanna, K.³ and Purwar, R. K.⁴

Affiliation(s): ^{1,2,3}University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Department of Computer Science and Engineering, PDM Group of Institutions, Bahadurgarh, Haryana

Source: IETE Journal of Research Vol. 62(6), (2016), pp 1-10

ISSN No. : 3772063

Abstract: In this paper, a new two-step approach for enhancing the accuracy of initial search center (ISC) prediction in h.264 has been proposed which improves the speed of motion estimation in video encoding. Previous methods for estimating the ISC worked in a single step by finding the mean/median of motion vectors (MVs) of neighboring blocks of the current and reference frames. The major drawback of all the existing ISC techniques is that they consider the participation of all the neighboring blocks with equal probability without taking into account their correlation with the current block. The blocks which have least correlation or no correlation at all affect the accuracy of prediction and hence increase the chances of trapping the search in local minima. Moreover, in the existing ISC prediction techniques, participation of MVs of restricted neighboring blocks is considered, which further limits the prediction accuracy. To elevate these drawbacks, a new two-step approach has been presented. The first step of the method works by identifying some candidate blocks for ISC and the second phase refines the search to obtain best possible ISC. Use of all the surrounding blocks from spatial and temporal frame along with the refinement stage has improved the accuracy. Simulation results clearly show the enhancement in accuracy of ISC prediction, improvement in video quality in terms of peak signal-to-noise ratio (PSNR) and reduction in the number of search steps. Most recent approach in ISC prediction has shown an improvement of 11.7% as compared to standard median predictor, whereas the proposed technique shows an improvement of almost 50%. The reduction in search points is nearly 40%–50% compared to standard median predictor for fast-motion sequences. Also the proposed technique works equally well for fast, medium, slow, cif, qcif and HD video sequences as indicated in the results.

USIC&T-19.02

Paper Title: Adaptive image watermarking scheme using fuzzy entropy and GA-ELM hybridization in DCT domain for copyright protection

Author(s): Mehta, R., **Rajpal, N.** and Vishwakarma, V.P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Signal Processing Systems, Vol. 84(2), (2016), pp 265–281

ISSN No. : 1939-8115

Abstract: A novel semi-blind image watermarking scheme based on fuzzy entropy and genetic algorithm (GA)—extreme learning machine (ELM) hybridization in discrete Cosine transform (DCT) domain for copyright protection is proposed in this paper. The selection of non overlapping blocks to embed the binary watermark is based on fuzzy entropy. As fuzzy entropy is able to discriminate data distribution under noise corrupted and redundant condition, feature extraction is more robust against various attacks. Each selected block is followed by 2-D DCT to transform it from spatial to

frequency domain. Low frequency coefficients have good energy compactness and are robust to image processing attacks. As addition of noise corresponds to high frequency coefficients, these are not considered to embed the watermark in the proposed approach. The optimal scaling factor used to control the strength of watermark for each selected block of the image based on its noise sensitivity and tolerance limit is determined using GA optimization process. ELM is used to find an optimal regression function between the input feature vector (low frequency DCT coefficients) and corresponding target vector (in which the watermark bits are embedded) of each selected block. Then watermark embedding and extraction is performed intelligently by the regression function obtained by the trained ELM. The experimental results show that the proposed scheme is highly imperceptible and robust to geometric and non geometric attacks such as JPEG compression, filtering, noise addition, sharpening, gamma correction, scaling and cropping etc. To demonstrate the effectiveness of the proposed scheme, comparison with the state-of-art techniques clearly exhibits its applications for copyright protection.

USIC&T-19.03

Paper Title: A robust image encryption algorithm resistant to attacks using DNA and chaotic logistic maps

Author(s): Jain, A¹, and Rajpal, N.²

Affiliation(s): ¹Inderprastha Engineering College, Ghaziabad(UP); ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Multimedia Tools and Applications, Vol. 75(10),(2016),pp 5455–5472

ISSN No. : 1380-7501

Abstract: An image encryption technique using DNA (Deoxyribonucleic acid) operations and chaotic maps has been proposed in this paper. Firstly, the input image is DNA encoded and a mask is generated by using 1D chaotic map. This mask is added with the DNA encoded image using DNA addition. Intermediate result is DNA complemented with the help of a complement matrix produced by two 1D chaotic maps. Finally, the resultant matrix is permuted using 2D chaotic map followed by DNA decoding to get the cipher image. Proposed technique is totally invertible and it can resist known plain text attack, statistical attacks and differential attacks.

USIC&T-19.04

Paper Title: LWT- QR decomposition based robust and efficient image watermarking scheme using Lagrangian SVR

Author(s): Mehta, R., Rajpal, N., Vishwakarma, V.P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Multimedia Tools and Applications, Vol. 75(7),(2016), pp 4129–4150

ISSN No. : 1380-7501

Abstract: In this paper, an efficient and robust image watermarking scheme based on lifting wavelet transform (LWT) and QR decomposition using Lagrangian support vector regression (LSVR) is presented. After performing one level decomposition of host image using LWT, the low frequency subband is divided into 4×4 non-overlapping blocks. Based on the correlation property of lifting wavelet coefficients, each selected block is followed by QR decomposition. The significant element of first row of R matrix of each block is set as target to LSVR for embedding the watermark. The remaining elements (called feature vector) of upper triangular matrix R act as input

to LSVR. The security of the watermark is achieved by applying Arnold transformation to original watermark to get its scrambled image. This scrambled image is embedded into the output (predicted value) of LSVR compared with the target value using optimal scaling factor to reduce the tradeoff between imperceptibility and robustness. Experimental results show that proposed scheme not only efficient in terms of computational cost and memory requirement but also achieve good imperceptibility and robustness against image processing operations compared to the state-of-art techniques.

USIC&T-19.05

Paper Title: An image Encryption Algorithm resistant to attacks using Chaotic Maps

Author(s): Jain, A¹ and Rajpal, N.²

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Source: International Journal of Tomography & Simulation, Vol. 29(1),(2016),pp 23193336

ISSN No.: 1996-8566

Abstract: Chaotic maps are effectively useful in image encryption techniques due to their sensitivity to the input conditions and non-linear and deterministic natures. A number of chaotic image encryption techniques exist in literature. In this paper, a new image encryption technique using a chaotic logistic map and 80-bit external key has been proposed which has been evaluated in terms of resistance to statistical attacks using histogram analysis and correlation coefficients. Key sensitivity and key space analysis have been used to demonstrate its effectiveness for image security. The proposed technique has also been analyzed for entropy measurement and various attacks on cipher image like block loss and introduction of noise as well.

USIC&T-19.06

Paper Title: Improved fuzzy transform-based image compression and fuzzy median filter based its artifact reduction: pair fuzzy

Author(s): Gambhir, D. and Rajpal, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Int. J. Mach. Learn. & Cyber., Vol. 6(6),(2015), pp 935–952

ISSN No. : 1868-808X

Abstract: During image compression, visually significant edges should be well preserved for human perception. Despite existence of many image compression standards, joint photographic experts 'group (JPEG) is the most popularly used standard for image compression. However at low bit rate, JPEG compressed images exhibit blocking artifacts that adversely affect the visual image quality. Thus, to produce a high visual quality image at low bit rate, pairFuzzy algorithm that is simple and more efficient as compared to JPEG alongwith the capability of reducing artifact is proposed. The proposed algorithm is carried out in three steps. First, an image is preprocessed using competitive fuzzy edge detection which efficiently detects the edge pixels contained in the image. Second, based on the edge information the image is compressed and decompressed using improved fuzzy transform. Third, the reconstructed image is postprocessed using fuzzy switched median filter for artifact reduction. The subjective as well as objective analysis alongwith the comparison to recent methods proves the superiority of proposed algorithm.

USIC&T-19.07

Paper Title: Reconstruction of curves from point clouds using fuzzy logic and ant colony optimization

Author(s): Khanna, K. and Rajpal, N.

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Source: Neurocomputing Vol. 161,(2015), pp 72-80

ISSN No. : 0925-2312

Abstract: A new approach based on fuzzy logic and ant colony optimization is presented for the reconstruction of curves from a set of unorganized points. Fuzzy clustering is used to reduce the number of points to cluster centers. Ant colony optimization is used to construct a travelling salesman path which is a closed curve. Extra edges are deleted and new edges are added using the fuzzy membership function. The algorithm presented in this paper has been used for reconstructing open as well as closed curves. The results obtained for multiple and self-intersecting curves are also good. Various examples for open, closed, multiple and intersecting curves with complicated shapes are shown to illustrate the significance of the presented algorithm.

USIC&T-19.08

Paper Title: Gray scale image watermarking using fuzzy entropy and Lagrangian support vector regression in DCT domain

Author(s): Mehta, R., Rajpal, N. and Vishwakarma, V.P.

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Source: International Journal of Applied Pattern Recognition Vol. 2 (3),(2015),pp 255-279

ISSN No. : 2049-887X

Abstract: A new image watermarking scheme based on fuzzy entropy and Lagrangian support vector regression (LSVR) in discrete cosine transform (DCT) domain is proposed in this paper. Fuzzy entropy is used to extract smooth non-overlapping blocks of an image followed by DCT to each selected block to transform it from spatial domain to frequency domain. Then a feature vector of low frequency DCT coefficients of each block act as an input to LSVR. The output (predicted value) of trained LSVR is used to embed the binary watermark by comparing it with the target value of the feature vector. As fuzzy entropy is able to discriminate data distribution under noise corrupted and redundant conditions, feature extraction is more robust against various attacks. The robustness of the proposed scheme is verified by performing various types of image processing operations which include geometric and non-geometric attacks. It is evident from experimental results that with the help of randomness measured of each image block using fuzzy entropy, good learning ability and high generalisation property of LSVR have made the proposed scheme more imperceptible and robust against different types of image processing operations.

USIC&T-19.09

Paper Title: Sub-band discrete cosine transform-based greyscale image watermarking using general regression neural network

Author(s): Mehta, R.¹, Rajpal, N.¹ and Vishwakarma, V.P.¹

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Source: International Journal of Signal and Imaging Systems Engineering, Vol. 8(6), (2015), pp 380-389

ISSN No. : 1748-0698

Abstract: In this paper, a new grey scale image watermarking scheme based on sub-band discrete Cosine transform (SB-DCT) using general regression neural network (GRNN) is proposed. The image features are extracted by applying the SB-DCT to each non-overlapping block of the image. These features are used to form the dataset, which act as input to GRNN. The output obtained by GRNN is used to embed the binary watermark logo in the selected low variance blocks of the image. Owing to the good function approximation and high generalisation property of GRNN, we are able to recover the watermark after performing several image processing operations. Through the extensive experimental results, high peak signal-to-noise ratio (PSNR) value of watermarked image and high bit correct ratio (BCR), normalised correlation (NC) value of the extracted watermark proves the imperceptibility and robustness of the proposed scheme compared to the state-of-art techniques.

USIC&T-19.10

Paper Title: Image coding using fuzzy edge classifier and fuzzy F-transform: dual Fuzzy

Author(s): Gambhir, D. and Rajpal, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Fuzzy Computation and Modelling, Vol.1(3),(2015),pp 235-251

ISSN No. : 2052-353X

Abstract: To achieve high compression ratio and good quality of compressed image, a new image compression scheme using fuzzy edge classifier and fuzzy F-transform is proposed. In the proposed scheme, fuzzy edge classifier decides the smooth or edge block, based on membership value of each block which is obtained from Gaussian function. Each smooth fuzzy block is encoded with block mean and edge block is processed using fuzzy F-transform. This encoding scheme is further decoded by applying inverse fuzzy F-transform to edge blocks and mean value to smooth block, to reconstruct the image. The output image of the decoding process shows some artefacts due to mean value of smooth blocks which is further improved by proposed Gaussian block image enhancement scheme. The experimental results show that the proposed scheme to compress the images not only improves the artefacts appearing in reconstructed image but also improves the compression ratio. The PSNR calculated in the dual fuzzy proposed method is superior than PSNR calculated in JPEG, fuzzy F-transform and fuzzy F-transform with single mean value of smooth blocks.

USIC&T-19.11

Paper Title: Address allocation for MANET merge and partition using cluster based routing

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Source: SpringerPlus Vol.3(1),(2014),pp 1-13

ISSN No. : 2193-1801

Abstract: Network merges and partitions occur quite often in MANET wherein address auto-configuration is a critical requirement. There are various approaches for address auto-configuration in MANETs which allocate address to the nodes in a dynamic and distributed manner in which HOST ID and MANET ID are assigned on the basis of their Base value. MANET merges and partitions employing Cluster Based Routing Protocol require a node to be assigned as the Cluster Head (CH). This paper presents the Election Algorithm which assigns a node as the Cluster Head on the basis of its weight. Through simulation using the NS-2, it has been shown that the Election Algorithm improves the packet delivery ratio (PDR) significantly and decreases the packet delay to a great extent in comparison to the existing AODV protocol.

USIC&T-19.12

Paper Title: Normalised LCS-based method for indexing multidimensional data cube

Author(s): Sharma, M, Rajpal, N., Reddy, B.V.R. and Purwar, R. K.

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Source: International Journal of Intelligent Information and Database Systems, Vol.7 (2), (2013),pp 180-204

ISSN No. : 1751-5858

Abstract: Query processors fail to retrieve information of interest in the presence of misspelled keywords given by users. The above problem persists because most of currently used indexing system does not have fault-tolerance ability to map the misspelled keywords to the correct records stored at physical level of databases. Therefore, the information retrieval systems need additional support of spell check mechanism with limitations for correction of misspelled keywords before submitting them to query processors. In this paper, a data indexing system is introduced for indexing multidimensional data cube, which maps the keywords to the records stored at physical level in multidimensional data structure and also has normalised longest common subsequence-based string approximation method to find correct keywords against misspelled keywords which comes directly to indexing processes through user queries. It provides more than 90% accurate results in mapping misspelled keywords to the physically stored records. These results are consistent even for large datasets.

USIC&T-20.01

Paper Title: Leakage Process and Minimization – Transistor Stacking Effect, Data Retention Gated Ground Cache, Drowsy Cache

Author(s): Mukherjee, D. and Reddy, B.V.R.

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Source: Advanced Materials Research, Switzerland, Vol. 403,(2012), pp 4287-4294

ISSN No.: 1662-8985

Abstract: Leakage Current is found to be gradually increasing in CMOS VLSI circuits with advance of technologies, specially in nanometer range. Though area of a transistor is becoming less and lesser, but precious control over the operations of a transistor is not possible in such a small structure. Reductions of threshold voltage, channel length, and gate oxide thickness are responsible for generation of leakage current. In this paper we have reviewed eight types of leakage current present in CMOS VLSI circuits, namely 1. Reverse Bias p-n Junction Current, 2. Sub-threshold Leakage, 3. Drain Induced Barrier Lowering Effect, 4. Gate Induced Drain Leakage current, 5. Punch Through, 6. Narrow Channel Effects, 7. Gate Oxide Tunneling leakage current and 8. Hot-Carrier Injection. After that, we have reviewed 6-T SRAM read and write operation. Next to that, we have reviewed three techniques of leakage reduction namely 1. Transistor Stacking Effect, 2. Data Retention Gated-Ground Cache and 3. Drowsy Cache. We have reproduced the simulation result of these leakage minimization techniques. Finally, we have shown comparison of 1. Conventional 6-T SRAM leakage current, 2. Leakage current using Data Retention Gated-Ground Cache techniques and 3. Leakage current using Drowsy Cache techniques. To obtain these three results we have used Cadence Virtuoso & SoC Encounter tools. All these three results have been simulated with IBM 90 nanometer technology file.

USIC&T-20.02

Paper Title: Effect of MOSFET p-n Junction Length on Leakage Current

Author(s): Mukherjee, D. and Reddy, B.V.R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Far East Journal of Electronics and Communications, special Vol. 3(I), (2016), pp 101-113

ISSN No.: 0973-7006

Abstract: For the first time, the effect of every hundredth part of drain (and source) to substrate p-n junction length on OFF and ON current was studied. A numerical relationship between subthreshold leakage current and p-n junction length was proposed. A single NMOS bulk transistor of 20 nm technology generation was simulated by Sentaurus TCAD tool. Simulation result was found in close proximity to the theoretical proposal. Maximum 5613 times reduction in subthreshold leakage current was achieved. A tradeoff between leakage current reduction and ON current loss was also provided as a ready reference for designers to choose among various alternatives for designing low leakage or high speed transistor. As reduction of leakage current was done in device level, this methodology can be merged with any circuit level techniques.

USIC&T-20.03

Paper Title: Eigenvector centrality-based cluster size control in randomly deployed wireless sensor networks

Author(s): Jain, A,¹ and Reddy, B.V.R.²

Affiliation: ¹Ambedkar Institute of Advanced Communication Technologies and Research, Delhi; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Expert Systems with Applications, 42(5), (2015),pp2287-2848

ISSN No.: 2657-2669

Abstract: Cluster size control plays a significant role in balancing energy consumption and mitigating hot spot problem in wireless sensor networks. Cluster size control is necessary as clusters having higher member nodes consume significantly higher amount of energy while low member nodes in a cluster lead to underutilization of channel capacity. Further, cluster-heads located near to sink have to perform additional function of relaying data of other nodes. All these factors are responsible for hotspots or energy holes creation which in turn affect the network lifetime. In this paper, we propose a heuristic approach based upon Eigenvector centrality for cluster size control which we have named as Ev-CSC. While existing methods in literature consider distance of a cluster-head from sink, layered architecture, uniform deployment of nodes, prefixed sink location as a precondition, our proposed method does not have these constraints and is applicable to any kind of deployment, traffic pattern and node types. We have applied Ev-CSC on equal clustering methods and have also compared the same with state-of-the-art cluster size control methods. The experimental results demonstrate that our proposed method enhances the performance of respective equal clustering methods and performs better as compared to cluster size control methods.

USIC&T-20.04

Paper Title: Ant Colony Optimization Based Orthogonal Directional Proactive–Reactive Routing Protocol for Wireless Sensor Networks

Author(s): Jain, A,¹ and Reddy, B.V.R.²

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Source: Wireless Personal Communications, Vol. 85(1), (2015),pp 179-205

ISSN No. : 1572-834X

Abstract: Routing protocols for wireless sensor networks are important in addressing the various quality-of-service (QoS) issues pertaining to different applications. The most important QoS issues while designing routing protocols for WSN are energy awareness, scalability and network lifetime. However, to deal with these issues the solutions provided in related literature have certain inherent disadvantages like high control overhead, low packet delivery ratio and requirement of global location information. In order to resolve these issues, we propose an orthogonal transmission based scalable, lightweight and energy aware routing protocol named as OD-PPRP which does not require global location information and has low control overhead. The proposed protocol OD-PPRP has the characteristics of both reactive and proactive routing protocols and utilizes fuzzy logic and Ant Colony Optimization to identify energy efficient and optimal paths. The simulation results show that in both static and dynamic environment, OD-PPRP has better network lifetime, low end to

end transmission delay, less overhead and high packet delivery ratio than other state of art QoS aware routing protocol viz. EARQ, EAODV and EEABR.

USIC&T-20.05

Paper Title: A Novel Method of Modeling Wireless Sensor Network Using Fuzzy Graph and Energy Efficient Fuzzy Based k-Hop Clustering Algorithm

Author(s): Jain, A,¹ and Reddy, B.V.R.²

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Source: Wireless Personal Communications, Vol. 82(1),(2015), pp157-181

ISSN No. : 1572-834X

Abstract: Clustering is one of the widely used methods to save energy, increase spatial re-usability, and scalability. In this paper, we have proposed a new fuzzy graph-based modelling approach for wireless sensor network which takes into account the dynamic nature of network, volatile aspects of radio links and physical layer uncertainty. The fuzzy graph constructs fuzzy neighborhoods which are used to identify all the prospective member nodes of a cluster. For computation of optimum centrality of a cluster, we have defined a new centrality metric namely fuzzy k-hop centrality. The proposed centrality metric considers residual energy of individual nodes, link quality, hop distance between the prospective cluster head and respective member nodes to ensure better cluster head selection and cluster quality. Finally, a new computationally inexpensive clustering algorithm has been developed. The simulation results demonstrate that the proposed algorithm resulted in prolonged network lifetime in terms of clustering rounds, scalability, higher energy efficiency and uniform cluster head and cluster members distribution, as compared to LEACH-ERE and CHEF.

USIC&T-20.06

Paper Title: QoS aware orthogonal routing protocol for WSN using directional antennas

Author(s): Jain, A,¹ and Reddy, B.V.R.²

Affiliation(s): ¹Ambedkar Institute of Advanced Communication Technologies and Research, Delhi; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Mobile Network Design and Innovation, Vol. 5(3),(2014),pp 129-137

ISSN No. : 1744-2869

Abstract: In this paper, we propose a QoS aware ORRP (Q-ORRP) routing protocol to minimise the energy consumption by reducing overhead and delay. The method of intersection of signals is used for transferring the data with improved QoS. Sink is enabled with orthogonal transmission in which it sends an interest request message to all neighboring nodes in all orthogonal directions. This process continues until the interest request matches with intended data. Then the node sends the interest acknowledgement back to the sink through the reverse path. The intersection point of these two messages is considered as the rendezvous point (RP). When the RP receives these packets, it changes their direction and sends them toward destination node. Finally, sink establishes data dissemination tree towards the source through RP nodes. RPs with high residual energy and queue lengths are selected for establishing tree, so that the data transmission will be energy efficient and robust.

USIC&T-20.07

Paper Title: Normalized LCS-based method for indexing multidimensional data cube

Author(s): Sharma, M, Rajpal, N., Reddy, B.V.R. and Purwar, R. K.

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Source: International Journal of Intelligent Information and Database Systems, Vol. 7 (2), (2013), pp 180-204

ISSN No. : 1751-5858

Abstract: Query processors fail to retrieve information of interest in the presence of misspelled keywords given by users. The above problem persists because most of currently used indexing system does not have fault-tolerance ability to map the misspelled keywords to the correct records stored at physical level of databases. Therefore, the information retrieval systems need additional support of spell check mechanism with limitations for correction of misspelled keywords before submitting them to query processors. In this paper, a data indexing system is introduced for indexing multidimensional data cube, which maps the keywords to the records stored at physical level in multidimensional data structure and also has normalized longest common subsequence-based string approximation method to find correct keywords against misspelled keywords which comes directly to indexing processes through user queries. It provides more than 90% accurate results in mapping misspelled keywords to the physically stored records. These results are consistent even for large datasets.

USIC&T-20.08

Paper Title: Asymmetrical π -shaped slot embedded microstrip antenna for circular polarization

Author(s): Sharma, A.K.¹, Mittal, A.² and Reddy, B.V.R.³

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Source: IET Electronics Letters, Vol. 51(8), (2015), pp608-609

ISSN No. : 0013-5127

Abstract: A dual band, singly fed slotted microstrip antenna for the 2.4 GHz wireless local area network (WLAN) and 2.5/3.5 GHz worldwide interoperability for microwave access (WiMAX) is implemented. The antenna consists of an aperture-fed square patch embedded with a narrow and symmetrical π -shaped slot to generate dual-band resonance. The geometry resonates at a lower frequency band which fully covers the 2.4–2.484 GHz WLAN band and 2.5–2.69 GHz WiMAX band. The higher-frequency resonance is obtained in the 3.5 GHz WiMAX band. An oval-shaped stub at the open end of the single microstrip feed line is used to obtain impedance matching over a wide band of frequencies. The 10 dB return loss bandwidth measured for the antenna is 18.07 and 8.28% in the lower and upper bands, respectively. Reactive loading of the patch with the π -shaped slot has resulted in a reduction of patch size by 36% when compared with a traditional square patch resonating at an operating frequency of 2.4 GHz.

USIC&T-20.09

Paper Title: Slot embedded dual-band patch antenna for WLAN and WiMax applications

Author(s): Sharma, A.K.¹, Mittal, A.² and Reddy, B.V.R.³

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Source: Springer Wireless Personal Communication, Vol. 83(3),(2015), pp 2069-2083

ISSN No. : 1572-834X

Abstract: A unique geometry of a square patch antenna with an embedded asymmetrical π -shaped slot for circular polarization is presented. The proposed structure has an aperture coupled feed which is matched over a very wide frequency band. This is accomplished by incorporating an oval shaped stub at the end of the single microstrip feed. The antenna shows a 3-dB axial ratio bandwidth of 3.9 % (2.50–2.60 GHz) with respect to the measured minimum axial ratio frequency of 2.56 GHz. The 10-dB return loss bandwidth measured is 40.23 % (2.32–3.35 GHz) with respect to 2.56 GHz. The antenna gain is 8.2 dBi in the circularly polarized band. The antenna is well suited for use in circularly polarized antennas and arrays for wireless communication.

USIC&T-20.10

Paper Title: M-SEP: A Variant of SEP for WSN

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Affiliation(s): ^{1,2}University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Intelligent Systems Technologies and Applications, Vol. 385, (2016),pp 45-56

ISSN No. : 1740-8865

Abstract: Abstract Energy efficiency of the protocol is one of the deciding factors while considering the efficiency of a protocol in WSN (Wireless Sensor Network). Thus, this paper presents an improved version of SEP protocol called M-SEP. M-SEP will inherit some properties of the SEP while introducing the multilevel power transmission in the protocol. Thus, extending the lifetime of the network. In a nutshell, the idea is to acknowledge the existence of the different minimum energy requirement while transmitting data packets in WSN i.e., the intra transmission of packets require lower energy than that of the entire transmission or from the cluster head to the base station transmission. By implementing the multilevel power transmission in the SEP protocol, we improve the efficiency of the SEP protocol as is shown by the simulation result, we called this protocol M-SEP or Modified Stable election Protocol.

USIC&T-20.11

Paper Title: Design and Development of a single fold hairpin line Microstrip bandpass filter at 3250 mhz for s-band Communication systems

Author(s): Shivhare, J.¹ and Reddy, B.V.R.²

Affiliation(s): ¹Department of Electrical, Electronics and Communication Engineering, ITM University, Gurgaon-122017; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Advances in Engineering & Technology, Vol.8(3), (2015),pp 337-346

ISSN No.: 2231-1963

Abstract: This paper presents a new class of folded hairpin slow-wave open-loop resonator bandpass filters of high performance, compact, low cost and reduced size of 35-45% compared to the conventional hairpin line microstrip filters. The filters are not only compact sized due to the slow-wave effect, but also have a wider upper stopband resulting from the dispersion effect. These attractive features make the single fold resonator filters hold promise for RF/wireless, mobile communications and other ground and space applications. The experimental results are demonstrated and discussed. The design technique for a fourth-order single fold slow-wave open-loop resonator filter is presented by realizing the cross couplings between adjacent and non-adjacent resonators. The Agilent make ADS, IE3D-Zeland and HFSS softwares have been used to design and simulate the filter at 3250 MHz Center frequency. The filter shows good microwave characteristics, moderate quality factor and more than -25 dBc stopband attenuation to suppress out of band harmonics. The results show very good agreement between the measured and simulated results with great reduction in size compared to the conventional hairpin resonator filters.

USIC&T-20.12

Paper Title: Enhancing the security of dynamic source routing protocol using energy aware and distributed trust mechanism in MANETs

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Source: Intelligent distributed computing,(2015), Vol.321, pp 83-94

ISSN No. : 2194-5357

Abstract: A routing protocol for detection of malicious nodes and selection of most reliable, secure, close to shortest and trustworthy path for routing data packets in Mobile Ad Hoc Networks (MANETs) is introduced. Dynamic Source Routing (DSR) protocol [1] is extended and termed as Energy Efficient Secure Dynamic Source Routing (EESDSR). The protocol is based on an efficient, power aware and distributed trust model that enhances the security of Dynamic Source Routing (DSR) protocol. The model identifies the nodes exhibiting malicious behaviors like gray hole, malicious topology change behavior, dropping data packets and dropping control packets. Monitoring mechanism is suitable for MANETs as it focuses on power saving, has distributed nature and adaptable to dynamic network topology. The new routing protocol is evaluated using Network Simulator 2 (NS2). Through extensive simulations, it has been proved that EESDSR protocol performs better than the standard DSR protocol.

USIC&T-20.13

Paper Title: Analytical Models for Trust Based Routing Protocols in Wireless Ad Hoc Networks

Author(s): Kukreja, D., Singh, U. and Reddy, B.V.R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: ACM SIGSOFT Software Engineering Notes, Vol.37(4),(2012),pp 1-16

ISSN No. : 0163-5948

Abstract: In Wireless Ad Hoc Network environment, there are three ways to understand a routing protocol: (i) monitoring, (ii) simulation and (iii) modeling. In this paper, the different trust based secure routing protocols used in wireless ad hoc networks are analyzed, modeled, and described by incorporating process flow diagrams. These process flow diagrams represent stepwise workflow activities and actions. It shows the overall flow of control of a process, program or a protocol. This paper focuses on the security aspects of routing by incorporating trust parameter into account and also highlights methodology used in secure routing protocols. Such protocols have been categorized based on the model used for enforcing security, methodology and information for making effective routing decisions. In this paper, we model, discuss and analyze trust based secure ad hoc routing schemes which do not require each network node to work in promiscuous mode. We propose and design a new protocol - Trust based Routing using Dominating Set Approach (TRDSA) which overcomes the shortcomings of existing protocols.

USIC&T-20.14

Paper Title: Analytical Study of Existing Methodologies of IDS for False Alarm Rate-A Survey and Taxonomy

Author(s): Shruti, G.¹, Umang, S.², Reddy, B.V.R.³ and Hoda, M.N.⁴

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Source: International Journal of Emerging Technology and Advanced Engineering, Vol. 2(4),(2012), pp 393-399

ISSN No.: 2250-2459

Abstract: A distributed network can be described as the collection of computer systems that interacts with each other via a communication network to attain a common goal. Research on IDS is presently focusing on reducing false alarm rate in this distributed network. This paper discusses the analytical model of existing techniques to reduce false alarm which will be beneficial to the network security community.

USIC&T-20.15

Paper Title: A High Selectivity and Small Sized Double Fold Microstrip Hairpin Line Bandpass Filter for L-Band RF/Wireless Communication Systems

Author(s): Shivhare, J.¹ and Reddy, B.V.R.²

Affiliation(s): ¹Department of Electrical, Electronics and Communication Engineering, ITM University, Gurgaon-122017; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Innovative Technology and Exploring Engineering Vol.5(1),(2018),pp 72-80

ISSN No.: 2278 - 3075

Abstract: This technical paper presents a new type of double folded hairpin line microstrip bandpass filter with high selectivity, low cost and 40-50% reduction in size compared to a conventional hairpin line bandpass filter. The filters are not only compact size due to the slow-wave effect, but also have a wider upper stopband resulting from the dispersion effect. These attractive features make the resonator filters hold promise for RF/wireless, mobile communications and other ground and space applications. The design topology has the advantage of desirable narrowband, high selectivity, reasonable return loss, small sized and low cost microstrip filters, make the design simpler for wider applications in the modern wireless radio communication systems. The expected frequency responses have been simulated by using the Agilent-make ADS and IE3D-Zealand software. The measured and simulated results show good agreement.

USIC&T-20.16

Paper Title: A High Performance and Small Sized Four-Fold Microstrip Hairpin Line Bandpass Filter at 2.250 GHz for Communication Systems

Author(s): Shivhare, J.¹, Reddy, B.V.R.²

Affiliation(s): ¹Department of Electrical, Electronics and Communication Engineering, ITM University, Gurgaon-122017; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Engineering and Advanced Technology, Vol.4 (4),(2015),pp 254-260

ISSN No.: 2249 – 8958

Abstract: The contents of this technical paper is presented a new class of multi-folded hairpin line microstrip bandpass filter with improved performance, low cost and great reduction (60-65%) in size compared to a conventional hairpin line bandpass filter. The expected frequency responses have been simulated/ optimized by using The Agilent-make ADS/IE3D-Zealand softwares. The measured results are very close to the simulated/optimized results.

USIC&T-20.17

Paper Title: Compact and Small Sized Single, Double and Multi-Folded Hairpin Line Microstrip Bandpass Filters for RF/ Wireless Communications

Author(s): Shivhare, J.¹ and Reddy, B.V.R.²

Affiliation(s): ¹Department of Electrical, Electronics and Communication Engineering, ITM University, Gurgaon-122017; ²University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Invention Journal of Engineering Science and Technology, Vol. 2 (1), (2015),pp 10-16

ISSN No. : 2349-6185

Abstract: A conventional hairpin line resonator size is normally very large. The folded hairpin line resonator filters are smaller in size and easy to design, simulate/optimize and fabricate. The contents of this technical paper is to presented a new class of folded hairpin line microstrip resonator filters with great reduction (60-65%) in size compared to the conventional hairpin line filters. The proposed single, double and multi-folded hairpin line microstrip filters are narrow band, high selectivity, small sized and low-cost band-pass filters for RF/wireless trans/receive communication

systems for ground and space applications. The expected performance and frequency responses have been simulated/ optimized by using The Agilent-make ADS/IE3D - Zealand software. The measured results are very close to the simulated/optimized results with great reduction in size compared to the conventional hairpin line filters.

USIC&T-20.18

Paper Title: Impact of Fading Correlation, Polarization Coupling and Keyholes on MIMO Detectors for V-Blast Architecture

Author(s): Bindu, E. and Reddy, B.V.R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Mobile Network Communications & Telematics Vol.3(4),(2013), pp65-74

ISSN No. : 1839-5678

Abstract: This paper analyzes the impact of fading correlation, cross polarization coupling and channel degeneracy alias keyhole condition on the error performance of V-BLAST MIMO system that employs detector algorithms like ZF, MMSE and ML with ordering and successive cancellation. Deleterious impact of above mentioned channel impairments on MIMO system capacity is studied. Simulation results show the BER performance of these detectors for different modulation schemes. It is observed that lesser the channel fading correlation and cross polarization coupling values better is the performance of these detectors. Study is extended to see the effect of transmit and receive antenna correlation on Ergodic MIMO capacity.

USIC&T-20.19

Paper Title: Elliptic Curve Cryptography based Security solution in Mobile Adhoc Networks: A Review

Author: Makani,R. and Reddy, B.V.R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: IFRSA, International Journal of Mobile & Adhoc Network Vol. 6(1), (2016), pp 7-17

ISSN No. : 2231-6825

Abstract: Mobile Ad hoc Networks (MANETs) are infrastructure-less networks where node changes its topology due to its mobility characteristics. MANETS are having constrained resources such as processing speed, available battery power and secure/reliable network connectivity with neighbor nodes is the vital requirement for these networks. Hence, nodes require less computational/processing solutions to maintain their connectivity and secure data transmission. Conventional wired security solutions are inadequate for MANET's applications. Elliptic curve cryptography (ECC) based secure techniques have emerged as appropriate solution for resource-constrained networks as these techniques offer optimal computational workload and can offer high security levels with shorter or fewer bits uses. The ECC scheme includes mainly key agreement between nodes, data encryption for transmission, and digital signature algorithms for authentication of nodes in the network. The ECC schemes for MANET's applications have been evolved over the period of time and provide improved performance with comparison to the conventional schemes. Here, in this paper, survey of elliptic curve cryptography-based security solutions is presented for MANET applications.

USIC&T-20.20

Paper Title: Leakage Process and Minimization – Transistor Stacking Effect, Data Retention Gated Ground Cache, Drowsy Cache

Author(s): Mukherjee, D. and Reddy, B.V.R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Scientific.Net: Advanced Materials Research, Vol. 403-408, Vol. MEMS, NANO and Smart Systems, (2011), pp 4287-4294

ISSN No.: 1662-8985

Abstract: Leakage Current is found to be gradually increasing in CMOS VLSI circuits with advance of technologies, specially in nanometer range. Though area of a transistor is becoming less and lesser, but precious control over the operations of a transistor is not possible in such a small structure. Reductions of threshold voltage, channel length, and gate oxide thickness are responsible for generation of leakage current. In this paper we have reviewed eight types of leakage current present in CMOS VLSI circuits, namely 1. Reverse Bias pn Junction Current, 2. Sub-threshold Leakage, 3. Drain Induced Barrier Lowering Effect, 4. Gate Induced Drain Leakage current, 5. Punch Through, 6. Narrow Channel Effects, 7. Gate Oxide Tunneling leakage current and 8. Hot-Carrier Injection. After that, we have reviewed 6-T SRAM read and write operation. Next to that, we have reviewed three techniques of leakage reduction namely 1. Transistor Stacking Effect, 2. Data Retention Gated-Ground Cache and 3. Drowsy Cache. We have reproduced the simulation result of these leakage minimization techniques. Finally, we have shown comparison of 1. Conventional 6-T SRAM leakage current, 2. leakage current using Data Retention Gated-Ground Cache techniques and 3. leakage current using Drowsy Cache techniques. To obtain these three results we have used Cadence Virtuoso& SoC Encounter tools. All these three results has been simulated with IBM 90 nanometer technology file.

USIC&T- 21.01

Paper Title: Prediction of testability using the design metrics for object-oriented software.

Author(s): Singh, Y. and Saha, A.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Applications in Technology, Vol. 44(1), (2012), pp 12–22

ISSN No.: 0952-8091

Abstract: One of the cost effective methods to monitor the testing effort is to assess the testability of the software from the early phases of the software development. Software metrics based testability assessment can enable testers to focus more on the testing of the less testable classes. This paper presents a study based on the experimental analysis that uses fourteen design metrics as the independent variables and two JUnit based test metrics as the dependent variables. The results of the study indicate a number of promising effects of design metrics on testability of a class in object oriented software.

USIC&T-22.01

Paper Title: Comparison of EDG, Diamond Grinding, and EDM Processing of Conductive Alumina Ceramic Composite

Author(s): Satyarthi, M.K.¹ and Pandey, P.M.²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Indian Institute of Technology Delhi, New Delhi 110016

Source: Materials and Manufacturing Processes, Vol. 28(4),(2013), pp 369-374

ISSN No.: 1042-6914

Abstract: The ceramic materials are widely used in various industrial applications nowadays as they possess excellent properties like high hardness, low fractural strength, and brittleness, which makes machining very difficult and costly. Therefore, in the present work, the processes like conventional diamond grinding, electric discharge machining (EDM), and electric discharge grinding (EDG) are compared on the basis of material removal rate (MRR) and surface finish (Ra). EDG is the hybrid process of EDM and grinding and hence utilizes the benefits of both processes to give better MRR and surface finish than the parent processes. The MRR achieved in the EDG process is up to 50 times higher, and the surface roughness is at least 4 times better than the EDM process. The surface finish obtained by the EDG process is at least 4.5 times better than the conventional diamond grinding process and 3 times lower than cryogenically cooled conventional diamond grinding process. Surface and subsurface cracks, pit formation, and micro pores were observed after conventional diamond grinding and EDM, but no such drawbacks were found on the selection of proper process parameters in case of the EDG process. Hence, surface finish and MRR obtained in EDG are better than EDM and the conventional diamond grinding process

USIC&T-22.02

Paper Title: Modeling of material removal rate in electric discharge grinding process

Author(s): Satyarthi, M.K.¹ and Pandey, P.M.²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Indian Institute of Technology Delhi, New Delhi 110016

Source: International Journal of Machine Tools and Manufacture, Vol.74,(2013), pp 65-73

ISSN No.: 0890-6955

Abstract: The mechanism of material removal in electric discharge grinding (EDG) is very complex due to interdependence of mechanical and thermal energies responsible for material removal. Therefore, on the basis of conceived process physics for material removal, an attempt has been made to predict the material removal rate (MRR). The proposed mathematical model is based on the fundamental principles of material removal in electric discharge machining (EDM) and conventional grinding processes. The inter-dependence of the thermal and mechanical phenomena has been realized by scanning electron microscopy (SEM) characterization of the samples machined at different processing conditions. The key input process parameters like pulse on time, pulse current, gap voltage, duty cycle, pulse off time, frequency, depth of cut, wheel speed and table speed are co-related with MRR for three distinct idealized processing conditions. The constant showing the extent of interdependence of two phenomena were evaluated by experimental data. The obtained expressions of MRR have been validated for processing conditions other than those used for obtaining constants. It was found that the discharge energy plays prominent role in

material removal. The percentage difference in experimental findings and theoretical predictions was found to be less than 3%.

USIC&T-22.03

Paper Title: Experimental Investigations into Electric Discharge Grinding of Al₂O₃– SiCw– TiC Ceramic Composite

Author(s): Satyarthi, M.K.¹ and Pandey, P.M.²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Indian Institute of Technology Delhi, New Delhi 110016

Source: International Journal of Engineering Research and Technology, Vol. 5(07),(2015),pp 149-161

ISSN No.: 2278-0181

Abstract: The physical and mechanical properties of ceramic composite materials make their processing difficult by conventional processes. The electric discharge machining (EDM) and conventional grinding processes has been tried successfully in the recent past to machine Al₂O₃–SiCw–TiC ceramic composite. Although the processing of alumina ceramic was successful, the defects induced by processes were also evident. In the present work, electric discharge grinding (EDG) has been tried as an alternative for machining of Al₂O₃–SiCw–TiC ceramic composite. The cost effective utilization of electric discharge grounded components in commercial applications relies on the material removal mechanisms, its relationship with the EDG parameters and the formation of surface and sub-surface damages. Therefore, influence of process factors like discharge current, duty cycle, pulse on time, table speed, and wheel speed has been studied on material removal rate (MRR) and surface roughness (SR). The central composite rotatable design (CCRD) has been used to plan the experiments. Optimization of process factors has been done to obtain the highest MRR and lowest SR. It was found that the contribution of process factors like duty cycle, pulse on time, table speed and wheel speed were significant on MRR. The contribution of discharge current alone in the selected range was found insignificant. It was observed that the MRR achieved was 4 to 10 times higher in EDG than EDM process. The process factors like discharge current, duty cycle, pulse on time and its interactions shows significant contribution on SR, whereas, the contribution of wheel speed and table speed were insignificant. Although the ratios of wheel speed to table speed affects the SR. It has been established that the SR obtained by EDG is less than EDM and conventional diamond grinding processes. It was also observed that the SR obtained is 2 to 5 times lower in EDG than EDM process. The surface and subsurface damages were assessed and characterized by scanning electron microscope (SEM). The surface produced by EDG was found free from surface/sub-surface defects. The recast layer was observed in few cases and was swept uniformly along the work surface resulting in low SR.

USIC&T-22.04

Paper Title: Processing of Al₂O₃–SiCw–TiC ceramic composite by powder mixed electric discharge grinding

Author(s): Satyarthi, M.K.¹ and Pandey, P.M.²

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Indian Institute of Technology Delhi, New Delhi 110016

Source: Mechanics of Advanced Materials and Modern Processes, Vol. 2(1),(2016), pp 2-13

ISSN No.: 2198-7874

Abstract: The machining of conductive alumina ceramic was successful by the electric discharge grinding (EDG). Therefore, the aim of the present work is to increase the material removal rate (MRR) during EDG of conductive alumina ceramic by addition of ceramic powder with dielectric.

USIC&T- 23.01

Paper Title: MBT for Functional Testing of Embedded Systems

Author(s): Khan, M.N., Arya, N. and Singh, A.P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Sciences and Engineering, Vol.4(5),(2016),pp10-16

ISSN No.: 2347-2693

Abstract: An electronic system developed for specific application with the integration of hardware and software is known as Embedded System. Due to complexity of hardware and software in a single system, it requires specific technique for testing before deployment of the device. This paper proposes the comparative study of testing techniques of embedded system. Methods/Analysis: In this paper, a test methodology of embedded system using PCBA has been proposed, that covers all the testing aspects of the embedded system from electrical board level hardware to the embedded system software. Three tests namely power rail test, interconnect test and the infrastructure tests are used for hardware functionality for stuck at and bridging faults. The functionality test has been used for programming validation using port interface. Findings: This paper proposed automatic testing of embedded board, which reduces manual errors, increases test coverage and reduces the test time in the production line. The proposed method showed that it can be applied to any board in any form with the same test hardware barring the input-output cables. The software in host machine has been used for testing purpose of different boards. This testing technique is useful for embedded systems implemented in control systems.

USIC&T- 23.02

Paper Title: Building up Environment sustainable city through IT lens

Author(s): Singh, S. and Singh, A.P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Latest Trends in Engineering and Technology RICSIT (2016), pp 24-28

ISSN No.: 2278-621X

Abstract: Global urbanization trends and pressing issues around sustainability pose great challenges for cities. The smart city concept has been developed as a strategy for

working with cities as they become systematically more complex through interconnected frameworks, and increasingly rely on the use of Information and Communication Technology to meet the needs of their citizens. The paper describes the main attributes of a smart sustainable city (SSC) and provides readers with a wider understanding of composition of sustainable smart city. The primary characteristics of the city along with its attributes are clubbed into four primary pillars viz. economy, governance, environment and society. It identifies and highlights the role and potential of information and communication technologies (ICTs) in SSC.

USIC&T- 23.03

Paper Title: Metrics for Measurement of Node Fault in Sigmoidal FFANNs

Author(s): Singh, A.P., Rai, C.S. and Chandra, P

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Modelling and Optimization, Vol. 3(1),(2013), pp 87-91

ISSN No. : 2010-3697

Abstract: An important issue in the design of a neural network is the sensitivity of its output to input, and node fault. In this paper, new sensitive measures are proposed for node fault, specifically node stuck-at-zero fault. Correlation coefficient between empirical mean squared error and error due to proposed metric shows that the proposed metrics are significant metrics due to their statistical significance at 95% confidence level for node stuck-at-zero fault.

USIC&T- 23.04

Paper Title: Empirical Study of FFANN tolerance to weight stuck at MAX/MIN Fault

Author(s): Singh, A.P., Rai, C.S. and Chandra, P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Artificial Intelligence & applications, Vol. 1(2), (2010),pp 13-21

ISSN No.: 0975-900X

Abstract: Fault tolerance property of artificial neural networks has been investigated with reference to the hardware model of artificial neural networks. Weight fault is an important link, which causes breakup between two nodes. In this paper three types of weight faults have been explained. Experiments have been performed to demonstrate fault tolerance behavior of feedforward artificial neural network for weight-stuck-MAX/MIN fault. Effect of weight-stuck-MAX/MIN fault on trained network has been analyzed in this paper. The obtained results suggest that networks are not fault tolerant to this type of fault.

USIC&T- 23.05

Paper Title: New Metric for Sensitivity Analysis of FFANN

Author(s): Singh, A.P., Rai, C.S. and Chandra, P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Engineering Science & Technology vol. 2(4), (2010),pp 322-329

ISSN No.: 0975-5462

Abstract: Fault tolerance property of artificial neural networks has been investigated with reference to the hardware model of artificial neural networks. Weight fault is an important link, which causes breakup between two nodes. In this paper weight fault has been explained. Experiments have been performed for Weight-stuck-0 fault. Effect of weight-stuck-0 fault on trained network has been analyzed in this paper. The obtained results suggest that networks are not fault tolerant to this type of fault.

USIC&T-24.01

Paper Title: Conceptual multidimensional modeling for data warehouses: a survey

Author(s): Gosain, A. and Singh, J.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Proc of the 3rd International Conference on Frontiers of Intelligent Computing: Theory and Applications (FICTA 2014), Vol. 328(1), (2014), pp 305-316

ISSN No. : 2194-5357

Abstract: Conceptual multidimensional modeling aims at providing high level of abstraction to describe the data warehouse process and architecture, independent of implementation issues. It is widely accepted as one of the major parts of overall data warehouse development process. In the last several years, there has been a lot of work devoted to conceptual multidimensional modeling for data warehouses. This paper presents a survey of various proposed conceptual multidimensional models for core as well as advanced features supported. Hereafter, a comparison of the models is done based on the criteria broadly categorized as: general aspects, relationship aspects and implementation aspects, showing the evolution in this area. General aspects involve basic features of the multidimensional model. The relationships among various constructs used in the multidimensional model are referred under relationship criteria. The implementation criteria relate aspects such as mathematical formalism and guidelines to define complex multidimensional structures.

USIC&T-24.02

Paper Title: Quality Metrics for Data Warehouse Multidimensional Models with Focus on Dimension Hierarchy Sharing

Author(s): Gosain, A. and Singh, J.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Proc of the 3rd International Symposium on Intelligent Informatics, Vol. 320 (1), (2014),pp 429-443

ISSN No. : 2194-5357

Abstract: Data warehouses, based on multidimensional models, have emerged as powerful tool for strategic decision making in the organizations. So it is crucial to assure their information quality, which largely depends on the multidimensional model quality. Few researchers have proposed some useful metrics to assess the quality of the

multidimensional models. However, there are certain characteristics of dimension hierarchies (such as relationship between dimension levels; sharing of some hierarchy levels within a dimension, among various dimensions etc.) that have not been considered so far and may contribute significantly to structural complexity of multidimensional data models. The objective of this work is to propose metrics to compute the structural complexity of multidimensional models. The focus is on the sharing of levels among dimension hierarchies, as it may elevate the structural complexity of multidimensional models, thereby affecting understandability and in turn maintainability of these models.

USIC&T-24.03

Paper Title: Assortment Of Materialized View: A Comparative Survey In Data Warehouse Environment

Author(s): Kirti, D. and Singh, J.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal Of Computer Applications, Vol.96(7), (2014),pp 1-8

ISSN No. 0975-8887

Abstract: Data warehouse is a repository of large amount of data collected from multiple heterogeneous and distributed data sources. Data warehouse stores lots of data in the form of views, referred as materialized views which provide a base for decision support or OLAP queries. Materialized views store the result of queries which improves the query performance. One of the most important aspect in data warehousing is the selection of materialized views which minimizes the query response time and maintenance cost, given a limited storage space. In this paper, analysis of various approaches of view selection in data warehousing environment is done that have been proposed in the recent past and also provided a comprehensive study of these approaches based on various parameters such as issues addressed, query language supported, comparison to benchmark etc.

USIC&T-24.04

Paper Title: Modelling Of Library System Using Agent Goal Decision Information Model: A Case Study

Author(s): Yadav, D. and Singh, J.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal Of Computer Applications, Vol. 96(7), (2014), pp 5-11

ISSN No. : 0975-8887

Abstract: Data Warehouse (DW) is defined as integration of heterogeneous data into multidimensional repository for providing decisional support. Requirement Analysis has played a main role in the development of DW which provides strategic information to the end-users. There are many approaches for elicitation of requirements in the DW. One of the approaches is Agent Goal Decision Information (AGDI) model. In this paper we have discussed about the Agent Goal Decision Information Model and illustrated it with the help of Library Management System.

USIC&T-24.05

Paper Title: Data Quality Tools For Datawarehouse Models

Author(s): Singh, J. and Vashishtha, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal Of Engineering Science And Technology, Vol. 7(5), (2015),pp 181-191

ISSN No. : 2548-6632

Abstract: Data quality tools aim at detecting and correcting data problems that influence the accuracy and efficiency of data analysis applications. Data warehousing activities require data quality tools to ready the data and ensure that clean data populates the warehouse, thus raising usability of the warehouse. This research targets on the problems in the data that are addressed by data quality tools. We classify data quality tools based on datawarehouse stages and features of tool; which address the data quality problems and understand their functionalities.

USIC&T-24.06

Paper Title: Validation Of Object Oriented Metrics For Evaluating Understandability Of Data Warehouse Models

Author(s): Singh, J. and Vashishtha, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal Of Computer Applications, Vol. 118(13),(2015), pp 26-33

ISSN No. : 0975-8887

Abstract: Datawarehouse has a key role in formulating strategic decisions thus it is very essential to maintain its quality. Metrics have been generally used to direct designers to develop quality data models. Numerous researchers have proposed metrics for multidimensional models for datawarehouse. These metrics are required to be empirically validated to prove their practical utility. Empirical validation of the object oriented metrics for multidimensional models for data warehouses at a conceptual level is presented in the paper. Quality attribute understandability is assessed through various combinations of metrics. Univariate and Multiple linear regression analysis have been used in this paper for computing the multidimensional models quality. The results show that these metrics may be considered as key indicators for quality of multidimensional data models.

USIC&T-25.01

Paper Title: Dielectric Material Selection of Microstrip Patch antenna for Wireless Communication Application using Ashby's Approach

Author(s): Choudhary, P.¹, Kumar, R.², and Gupta, N.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ^{2,3}Birla Institute of Technology and Science, Pilani, Rajasthan

Source: International Journal of Microwave and Wireless Technologies, Vol. 7(5),(2015), pp 579-587

ISSN No. : 1759-0787

Abstract: In this paper, material selection has been done for dielectric substrate material in microstrip patch antenna (MPA) for three distinct classes of wireless communication

applications using Ashby's approach. This material selection procedure is based on the creation and evaluation of Ashby's chart of different material indices. These material indices in turn affect the device performance indices, which decide the best possible dielectric material to be used as substrate for MPAs. In this work, quality factor, relative permittivity, and temperature coefficient of resonant frequency are chosen as material indices of MPA's dielectric substrate to get relevant performances. Ashby's selection chart shows that $0.75\text{MgAl}_2\text{O}_4\text{--}0.25\text{TiO}_2$ material for millimeter waves applications, $\text{Ca}[(\text{Li}/3\text{Nb}_{2/3})0.85\text{Ti}_{0.15}]\text{O}_{32d}$ for mobile base station applications, and $(\text{Ba}_{0.95}\text{Ca}_{0.05})\text{O--Sm}_2\text{O}_3\text{--}4.5\text{TiO}_2$ ceramic for mobile phone miniaturization applications are the promising materials that allows best overall performance in MPAs for wireless communication.

USIC&T-25.02

Paper Title: In-line spur line band stop filter in modified microstripline structure

Author(s): Choudhary P.¹, Gangwar D.², and Mittal A.³

Affiliation(s): ¹University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Bharati Vidyapeeth's College of Engineering New Delhi; ³Ambedkar Institute of Advanced Communication Technologies and Research, Geeta Colony, New Delhi-110 031

Source: International Journal of Microwave and optical Technology, Vol.7(2), (2012), pp 97-100

ISSN No.: 1553-0396

Abstract: The work presented here describes the novel design of in-line spur line band-stop filter in modified Microstripline structure. The proposed structure uses a conventional quarter-wavelength open-stub resonator terminated with a discontinuity capacitor. Spur line resonator has been incorporated in the ground plane with broadside coupling. Additional ground plane has been provided below the spur for closing the field lines. Design has been carried out at 14 GHz with reference structure. The Design results have been verified with simulations carried out with AWR Microwave Office. The concept has been proved with experimental Results.

USIC&T-26.01

Paper Title: Bi-modal derivative activation function for sigmoidal feedforward networks

Author(s): Sodhi, S.S. and Chandra, P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Neurocomputing, Vol. 143, (2014), pp182-196

ISSN No.: 0925-2312

Abstract: A new class of activation functions is proposed as the sum of shifted log-sigmoid activation functions. This has the effect of making the derivative of the activation function with respect to the net inputs, be bi-modal. That is, the derivative of the activation functions has two maxima of equal values for nonzero values of the parameter, that parametrises the proposed class of activation functions. On a set of ten function approximation tasks, the usage of the proposed activation function demonstrates that there exists network(s), using the proposed activation, and are able to achieve lower generalisation error, in equal epochs of training using the resilient backpropagation algorithm. On a set of four benchmark problems taken from UCI machine learning repository, for which the networks are trained using the resilient backpropagation algorithm, the scaled conjugate algorithm, the Levenberg–Marquardt algorithm and the quasi-Newton BFGS algorithm, we observe that the

usage of the proposed algorithms leads to better generalisation results, similar to the results for the ten function approximation tasks wherein the networks were trained using the resilient backpropagation algorithm.

USIC&T- 27.01

Paper Title: Development and validation of an improved test selection and prioritization algorithm based on ACO

Author(s): Suri, B. and Singhal, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Reliability, Quality and Safety Engineering, Vol.21(6),(2014) pp 1450032(1-13)

ISSN No: 0218-5393

Abstract: Regression testing is an important and often costly software maintenance activity. Retesting the software using existing test suite whenever modifications are made to the system, in order to regain confidence in correctness of the system, is called as Regression Testing. Regression test suites are often too large to re-execute in the given time and cost constraints. Reordering of the test suite is done according to appropriate criteria like code, branch, condition and fault coverage, etc. This process is known as Test Suite Prioritization. We can also select a subset of the original test suite on the basis of some criteria, often called as Regression Test Selection. The research problem that arises from this is the choice of technique or process to be used for selecting and prioritizing according to one or more of the chosen criteria(s). Ant Colony Optimization (ACO) is one such technique that was used by Singh et al. for solving Time-Constrained Test Suite Selection and Prioritization problem using Fault Exposing Potential (FEP). In this paper, we propose improvements to the existing algorithm along with details of the time complexity of the algorithm. It was very convincing to implement the technique considering the results obtained. Implementation of the proposed algorithm has also been demonstrated. The tool was repeatedly run on sample programs by changing the time constraint criterion. The analysis shows the usefulness and effectiveness of using ACO technique for test suite selection and prioritization.

USIC&T- 27.02

Paper Title: Understanding the effect of time-constraint bounded novel technique for regression test selection and prioritization

Author(s): Suri, B. and Singhal, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Systems Assurance Engineering and Management, Vol. 6(1), (2015), pp 71–77

ISSN No.: 0976-4348

Abstract: It is the demand of our ever-advancing IT industry that software be updated in order to continue its use. Such a modification should not introduce any unwanted new faults in the system. For this, the existing test suite needs to be rerun, often called as regression testing. The main challenge during the regression testing process is not to exceed the desired time and budget deadlines. As a consequence various techniques such as test case selection, minimization and prioritization are used. This paper proposes and analyzes the effect of time constraint on an ant colony optimization based technique for Regression test selection and prioritization. It has been found

that with an increase in the applied time constraint, there are more chances to get an optimum selected and prioritized test suite. Also it was found that the complexity of our algorithm depends on the size of the test suite and the applied time constraint and is independent of the number of faults being mutated or any other input variable.

USIC&T- 27.03

Paper Title: Evolved regression test suite selection using BCO and GA and empirical comparison with ACO

Author(s): Suri, B. and Singhal, S.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: CSI transactions on ICT, Vol. 3 (2), (2016), pp 143-154

ISSN No.: 2277-9086

Abstract: Regression testing is a maintenance activity that is performed to ensure the validity of modified software. The activity takes a lot of time to run the entire test suite and is very expensive. Thus it becomes a necessity to choose the minimum set of test cases with the ability to cover all the faults in minimum time. A lot of techniques have already been developed and proved to be very effective in reduction of test suite. The paper presents a new improved modified technique based on Bee Colony Optimization and Genetic Algorithm that makes use of permutations/combinations to generate a new set of test cases. The proposed modified technique has been empirically validated on 17 sample programs for its near 90 % correctness and an average 80 % execution time reduction capability. Also, the developed technique has been compared with the existing technique for test case selection using ACO. The comparison proves the superiority of the developed technique against the existing one in majority of the programs with some exceptions. In addition to this, the results have been analyzed based on the language of the programs under test and the type of desired result. The comparison between the tool MHBG_TCS (developed for the technique proposed in this paper) and the tool ACO_TCSP (existing tool) yielded superiority of the new technique in general. All the results prove the validity of our technique and inspire us to work further on this technique.

USIC&T-28.01

Paper Title: Adaptive Congestion Controller for ABR Traffic in ATM Network

Author(s): Ujjwal, L.R., Rai, C. S., and Prakash, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Wireless Personal Communication, Vol. 70(2), (2012),pp 759-768

ISSN No.: 0929-6212

Abstract: One of the imperatives for improving the quality-of-service (QoS) of high-speed networks of next generation is to reduce congestion. Congestion occurs when the resource demand exceeds the capacity of the network. The purpose of this paper is to analyze the performance of Robust Adaptive Congestion Control algorithm for available bit rate traffic in asynchronous transfer mode networks and suggest improvements of the algorithm for better performance and fairness. The results of simulation presented here corroborates the fact that the improved algorithm reduces settling time and cell loss ratio and thus maximizes utilization of the network.

USIC&T-28.02

Paper Title: Resource Allocation Algorithm to Improve the Quality-of-Service in OFDMA System

Author(s): Ujjwal, L.R., Rai, C. S., and Prakash, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: CSI Communications, Vol. 38(1), (2014),pp 28-30

ISSN No.: 0970-647X

Abstract: Wireless mobile communications play a very important role in our life. It provides the communication services anywhere and at anytime. In order to improve quality of service, determined on the basis of acceptable data transfer rate, signal to noise ratio (SNR) and bit error rate (BER), it is imperative to provide high capacity downlink in cellular systems. It can be achieved by management of resources in orthogonal frequency division multiple access (OFDMA) systems.

USIC&T-28.03

Paper Title: CAVEAT: Credit Card Vulnerability Exhibition and Authentication Tool

Author(s): Jain, I., Johari, R., and Ujjwal, L.R.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Security in Computing and Communications, of the series Communications in Computer and Information Science, Vol. 467,(2014), pp 391-399

ISSN No.: 978-3-662-44965-3

Abstract: Online banking (or Internet banking or E-banking) makes people capable to do financial transactions on a secured website. It allows users to manage their money without going to their respective banks. Today, the users can do the financial transactions of their daily life like bill payments, shopping, booking movie, train, air and various other event tickets through online banking. Since the online banking involves circulation of money so it should be secured but as the use of online banking is increasing, the security threats to the banking applications are also increasing. In this paper, we have designed a Java based tool to show the exploitation of Injection (OWASP Top 10-2013 A1 Vulnerability) using SQL Injection attack and Broken Authentication(part of OWASP Top 10-2013 A2 Vulnerability) using Brute Force Attack and Dictionary Attack and the prevention of all these attack by storing the data in our database in encrypted form using AES algorithm.

USIC&T-28.04

Paper Title: Adaptive Resource Allocation in OFDMA System: A Review

Author(s): Ujjwal, L.R., Rai, C. S., and Prakash, N.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Applications, Vol. 114 (16),(2015), pp 21-24

ISSN No.: 0975 – 8887

Abstract: The need for high capacity downlink in wireless mobile network in future is very much essential and efforts are being made to identify appropriate techniques to attain high capacity downlink. Latest approaches indicated that the orthogonal frequency division multiple access (OFDMA) technique is emerging as a potential technique. While the other techniques result inter-carrier interference, OFDMA technique over comes this problem due to orthogonal location of sub-carriers. This gives advantage by obviating the need for intercarrier guard band. The issues of efficient utilization of bandwidth, minimizing power consumption and fair distribution of resources among users are central to determine the appropriate technique to be used for resource allocation. This paper discusses various techniques suggested by the researchers for resource allocation and concludes that adaptive algorithm is more efficient compared to static TDMA/FDMA system

USIC&T- 29.01

Paper Title: Lagrangian twin support vector regression and genetic algorithm based robust grayscale image watermarking

Author(s): Yadav, A.K.¹, Mehta, R.², Kumar, R.³, and Vishwakarma, V.P.⁴

Affiliation: ^{1,3}Department of Computer Science and Engineering, University Institute of Engineering and Technology, Maharishi Dayanand University, Rohtak; ²Amity School of Engineering and Technology, Bijwasan, New Delhi; ⁴University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Multimedia Tools & Application, Vol. 75(5),(2016), pp 1–24

ISSN No. : 1380-7501

Abstract: A novel imperceptible, secure and robust grayscale image watermarking scheme using Lagrangian twin support vector regression (LTSVR) and genetic algorithm (GA) in discrete Cosine transform (DCT) domain is presented in this manuscript. Fuzzy entropy is used to select the relevant blocks for embedding the watermark. Selected number of blocks based on fuzzy entropy not only reduces the dimensionality of the watermarking problem but also discards redundant and irrelevant blocks. Significant DCT coefficients having high energy compaction property of each selected block are used to form the image dataset to train LTSVR to find the non-linear regression function between the input and target vector. The adaptive watermark strength, different for each selected block, is decided by the GA process based on well defined fitness function. Due to good learning capability of image characteristics and high generalization property of LTSVR, watermark is successfully extracted from the watermarked images against a series of image processing operations. From the experimental and comparison results performed on standard and real world images, it is inferred that the proposed method is suitable for copyright protection applications where high degree of robustness is desirable.

USIC&T- 29.02

Paper Title: An efficient classification based on genetically optimised hybrid PCA-Kernel ELM learning

Author(s): Goel, T., Nehra, V., and Vishwakarma, V.P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi, Delhi 110078

Source: International Journal of Applied Pattern Recognition, Vol. 3(3), (2016),pp241–258

ISSN No. 2049-887X

Abstract: A new classifier based on genetically optimised kernel extreme learning machine (KELM) is presented here. Firstly, principal component analysis (PCA) is used to retrieve the important features from the datasets and further these features are used for classification. Classification is done by using the genetically optimised KELM algorithm in which the kernel parameters of the kernel function of ELM are optimised by using the genetic algorithm (GA). The present approach is investigated on eight benchmark biomedical datasets from UCI machine learning repository and AT&T face database to show its efficiency and effectiveness. The results are validated by using classification accuracy, ROC and cross validation. The results show that the proposed learning algorithm is better in terms of generalisation performance and learning speed compared to other state of the art learning algorithms.

USIC&T- 29.03

Paper Title: Face Recognition using Two Dimension Fractional Discrete Cosine Domain and BPNN

Author(s): Arora, K., Vishwakarma, V.P., and Garg, P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi- 110078

Source: International Journal of Computer Applications, Vol. 113(10), (2015),pp 45-50

ISSN No. : 0975-8887

Abstract: Face database contains images taken at various instants of the same person. The matching accuracy of spatial features drops significantly both in the presence of noise as well as when the variations in the different instances are high. To attenuate the image variations up to certain extent, image data is transformed from spatial domain to transformed domain. In this paper an effort is made to explore the effect of using fractional order spectrum obtained by the application of 2D FRDCT on the accuracy of face recognition. PCA is used as dimension reduction approach for reducing transformed feature set dimensionality. Reduced feature set is then classified by back propagation neural network classifier. Through the experiments performed on AT&T database it is shown that proposed FRDCT feature set approach gives a recognition accuracy of 94% with BPNN. Comparison is conducted for fractional order feature classification accuracy of AT&T public database with nearest neighbour classification approach. Experimental result shows marked reduction in classification error rate with neural network classification

USIC&T- 29.04

Paper Title: Illumination normalization using fuzzy filter in DCT domain for face recognition

Author(s): Vishwakarma V.P.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi, Delhi 110078

Source: International Journal of Machine Learning &Cybernetics, Vol. 6(1), (2015) pp17–34

ISSN No. : 1868-808X

Abstract: We develop a new approach of illumination normalization for face recognition under varying lighting conditions. The effect of illumination variations is in decreasing order over low-frequency discrete cosine transform (DCT) coefficients. The proposed approach is expected to nullify the effect of illumination variations as well as to preserve the low-frequency details of a face image in order to achieve a good recognition performance. This has been accomplished by using a fuzzy filter applied over the low-frequency DCT (LFDCT) coefficients. The 'simple classification technique' (k -nearest neighbor classification) is used to establish the performance improvement by present approach of illumination normalization under high and unpredictable illumination variations. Our fuzzy filter based illumination normalization approach achieves zero error rate on Yale face database B (named as Yale B database in this work) and CMU PIE database. An excellent performance is achieved on extended Yale B database. The present approach of illumination normalization is also tested on Yale face database which comprises of illumination variations together with expression variations and misalignment. Significant reduction in the error rate is achieved by the present approach on this database as well. These results establish the superiority of the proposed approach of illumination normalization, over the existing ones.

USIC&T-30.01

Paper Title: An improved application package for mobile devices on Symbian platform.

Author(s): Yadav J. and Sadana, S. J.

Affiliation(s): University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of engineering research and applications, Vol.1(2), (2011),pp 125-139

ISSN No.: 2248-9622.

Abstract: This paper focuses on the growing trends in the processor speed of mobile devices, which has already touched 2GHz and the huge internal and external memory available in the form of Micro SD cards, with supportable communication technology like 3rd Generation Mobile Telephony. The mobile devices shall be out casting the Personal Computers in the coming decade as they are becoming sophisticated general purpose computers . In this paper application development of an executable Application package has been done on a mobile device (Nokia E71), on Symbian 3.0 Real Time Operating System, thereby developing Bluetooth and Camera functions of the said mobile device by means of python programming language for S60 platform.

**UNIVERSITY SCHOOL OF
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USMS-1.01

Paper Title: Service Quality Models: A Review

Author(s): Aggarwal, V.S. and Jain, P.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BVIMSR'S Journal of Management Research, Vol.7(2), (2015), pp 125-136

ISSN No.: 0976-4739

Abstract: Purpose – The main objective of this paper is to critically appraise various service quality models and identify issues for future research based on the critical analysis of literature. Design/methodology/approach – The paper critically examines 19 different service quality models reported in the literature. The critical review of the different service quality models is intended to derive linkage between them, and highlight the area for further research. Findings – The review of various service quality model revealed that the service quality outcome and measurement is dependent on type of service setting, situation, time, need etc factors. In addition to this even the customer's expectations towards particular services are also changing with respect to factors like time, increase in the number of encounters with a particular service, competitive environment, etc. This paper provides a rich agenda for future research in the subject. Research limitations/implications – This research developed a linkage between the different service quality models. Practical implications – The growth of literature in the field of service quality seems to have developed sequentially, providing a continuous updating and learning from the findings/observations of predecessors. This paper provides new directions to service quality researchers. Originality/value – This paper explores new directions in service quality research and offers practical help to researchers and practitioners in providing a direction for service quality improvement.

USMS-1.02

Paper Title: A Study of Effectiveness of Advergaming on Children

Author(s): Khurana, S. and Aggarwal, V.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BVIMSR'S Journal of Management Research, Vol. 7(2), (2015), pp 137-142

ISSN No.: 0976-4739

Abstract: In the modern media environment children usually spend most of their leisure time in playing games, watching TV, surfing on the internet which makes them more critical and knowledgeable thus, leading to changes in purchasing preferences and intentions. Advergaming are new and emerging tool of Digital marketing used to entice adults and children to play in branded environments. The paper aims to determine the effectiveness of advergaming on young children on the basis of modified hierarchy of effects model. A qualitative research was done on controlled group of young children. Also, this paper provides a first opportunity to do this kind of research in an Indian context. A qualitative research was conducted in the private computer classes in the Gurgaon region. The sample population consisted of controlled group of 15 children in the age group of 5-8 years who could use internet and could also respond to simple paper and pencil surveys. An experiment performed over young children by providing them the computers to play KFC game online for certain minutes so as to check their response after game playing on the basis of attention, recognition, liking, preference, intention and choice. Finally, it was concluded that advergaming are very effective in influencing children buying

behaviour as majority of them are able to retain character in their mind showed in the game and KFC is the brand which is preferred over other brands by the children but not for consumption purpose. KFC is the brand, which is preferred over other brands by the children but not for consumption.

USMS-1.03

Paper Title: Female Headed Households and Feminization of Poverty

Author(s): Aggarwal, V.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Research Journal of Social Science and Management, Vol. 2 (4), (2012), pp 57-62

ISSN No.: 2251-1571

Abstract: This essay aims to discuss the assertion that the overemphasis on “female- headed households” in the “feminization of poverty” is somewhat paradoxical not only on account of tenuous data, but on conceptual grounds as well (S Chant 2006:205). The essay relies greatly on the writings of Sylvia Chant in general and in particular on the original sources identified and the arguments delineated in Chant (2003). Defining the basic issues involved, “Female household headship” refers to situations where an adult women (usually with children) resides without a male partner (or, in some cases, another adult male such as a father or brother) (Chant 1997a:5; also Wartenburg, 1999:77). Even though standardized definitions have limitations as headship is not a politically neutral concept and female headship is likely to be underreported through male bias (Buvinic and Gupta, 1997:260; Feijoo, 1999:162; Folbre, 1991; Harris, 1981), an estimated 20-25% households are reported to be headed by women (Moghadam, 1997 as cited in Chant, 2003: Note 2).

USMS-1.04

Paper Title: The causes and effects of the ‘Housing Bubble and Real Estate Crisis’

Author(s): Aggarwal, V.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Research Journal of Social Science and Management, Vol. 2 (1), (2012), pp 7-19

ISSN No.: 2251-1571

Abstract: Housing bubble is a phenomenon that has been observed in many real estate markets. In recent times, the U.S. Housing bubble has come to the forefront and has become the cause for one of the major financial crisis of the world. Housing Bubbles are typically characterized by rapid increases in the valuations of real estate until unsustainable levels are reached relative to incomes, price-to-rent ratios, and other economic indicators of affordability. This is followed by decreases in home prices that result in many owners finding themselves in a position of negative equity i.e. mortgage debt higher than the value of the property.

USMS-1.05

Paper Title: Lifelong Learning: The Challenges in Context of India

Author(s): Aggarwal, V.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: TIJ's Research Journal of Social Science & Management, Vol. 10 (1), (2012), pp 1-9

ISSN No.: 2251-1571

Abstract: Ensuing transitions in today's globalized world may seem to marginalise certain population segments or exacerbate socio-economic divisions. Lifelong learning in this context is seen as part of the solution to these social challenges (Anderson, G, E 1996; Giddens, A 1999; Rubenson, K 2006). This paper attempts to discuss the concept of lifelong learning and its evolution in general, along with its interpretation in India. Further the challenges for lifelong learning in India's context, particularly with reference to vocational training and some aspects of development such as equity have been discussed. Prominent models of lifelong learning have also been evaluated in Indian context.

USMS-1.06

Paper Title: Validating RSQS in Organized Electronics Retail Market in India

Author(s): Aggarwal, V.S. and Jain, P.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BVIMSR'S Journal of Management Research, Vol. 8(2), (2016), pp 128-136

ISSN No.: 0976-4739

Abstract: Introduction-In today's globalised retail environment, service quality has become a concept of utmost importance for the retailers to win themselves a strong position in the world of competition. This has led to the need to identify the importance of service quality factors with respect to different retail segments. There has been a surge of instruments used to measure service quality such as SERVQUAL, SERVPERF, P-C-P, RSQS etc. The RSQS model developed by Dabholkar, Thorpe and Rentz in 1996 exclusively for the measurement of quality of retail services has gained wide acceptance and acknowledgement. However, the model has been originally validated in USA. Purpose – The main objective of this paper is to critically review and assess various models to measure retail service quality and to validate RSQS model by Dabholkar et al in U.S.A with regard to Organised Indian retail industry specifically in the context of electronic durables and to check its predictive ability by finding out the repurchase intentions of the customers. Design/methodology/approach – Descriptive research was undertaken on a total of 200 respondents who have visited at least one electronics organised retail store during last 6 months in Delhi-NCR. Findings – The results of the study clearly indicate that all the five dimensions of RSQS model are suitable to measuring service quality in consumer durable stores, also proving that the instrument is valid in Indian context. Research limitations/implications – Sample size and sampling regions are very restricted. Practical implications – The study is of immense importance for retailers to identify the areas where service quality is lacking and also to identify the most important and least important factors affecting customers while making a purchase decision. Originality/value – This research contributes to the somewhat limited studies carried out on instrument validation in India in context of organised electronics retail stores.

USMS-1.07

Paper Title: Influence of Children on Family Buying Process

Author(s): Aggarwal, V.S. and Khurana, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BVIMSR'S Journal of Management Research, Vol. 8(2), (2016), pp 146-156

ISSN No.: 0976-4739

Abstract: Purpose: The purpose of the study is to find out the influence of children in family purchase decision process for different product categories: Durable products, Non-durable and Child related products & services during different buying stages. Design/methodology: Both primary and secondary research has been conducted. Primary survey was conducted 120 parents of children of age group 6-14 years in Delhi NCR as Delhi being the metropolitan city constitutes a representative market. Findings: The study revealed the influence of children which was found to be highest for non-durable products at all the three stages of the buying decision process followed by child related products and was lowest for the durable products. Also, it was found that different product categories had variable influence over different stages of the buying decision process. Practical implications: Marketers are expected to understand the role of children in family buying process. The study will help marketers to design marketing strategies as per the influence of children during different buying stages of buying process.

USMS- 2.01

Paper Title: Women Entrepreneurship in Haryana: Challenges & Problems

Author(s): Bansal, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Voice of Research, Vol. 2(1), (2013), pp 1-15

ISSN No.: 2277-7733

Abstract: The paper highlights the various problems and challenges faced by woman entrepreneurs while running the enterprises in the present competitive world of today which is both healthy as well as unhealthy. The problems of women entrepreneurs include working capital, distribution channel, sales promotion, electricity, human resources and competition with medium and large industries. To justify the need of the present study we have reviewed the literature. To draw policy implications we are required to do serious research in a continuous manner which justify the present effort. To harness the potential and continued growth and development of women entrepreneurs and to formulate appropriate strategies for stimulating, supporting and sustaining their efforts to run smooth functioning of enterprises, we need to provide them level -playing- field for healthy competition

USMS- 2.02

Paper Title: Is Advertisement a Valid Tool to Increase Sales: A Study of Indian Manufacturing Companies

Author(s): Bansal, S. and Sharma, G. D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Management and Business Research, Vol. 16(2), (2016), pp 41-48

ISSN No.: 2249-4588

Abstract: The paper studies the inter-relationship between advertisement expenditure, sales and profit. Taking ten-year data (2005-06 to 2014-15) of twenty manufacturing companies indexed in NSE's NIFTY, the study applied various models including descriptive study, correlation and regression. The tools used (Regression and Correlation) clearly show that there is a significant relationship between advertisement expenditure, sales and profit. The study concludes that there is a one-sided relationship between advertisements, sales and profit wherein advertisement expenditure positively impacts the sales and profit of the business in case of manufacturing companies.

USMS 3.01

Paper Title: Green Banking in India: Way to Sustainable Growth

Author(s): Rajput, N., Bharti, Bhutani, S. and Oberoi, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Enterprise Information System, Vol. 6(3), (2014), pp 20-25

ISSN No.: 0975-1432

Abstract: On planet earth, the rich biodiversity and the varied flora and fauna along with the changing climate, weather, natural resources, all the components are integral to sustainable development. Due to the turbulence in nature, many countries are promoting pathways for environmental development at par with economic growth and are "Going Green". It is the need of the hour and Banks being the backbone of the economy and of prime importance can help in providing with the ideas and vision for financing portfolio projects that create a strong and successful low carbon economy. The objective of the study is to highlight the responsiveness of banks in India towards the environmental uproar and to understand the action plan towards adoption of green banking practices. In the study parameters based on awareness, implementation, gaps and drivers for green banking practices in India have been studied. The performance of regional rural banks has also been mapped to study the level of their participation in green banking. The research has been conducted using a structured questionnaire in addition to the secondary data obtained from published reports. The results show that only a very small subset of Indian banks have recognized the opportunity of green banking and are vigilant in dealing with environmental issues. Also, on a global front, despite a number of initiatives taken and the potential opportunities arising, Indian banks have shown a tepid response. This is evident from the number of signatories in United Nations Environmental Program- Finance Initiative (UNEP-FI, 2014) where only two of them are Indian namely, Yes Bank Ltd and Infrastructure Finance and Leasing Corporation. The main deterrent for Indian banks probably is the risk of losing business to competition whereas the major drivers are shareholder pressure and improvement in brand equity and value addition. For making the topic of green banking more inclusive, clear RBI

mandate, training and development, reduction of information asymmetry will play a pivotal role.

USMS-3.02

Paper Title: **Impact of Corporate Governance Practices on Financial Performance: A Statistical Introspection of India**

Author(s): Rajput, N. and **Bharti**

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: MAIMS Journal of Management, Vol. 9(2), (2014), pp 34-44

ISSN No.: 2249-0116

Abstract: Ethical and good corporate governance practices promise growth and sustainability in the long term. It is widely accepted that firm with good and ethical practices for corporate governance will witness increased shareholder value in the long term. The present research aims to study the theoretical and empirical foundation of ownership pattern and presence of women directors as an important corporate governance mechanism and its impact on financial performance of the firm. The main objective is to investigate how shareholder types affect firm performance. The second objective is to study the impact of inclusion of women directors on board with the financial performance of the company. Also, the paper studies the impact of corporate governance practices and its effect on performance. Pooled panel regression method has been used to study the effect of CGI and ownership structure on firm performance. It is concluded that each type of shareholder impacts the firm in a different way due to the benefits and enrichments it brings to the company or due to more negative effects a distinct type of owner has. CGI has a negative impact on firm performance. The research also reveals that there is no strong and significant relation between board diversity and firm performance.

USMS- 3.03

Paper Title: **e-governance practices in india: an analysis of mca 21**

Author(s): Rajput, N., **Bharti**, and Oberoi, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: MAIMS Journal of Management Vol. 9(2), (2014), pp 34-44

ISSN No.: 2249-0116

Abstract: With the globalization, companies need world-class governance system. The essence of companies lies in upholding acquiescence of the law, transparency, and accountability and above all, gratifying the fair anticipations of all the stakeholders. The Ministry of Corporate Affairs has instigated a comprehensive E – governance system named as “MCA – 21”. This project will offer an easy and protected online access to the information, including filing of documents and public access to the information required to be in the public domain under the Statute, at anytime and anywhere which would result in proficiency in legislative supervision of corporate processes and competent professional services under the Companies Act, 1956. This project will advance corporate governance through enhanced scrutiny of company disclosures, better administration of corporate laws and paperless working. The objective of the paper is to analyze whether MCA 21 portal is better than the manual systems and how do companies utilize ICT to encourage all the stakeholders to ensure better corporate governance practices in their firm. Likert’s Scale has been used to analyze the data.

USMS- 3.04

Paper Title: Shareholder Types, Corporate Governance and Firm Performance: An Anecdote from Indian Corporate Sector

Author(s): Rajput, N. and Bharti

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Asian Journal of Finance & Accounting, Vol. 7(1), (2015), pp 45-63

ISSN No.: 1946-052X

Abstract: The issues regarding corporate governance have received major attention owing to their apparent importance for the economic health of companies especially after plethora of corporate scams and debacles in the recent times. High ethical values can reduce costs to achieve a high corporate governance standard and make it more sustainable. Improving corporate governance is an issue of critical importance to India today and for future developments. The Indian government has realized that good corporate governance is necessary to improve corporate competitiveness and to attract foreign investors. It is believed that with better corporate governance, listed firms can reduce agency costs, become more competitive in global markets, and fulfill their social responsibilities. There are no conclusive evidences so far in the literature in proving the linkages between shareholder types and firm performance, hence the present study will add and address the glaring knowledge gap in Indian literature. The typical shareholder types among listed companies in India are institutions, government, managers, foreigners and diverse shareholders. Using panel regression, the relationships between shareholder types and financial performance as measured by Tobin's Q, ROA, ROE was tested taking a sample of BSE100 companies excluding banking and insurance companies. The analysis of the result shows significant positive influence of foreign institutional investors and family ownership on ROE whereas government and retail shareholder affect ROE negatively. Also, the corporate governance index has a significantly negative impact on ROE. However, the relationship of CGI with ROA and Tobin's Q was not found to be significant.

USMS- 3.05

Paper Title: Study of Options Volatility Smile: Empirical Evidence from India

Author(s): Rajput, N. and Bharti

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Enterprise Information System, Vol.7(3), (2015), pp 20-27

ISSN No.: 0975-1432

Abstract: According to the latest data compiled by Futures Industry Association (FIA) NSE's CNX Nifty Options is ranked in the first place for trading volumes globally. NSE uses Black Scholes model as a benchmark tool to fix the base prices of options underlying Nifty index and stocks. The model has certain anomalies and limitations. Our research examines the volatility smile pattern and the determinants for S&P CNX Nifty options from April 2014 to March 2015. We have used OLS regression to estimate the relationship between IV and moneyness. To assess the determinants that cause the smile pattern, we have used Granger Causality test. We conclude that there exists a positive relationship between implied volatility and moneyness and the volatility smile is more asymmetric for put options rather than call options. Also, the time to expiration for an option and historical volatility are the important determinants of the observable asymmetric profile.

USMS- 3.06

Paper Title: Does Futures Speculation Destabilize Spot Prices? New Evidence for Indian Energy Market

Author(s): Rajput, N., Oberoi, S. and Bharti

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Asian Journal of Management Applications and Research, Vol. 5(1), (2015)

ISSN No.: 2230 –8679

Abstract: Stirred by repetitive price hikes, crash and hurtle over last few decades we probe whether the growing market shares of futures speculators destabilize commodity spot prices in our case energy market i.e. crude oil and Natural Gas. In the context of emerging Indian commodity futures markets, this paper empirically examines the effect of futures trading activity (trading volume; proxy of futures liquidity) on spot price volatility for Energy market. The daily spot and future prices data has been collected from the MCX Energy i.e. Crude Oil and Natural Gas from January 2006 to April, 2014. We decompose the futures volume into expected and unexpected components using Hodrick–Prescott filter (HP filter). To clearly understand the destabilization effect, the relationship of the unexpected liquidity of futures market is done with Unexpected volatility of spot market returns which is estimated by taking the residuals of the GARCH model. We find that unexpected futures trading volume and spot price volatility are having bi-lateral relationship in case of natural gas and as well as in case of crude oil.

USMS- 3.07

Paper Title: What Business Schools Teach? - A Study in India Context

Author(s): Rajput, N. and Bharti

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Asian Journal of Humanities and Social Studies, Vol. 4(2), (2016), pp 161-169

ISSN No.: 2321 – 2799

Abstract: With education sector becoming a business model in itself, numerous colleges and universities have been established, churning out thousands of business management graduates every year in the market. The limited jobs and employment prospects existing lead to filtration of the talent pool, giving opportunities to only a few who have the relevant skills and capabilities. The present paper focuses on assessing the quality of education imparted by business schools in India and the opportunities for further development. We have interviewed the human resource managers and executives of companies across industries in Delhi/NCR to provide how businesses think about education and higher studies, particularly Master of Business Administration. We have used t-test to find out what type of skills- functional or soft skills are relevant to the employers. Further, a framework to study the quality of education in business schools in India has also been devised that can be used to assess the various factors and processes that affect the education quality in institutions. The paper concludes that general skills and not functional and technical add more value to an individual and hence are of more significance. The findings help in reducing the disparity between academia and business practitioners.

USMS-4.01

Paper Title: Managing the Internal IT Service Quality in Public Sector Banks of India

Author(s): Dhingra, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Business Information System, Vol. 19(4), (2015), pp 403-417

ISSN No.: 1746-0972

Abstract: The present study evaluates the internal information technology (IT) service quality of public sector banks in India by using SERVPREF instrument of SERVQUAL model. The results revealed the relative importance of IT service quality dimensions as perceived by IT users. The 'empathy' has been found the most important dimension, followed by 'tangibility', 'responsiveness', and 'reliability', while 'assurance' has been found to be insignificantly affecting the service quality.

USMS-5.01

Paper Title: Perception of Stakeholders on Web-based Corporate Reporting Practices

Author (s): Gakhar, D.V.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Advances in Management Research, Vol.9(1), (2012), pp 64-67

ISSN No.: 0972-7981

Abstract: Web-based corporate reporting has emerged as a new mode of communication between companies and stakeholders. The purpose of this research is to assess the perception of various stakeholders on adequacy, usefulness and the future of web-based corporate reporting. A questionnaire was administered to 255 respondents and factor analysis was applied to analyse the data. Factor analysis identified eight factors, which describe stakeholders' perceptions about web-based corporate reporting. These include usefulness of web reporting, future prospects, legal acceptability, adequacy of information, usefulness for investment decision, standardisation of content, mandatory requirement and substitute for traditional reporting. The research findings will guide companies, regulators and service providers to deliver better information to stakeholders through disclosures on corporate websites. The paper provides an insight into stakeholders' beliefs and perceptions with respect to web reporting practices by companies and the future of these practices.

USMS-5.02

Paper Title: Earnings Management Practices in India: A Study of Auditor's Perception

Author (s): Gakhar, D.V.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Financial Crime, Vol. 21(1), (2014), pp100 – 110

ISSN No.: 1359-0790

Abstract: Earnings management are euphemisms referring to accounting practices that may follow the letter of the rules of standard accounting practices, but certainly deviate from the spirit of those rules. Companies across the world follow earnings management practices in a way so as to show a favourable position to their stakeholders. Satyam scam in India was a similar type of case. The present study has been carried out with the aim of examining the perception of auditors on earnings

management in Indian perspective. A questionnaire was administered on 65 auditors and was analysed using descriptive statistics and factor analysis methods. The analysis shows that most of the firms indulge into such practices even in the presence of regulatory framework available to keep a check on these practices. The management tries to interpret and modify the law provisions as per their will and do manipulations in the financial results. The research findings would guide regulators and management to curb such malpractices. The auditors, top management and government have to become more aware, socially responsible, have ethical behaviour, become more transparent to protect the interests of stakeholders associated with the organizations. The paper provides an insight into auditor's perception on earnings management during a time when financial scams like Satyam in India have taken place and auditor's integrity is questioned

USMS-5.03

Paper Title: Impact of Union Budget on Indian Stock Market

Author (s): Gakhar, D.V., Kushwaha, N. and Vinita, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Scholedge International Journal of Management & Development, Vol. 2(11), (2015), pp 21-36

ISSN No.: 2394-3378

Abstract: This paper analyzes the impact of Union budget on NSE's CNX NIFTY Index. The impact is measured in terms of daily average returns and volatility over the short term, medium term and long term period in pre and post budget period. The data has been collected for five budget periods from 2011 to 2015. The statistical tools used are paired T-test and F-test. Paired T-test is conducted on average returns and F-test is conducted on variances over the period i.e., 3, 10 and 30 days in pre and post budget period. The maximum impact of budget is seen in short term then it gradually decreases in medium term and finally diminishes in the long term. The implication of this paper is that the investor should fear from investing in the stock market around the budget period.

USMS-5.04

Paper Title: Lead Lag Relationship between Nifty Index Futures and Spot Market

Author (s): Gakhar, D.V.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Accounting, Finance and Economics, Vol. 6(2), (2016), pp 78-89

ISSN No.: 2200-7970

Abstract: Derivatives were introduced in Indian securities market as it offers various benefits like price discovery, efficiency and transparency. This paper analyses lead lag relationship between Nifty Index futures and Nifty Index spot prices. By taking daily price data from 4-06-2000 to 05-02-2015 of Nifty Index futures and Nifty index cash market price, we have tried to understand whether Nifty futures prices leads the spot market price or vice versa. By using cointegration test, granger causality test, Vector error correction model and diagnostic testing results have been analysed. VECM results indicate that there is long run causality which exists running from near month nifty futures to nifty index and short run relationship also exists between two markets

USMS-5.05

Paper Title: Indian Derivatives Market: A Study of Impact of Volatility and Investor Perception

Author (s): Gakhar, D.V.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Social Science and Humanity, Vol. 6(12), (2016), pp 913-918

ISSN No.: 2010-3646

Abstract: Derivatives Market has an important role to play in the economic development of a country. The objective of the study is to examine the impact of financial derivatives (futures and options) on the underlying market volatility. The paper also analyses derivatives awareness level of Indian investor and perception of investor about future of derivatives market in India. Data has been collected for a period of 18 years from January 1, 1997 to February 5, 2015. The questionnaire was distributed to 1000 respondents but 522 filled questionnaires were received and have been analyzed in this study. The final AR (1)-GARCH (1,1) model show that overall volatility has reduced in the spot market after the introduction of derivatives. The results of Structural Equation Modelling reveals perception of investors about future of derivatives market in India includes having an investor grievance redressal mechanism which is approachable under trading hours, steps to be taken by regulators to increase investments, conducting investor training and awareness programmes, global integration will happen, derivatives market will affect growth of the economy and consolidation of exchanges is required.

USMS-5.06

Paper Title: Perception of Stakeholders on Quality of Corporate Reporting on Websites

Author(s): Gakhar, D.V.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Siddhant- A Journal of Decision Making, Vol.16(2), (2016), pp 15-24

ISSN No.: 2231-0657

Abstract: Corporate reporting relates to communication of financial and non-financial information regarding resources and performance of a company. Websites are a popular medium of corporate reporting. The present study aims to look at the perception of stakeholders on the quality of the websites. To assess the quality of website in this study we have taken websites of BSE 200 Index companies and studied them on a scale consisting of 37 items relating to technological aspects of the website. To analyse the perceptions of stakeholders on quality of website content we have administered a structured questionnaire with 255 respondents. Analysis shows that quality of website content is good as revealed by 57.30 per cent respondents. 54.90 per cent of the respondents consider that information content available on website is good. 52.90 per cent believe that reliability of website information is average. The chi-square result of stakeholder groups is insignificant, which shows that they have similar perception that quality of website content is good. Quality of website content depends upon two main factors as revealed by factor analysis i.e. characteristics of website content and accessibility of information.

USMS-6.01

Paper Title: **Impact Analysis of ICT Teaching Aids Used for Training and Development of Employees**

Author (s): Sharma, S., **Garg, S.** and Mittal, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Procedia-Social and Behavioral Sciences, Vol. 182, (2015), pp 239-248

ISSN No.: 1877-0428

Abstract: Teaching aids are the common and new practice in today's scenario. Learning is now not only limited to classrooms but has broken the barriers across borders. This has been made possible by the influence of ICT (Information and Communication Technology). The paper focuses on various ICT teaching aids and studies the impact of these teaching aids on its users. The paper demonstrates the impact based on two parameters: Individual Impact and Organizational Impact. Individual Impact talks about the ICT teaching aids used by its user and the ease in utilizing it. Organizational Impact converses about the importance of using ICT teaching aids for developing its manpower. The research is conducted using both primary as well as secondary data and the data is conducted through structured questionnaire consequently finding the impact of ICT teaching aids in organizations.

USMS-6.02

Paper Title: **A Top Management Perspective with reference to Travel Agencies in India**

Author(s): **Garg, S.¹**, Vikas, S.² and Lather, A.S.¹

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²IILM University

Source: Indian Journal of Training and Development, Vol. 44 (4), (2014), pp 32-47

ISSN No.: 0971-5592

Abstract: The need to develop the required human resources in the tourism industry has become imperative as a consequence of rapidly changing technology and dynamic changes in the international tourism market. And in this regard the role and commitment of the top management towards developing the human resources cannot be undermined. A study has been conducted to assess the perception of the top management towards training among travel agencies across India. Results indicate that the top management faces several issues in imparting trainings to the employees. The key problems contributing to the perception of the top management towards training and development are Industry Impediments, Cost Issues, Employee Attitude and Managerial Myopia. Since training plays a significant role in the tourism industry, the top management needs to shed the inhibitions and make a concerted effort to implement training so as to derive its benefits.

USMS-6.03

Paper Title: **Mapping Leadership Styles of Public and Private Sector Leaders using Blake and Mouton Leadership Model**

Author (s): **Garg, S.** and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Drishtikon, Symbiosis Centre for Management and HRD, Vol. 4(1), (2013), pp 48-64

ISSN No.: 0975- 7422

Abstract: Effective leadership makes an organization successful. Without leadership, organizations move too slowly, stagnate, and lose their way. The present research is based on the comparative leadership styles in public and private sector using Blake and Mouton Leadership Model to understand whether these leaders are people oriented or task oriented. The study was conducted on 80 leaders of public and private banks to know about what kind of leadership style they possess based on which it could be determined how close they are with people and how much importance they give to the achievement of task. The results indicated that leaders of private sector are significantly higher on task orientation as compared to public sector leaders and their own people orientation, while public sector leaders are significantly higher on people orientation as compared to private sector leaders and their own task orientation. Results further show that private sector leaders come under Authoritarian style of leadership who focus more on task than on people where the leaders of the public sector banks fall under the category of Country Club which shows that the leaders are high on relationship with people and low on task.

USMS-6.04

Paper Title: Analysis of Employees 'Perception towards Succession Planning in a Family Business

Author (s): Garg, S. and Kumar, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Sciences and Management Studies, Vol. 13 (8), (2013), pp 1-13

ISSN No.: 2231-5268

Abstract: Succession planning is a major problem within small and family owned businesses. A peep into the literature clearly shows that most of these businesses are run by their founders or by a small management team and very few such organisations have in place a proper succession planning. The lack of proper succession planning can have the direct effect of causing the collapse of these businesses especially when key players leave the business upon retirement or in pursuit of other options. The departure of a key stakeholder can make such a business susceptible and lessen its worth as investors will not invest in a business that is not sustainable. Therefore, it becomes imperative for the business to establish a succession strategy so as to avoid any unpleasant situation in future. In this study a survey has been conducted among the employees at different levels in an organisation to capture their opinion towards the succession plan in their organisation. For this purpose, 10 characteristics of succession planning strategy were identified of which 10 questions were constructed. The responses of 50 respondents at different levels of hierarchy in the organisation were collected on a scale of 1 to 5. The study found that there was significant difference in the perception of employees at different levels. The findings also suggest that most stakeholders agreed that good succession planning can add value to organisation and help them becoming more sustainable. The conclusion from this study served can be considered as a wakeup call towards making small business houses more aware about the succession planning.

USMS-6.05

Paper Title: Mapping Career Aspirations to Combat Attrition: A Study of Leading Multinational BPO Operating in India

Author(s): Garg, S., and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: DIAS Technology Review, Vol. 8 (2), (2012), pp 27-35

ISSN No.: 0972-9658

Abstract: During the past decade employee turnover have become a very serious problem for Organisations. Managing retention and keeping the turnover rate below the target and Industry norms is one of the most challenging issues. Even as economic times changed, Turnover will continue to be an important issue for most of the job groups. Yet despite these facts employee turnover continues to be the most appreciated and under –valued issue facing business leaders. In this study employee turnover is studied in specific to a leading Multi- National BPO operating in India-Global Pvt. Ltd. (Name changed). What are the major reasons of employee turnover in this Company and what initiatives it took to combat the employee turnover rate. An extensive exit analysis is done to understand the key factors and employee attitude to conclude the reasons behind employee turnover. This study contributes to the BPO Industry a classic example of retention, purely focusing on creating a leaning and development culture to engage the employees and realize their potential.

USMS-7.01

Paper Title: Pharmaceutical Retailers and Promotion by Pharmaceutical Companies in India

Author(s): Srivastava, V¹., Handa, M.² and Vohra, A.³

Affiliation(s):¹Institute of Technology and Science, Mohan Nagar, Ghaziabad,UP; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Faculty of Management Studies, University of Delhi, Delhi

Source: Journal of Medical Marketing, Vol. 14 (2-3), (2014), pp 74-80

ISSN No.: 1745-7904

Abstract: Pharmaceutical firms target their promotion to physicians, chemists and patients. Chemists are an important entity in pharmaceutical marketing. Despite this, there exists very little research on the promotional tools aimed at chemists. Thus, it becomes important for the marketers to study the perception of chemists towards the promotion tools being used by the pharmaceutical companies. The current study attempts to study the promotional tools used by pharmaceutical industry aimed at chemists. Authors also try to study the influence of these promotional tools on decisions to place orders. Methodology: A structured questionnaire was developed for collecting primary data to meet the objectives of the study. List of chemists has been compiled after obtaining the Chemist-Must-See-List from a few pharmaceutical companies operating in Delhi. In all, 250 chemists were approached through convenience sampling and 197 usable questionnaires were received. Findings: Medical representatives, gifts and schemes influence the chemists 'decision to place orders more in comparison to promotional literature. Thus, rather than making expenditure on promotional literature for chemists the companies should focus on regular visit of medical representatives, gifts and schemes. Online promotion was not found to be influencing chemists. It was found that chemists want regular information about the schemes by sms. Originality/value; The study attempts to

study the influence of promotional tools, in reordering decisions of the chemist. It also seeks to identify additional support measures that pharmaceutical companies can take up to facilitate chemists in managing their business. Reasons for chemist cooperation with medical representative of pharmaceutical companies are also examined.

USMS-7.02

Paper Title: A Study of the Relationship between Shopping Orientation and Online Shopping Behaviour among Indian Youth.

Author(s): Handa, M.¹ and Vohra, A.²

Affiliation(s):¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²ITM University, Gurgaon, Haryana

Source: Journal of Internet Commerce, Vol.13(1), (2014), pp 22–44

ISSN No.: 1533-2861

Abstract: The increasing use of the Internet by young adults in emerging markets such as India provides an opportunity for marketers to tap an underdeveloped segment of young net users. A better understanding of the drivers of online shopping behavior among young adults can enable online marketers to design more effective marketing strategies. The present research explores the relationship between shopping orientation of young adults in India and their online shopping behaviour in terms of online shopping adoption and frequency. Primary data were collected through a self-administered questionnaire from 831 college students. The study finds a significant difference in the entertainment, experiential and convenience orientation of online and non-online shoppers. Trial and frequent online shoppers also differ in the extent of entertainment orientation but no significant difference is found in their experiential or convenience orientation. Based on the findings, recommendations are made for encouraging young adults to shop online.

USMS- 7.03

Paper Title: Balancing job demands and job resources- Gateway to reduce burnout and build work engagement.

Author(s): Handa, M. and Gulati, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Management Research, Vol.14(1), (2014), pp 57-67

ISSN No.: 0972-5814

Abstract: The purpose of the present study is to explore the relationship between personality and employee engagement amongst frontline personnel in the organized retail industry in India. In particular, the study seeks to examine the relationship between two personality traits, extraversion and conscientiousness with engagement amongst frontline employees. The Utrecht work engagement scale (2003) and Big Five Personality scale (McCrae and Costa, 1989) have been used for this purpose. Primary data was collected from 333 frontline employees working in different retail formats. The study finds that there is considerable scope for improvement in the level of employee engagement amongst the frontline personnel in the organized retail industry. There, however does exist a positive relationship between the extraversion and conscientiousness personality traits and employee engagement. Based on the findings, the paper recommends measures for improving employee engagement levels through a better fit between employee personality and the retail work environment.

USMS- 7.04

Paper Title: Ethics: The Physician–Pharma Dyad in India

Author(s): Handa, M.,¹ Vohra, A.² and Srivastava, V.³

Affiliation(s):¹University School of Management Studies, Guru Gobind Singh Indraprastha University, New Delhi-110078; ²Faculty of Management Studies, University of Delhi; ³Institute of Technology and Science, Mohan Nagar, Ghaziabad,UP.

Source: Asian Journal of Business Ethics, Vol. 3(1), (2014), pp 1-10

ISSN No.: 2210-6723

Abstract: The study examines the attitudes among physicians regarding acceptance of gifts, sponsorships, and drug samples in response to marketing efforts of pharmaceutical companies in India. The research also attempts to study physicians' perceptions of the Medical Council of India (MCI) guidelines on the code of conduct for pharmaceutical marketing practices and the influence of these guidelines on physicians' actions. A structured questionnaire was developed for collecting primary data regarding exposure of physicians to promotional tools and physicians' attitudes and practices with regard to various professional ethical issues. One thousand physicians from private and government hospitals located in a metropolitan area were approached personally or through email for getting the questionnaire filled. A total of 189 completed and usable questionnaires could be obtained which is a response rate of approximately 20 %. Respondents in the study indicate being offered samples, sponsorship, and gifts by pharmaceutical companies with a frequency of at least once a month. Thus, many pharmaceutical firms are not following the code of conduct issued by the Department of Pharmaceuticals, Govt. of India. Further, though almost all physicians report being aware of the guidelines issued by the MCI, yet as many as 69 % of the sample admitted to be accepting gifts and sponsorships offered by the pharmaceutical firms. Educational programs were found to be influencing physician prescription behavior to a greater extent when compared with gifts. Frequency of offers made for gifts and sponsorships were found to be dependent upon physicians' practice (number of prescriptions written) and the type of hospital they are associated with (private or government). The study focuses on sensitive yet critical ethical issues related to the promotional practices of pharmaceutical firms in India and physicians' responses with regard to these promotional practices in the context of the guidelines of the Medical Council of India and the Department of Pharmaceuticals.

USMS- 7.05

Paper Title: Gender as a Moderator of the Relationship between Materialism and Fashion Clothing involvement amongst Indian Youth

Author(s): Handa, M.¹ and Khare, A.²

Affiliation(s):¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Indian Institute of Management-Rohtak, Rohtak, Haryana

Source: International Journal of Consumer Studies, Vol. 37(1), (2013), pp 112-120

ISSN No.: 1470-6431

Abstract: The research examines the role of gender in moderating the relationship between materialism and product involvement with fashion clothing among the Indian youth. The Richins materialism scale and the product involvement and purchase involvement scales developed by O'Cass were used to understand the behaviour of

Indian youth towards fashion clothing. The sample (n = 254) comprised of university students from different parts of India. The findings indicate that Indian youth do not possess a high level of materialistic tendencies. Gender has a moderating influence on the relationship between materialism and involvement with fashion clothing. Young men and women differ with respect to their involvement with fashion clothing and even more with regard to their involvement with the purchase of fashion clothing, with women reporting a higher level of involvement in both case.

USMS- 7.06

Paper Title: Perception of Physicians Towards Pharmaceutical Promotion in India

Author(s): Handa, M.,¹ Vohra, A.² and Srivastava, V.³

Affiliation(s):¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Faculty of Management Studies, University of Delhi; ³Institute of Technology and Science, Mohan Nagar, Ghaziabad, UP

Source: Journal of Medical Marketing, Vol.13(2), (2013), pp 82-92

ISSN No.: 1745-7904

Abstract: Pharmaceutical firms spend a significant amount of their budget on promotions. Thus, it becomes imperative to study the perception of physicians, at whom a major share of these promotional efforts is targeted. Despite this, there exists very little published research examining customer response at the perceptual level. Thus, the authors have attempted to study the importance attached to promotion tools as information sources and the extent to which these promotion tools influence prescription behavior as perceived by physicians. Primary data for the study was collected through a survey of physicians. A total of 115 physicians participated in the study. The study indicates that physicians perceive conferences/symposia to be the most credible information source. An examination of the relationship between perceptions regarding various promotion tools and demographic variables indicates a significant relationship between gender and type of hospital and credibility attached to the various promotional tools. The study indicates a positive correlation between credibility of promotion tools and the extent to which it influences prescription behaviour.

USMS- 7.07

Paper Title: Work Engagement- A Trail to Positive Outcomes

Author(s): Handa, M. and Gulati, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Amity Business Review, Vol. 14(2), (2013), pp 24-37

ISSN No.: 0972-2343

Abstract: The present study examines the relationship between work engagement and job resources like supervisor support, control and professional development. Further, relationship between work engagement and job satisfaction, organization commitment, organization citizenship behavior and reduced turnover intentions are predicted as outcomes of work engagement and their relationship studied. The research hypotheses are tested using frontline employees working in organized retail industry in India. Work engagement has been found to be significantly mediating the relationship between job resources and various outcomes. The study has implications for Human Resource practitioners and academicians seeking to improve employee productivity and sat

USMS- 8.01

Paper Title: Relationship between Locus of Control and Mental Accounting of an individual with respect to investment in gold and gold ETFs.

Author(s): Jain, S. and Prakash, D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: DIAS Technology Review. Vol. 12 (2), pp 16-23

Abstract: It has been viewed that behavioral factors undoubtedly play a role in decision making process. People receive information from different sources and process these in their mind while making a decision. People are creating separate mental accounts for different goals when it comes to spending/ investing. The aim of this study is to understand the relation that exists between mental accounting of an individual and his buying behavior towards the purchase of gold and gold exchange traded funds (ETFs) as an investment to the person's locus of control. The study was conducted on 114 individuals who invest in commodities and the results show that individuals with internal and external locus of control differs on their mental accounting while taking decision of investment in Gold and Gold ETFs. Individuals from different gender, age groups, education level and income level differ in their mental accounting for taking decisions to invest in Gold and Gold ETFs.

USMS-9.01

Paper Title: Workplace Spirituality, Organizational Politics and Employee Wellness: A Research agenda

Author (s): Khatri, P¹. and Gupta, P.²

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jaipuria Institute of Management, Noida

Source: DIAS Technological Review, Vol. 12(1), (2015), pp 41-56

ISSN No.: 9729658

Abstract: Spirituality in workplace has caught snowballing attention of the popular literature and organizational practitioners; however it still is far away from being considered an established theory in management sciences. Although there are innumerable articles available on workplace spirituality, still it lacks a comprehensive definition and elucidation of the concept owing to the complexity of the construct. In this article, the authors review various literature streams to explore what dimensions and attributes are considered to be important and effective in terms of practical applications of spirituality in the workplace. It also provide a conceptual framework that covers the research in workplace spirituality and its relationship with the comparatively under-researched constructs of organizational politics and employee wellness. The paper concludes with a discussion on the gap areas across the various research domains and a discussion of the important areas for future research.

USMS-9.02

Paper Title: Correlational Study of Individual Personality Differences and Spirituality at Workplace

Author (s): Khatri, P¹. and Gupta, P.²

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Source: DIAS Technological Review, Vol. 12(2), (2015), pp 38-49

ISSN No.: 9729658

Abstract: Organizations worldwide including India; have been plagued by tumultuous business conditions triggered by factors like economic recession, downsizing of workforce, distrust in management and likewise. In such times, a growing number of organizations and employees are finding solace in the positive outcomes associated with a workplace that augments fulfilment of the spiritual needs of the workers. India, despite being considered the seat of spiritualism, does not have many empirical studies related to the topic of fostering spirituality at workplace. On the other hand, personality psychology reveals that spiritual and religious beliefs are distinctive components of an individual and they have the potential to shape a person's life and personality. The study of relationship between personality traits and spirituality can bring new insights to the research on benefits associated with implementation of spirituality at work. This is an attempt to understand the link between various personality domains and the dimensions of workplace spirituality to highlight its positive payback.

USMS-9.03

Paper Title: Towards Redefining Values in Business: With Special Reference to Sach Ka Saamna (Indian version of Moment of Truth)

Author (s): Thakur, M.S¹., Khatri, P². and Ahuja, Y.³

Affiliation(s): ¹Faculty of Management Studies, Delhi University; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110 078; ³University School of Management Studies, GGSIP University, Dwarka, Delhi - 110 078; ³Jagan Institute of Management Studies, Rohini, Delhi

Source: International Journal of Indian Culture and Business Management, Vol. 5(3), (2012), pp 280 – 298

ISSN No.: 1753-0814

Abstract: The Indian viewer is waking up to the new concept of reality television viewing which has already made waves in the international arena. Yet another development has been the genre of voyeurism which is taking the forefront. This research explores the impact of reality viewing on socio-cultural milieu of India. 'Sach ka saamna' is one such show which has drawn considerable publicity in terms of its debatable alignment with the Indian culture. The show promotes candid public confessions in return of monetary gains as prize money. The research presents a multi-perspective framework highlighting implications on cultural erosion. Primary data (N = 106) from prime time television viewers with minimum exposure of three episodes has been collected with the help of a questionnaire through multi-stage sampling, keeping in perspective the variables related to the study. The research has been extensively done with the use of statistical package SPSS 17.0 through correlation techniques. Some of the findings of the research depict that such shows are a failure in India as they lead to cultural erosion ($r = 0.386$; $p < 0.01$). However, people may find it interesting if the show is constructively positioned through innovative

strategies. Reasons for failure of the show and strategies for rejuvenation have been proposed.

USMS-9.04

Paper Title: Faculty Engagement in Higher Education: Prospects and Areas of Research

Author (s): Raina, K. and Khatri, P.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110078

Source: ON THE HORIZON, Vol.23(4), (2015), pp 285-308

ISSN No.: 1074-8121

Abstract: Purpose – The purpose of this paper is to explore the available literature on engagement of faculty members teaching in higher education institutions and present forth a strong foundation for researchers of the same area to gain insight into the available literature and prospects of faculty engagement. Design/methodology/approach – Exploratory study has been conducted using different keywords to draw a list of relevant research papers on Google Scholar and several online databases like Emerald Management, EBSCO Host, Elsevier, etc. Findings – Various definitions of the major constructs have been captured from which dimensions have been explored. Identification of dimensions and factors has been done by performing extensive literature review. Studies so conducted on the major construct have been tabulated to present a comprehensive picture. Universities across the world have been studied to find out differences with respect to India in terms of their higher education system and practices related to faculty. Originality/value – The paper is original and holds significance as not much literature is available on faculty engagement in published domain and higher education has become an area of keen interest in present times. This paper will give a strong foundation of literature to future researchers who want to pursue their studies in this area.

USMS-9.05

Paper Title: Correlates of HRM Practices and Organisational Commitment of Retail Employees in Delhi-NCR

Author (s): Khatri, P.¹ and Gupta, P.²

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jaipuria Institute of Management, Noida

Source: Asia-Pacific Journal of Management Research and Innovation, Vol. 11(2), (2015) pp 95–107

ISSN No.: 2321-0729

Abstract: Purpose: The advent of global players in the Indian retail sector has generated mammoth challenges for the Indian retail establishments by increasing the gap in supply and demand of talented professionals. The current article seeks to analyse the perceptions of prevalent human resource (HR) practices, such as hiring and selection, career management, learning and development, performance evaluation, management policies and grievance handling and its relationship with the commitment level of the retail sector employees. Research methodology: The data were collected from 100 respondents working in retail companies in Delhi National Capital Region (NCR) through a combination of standardised and self-constructed questionnaires including demographics. Findings: The significant discoveries of this empirical research display a highly significant and positive relationship between organisational commitment and perceptions of staffing and resource management practices ($r = 0.424$, $p \# 0.01$), the perceptions of performance evaluation practices in the organisation ($r = 0.592$, $p \#$

0.01) and perceptions of people management practices prevalent in the organisation ($r = 0.396$, $p \# 0.01$).

Research limitations/implications: First, the study sample picked for the research belonged to Delhi NCR and this study does not include the perceptions of retail employees in Tier II and Tier III cities. Second, it mainly focused on the entry-level and junior-level employees; therefore, future research should be conducted to find out its validity in the context of middle and senior management.

USMS-9.06

Paper Title: A Study of Organizational Commitment and Moonlighting Practices of SME Employees in Delhi-NCR

Author (s): Khatri, P. and Khushboo

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Finance and Management. Vol. 6(6), (2014), pp 535-544

ISSN No.: 0975-6477

Abstract: The environment in which today's organizations operate has undergone serious transformations owing to the advent of globalization. MNCs which offer huge employee benefits and possess every required resource withstand this dynamism but the Small and Medium Enterprises find themselves unable to face this fierce competition. SMEs act as the backbone of every developed and developing nation. In India, their role is indispensable as they utilize in-house resources and generate employment. Despite of many contributions, this sector faces serious issues like high turnover rate, less access to market information, credit issues, job insecurity amongst employees etc. The employees working in SMEs are getting employment but their cue for professional growth is not satisfied. With so many other options, such employees join other firms which depicts that their commitment towards the organization has declined. Employees, when committed towards their organization are more productive and bring better results for the firm. With introduction of the concept of 'Moonlighting' i.e. holding more than one job at hand, the organizational commitment has further reduced. Employees working in event management companies of this sector have to travel, receive less remuneration as compared to their counterparts in MNCs and get fewer opportunities for professional growth. The present study seeks to understand the perception of employees pertaining to the importance of organizational commitment and moonlighting practices. The study was conducted in Delhi-NCR region wherein the respondents were selected through multistage sampling ($N=100$). Data was collected through self constructed questionnaire (cronbach alpha $=.83$). Contrasting results were also seen between male and female respondents regarding perceptions of commitment towards their organization and moonlighting practices. The paper seeks to provide an insight to managers and corporate practitioners of SMEs to manage the perils of employee turnover and decreasing job security.

USMS-9.07

Paper Title: Technology Orientation, Social Media Usage and Ethical Disposition of Generation Y Employees in Delhi NCR

Author (s): Khatri, P¹. and Gupta. P².

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jaipuria Institute of Management, Noida

Source: DIAS Technological Review, Vol.11(1), (2014), pp 38-47

ISSN No.: 9729658

Abstract: This paper attempts at studying the frequency and pattern of Social media usage by generation Y workforce; specially focusing on their perceptions regarding allowing the use of social media by the employer. The study was conducted in Delhi NCR region on a sample of select employees from companies in IT, Finance, Consultancy and Education sectors (N=103). Data was collected by administering self- made questionnaire. The study specifically targets those employees who have spent a few years of employment– employees from lower and middle management level. The analysis aimed at investigating varying levels of perceptions between male and female respondents on their technological orientation as well as their ethical disposition. The data analysis focuses on the correlates of perceptions that companies should allow social media usage with actual usage of social media ($r = 0.576$, $p \leq 0.01$), awareness of the risks in use of social media ($r = 0.394$, $p \leq 0.01$), perceptions of stress if unable to access social media at work ($r = 0.233$, $p \leq 0.05$) and hindrance in employee productivity (no relationship found), etc. The paper debunks certain popular myths surrounding the generation Y employees with respect to their technology orientation and workplace characteristics.

USMS-9.08

Paper Title: Correlates of Satisfaction & Giving Behavior of IT Working Professionals in Delhi NCR

Author (s): Khatri, P. and Raheja, N.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Enterprise Information System, Vol. 5(2), (2013), pp 32-39

ISSN No.: 0975-1432

Abstract: This paper analyses the relationship shared between working professional and their alma mater. Alumni are the primary representative of the institution in the outside world. These days 'public as well as private colleges and universities depend upon their alumni for financial and social support so, it becomes imperative to study and examine the level of satisfaction and giving behavior of working professionals with their alma mater which will help to formulate a framework for the institution to improve their relations with the alumni and enhance giving behavior of alumni. This study has been conducted in Delhi/NCR region among alumni of public as well as private institutions offering technical education.

USMS-9.09

Paper Title: A Study of Empowerment and Engagement of ITES/BPO Professionals in Delhi-NCR

Author(s): Khatri, P. and Khushboo

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BIJIT - BVICAM's International Journal of Information Technology, Vol. 5(2), (2013), pp 610-617

ISSN No.: 0973-5658

Abstract: With the advent of globalization, technology revolution has fastened its pace. Owing to availability of skilled, English speaking and cheap manpower, India enjoys being the favorite destination for outsourcing. These organizations are characterized by IT enabled operations, strategic HR practices, rotational shifts and high employee turnover rate. Despite good remuneration and other benefits, this sector witnesses maximum attrition. Managers try to empower and support their subordinates but the engagement level of employees is decreasing day by day. The present study seeks to understand the perception of employees pertaining to the level of empowerment and engagement with respect to variables like, job security, work-life balance, concern from top management, performance review system etc.. The study was conducted in Delhi NCR region wherein the respondents were selected through multistage sampling (N=100). Data was collected through self-constructed questionnaire (cronbach alpha =0.83). Demographic differences were also explored as male and female employees are treated differently at BPOs. Relationship between the level of empowerment and engagement was also analyzed. The paper seeks to provide an insight to top management and corporate practitioners of BPOs, who can use advanced techniques to develop an empowered culture thus, promoting engagement.

USMS-9.10

Paper Title: A Study of Relationship of Perceived Organizational Politics and Spirituality at Workplace in IT and ITES Organizations

Author(s): Khatri, P¹. and Gupta, P²

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jaipuria Institute of Management, Noida

Source: Global Journal of Enterprise Information System, Vol. 8(1) (2016), pp 1-8

ISSN No.: 0975-1432

Abstract: The increasing popularity of workplace spirituality has been associated with a myriad of benefits it is purported to bring about in the organizations, however not many empirical evidences of its inverse relationship with organizational politics have been reported. A sample of 202 employees from IT and ITES sectors based out of Delhi NCR was studied to not only examine the relationship of workplace spirituality with perceptions of organizational politics in a negative context as is popularly viewed but also look at the concept of positive/constructive politics at play in the organization. Analysis indicates significant relationship with the negative POPS but no relationship found with respect to positive politics. The reasons for these findings, its consequences and implications as well as directions for future research have been discussed.

USMS-9.11

Paper Title: A Study of Relationship of Importance of Self-Competence with Other Variables Leading to a More Employable Generation Y.

Author(s): Khatri, P. and Raina, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Advances in Economics and Business Management, Vol.3(1), (2016), pp 144-146

ISSN No.: 2394-1553

Abstract: Indian higher education system boasts of maximum number of enrollments across globe. Thousands of students graduate every year yet very few are employable. Studies reveal that Indian students lack hard and soft skills required by industry to be a part of the workforce. Self-assessment or assessment of self competence has emerged out to be a major soft skill in determining the attitude to be employable. The study analyses the perceptual inferences of Management and IT graduates as regards the relationship of assessment of self competence with variables like conflict management, decision making and networking. The study was conducted in Delhi NCR region wherein the respondents were selected through multistage sampling (N=107). Data was collected through self-constructed questionnaire (cronbach alpha =.975).

USMS-9.12

Paper Title: Customerisation of Management Education: A Study of Impact of Quality and Support Services on Students 'Decision Making of Self-Financed Management Institutes

Author (s): Chauhan, R.K. and Khatri, P.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source : Indraprastha Journal of Management , Vol 2. (1), pp 14-22

ISSN No.: 2454-4175

Abstract: Management Education in India which started a little less than half a century ago has made rapid strides over the past decade. The process of liberalization which started in India in 1991 led to major spurt in the demand for management graduates. This increase for management graduates, in turn, gave a major fillip to the demand for management education in the country which resulted in mushrooming of institute/university department offering management education. The task of selecting a management institute has become more difficult due to this as there are no standard or universally acceptable parameters or criteria in our country for ranking management institutes. This study therefore was conducted to find out the parameters on which an institute is judged upon by any student. The study seeks to find out how does the students take the decision of selecting a particular institute for joining? What are the factors which contribute towards making an institute a strong brand? It also highlights the fact that faculty of an institute is a very important factor in guiding the decision making. The study has implication for providers of private education by helping in analyzing the student customer so as to sell their wares competitively in the open market. It is also may be useful for educational entrepreneurs who are planning to venture out and explore the education sector in terms of business opportunities.

USMS-9.13

Paper Title: **Ethics in Indian Higher Education: An Endeavor Towards Building a Sustainable Alumni Bond**

Author (s): **Khatrri, P.¹** and Sharma, Y.A.²

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Management Studies, Jagan Institute of Management Studies, Rohini, Delhi

Source: International Journal of Business and General Management, Vol. 3 (3), (2014), pp 39-52

ISSN No.: 2319-2267

Abstract: Education forms the backbone of a nation and is one of the most important indicators of a country's growth and development. Higher education in India has seen a transition in the last decade where from a nobler venture it has acquired the status of a "big business". This has led to a compromise on certain major ideals which have always been at the core of educational institutions. Lately the institutions have realized the potential of being ethically and morally upright. This assessment led to the dawn of more ethical practices at higher education institutions for the benefit of all stakeholders. This paper seeks to explore if the alumni, who are the most critical stakeholders for an institution value the moral and ethical training that they receive during their student life. If the ethical foundation that they receive at the institution makes them ethically competent, also, will it bring them back to their institution whenever required? For the study, a survey was conducted to identify the relationship between ethical practices and training in higher education institutions and alumni willingness for a long term association with their alma mater. The universe for the study comprises higher education institutions in and around Delhi NCR, India. The data has been collected through a self constructed questionnaire and techniques of correlation, t- test have been used through spss version 17.0 for data analysis. The key findings of the research show a positive correlation between faculty being instrumental in building an ethical institution and potential of inculcating moral behavior in students by institutions practicing ethics. ($p < .01$, $r = .254$). There is a positive correlation between competency to take ethical decisions in testing times and Beliefs and values inculcated by the institution lay basis for ethical decision making ($p < .01$, $r = .495$), a positive correlation between feeling a sense of pride towards the institution for inculcating ethical behavior and willingness to participate in the institutions activities even after passing out ($p < .01$, $r = .304$) and a strong positive correlation between feeling a sense of pride towards the institution for inculcating ethical behavior and willingness to come back to the institution to give professional inputs ($p < .01$, $r = .588$).

USMS-9.14

Paper Title: **Role of Basic Education towards Building Entrepreneurial Achievement Motivation: Indian Perspective**

Author (s): **Khatrri, P.** and Prakash, D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: MAIMS Journal of Management, Vol. 9(2), (2014), pp 17-29

ISSN No.: 2249-0116

Abstract: This research emphasizes the growing need of entrepreneurship education particularly entrepreneurial learning foundations and how they are being achieved. The growing interest in entrepreneurship education and its outcomes is something

shared by both academics and policy makers. The importance of entrepreneurship education at different levels of the education system is widely acknowledged. The aim of this paper is to investigate the impact of students' basic education, upbringing and socialization on building entrepreneurial achievement motivation. Entrepreneurial success is strongly influenced by individual differences in entrepreneurial achievement motivation and basic education. The current study examines the relationship between entrepreneurial achievement motivation, basic education and influence of family.

USMS-9.15

Paper Title: A Study of Leadership Behavior Exhibited by Management Students

Author (s): Khatri, P¹. and Sharma, Y.A².

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Source: International Journal of Business Management & Research (IJBMR) Vol. 4 (3), (2014), pp 1-10

ISSN No.: 2249-6920

Abstract: The emerging economy will confront greater challenges of risk, uncertainty, innovation and experimentation. Organizations will need leaders who can manage shared efforts with a broad spectrum of diverse people in order to address problems and find solutions. The study is an endeavor to gauge the management student perception of leadership, their opinion about task and relationship orientation of leadership. Since these management students are going to be future leaders it is imperative that their insights on leadership are studied and used as an input for developing business strategies. The research was conducted with the help of a self constructed questionnaire based on the variables of task leadership, relationship leadership, conceptual skills, administrative skills and relationship skills. The findings of the research highlighted on the importance of relationship orientation of management students and significant links between various skills and relationship based leadership.

USMS-9.16

Paper Title: A Study of Workplace Behavior of Knowledge Workers with respect to Gender, Marital Status and Humor Quotient

Author (s): Khatri, P¹. and Sharma, Y.A².

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Management Studies, Jagan Institute of Management Studies, Rohini, Delhi

Source: Delhi Business Review Vol. 15(1), (2014), pp 53-66

ISSN No.: 0972-222X

Abstract: Purpose: IN a knowledge economy the knowledge workers earn their living with mental strength. The skill set required for the job, makes it immensely stressful and demanding. This has led to augmenting rates of emotional disorders, frustration, and exasperation among the employees. The turbulent corporate environment, expects the knowledge workers to cope with the anxiety and demonstrate resilience in order to sustain. The study is an endeavor to study the workplace behavior of knowledge workers with respect to gender, marital status, and humor quotient. Design/Methodology/Approach: A self constructed questionnaire was used for the purpose of the survey. The questionnaire had items related to the perception

of professionals regarding key factors in an organizational environment. The universe comprises IT organizations. The technique of multi stage sampling has been used, at the first stage area sampling has been adopted and the IT organizations in Delhi and NCR were chosen. At the second stage stratified sampling has been used in which the corporate professionals of each organization were further divided into three cadres namely top management, middle management, and low level of management this has been used to attain a representative sample of respondents. Out of 150 questionnaires sent to the respondents we received 114 completed questionnaires.

Findings: It was found that both gender and marital status are key variables making a difference in the way people behave and conduct when they are at work. It was also found that personal life has a lot to do with professional performance. The priorities, discipline, commitments are handled differently with respect to gender and marital status. Another, significant variable that this study addresses is humor which is found to have correlations with recession and layoffs.

Research Limitations: The study is restricted to National Capital Region (NCR).

Practical Implications: It has valuable takeaways for HR professionals, policy makers, and academicians.

Originality/Value: It's a unique study in which element of humour has been studied as a key variable with stress at work place and the interplay of these variables give researchers several dimensions to ponder upon.

USMS-9.17

Paper Title: **Ethics in Indian Higher Education: A Study towards Achieving Competitive Sustenance**

Author(s): **Khatrī, P¹.** and Sharma, Y.A².

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ² Department of Management Studies, Jagan Institute of Management Studies, Rohini, Delhi

Source: Research Journal of Social Science & Management, Vol. 2 (10), (2014), pp 105-113

ISSN No.: 2251-1571

Abstract: Education forms the backbone of a nation and is one of the most important key indicators of a country's growth and development. Higher education in India has seen a transition in the last decade where from a nobler venture it has acquired the status of a "business". This has led to intense competition in the field where institutions are fighting for their fair share of pie. However, it is expected of them that they keep their values and ethics upright when aiming for competitive sustenance. This paper discusses the significance of ethical practices at higher education institutions in their endeavor to achieve the same. An institution practicing ethics will strive towards excellence and will benefit all the stakeholders who are a part of the system. For the study, a survey was conducted to identify the relationship between ethical practices in higher education institutions and its perception by the beneficiaries that are the students. The universe for the study comprises higher education institutions in and around Delhi NCR, India. The results distinctly show that there is a positive relationship between reputation, brand image, and the competitive sustenance of a higher education institution.

USMS-9.18

Paper Title: A Study Towards Understanding Consumer Perception about Mobile Number Portability Services in Delhi NCR

Author(s): Khatri, P¹. and Ahuja, Y².

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Source: Research Journal of Business Management Vol. 2 (4) (2012), pp 1-12

ISSN No.: 1819-1932

Abstract: The Indian telecom industry is the world's fastest growing industry with close to 792 million mobile phone subscribers as of February 2011. Indian telecommunication sector has continued to record noteworthy success and has emerged as one of the key sectors that have been accountable for resurgent growth of the Indian economy. The industry will reach around \$80 billion in revenues by next year showing an astounding CAGR of over 25% and will employ a stupendous 1 crore employees making it one of the biggest value creators in India in recent times. Mobile Number Portability (MNP) was launched in India in January 2011, which allows the user to retain the existing number while giving him an option to change the subscriber. This has been a revolution in the field of telecom and hence becomes a relevant area of research in terms of mapping the customers' perception towards the facility. A primary research has been conducted to study the impact of select variables with respect to the mobile number portability. Data has been analyzed with the help of SPSS software version 17 with techniques of correlation and t-test.

USMS-9.19

Paper Title: A Test of Transactional and Transformational Leadership Behaviour of Salesman on Customer Relationship Marketing Behaviour: A Study of the Indian Banking Sector

Author (s): Khatri, P.¹ and Duggal, S.².

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Source: BVICAM's International Journal of Information Technology, Vol. 4(1), (2012), pp 1-8

ISSN No.: 0973 – 5658

Abstract: The present study was aimed to test constituents as well as complete theories of Transactional and Transformational Leadership behaviour of salesman on customer relationship marketing behaviour in Indian Banking scenario. For Transactional Leadership it was hypothesized that contingency reward system and management by exception of salesperson positively affect customer trust, customer commitment and together they contribute to customer relationship behaviour. For transformational Leadership it was hypothesized that idealized influence behaviour, individualized considerate, Intellectual stimulation, Inspirational motivation behaviour of salespersons positively affect customers' trust, customers' commitment, customer assumptions and customers optimistic engagement. Non-Probabilistic sampling methods were used. A survey was conducted among 61 sales persons and their customers in the Indian banking sector, and the regression analysis was performed to test hypotheses. Conclusion shows that contingency reward system influence customer relationship up to a certain extent while management by exceptions is not so appropriate for maintaining the relationship with customer though it is showing

correlation, while in case of transformational leadership idealized influence behaviour of salespersons positively influences customer trust, individualized consideration of salespersons, in turn influences customer commitment, Intellectual stimulation encourage creativity and changes earlier assumptions of customer and Inspirational Motivation influences optimistic engagement of customers. It was also found that the combined effect of all the constituent of Transformational Leadership theories are positively related with customers' relationship commitment. Conclusion motivate us to think complementary nature of these theories thus points out how leadership development training can be adapted to improve relationship marketing skills of sales persons.

USMS-10.01

Paper Title: A Study of Efficiency of Public Sector Banks in India

Author (s): Kumar, A. and Kumar, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: IJMRS's International Journal of Management Sciences, Vol.1(2), (2010), pp 102-108

ISSN No.: 2277-968X

Abstract: Abstract The overall growth of an economy is dependent to a great extent on the efficiency and soundness of its banking system. A sound banking system serves as an important medium for pushing economic growth by mobilisation of small savings of unproductive domestic sector and putting them to the productive use. Given the socioeconomic implications of the banking sector the analyses of relative efficiency of banks has gained popularity among people from banking sector, policy makers, researchers and academicians and other interested parties. This paper is an attempt to investigate the efficiency of Indian public sector banks with the help of data envelopment analysis (DEA) which is a deterministic non-parametric approach. DEA was firstly applied by Sherman and Gold (1985) for assessing the efficiency of banks. It is a very promising tool for measuring the efficiency of banks (Berger and Humphrey, 1997). DEA is a preferred econometric approach of measuring efficiency because of its advantages over other techniques. The result of the study shows that only 6 banks are efficient on the criteria of technical efficiency and 10 banks are efficient on the standard of pure technical efficiency on the basis of the input and output variables selected.

USMS-10.02

Paper Title: Conceptual Framework and Recent Trends in Project Financing

Author (s): Kumar, S. and Kumar, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Computer Sciences and Management Studies, Vol. 12(6), (2012), pp 56-68

ISSN No.: 2231-5268

Abstract: Project financing is a non-recourse financing which provides leverage, contractual structure, creates a special purpose vehicle and considers the revenue generated by the project not the general assets of the business at the time of financing. Project financing technique is prominently used for mines, toll road, pipeline, power station, hospital and other infrastructure projects. Past studies show that the Public-Private-Partnership, Take-out Finance, Bond Finance, Securitisation, Viability Gap Funding,

and Infrastructure SPV are the prominent project finance structures being used now a day. The foremost advantage of project financing is that it is a nonrecourse financing which results in high leverage for the firms. It also helps in distributing the risk and provides efficient returns in comparison to conventional financing techniques. The shortcoming of project financing is that it is a time consuming process which is relatively expensive. Also, the transactions of project financing are very complex in comparison to traditional corporate financing. With the impact of privatization, deregulation and spread of globalisation project finance has emerged as a key financing technique throughout the world. A year wise analysis of the project finance investment shows that in the year 2004 project finance investment rose by 466.59% over 1994. Region-wise analysis of project financing in the world shows that Western Europe and North America contributed nearly 53% of the total investments in the year 2000 but it was reduced to 36% only by the year 2004. Sector-wise analysis shows that Power sector accounted for maximum project finance followed by Infrastructure, Oil & Gas, Petrochemicals and Telecom etc. The study further reveals that project finance is catching up steadily in India because of emphasis given to infrastructure given to infrastructure by the government. At present nearly 300 PPP projects are going on in the country.

USMS- 10.03

Paper Title: Impact of Currency Futures on Volatility in Exchange Rate: A Study of Indian Currency Market

Author (s): Kumar, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Paradigm: A Management Research Journal, Vol. 19(1), (2015), pp 95-108

ISSN No.: 0971-8907

Abstract: The present study has been carried out to study the impact of currency futures on the exchange rates volatility with respect to “euro”. The daily exchange rate values of euro vis-à-vis Indian rupee (INR) have been obtained for a period commencing from 1 January 2006 up to 30 September 2014. The time series data used in the study have been tested for stationarity by applying augmented Dicky and Fuller (ADF) test of unit root. The presence of heteroskedasticity in the residuals of return series of underlying data has been verified with autoregressive conditional heteroskedasticity Lagrange multiplier (ARCH LM) test. The volatility of the exchange rate return has been modelled with the help of generalized autoregressive conditional heteroskedasticity GARCH (1, 1) and Glosten–Jagannathan–Runkle (GJR) GARCH models. The results of GARCH models confirm that volatility is persistent and good news is causing more volatility than bad news. The difference in the volatility in the exchange rate returns during pre- and post-currency futures period has been examined with the help of various statistical tests and the results have been found to be significantly different and volatility has reduced in the post-futures period.

USMS- 10.04

Paper Title: Evaluating the Efficiency of Indian Public Sector Banks

Author (s): Kumar, A. and Dhingra, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Indian Culture and Business Management, Vol. 13(2), (2015), pp 226 – 242

ISSN No.: 1753-0814

Abstract: The present paper examines the efficiency of public sector banks in India. The public sector banks have been deliberately chosen for the study, given the fact that even in the third decade of liberalisation, the dominance of public sector banks is still obvious in terms of market share, impact on economy, number of branches, general perception of the people and overall contribution to the financial system. At present there are 26 public sector banks in India including six State Bank of India and its associate banks. In this paper, the efficiency of the public sector banks has been examined with the help of data envelopment analysis using CCR and BCC models. The study makes use of intermediation approach of output. The study is based on three inputs namely; number of branches, deposits and operating expenses and two outputs viz. loans and advances and non-interest income. The results of the study indicate that in all, only two banks are relatively efficient on the basis of CCR model, i.e., overall technical efficiency and as per BCC model (pure technical efficiency) nine banks are efficient. Further, it has been found that the reason for inefficiency of the public sector banks in India for the year 2012-2013 is due to scale inefficiency.

USMS- 10.05

Paper Title: An Examination of Herding Behavior in an Emerging Economy – A Study of Indian Stock Market

Author(s): Kumar, A., Bharti and Bansal, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Management and Business Research, Vol.16(5), (2016), pp 56-63

ISSN No.: 2249-4588

Abstract: The present study makes an attempt to examine the presence of herding in Indian stock market amongst the investors, using the daily closing price of NSE's benchmark index Nifty and thirty six companies forming part of it for a period commencing from January 1, 2008, to December 31, 2015. It explores the likely consequences of different levels of herding in Indian stock market. The study employs the methodology suggested by Chang et al. (2000) of cross sectional absolute deviation (CSAD) to test herd formation. The results of the study do not provide any evidence of herding in the Indian security market during the chosen period. The study further denies the evidence of herding during bull and bear phases of markets and also during the extreme market conditions. These results indicate that Indian security market investors tend to take investment decisions of their own and do not indulge in any herd tendency and imitate the investment behavior of other fellow investors.

USMS-10.06

Paper Title: Empirical Modeling of Profitability of Public Sector Banks in India

Author(s): Kumar, A. and Dhingra, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Prajnan: Journal of Social and Management Sciences, Vol. 45(2), (2016), pp 123-141

ISSN No.: 0970-8448

Abstract: The present research paper examines the impact of bank-specific and economy-specific variables on the profitability of public sector banks (PSBs) in India over the period 2005-2015. The paper uses a dynamic panel model suggested by Arellano and Bover (1995) and Blundell and Bond (1998) to examine the impact of bank-specific determinants viz. size, capital adequacy, quality of assets, net interest margin, noninterest income, operational efficiency and macroeconomic variables namely GDP growth rate and inflation on return on assets (ROA). The empirical results explicitly demonstrate that bank-specific and macroeconomic variables affect the variation in the profits of chosen banks over the period of the study. The results of the study are important both for academicians as well as policymakers. The policy implications from the study are that banks must pay attention to the bank-specific determinants and macroeconomic developments to sustain the growth of profitability.

USMS-11.01

Paper Title: Corporate Social Responsibility under Companies Act, 2013: Hard in Form, Soft in Substance

Author(s): Kumar, S.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Emerging Researcher (Research for All), Vol. 1(1), (2014), pp 47-56

ISSN No.: 2348-5590

Abstract: The Companies Act, 2013 recently enacted by the Parliament of India contains specific provisions regarding mandatory implementation of Corporate Social Responsibility (CSR) by large sized private sector companies. The proponents of mandatory CSR hail them as game changing while the opponents deride them as unwanted state intervention and opposed to the ethos of market economy. One may wonder as to why a neo liberal state found it necessary to incorporate CSR provisions within the framework of Corporate law indicating a hard law approach. This paper analyses, relying on existing literature and other public documents, the impact of economic reforms on the socio-economic conditions of the vulnerable sections of the society. It posits that the discontent simmering among the marginalized sections due to the dwindling of opportunities in public sector employment during the neo-liberal era and their exclusion from the market based developmental processes led then to raise demand of affirmative action. Due to the democratic pressure, the political class despite opposition from the industry leaders expressed solidarity and support for their demands. Political parties which are otherwise conservative on the issues of positive discrimination also joined the bandwagon due to political exigencies of democratic polity. Neo-liberal regimes produce "oligarchy of power" and the political class caught between the democratic and political assertion of marginalized and the economic power of "oligarchy" brought in CSR provisions that can be characterized as "hard in form but soft in substance". The law, this paper argues, leaves ample scope for voluntary CSR,

integrating into it companies business interests, and align market with social causes provided the companies are guided by constitutional morality and sustainability rather than narrow self-interest and immediacy.

USMS-11.02

Paper Title: Student as Consumer, Education as Service: Legal Interpretation and Market Implications

Author(s): Kumar, S.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Emerging Researcher (Research for All), Vol. 1(2), (2014), pp 51-56

ISSN No.: 2348-5590

Abstract: Economic reforms initiated in early 1990's are largely driven by market ideology and are aimed at reducing the role of State in economic arena and unleash the market forces. As a consequence of this paradigm shift in the economic policy of Indian State the role of public sector in providing education has gradually receded and market driven private self-financing institutes have proliferated. In a market economy, market mechanisms, in general, are considered to be efficient in allocation of scarce resources. They ensure that both consumers' benefits and producers' benefits are maximized. The invisible hand of market works to address issues of deficit and surplus and maintains equilibrium conditions where supply matches the demand. Neo-liberal approach to education reduces education into a market commodity. While making policies education as market commodity is being increasingly normalized and uncritically accepted without paying attention to alternative conceptions of education. The recent judgement by the Supreme Court of India in Maharshi Dayanand University Vs Surjeet Kaur held that the definitions of "consumer" and "service" in the Consumer Protection Act, 1986 do not include students and education is not a service relying on a previous judgement accepting it as a settled position of law. This judgement is likely to have bearing on several disputes pending before the Consumer forums at District level and before various State Commissions and National Commission for Redressal of Consumer Disputes. The law laid down by the Supreme Court requires close scrutiny as it apparently rejects the metaphors of "student-as-consumers" and "teachers/educational institutes-as-service providers". In the light of policy push towards financial privatization of public education and massive increase in the number of private educational institutions, particularly in the field of technical and professional education, it may have profound impact on the interests of students. An attempt is made to analyze the consequences, drawing on extant literature that highlights the limitations of neo-liberal approach to education and the vulnerabilities that students are exposed while discussing their sources. It concludes suggesting the need for an efficacious grievance redressal system to adjudicate on matters involving unfair practices by educational institutions.

Paper Title: Supreme Court of India and the Mystery of Merit and Efficiency: Some Critical Thoughts

Author(s): Kumar, S.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Education Plus, Vol. 4(3), (2015), pp 200-210

ISSN No.: 2277-2405

Abstract: Reservation policies in India have been subjected to judicial scrutiny since early days of independence. The constitutional provisions related to the subject matter of reservation, particularly article 15(4) and 16 (4), enables state to provide respectively for reservation of seats in educational institutions and posts in public services under the state in favour of backward classes of citizens. These provisions are regarded as integral to Article 14 – Right to equality and are important facets of the larger goals of equality and social justice enshrined in the preamble of the constitution of India. Positive discrimination permissible under the constitution of India is not limited to what is permissible under 15(4) & 16(4). Several other provisions allowing for positive discrimination or special treatment on the basis of sex, place of birth, religion etc do exist and no other policy of state consistent with positive discrimination has been subjected to such intense contestation, both in public discourse as well as legal forums, as much as the positive discrimination policies based on social and educational backwardness identified by caste as a predominant factor are subjected to. The judicial approach evident from the judgements delivered on the earliest case in post-independent India i.e Champakam Dorairajan to the most recent decision of supreme court of India in Indra Sawhney indicate a narrow legal approach of striking a balancing between dominant group member's individual right to equality of opportunities and a disadvantaged group's right to be adequately represented without paying sufficient attention to the compelling reasons of diversity and inclusion and consequential administrative efficiency is antithetical to the egalitarian objectives sought to be secured to the citizens of India through operationalization of the core constitutional principles. The sum and substance of the law laid down in Indra Sawhney have significant implications for social justice and is likely to retard the progress of the nation towards transforming India into a social and economic democracy. This article attempts to analyze the trends in judgement delivered by Indian apex court while interpreting the relevant constitutional provisions i.e Articles 16(1), 16(4) and Article 335 and argues that judicial reasoning underlying Indra Sawhney judgement significantly deviate from earlier judgements and are informed by narrow and pedantic views rather than a progressive and inclusivist approach necessary for realizing social and economic democracy that the architects of Indian Constitution and its chief architect Dr B R Ambedkar has had envisioned. Relying on the academic literature and theoretical frameworks inspired by critical management studies and the praxis of diversity management in the context of organizations that lay emphasis on multiculturalism for enhanced organizational performance, it suggests that the jurisprudence whose foundations are adequately embedded in the concepts of inclusion and diversity without yielding to "antilocution", a term coined by Allport (1954), should enable necessary course corrections in upholding constitutional morality and enhancing the prospects of realizing the goals of social justice.

USMS 12.01

Paper Title: Perception of Work Culture and its Impact on Performance in DMRC

Author(s): Lather. A.S., Jain, S. and Kumar, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: Indian Journal of Marketing, Vol. 42(8), (2012), pp 27-33

ISSN No.: 0973-8703

Abstract: The present study was undertaken to examine the perception of work culture by managerial associates and its impact on performance in DMRC. A group of 199 associates belonging to top, middle, and lower levels served as a sample for the study. To attain the objectives of the study, Organizational Culture Survey, developed by Pareek (2001), Organizational Culture Questionnaire (Mathur, Khurana, and Parida, 1990) and Performance scale (Lather and Jain, 2008) were administered. Results indicated structure, exercise of authority and beliefs to be relatively strong dimensions of culture as perceived by the entire group of associates. Significant differences were also observed across three hierarchical levels in respect of different dimensions of work culture. Results further showed a significant effect of support, structure and individual responsibility on employee performance. Implications of findings of the present study have been discussed in the paper.

USMS 12.02

Paper Title: Human Resource Practices and its Influence on Job Satisfaction and Motivation: A Study of State Trade Corporation of India

Author(s): Lather, A.S. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: Indraprastha Journal of Management, Vol. 2 (1), (2012), pp 56-67

ISSN No.: 2454-4175

Abstract: The role of Human Resource Management in organizations has been evolving in recent years. HR is being seen as a critical strategic partner and assuming far reaching and transformational roles and responsibilities. Distinctive human resources are firm's core competencies and developing strategies to enhance the value of these resources is the major task of HR manager in an organization. This task is impossible without understanding what effect these policies and strategies of the organization have on their associates which ultimately gets converted in to the performance and productivity of the individual and organization. The present study was designed to understand the role of human resource practices in determining the job satisfaction and motivation of the associates of State Trade Corporation of India. The results show there is a significant positive correlation of training & development practices and policies, performance appraisal system & compensation with job satisfaction and motivation. And there is also a significant positive effect of training & development practices and policies, performance appraisal system & compensation on job satisfaction of all the associates.

USMS 12.03

Paper Title: Atheism or Religiosity: What Drives New Age Administrators and Entrepreneurs?

Author(s): Lather A. S., Jain S and Prakash D

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research in Commerce, IT and Management, Vol. 5(1), (2015), pp 5-8

ISSN No.: 2231-5756

Abstract: There have been numerous debates on religiosity and atheism. The scriptures across the world have discussed this issue in details but it is relatively a new and interesting concern to understand that whether this religiosity and atheism relates to entrepreneurial activities. The present study is also such an attempt to understand relationship between religious vs atheist orientation and entrepreneurial vs administrative interest of entry level managers. A sample of 74 such managers was taken and the results reveal that atheism is significantly positively correlated with entrepreneurial interest.

USMS 12.04

Paper Title: Identifying Training Problems of Travel Agency Employees across India using Structured Equation Modelling.

Author(s): Lather, A. S., Garg, S. and Vikas, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Indian Culture and Business Management, Vol. 10(4), (2015), pp 409-432

ISSN No.: 1753-0814

Abstract: Quality of trained manpower is one of the key factors contributing to the service quality in the travel and tourism industry. There is a perceived need for human resource development, to raise the profile of the industry, increase productivity and provide sustainable employment within the tourism industry and in such a situation, training plays a vital role for upgrading employee skills. However, apart from industry related issues, there are several other training problems besieging the travel industry. This study has been carried out from the employee perspective to identify the critical factors affecting training and development in travel agencies. A structured questionnaire was administered on 450 employees working in 50 travel agencies across India. The results through structured equation modelling show that employees of travel agencies feel that the key issues affecting training and development initiatives in their organisations are training provisions, employee perception and managerial support.

USMS 12.05

Paper Title: Importance of Teaching Team Building as Part of Curriculum: A Need Gap Analysis of The Students 'Team

Author(s): Lather, A.S., Khatri, P. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: Academia Journal of Educational Research, Vol. 2 (9), pp 142-150

ISSN No.: 2315-7704

Abstract: Working in teams is a mandate of corporate world. Importance of team building is discussed at length for corporate, but from where this knowledge of team building should start is never focused. If the new entrants are trained for it, they would be more effective and corporate time to fit them in teams is saved. This training can be done through teaching team building as part of curriculum to students of professional courses. The present study found where the students are lacking in building effective teams. This provides the need gap from where training can be started through incorporating team building as a subject in the curriculum of professional courses so as to provide better workforce to the corporate.

USMS 12.06

Paper Title: Components of Creativity in Relation to Locus of Control: A Study of Students from Mysore University, India

Author(s): Lather, A.S., Jain, S. and Shukla, A.D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: Journal of Research in Humanities and Social Science, Vol. 2(10), (2014), pp 48-61

ISSN No.: 2321-9467

Abstract: The aim of the present study was to analyze and compare components of creativity of students with respect to their locus of control, age, gender and family type. The study was conducted on students of undergraduate and post graduate programmes of university of Mysore. The data was collected from a sample of 244 students, of which 112 were males and 132 were females. It was also found that 146 students had external locus of control and 98 students were found to have internal locus of control. The students were divided into three age groups, the first group consisted of students from 18 to 20 years, second group comprised of students from 21 to 23 years and the last group was formed of students from 24 to 26 years. When the family type was considered it was found that 81 students came from joint family and 163 students were from nuclear family. Abbreviated Torrance Test for Adults and Levenson & Miller's Locus of Control tests were administered on students and their socio – demographic details were taken. The results show that the respondents with external and internal locus of control significantly differ on components of creativity. The students with internal locus of control were found to be higher on Fluency, Elaboration, Flexibility, Figural Response, Norm Referenced Creativity, Criterion Referenced Creativity and Total Creativity. Females were found to be significantly better than males on Originality, Elaboration, Flexibility, Norm Referenced and Criterion Referenced creativity. Within the different age groups it was found that the students from the age groups of 21-23 and 18-20 years were better than the students in age group of 24-26 on Elaboration, Verbal creativity, Norm Referenced and Criterion Referenced Creativity. The interaction of locus of control and age groups revealed that the students with internal locus of control in the age group of 18-23 were significantly higher on Fluency, Verbal Responses, Norm Referenced Creativity, and Criterion Referenced creativity as compared to students having external locus of control in this age group, while in the age group of 24-26 years, the externals are higher on these creativity factors as compared to internals. The results of students living in Nuclear and Joint families show that the students belonging to Nuclear families are significantly higher on Fluency, Norm Referenced Creativity and Overall Creativity as compared to the students living in Joint families. Interestingly the results also revealed that the students with internal locus of control living in nuclear families are significantly higher on norm referenced creativity and total creativity as compared to the one's living in joint families while the results are vice versa for students with external locus of control.

Paper Title: Student's Creativity in Relation to Locus of Control: A Study of Mysore University, India

Author(s): Lather, A.S., Jain, S. and Shukla, A.D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: The International Journal of Indian Psychology, Vol. 2(1), (2014), pp 146-165

ISSN No.: 2348-5396

Abstract: The study explored the relationship of creativity and locus of control of students coming from various academic disciplines (Biotechnology, Environmental Sciences, Civil Engineering, Electronics & Communication, Centre for Women Studies, Mathematics, Food and Nutrition and Geography). The data was collected from a sample of 450 students of Mysore University out of which 40 belonged to Electronics and communication, 44 were from Civil Engineering, 40 from Environmental Sciences, 37 from Biotechnology, 40 from Geography, 16 from mathematics, 20 from Food and Nutrition and 7 from Centre for Women Studies. Abbreviated Torrance Test for Adults and Levenson's Locus of Control tests were administered on students and their socio – demographic information was taken. Results showed that highly creative students are significantly higher on Internal Locus of Control and the students who were low on creativity are significantly higher on External Locus of Control. The study also found that students at post graduate level were significantly higher on Powerful Others as compared to students at under graduate level. Students with low creativity at both post graduate and undergraduate levels and from all disciplines are significantly higher on powerful others (external locus of control) as compared to the students with high creativity, while students with high creativity at post postgraduate and undergraduate level and from all disciplines are significantly higher on individual control as compared to students with low creativity at both the levels. The results also show that students from Geography are significantly higher on powerful others as compared to students from other disciplines, while students from centre for women studies are significantly lower on powerful others as compared to students from other academic disciplines except food and nutrition students. Students from Centre for women studies are significantly lower on chance control as compared to students from mathematics, environment sciences, biotechnology, civil engineering, and geography. However the students of geography are significantly higher on chance control as compared to students from mathematics, food and nutrition, electronics and communication, and centre for women studies.

Paper Title: Unveiling the Teacher Leadership Styles: A Study of Perceptual Differences Between Students Perusing Business Education

Author(s): Lather, A.S., Khatri, P. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: International Journal on Education Growth and Research, Vol. 1(1), (2015), pp 1-10

ISSN No.: 2455-0590

Abstract: Purpose – The purpose of the study is to identify the teacher leadership styles preferred by post graduate management students (male vs. female, working professionals vs. non working MBA students). The paper attempts to apply the concept of leadership to teachers in the business higher education. Attempt has been made to identify the various teacher leadership styles and their preferences as perceived by students engaged in business education

Design/methodology/approach – Based on a combination of literature research and structured self-designed questionnaire, the paper explores teacher leadership styles preferred by students of business studies. The study was conducted on 371 MBA students out of which 171 were working professionals and 200 were non-working MBA students. The male/female composition of the sample was 223/148 respectively. A teaching style questionnaire was administered on the participants measuring five teaching styles i.e. Participative, Autocratic, Laissez Faire, Supportive and Action Oriented.

Findings The results of the study show that working professional MBA students significantly differs from non-working MBA students on Action Oriented and Autocratic teaching styles where working professionals prefer more of both action-oriented and autocratic styles of teaching. The results of male and female comparison shows that males and females differ significantly on laissez faire and action-oriented style of teaching, where females prefer both the styles more than males.

Research limitations/implications – Teacher Leadership style and the perceptions of an appropriate style varies from MBA students who are working professionals than those engaged in regular degrees without any exposure to business environment. This in turn unfolds the requirements of students in terms of their preferred teacher leader. The relationship between the two can help teachers engaged in these two different groups to suit themselves as per the requirement so as to enhance the learning process. The study is limited to metro city of India. Differences may even be prominent if extended to three tier and two-tier cities.

Originality/value –Despite the growing impetus given to teachers engaged in teaching learning process, little has been said about their role as a leader. Though discussed in case of students at the school and college level, there is dearth of studies pertaining to higher education and segment of people who engage in completing their degrees while working in the corporate.

USMS 12.09

Paper Title: Students 'Commitment to Attend Classes in Management Higher Education: A Comparative Study of Working Executives and Non-Working Students Pursuing Full Time Post Graduate Management Programme

Author(s): Lather, A.S., Khatri, P. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: Global Journal of Education Studies, Vol. 1(1), (2015), pp 1-15

ISSN No.: 2377-3936

Abstract: The purpose of the present study is to identify the commitment of students to attend classes amongst post-graduate management students (male vs. female, working professionals vs. non-working MBA students). The paper attempts to apply the concept of commitment to students in the business higher education. For this the Meyer and Allen's (1991) Three Component Model of Commitment was adapted to measure student's commitment to attend classes and finally the commitment of students was mapped who are working executives and non-working students pursuing full time post graduate management studies. The study was conducted on 371 MBA students out of which 171 were working professionals and 200 were non-working MBA students. The male/female composition of the sample was 223/148 respectively. A commitment to attend class questionnaire was administered on the participants measuring three type of commitment i.e. Normative Commitment, Affective Commitment and Continuance Commitment. The results of the study show that working professional MBA students significantly differs from non-working MBA students on Continuance Commitment where Non -working MBA students are significantly higher than working professionals. The interaction results of male/female with working/ non-working students comparison shows that the Male non-working MBA students are higher on Normative Commitment as compared to the Male working professionals, while the Female non-working MBA students are lower than the Female working professionals on Normative Commitment.

USMS 12.10

Paper Title: Mapping Personality Traits of High Performers: A Study of Middle and Lower Management

Author(s): Lather, A.S. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: Journal of Indian Academy of Applied Psychology, Vol. 41(2), (2015), pp 217-225

ISSN No.: 0019-4247

Abstract: The present study was conducted on 120 associates from lower and middle level management from a manufacturing and an IT organization to analyze the personality traits which can indicate towards who can be potentially high performers. The results suggest that the associates having sensing and judging personality orientation are better performers irrespective of their level in the managerial hierarchy. Also the individuals with the personality type of Sensing-Judging are significantly better performers as compared to Sensing-Perceiving (SP), Intuitive-Perceiving (NP) and Intuitive- Judging (NJ)s. This study proposes that there are certain personality types who tend to be high performers because of their characteristic traits such as Extraverted Thinking with Introverted Sensing (ESTJ), Introverted Sensing with Extraverted Thinking (ISTJ), Extraverted Feeling with Introverted Sensing (ESFJ), or Introverted Sensing with Extraverted Feeling (ISFJ) can be better performers. The results of the present study do not differentiate on the basis of gender.

USMS 12.11

Paper Title: Interpersonal Need Orientation and Employee Engagement: An Empirical Evidence

Author(s): Lather, A.S. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: American International Journal of Research in Humanities and Social Sciences, Vol. 20 (1), (2105), pp 66-71

ISSN No.: 2328-3734

Abstract: The present study was aimed to map the effect of interpersonal need orientation on employee engagement with respect to the demographic profile of employees working in the public and private organizations. A sample of 100 employees was chosen from public and private sector organizations. Interpersonal need orientation was mapped through FIRO-B by Schutz (1958) and employee engagement was measured through job satisfaction, organizational commitment, intent to stay, pride, advocate, and emotional connect. The results show that Males higher on 'people gatherer' attitude are less engaged while females high on inhibition, submissive and dependent attitude are less engaged. The results of the study also reveal different interpersonal need orientations that effect engagement level of employees belonging to different marital status, types of organizations, level of management, and age groups.

USMS 12.12

Paper Title: Learning Innovation and Entrepreneurship Edison Style

Author(s): Lather A. S. and Prakash D

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Aweshkar, Vol. 19(2), (2015), pp 100- 106

ISSN No.: 0974-1119

Abstract: It is important to explore beyond conventional to understand things your way. This is nothing but experiencing creativity. Putting creative thoughts into action is innovation. Creative thinking processes and knowledge work together. Being innovative requires interest, in the form of motivation or inspiration. People are most innovative in activities that they love because they enjoy the play, the activity, and the thinking involved. Creativity and innovation improve the self-esteem, motivation and achievement at individual and organizational level. Edison's life is an example to understand what creativity and innovation can do to one's life. In his mind Edison hadn't failed once. Instead, he said he discovered thousands of things that didn't work. The following case unfolds his life and his style of doing things.

USMS 12.13

Paper Title: Understanding Entrepreneurial Achievement Motivation through Big Five Personality Factors: A Study of Students pursuing Professional Education.

Author(s): Lather, A.S., Khatri P. and Prakash D

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Drishtikon: A Management Journal, Vol. 8(1), (2016), pp 49-65

ISSN No.: 0975-7848

Abstract: Entrepreneurial growth can be accelerated by understanding what makes a would-be entrepreneur. This study is an attempt to understand Big Five personality factors of students pursuing professional education and their entrepreneurial achievement motivation. In this study 133 university students from Delhi NCR were surveyed to examine the relationship between their entrepreneurial achievement motivation and Big Five personality traits. The study shows that the entrepreneurial achievement motivation is a function of conscientiousness among Big Five personality dimensions. Our research suggests that creating a structured environment with clear policies may encourage students to be organized, disciplined, and proactive about learning and being an entrepreneur.

USMS 12.14

Paper Title: Impact of Ten Cs Leadership Practices on Employee Engagement with Respect to Socio-Demographic Variables: A Study of Hotel and Tourism Industry in National Capital Region Delhi, India

Author(s): Lather, A.S., Jain, V.K. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi – 110078

Source: International Journal of Indian Culture and Business Management, Vol. 12 (4), (2016), pp 425-445

ISSN No.: 1753-0814

Abstract: The present study was aimed to map the effect of specific leadership practices on employee engagement with respect to the socio-demographic profile of employees working in the hotel and tourism industry. A sample of 100 employees was selected using stratified random sampling. Ten Cs suggested by Dan Crim and Seijts (2006) were taken as leadership practices and employee engagement was measured through job satisfaction, organisational commitment, intent to stay, pride, advocate, and emotional connect. The results show that males prefer democratic control while females want control as well as leader's focus on their career development. The results of the study also reveals different leadership practices (Ten Cs) which engage employees belonging to different income group, educational background, marital status, family type, schooling type, socio economic status, and area of location. Interestingly, these socio demographic factors differentiate amongst individuals as regards with which specific leadership practices engage them in their jobs.

USMS-13.01

Paper Title: Modelling Volatility in Indian Currency Market

Author (s): Mittal, S. and Kumar, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Bonds and Derivatives, Vol. 2 (1), (2016), pp 40-58

ISSN No.: 2050-229X

Abstract: The present paper aims at studying the relationship between volatility in the exchange rate in the spot market and trading activity in the currency futures market. The data used in this paper comprises of daily exchange rate of USD in terms of Indian rupees for the sample period 1 January 2006 to 12 September 2011. The volatility of the exchange rates has been measured by applying suitable GARCH model. For establishing the feedback causality between the volatility in the spot exchange rate and trading activity in the currency futures market Granger causality test has been applied. The results of the study report a significant difference in the mean volatility in spot exchange rates return in pre futures period and post futures period. The estimated mean volatility is higher in post futures period indicating that futures have resulted in increase in the spot exchange rate returns. Further, the results of Granger causality test establish the bi-directional relationship between volatility in exchange rate returns and volumes in currency futures.

USMS-13.02

Paper Title: E-Buying Behaviour: A Study of Perceptual Differences Between Prospective Generation Y Professionals in Delhi-NCR Region

Author(s): Mittal, S., Khatri, P. and Khushboo

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: RDIAS Journal of Information Technology and Computer Applications, Vol. 1(1), (2015)

ISSN No.: 2394-7365

Abstract: Internet has revolutionized the way of shopping. Now it's not a mere act of purchasing but a lot more. There are number of benefits offered by Internet based shopping like availability across the globe, connectivity, cost efficiency, convenience, etc. Internet is also used as a medium of communication. Maximum use of internet is drawn by young generation these days. This is the commonly accepted norm that young generation is adept at technology and its applications. Their presence over web has transformed the way e-retailers design their websites. The need of generation y is entirely different from the old ones. Generation Y is impatient, brand loyal, money minded, information oriented, appraise quality, logic oriented and highly conscious about security and privacy features of these websites. The present study seeks to understand the perception of Management and IT graduates on different variables of six steps of decision making. The study was conducted in Delhi NCR region wherein the respondents were selected through multistage sampling (N=100). Data was collected through self-constructed questionnaire (cronbach alpha= 0.872). Contrasting results were also seen between male and female respondents regarding perceptions of six steps of decision making while shopping online. The paper seeks to provide an insight to e-retailers and organizations targeting young population for enhancing sales over web.

USMS- 14.01

Paper Title: Entrepreneurial Education in Universities and Support for Economic Development: An Analysis of Existing Literature.

Author(s): Chauhan, K., Prakash, D. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research in Management, Economics & Commerce, Vol. 4(10), (2014), pp 14- 52

ISSN No.: 2250-057X

Abstract: Entrepreneurship is an attitude that reflects an individual's motivation and capacity to identify an opportunity and to pursue it, in order to produce new value or economic success. Entrepreneurship is a matter that involves everyone—the government, society, and the educational institutions. In order to catch up with the pace of developed countries, developing nations including India needs many entrepreneurs willing to make their businesses bigger and better. If the university students with high entrepreneurial potentials get proper training, they will have the best prospects for becoming the undefeated entrepreneurs. Stimulating, innovative and growth-oriented entrepreneurship is a key economic and societal challenge to which universities and colleges have much to contribute. The present paper provides extensive list of evidences that how government with its supportive policies, and the universities with its entrepreneurial development initiatives help in creating entrepreneurs and economic development through them.

USMS 14.02

Paper Title: Entrepreneurial Intensity in Relation to Presence of Entrepreneurship Development Cell: A Study of Institutes Offering Professional Courses in National Capital Region Delhi, India.

Author(s): Prakash, D., Jain, S. and Chauhan, K,

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Journal of Management Education, Vol.13, (2015), pp 95-105

ISSN No.: 1472-8117

Abstract: Entrepreneurship is the back bone of economic growth of any country. Entrepreneurship can be fostered by inculcating entrepreneurial skills right at the stage of education. The presence of Entrepreneurship Development Cell (EDC) in educational institutes helps in developing entrepreneurial culture in academic institutions so as to foster growth of innovation and entrepreneurship. With this premise a study was conducted on 1254 students of government and private institutes pursuing post-graduation in Commerce, Science and Humanities with/without exposure to EDC in the national capital region of India. The results of the present study show that the students exposed to the activities of EDC are significantly higher on Innovation as compared to the students who do not get any such exposure. Also results shows that even the students of courses like science and humanities (these courses do not include business subjects) in private institutes are higher on Frequency of Entrepreneurial Activities where they are exposed to Entrepreneurial Development Cells.

USMS 14.03

Paper Title: Supportive Government Policies, Locus of Control and Student's Entrepreneurial Intensity: A study of India

Author(s): Prakash, D., Jain, S, and Chauhan, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Global Entrepreneurship Research, Vol. 5 (1), (2015), pp 1-15

ISSN No.: 2251-7316

Abstract: The study surveyed 1255 (Male = 847, Female = 408) University students who are pursuing professional courses. The multivariate analysis of variance (MANOVA) was applied to identify the relationship between Gender, Locus of control (LOC) and whether students consider government long term policies as a support to start their own business with Entrepreneurial Intensity of Students. Entrepreneurial intensity captures the combined effect of degree (proactiveness, innovativeness and risk taking) and frequency (number of times entrepreneurial act is repeated) of entrepreneurship. It was found that type of locus of control (internal or external) differs significantly on Proactiveness, frequency of entrepreneurship, innovativeness and Entrepreneurial Intensity of students. It was also found that if students consider government long term policies as support to start their business; they differ significantly on Entrepreneurial Intensity (both degree and frequency of entrepreneurship).

USMS 14.04

Paper Title: Creating a Model to Measure Entrepreneurial Intensity.

Author(s): Prakash, D., Jain, S. and Chauhan, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Asian Journal of Management Research, Vol. 6(1), (2015), pp 187- 207

ISSN No.: 2229-3795

Abstract: In today's global economy, which is based on knowledge and the ability to adjust quickly to new conditions, countries with a young workforce will enjoy a significant competitive advantage against their older counterparts. Entrepreneurship brings vibrancy in terms of innovation, freedom, creation of new jobs, technology, money, etc. Introducing entrepreneurship to tomorrow's workforce is an important task for universities in developing economies. An educated entrepreneur will find more opportunities to explore and introduce change. Education shall play the role of a catalyst to proliferate the process called "Entrepreneurship". The present research attempts to create a model of Entrepreneurial Intensity in Indian Context based on the factors identified from the literature. These factors were then tested in Indian Context on 144 entrepreneurs with a full-time post-graduation to create a measurement model of Entrepreneurial Intensity. The finally developed questionnaire can be applied on students to measure their level of Entrepreneurial Intensity and educational institutes then can apply interventions to develop the students for the same.

USMS- 15.01

Paper Title: Customer Relationship Management in Service Organisations: Prospects, Practices and Areas of Research

Author(s): Saini, A. K., Khatri, P. and Thareja, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Management Practice, Inderscience, Vol.5(1), (2012), pp 1-24

ISSN No.: 1741-8143

Abstract: Customer Relationship Management (CRM) is a 'key success factor' for enhancing profitability of firms, especially in the service organisations. The last two decades have witnessed CRM to be an extensively researched and practiced field of management. This paper endeavours to encapsulate the concept available literature on CRM, both with national and international perspective. It seeks to epitomise the concept and implementation of CRM with focus on service organisations and to highlight the areas having scope for further clarity and for domain specific research to ensure effective CRM practices.

USMS- 15.02

Paper Title: Information System Security and Risk Management: Issues and Impact on Organizations

Author(s): Gupta, S. and Saini, A.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Enterprise Information System, Vol. 5(1), (2013), pp 31-35

ISSN No.: 0975-1432

Abstract: Information Technology (IT) based information systems have become the backbone of not only success but of survival of organizations in this highly competitive world. Considering that IT is an important asset it must be managed efficiently to minimize the risks associated with it and the systems it supports. The paper is based on literature review of existing work on information security and risk management. It attempts to describe the theoretical perspective of information system security. It also discusses and analyses the various information security methodologies in practice.

USMS- 15.03

Paper Title: Resource Capabilities Enabled by Enterprise Applications in Public Sector – Conceptual Framework Applied to a Maharatna, a Navratna and a Miniratna

Author(s): Prakash, N, Saini, A.K. and Jaiswal, M.P.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: JK Journal of Management & Technology, Vol. 5 (1), (2013), pp 1-22

ISSN No.: 0975-0924

Abstract: Resource Based View (RBV) forms an important theoretical base for several IS researches. RBV theory and related IS researches provide several categories and types (typology) of resource capabilities that create and enhance the sustained competitive advantage (SCA) of firms. While the resource capabilities that are enabled by enterprise applications (EA) will closely mirror the ones provided by IS researches on this topic, a specific study of such capabilities in the context of enterprise applications in public sector is attempted in this study. This will improve

the understanding of EA-enabled resource capabilities in general and public sector in particular. Literature survey provides the capabilities 'matrix and the resulting framework is corroborated with three unnamed case studies that represent the complete formal spectrum of public sector enterprises categorization in India viz. the Maharatna, Navratna and Miniratna.

USMS- 15.04

Paper Title: Ethical Dilemmas Amongst Students in a Dental Institution

Author(s): Verma, M., Mohanty, V.R., Nawal, R.R. and Saini, A.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Management Research, Vol. 13(3), (2013), pp 155-162

ISSN No.: 0972-5814

Abstract: Dental surgeons have well-recognized professional and ethical responsibilities. However, as their role and the corresponding responsibilities expand further as the profession evolves, the demands of the profession increase and the context of professional approach may vary. The present study was carried out to assess ethical dilemmas experienced by dental students using a close-ended questionnaire. It explored different clinical scenarios, doctor-patient relationship, communication, autonomy, and consent. The most common ethical dilemmas encountered by the respondents were patient-related issues followed by clinical decision making issues. The respondents, mainly post graduates, felt that the present curriculum on ethics and its practical implications had to be improved. Seventy six per cent believed that dental surgeon-patient relationship is based on beneficence, autonomy, veracity, and confidentiality. Students' perceptions of ethical dilemmas in practice offer a foundation for designing a dental ethics curriculum that is realistic and appropriate.

USMS- 15.05

Paper Title: Using Serendipity for ICT Development

Author (s): Saini, A.K. and Khurana, V.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Enterprise Information System, Vol. 5(2), (2013), pp 48-54

ISSN No.: 0975-1432

Abstract: In today's global marketplace, characterized by the ever-increasing pace of competition, ever-increasing & changing demands of customers, and explosion of knowledge and technology, all organizations require creative out-of-the-box thinkers and approaches for survival and growth. It is indeed survival of fittest and fastest these days. Better & faster idea generation holds the key to long term survival and growth of the organization. Organizations use variety of techniques for stimulating creativity and generating new ideas. While traditional creativity techniques do not focus on using accidental discovery for tapping new ideas, these days serendipity i.e. accidental discovery is also being explored by organizations like Yahoo & Google etc for generating new ideas. This paper highlights the importance of serendipity for idea generation and its contribution for ICT development. The paper explores the challenges likely to be faced in using serendipity for idea generation. Finally the paper suggests a framework for meeting such challenges for harnessing the potential of serendipity for idea generation.

USMS- 15.06

Paper Title: Examining the Tripod Relationship between Employee Cognition, Corporate Culture and Employee Behaviour

Author (s): Saini, A.K., Khatri, P. and Thareja, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Business Studies, Vol. V-VI, (2012-14), pp 42-54

ISSN No.: 2362-0269

Abstract: It has been studied over the years that a person is satisfied when what he gets, meets or exceeds his expectations and perceptions. The same is true in employment field also and this paper is focused towards measuring the satisfaction of employees based on the underlying fact. The perception and expectation of an employee about his job, the job culture and job responsibilities are formed as an outcome of his cognition scope developed through the professional learning and training received in the learning institutions attended. If the corporate atmosphere and the role responsibilities encountered at the time of actual employment meet or exceed the expected levels, the employee is said to be satisfied and thus becomes an asset to the employing organization by exhibiting enhanced levels of internal and external yields. Based on this premise, this research paper is an attempt to discuss the linkage between 1) the expectations of employees, developed/formed through cognitive senses during the professional learning stages of life 2) the job satisfaction levels arrived at, when exposed to practical work cultures of organizations and 3) the effect on internal and external yields of the employee that directly or indirectly has a big effect on the productivity and profitability of both, the employer as well as the employee.

USMS- 15.07

Paper Title: Managing Technology Transfer and Absorption for Organizational Competitiveness

Author (s): Saini, A.K. and Khurana, V.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Management and Technology, Vol. 5 (1), (2014), pp 15-24

ISSN No.: 2229-3925

Abstract: Modern era is witnessing fast changes driven by rapid technological advances and increasing competition. Customer preferences and needs are changing at a phenomenal rate. Despite these complexities, organizations keep on trying to grab the bigger chunk of market demand to their account by aggressively pursuing innovations and improvements. So as to produce innovative products/services, frequent technology transfer and absorption have become inevitable. Some organizations succeed in producing and marketing innovative products and services in quick succession and by doing so, they are able to generate superior financial results. In contrast, some organizations are found struggling for their survival in the marketplace. This poses a serious question as to whether differences in approaches towards technology transfer and absorption influence the successful market commercialization, and competitive advantage. The present study has been undertaken from the perspective of technology recipient organizations by conducting extensive literature review. This paper highlights the importance of successful technology transfer and absorption for shaping the organizational competitive advantage. This paper explores the factors influencing successful implementation of technology transfer and absorption process. Finally the paper proposes a framework for ensuring successful technology transfer and absorption for developing sustainable organizational competitive advantage.

USMS- 15.08

Paper Title: Rejuvenating Business in the Era of Global Dynamic Markets

Author(s): Saini. A.K., Khatri, P. and Thareja, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BVIMR Management Edge, Vol.7(2), (2014), pp 66-77

ISSN No.: 0976-0431

Abstract: In the dynamic and competitive business environment of the current era, where there exists great turbulence specially, post the global downturn period, there arise a more prominent need for the businesses to adapt to a sound and more vigilant strategic framework to ensure their sustainability and excellence. In the light of the above, this paper attempts to list out the strategic modalities for 'rejuvenating businesses 'and also to study the (Norton, 2007) model of 'strategy failures 'in Indian Context. The study of Norton's model in Indian context is intended to bring out the causes for strategy failures.

USMS- 15.09

Paper Title: Enterprise Applications Led Resource Capabilities in Public Sector and Government in India: Key Insight into ICT for Development

Author(s): Prakash, N., Saini, A.K. and Jaiswal, M.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Information Communication Technologies and Human Development, IGI Global, Vol. 6(1), (2014), pp 1-17

ISSN No.: 1935-5661

Abstract: Resource Based View (RBV) forms an important theoretical base for several IS researches. RBV theory and related IS researches provide several categories and types (typology) of resource capabilities that create and enhance the sustained competitive advantage (SCA) of firms. While the resource capabilities that are enabled by enterprise applications (EA) will closely mirror the ones provided by IS researches on this topic, a specific study of such capabilities in the context of enterprise applications in public sector and government is attempted in this study. This will improve the understanding of EA-enabled resource capabilities in general and public sector in particular. The understanding and insights can be widely applied to ICT for Development. Literature survey provides the capabilities' matrix and the resulting framework is corroborated with a study of 55 public sector and government organizations in India.

USMS- 15.10

Paper Title: ERP and Lean Six Sigma: A Pioneer Journey from Most Critical Problems to Most Critical Success Factors

Author(s): Jha, R., Saini, A.K., Jha, D., Jha, A. and Jha, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Invertis Journal of Science and Technology, Vol. 7(3), (2014), pp 138-146

ISSN No.: 0973-8940

Abstract: To successfully take on an ERP System, SMEs need to be dynamic with changing time and emerging trends to have an edge over competitors. Despite all, there might be some common problems that may be always considered as foremost which influence SME's success rate to achieve objectives. The Central aim of this paper is to make an explanatory factor analysis (EFA) through SPSS 18.0 to analyze and prioritize the most critical problems (MCPs) during ERP implementation. In effect, SMEs can take care of these problems on war footing basis to realize its sustainable success stories with most critical success factors (MCSFs), by implementing Lean Six Sigma implementation to ERP.

USMS- 15.11

Paper Title: A Review to Assess Opportunities and Security Risk Challenges in Cloud Computing

Author(s): Gupta, S and Saini, A.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research in Engineering and Technology, Vol. 3(14), (2014)

ISSN No.: 2321-7308

Abstract: In today's competitive world, organizations are under increasing pressure to develop efficiently and convert their IT practices to achieve more with less. Cloud Computing is a flexible technology that can support a wide variety of application. In contrast to grid computing and clustering, cloud computing is service oriented, loosely coupled, TCP/IP based Business Model technology that provides high security and advantage of virtualization and strong fault tolerance. The purpose of the paper is to provide a review of the cloud computing concepts and challenges facing organizations in its adoption

USMS- 15.12

Paper Title: Implementation Status of Health Care Information System: A Study of Some of the States of Northern India

Author(s): Kataria, B.G., Saini, A.K. and Gupta, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Soft Computing and Engineering, Vol. 4(1), (2014), pp 51-54

ISSN No.: 2231-2307

Abstract: In twenty first century world has viewed India as country, who wants to invest their public money into health care sector. Moreover, India is the global destination for information technology and its related applications. The health care information system was introduced in developing country like India. The major concern of any

information system is to produce information that is used in decision making in every service sector as in health care. The evaluation in health care information systems should be multidimensional whether it is related to medical record keeping, inventory, infrastructure, administrative and billing beyond technical functionality. At present information and communication technology initiative in India gave us the opportunity to evaluate the introduction of health care information system in a changed environment. This paper aims to study the implementation status of health care information system.

USMS- 15.13

Paper Title: The Geographical Location of Patenting in Indian Semiconductor Companies: A Cluster Analysis

Author(s): Saini. A.K. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Apeejay - Journal of Management Sciences and Technology, Vol.2 (2), (2015), pp 21-32

ISSN No.: 2347-5005

Abstract: The selection of appropriate location of a firm is one of the company's preliminary decisions. Especially, in a dynamic industry like semiconductors, a strategic geographical location decision can help the companies to handle the global competition in a better way. In this article, a study of semiconductor product patenting Indian semiconductor firms is done. The main objective of this article is to find the linkages between the geographical location of the company and the number of patent applications filed. It was adjudged that how these companies select their favoured location for company's set up. As per cluster analysis and data collected, it was found that company's domicile and resource allocation plays a vital role in deciding the semiconductor companies' location in India. It was also found that appropriate geographical location of company helps in competing with close and alike neighbours.

USMS- 15.14

Paper Title: Efficient Performance of Indian Semiconductor Companies: A Data Envelopment Analysis (DEA) of IT Firms

Author (s): Saini, A.K. and Jain, S

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Management Research, Vol. 15 (1), (2015), pp 3-12

ISSN No.: 0972-5814

Abstract: This study is based on Data Envelopment Analysis to analyze the performance of semiconductor product manufacturing Indian IT companies. The study will explore the patent related activities and variables of randomly selected 32 semiconductor product manufacturing companies in India. These companies have their respective Research and Development Centres in India. It is a highly volatile industry and hence, it is very important for every semiconductor company to perform to stay in competition. The findings suggest that as per input-oriented DEA with VRS (Variable Return to Scale) assumption, most of the semiconductor companies are not utilizing their input resources efficiently and to follow the benchmark companies.

USMS- 15.15

Paper Title: Niche vs. Multi-specialty Firms: A SAP-LAP Analysis of Indian Semiconductor Industry

Author(s): Saini, A.K. and Jain, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Amity Business Review, Vol.16(1), (2015), pp 543-72

ISSN No.: 0972-2343

Abstract: The Indian semiconductor Industry is one of the most dynamic and competitive industry in India. There are several participants of this industry. Some are only semiconductor product companies and some are multispecialty firms which are dealing in other industries simultaneously. This study will examine whether there exists any similarity between these companies or not? The study has adopted the case-study method. Four semiconductor companies were selected and tested on SAP-LAP (Situation-Actor-Process Learning-Action-Performance) framework. The findings suggest that except few components and the structure, there is no difference in the competitiveness, the basic work environment of both type of companies.

USMS- 15.16

Paper Title: Indian Automobile Industry: Managing Absorption of Technology for Success

Author(s): Saini, A.K. and Khurana, V.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: BVIMR Management Edge, Vol. 8 (2), (2015), pp 67-79

ISSN No.: 0976-0431.

Abstract: Modern era is witnessing fast changes driven by rapid technological advances and increasing competition. Preferences and needs of customers are changing at a phenomenal rate. So as to meet fast-changing requirements and produce innovative products/ services, frequent technology transfer and absorption have become inevitable in all industries including automobile sector. Despite regular investments in technology & innovation, few Indian car manufactures recalled their cars from the Indian market during last two-three years due to quality and engineering problems. Further an increasing number of cars caught fire on the roads in India, in which some persons were unfortunately burnt alive and only few persons were lucky to escape. These incidents are not confined to car industry alone. During last two-three years, some low floor DTC buses caught fire on Delhi roads. During summer of 2014, on an average 16% of DTC buses are reported to break-down daily. As a result, Indian automobile industry remained on the edge. This poses a serious question as to whether automobile firms are not able to manage properly frequent technology transfer and absorption. The present study has been undertaken from the perspective of technology absorbing firms in Indian Automobile Industry. The paper attempts to explore the factors influencing successful implementation of technology transfer and absorption process. Finally, the paper proposes a framework for ensuring successful technology transfer and absorption for developing sustainable competitive advantage.

USMS- 15.17

Paper Title: Technical Edge for Competitive Advantage by Patenting: A Study of Indian Semiconductor Industry

Author(s): Jain, S., Saini, A.K. and Verma, R.K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Advanced Computer Research, Vol. 2(4), (2012), pp 223-229

ISSN No.: 2277-7970

Abstract: Every successful organization is a masterpiece of some brilliant minds and skills of knowledge workers. This can be seen in the fields like Pharmaceuticals, IT, Telecom, Electronics, Electricals Bio-technology, etc. They all emphasized on newer and competitive innovations resulting into patents for upliftment of their enterprises. This paper also tries to explain one such aspect of semiconductor industry. This paper establishes a relationship of patenting with competitive edge in the global market. The study is based on the analysis of selected 20 Indian semiconductor product manufacturing companies. On the basis of the results from data collected, it has been observed that the firms with more inclination towards technical edge through newer innovations are leading a competitive and comfortable advantage in global market. This added advantage happened due to increase in the number of patents by the companies. This result is supported by almost all the sample companies whether from telecom or electronic industry.

USMS- 16.01

Paper Title: Effectiveness of Contract Farming: A Case of NadukkaraAgro Processing Company Ltd

Author(s): Sinha, N.,¹ Abraham, B.² and Sachdeva, T.³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Head Marketing FENA; ³Vivekananda Institute of Professional Studies, GGSIPU, Delhi

Source: BVIMR Management Edge, Vol. 5(1), (2012), pp 94-106

ISSN No.: 0976-0431

Abstract: The effectiveness of marketing agricultural products is important to the viability of Indian agricultural economy. With the changing legislative framework it has been possible to corporatize agri-business. An important development in the recent years is corporate organization like ITC and Pepsico entering into contract farming agreements with the farmers. There are important inferences to be drawn from studying contract, its forms and functions, and the way that the farmers and the business interact. This calls for a multidisciplinary approach and the review attempts to draw together insights from economics, legal framework covering land law, strategy, inclusive marketing and supply chain management as they apply to the study of effectiveness of contract farming . With the help of literature survey an attempt is made to assess the effectiveness of contract farming model in India. In this paper we also explore other innovations in promoting agri-business that can be applied in India. Finally, we explore the impact of contract farming through a case of NadukkaraAgro Processing Company Ltd. developed under the Kerala Horticulture Development Programme, a modern fruit processing factory for the commercial processing of pineapple, mango and other fruits that has been established in the heart of Kerala.

USMS- 16.02

Paper Title: Inter Linkages Between Organizational Culture and Quality Management System: A Study of Small and Medium Enterprises in Indian Auto Component Sector

Author(s): Sinha, N.,¹Dhall, N.² and Garg, A.K. ³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jagan Institute of Management Studies, Rohini, Delhi; ³Fairleigh Dickinson University-Vancouver, Canada.

Source: DIAS Technology Review, Vol. 9 (1), pp 27-36

ISSN No.: 0972-9658

Abstract: Indian Auto component sector is one of the fastest growing within the Small and Medium Enterprise (SME) category of industries. This study investigates the relationship between cultural values and implementation of quality management principles in Indian Auto component manufacturing SMEs. Empirical data was collected via a questionnaire survey, and 61 Indian Auto component manufacturing SMEs located in Delhi and National Capital Region were studied. Statistical analysis revealed a significant difference between 'small' and 'medium' enterprises in relation to the prevalence of Cultural values like-Openness, Confrontation, Trust and Pro-action. However, no significant difference was found in the extent of practice on each of Quality Management factors between 'small and medium enterprises. An interesting aspect that has been highlighted is that both small and medium companies have shown a higher level of implementation of all quality principles. The results indicate three cultural dimensions -Openness, Confrontation & Pro-action which exhibited a significant positive association with all the quality management factors. Similarly, Experimentation, Collaboration, Authenticity and Trust exhibited positive significant correlation with most of the Quality Management factors. However, Autonomy is the only cultural dimension, which was found to have non-significant low negative correlation with four Quality factors. The findings suggest that the cultural dimensions -Openness, Confrontation and Pro-action should be emphasized more given their association with all Quality Management factors. This paper presents new results evidencing the importance of OCTAPACE values in TQM implementation. Overall, the research findings provide a useful reference for Indian Auto component SMEs in their efforts to sustain global competitiveness.

USMS- 16.03

Paper Title: Quality Management in New Automotive Supply Chains: A Study of Select Indian Auto Component SMEs

Author(s): Sinha, N.,¹Dhall, N.² and Garg, A.K. ³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078; ²Jagan Institute of Management Studies, Rohini, Delhi; ³Fairleigh Dickinson University-Vancouver, Canada.

Source: International Journal of Automotive Technology and Management, Vol.13(4), (2013), pp 391-410

ISSN No.: 1470-9511

Abstract: As the Indian auto component industry has matured, SMEs have emerged as strong contributors to the overall output of this industry in the country and have a significant share in the exports of the industry. The present paper aims to study the extent of quality management implementation in Indian auto component SMEs and to further examine the association between organizational cultural values and the extent of quality management principles practiced in this sector. Results indicate a higher level of implementation of all quality principles in these SMEs. In addition,

values of organizational culture and principles of quality management were found interrelated; however, each dimension of culture is related to seven quality management principles in different manner.

USMS- 16.04

Paper Title: Effect of Mergers and Acquisitions on Shareholders Wealth: Evidence from Indian Stock Market

Author(s): Sachdeva, T.,¹Sinha, N.² and Kaushik, K.P.³

Affiliation(s): ¹ University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³National Institute of Finance Management, Faridabad.

Source: Amity Business Review, Vol. 14 (2), (2013), pp 104-121

ISSN No.: 0972-2343

Abstract: The global business scenario is undergoing a period of economic slowdown. In this scenario while mergers and acquisitions (M&A) activity in emerging economies like India and China remains a major source of growth, it also involves risk. The present paper examines the impact of mergers and acquisitions on shareholders 'value of acquiring companies in Indian Corporate Sector. By using the event study approach, we calculate the impact of media announcement on shareholders wealth during the period 1991-2008. This study also analyzes the pre-merger and post-merger scenario of acquiring companies in terms of their risk-return characteristics. The result of the study indicates that M&A cases in India show insignificant impact in terms of risk characteristic.

USMS- 16.05

Paper Title: Transition towards a Green Economy: Role of FDI.

Author(s): Kumar, N.V.¹ and Sinha, N.²

Affiliation(s): ¹Centre for Advanced Management and Power Studies of National Power Training Institute (NPTI), Faridabad, Haryana; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Technology and Globalization, Vol. 7 (4), (2014), pp 288-306

ISSN No.: 1476-5667

Abstract: The energy use in India is at present considerably higher than a few decades ago, mainly as a result of economic growth. The primary source of energy in India, thermal power, is a source of greenhouse gas emissions. To stabilise the CO₂ emissions and promote sustainable development, economic development must go hand in hand with low-carbon society's development. A transition towards a green economy will require a shift away from current production and consumption patterns of energy. This is achievable through improved process and end-use energy efficiency, and increased adoption of cleaner energy sources. Fostering increased investments in clean energy and energy efficiency is an important step to achieving more sustainable economic development. Therefore, we have undertaken this study that attempts to examine the impact of FDI in Indian power sector on the path of clean energy.

USMS- 16.06

Paper Title: **Harnessing the Power of Knowledge Management for Innovation**

Author(s): **Sinha, N.,¹Kakkar, N.K. ² and Gupta, V.³**

Affiliation(s):¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Maharaja Agarsen Technical Education Society, PSP Area, Plot no. 1, Sec 22, Rohini, Delhi; ³Delhi School of Management, Delhi Technological University, Bawana Road, Delhi

Source: International Journal of Knowledge and Learning, Vol.10(2), (2015), pp 124-146

ISSN No.: 1741-1009

Abstract: Innovation, the successful exploitation of new ideas, is integration of knowledge with action. Researchers have discovered that knowledge, which includes what the organisation knows, how it uses what it knows and how fast it can know something new, offers a competitive edge to an organisation (Adams and Lamont, 2003; Sinha et al., 2012; McLaughlin and Caraballo, 2013). This paper makes a contribution by conceptualising and empirically testing a knowledge-based framework for innovation by taking up the case of the Indian IT/ITeS sector, specifically, National Association of Software and Services Companies (NASSCOM) members. The authors surveyed 435 respondents from 46 companies. The findings reveal that five out of nine knowledge management (KM) practices surveyed are relevant, namely culture and leaders' support, KM processes and networking and alliances. However, statistically, the fourth practice, namely, KM strategy, and the fifth, training and development of employees for KM, are not very successful as predictors.

USMS- 16.07

Paper Title: **Sustainable Buying Intentions Different Purchase Situations: A Study**

Author(s): Gupta, S.¹ and Sinha, N.²

Affiliation(s):¹Delhi School of Business, Pitampura, Delhi;²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: ASBM Journal of Management, Vol. 8 (2), (2015), pp 78-92

ISSN No.: 0974-8512

Abstract: This paper aims to evaluate influence of marketing mix elements and macro environmental variables on Sustainable buying intention of consumers in Habitual and Extended Problem-solving-buying Situations. This can help marketers to modify their propositions as per buying situation. Field study was conducted to capture consumer responses for comparing their purchase intention towards green products in two buying situations. Findings indicate that two out of three factors that influence consumers vary with buying situations. Product Quality, Promotion and Governmental Regulations play different roles in different type of purchase situation. Companies would realize higher product demand if they focus efforts towards Promotion and Government Regulations in Extended problem-solving-buying situation. In habitual problem-solving-buying situation, companies would benefit by focusing their efforts more towards Quality. Other factors of consumer behavior like lifestyle, reference groups and their inter-linkages can be studied in global context.

USMS- 16.08

Paper Title: Product Innovation and Measuring Its Effectiveness

Author(s): Verma, P.¹ and Sinha, N.²

Affiliation(s): ¹School of Retail Management, FDDI, Noida, U.P., ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Innovative Research and Advanced Studies, Vol. 3(7), pp 140-146

ISSN No: 2394-4404

Abstract: Survival of a company is dependent on the importance it assigns to change. Innovation is a key to change. There are different types of innovation. The most significant is product innovation. A company should strive to achieve the best in its field. Speed, market orientation and flexibility are the three factors which accelerate this type of innovation leading to creation of market value.

USMS- 16.09

Paper Title: Uncovering the Secrets of the Twenty-First-Century Organization

Author(s): Sinha, N.¹, Kakkar², N.K. and Gupta, V.³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Director, MAIMS Rohini, Delhi; ³Delhi Technological University Delhi.

Source: Global Business and Organizational Excellence, Vol. 31(2), (2012), pp 49-56

ISSN No.: 1932-2054

Abstract: What will shape the organizations of the future? This article presents an eight-level model that describes past, present, and future modes of operating and deals with the sources of power in an organization, the way that it is structured, how leadership style has changed, the role of stakeholders, the changing face of competition, the importance of creativity, teamwork, and the shifting nature of supply and demand. To keep up with the rapid pace of developments in these areas, today's business leaders need to have the courage to embrace new ways of thinking about shareholders, customers, and employees.

USMS- 16.10

Paper Title: Effectiveness of Contract Farming: A Case of Nadukkara Agro Processing Company Ltd

Author(s): Sinha, N.,¹ Abraham, B.² and Sachdeva, T.³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Head Marketing FENA; ³Vivekananda Institute of Professional Studies, GGSIPU

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Abstract: The effectiveness of marketing agricultural products is important to the viability of Indian agricultural economy. With the changing legislative framework it has been possible to corporatize agri-business. An important development in the recent years is corporate organization like ITC and Pepsico entering into contract farming agreements with the farmers. There are important inferences to be drawn from studying contract, its forms and functions, and the way that the farmers and the business interact. This calls for a multidisciplinary approach and the review attempts to draw together insights from economics, legal framework covering land law,

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USMS- 16.11

Paper Title: **Inter Linkages Between Organizational Culture and Quality Management System: A Study of Small and Medium Enterprises in Indian Auto Component Sector**

Author(s): **Sinha, N.,**¹Dhall, N.² and Garg, A.K. ³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jagan Institute of Management Studies, Rohini, Delhi; ³Fairleigh Dickinson University-Vancouver, Canada.

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USMS- 16.12

Paper Title: Quality Management in New Automotive Supply Chains: A Study of Select Indian Auto Component SMEs

Author(s): Sinha, N.,¹Dhall, N.² and Garg, A.K.³

Affiliation(s):¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Jagan Institute of Management Studies, Rohini, Delhi; ³Fairleigh Dickinson University-Vancouver, Canada

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USMS- 16.13

Paper Title: Effect of Mergers and Acquisitions on Shareholders Wealth: Evidence from Indian Stock Market

Author(s): Sachdeva, T.,¹Sinha, N.² and Kaushik, K.P.³

Affiliation(s):¹Guru Gobind Singh Indraprastha University, Delhi; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³National Institute of Finance Management, Faridabad.

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USMS- 16.14

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Author(s): Kumar, N.V.¹ and Sinha, N.²

Affiliation(s): ¹Centre for Advanced Management and Power Studies of National Power Training Institute, Faridabad,; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

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Abstract: The energy use in India is at present considerably higher than a few decades ago, mainly as a result of economic growth. The primary source of energy in India, thermal power, is a source of greenhouse gas emissions. To stabilise the CO₂ emissions and promote sustainable development, economic development must go hand in hand with low-carbon society's development. A transition towards a green economy will require a shift away from current production and consumption patterns of energy. This is achievable through improved process and end-use energy efficiency, and increased adoption of cleaner energy sources. Fostering increased investments in clean energy and energy efficiency is an important step to achieving more sustainable economic development. Therefore, we have undertaken this study that attempts to examine the impact of FDI in Indian power sector on the path of clean energy.

USMS- 16.15

Paper Title: Harnessing the Power of Knowledge Management for Innovation

Author(s): Sinha, N.¹, Kakkar, N.K. ² and Gupta, V.³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Maharaja Agarsen Technical Education Society, PSP Area, Plot no. 1, sec 22, Rohini, Delhi; ³Delhi School of Management, Delhi Technological University, Bawana Road, Delhi

Source: International Journal of Knowledge and Learning, Vol. 10(2), (2015), pp 124-146

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Abstract: Innovation, the successful exploitation of new ideas, is integration of knowledge with action. Researchers have discovered that knowledge, which includes what the organisation knows, how it uses what it knows and how fast it can know something new, offers a competitive edge to an organisation (Adams and Lamont, 2003; Sinha et al., 2012; McLaughlin and Caraballo, 2013). This paper makes a contribution by conceptualising and empirically testing a knowledge-based framework for innovation by taking up the case of the Indian IT/ITeS sector, specifically, National Association of Software and Services Companies (NASSCOM) members. The authors surveyed 435 respondents from 46 companies. The findings reveal that five out of nine knowledge management (KM) practices surveyed are relevant, namely culture and leaders' support, KM processes and networking and alliances. However, statistically, the fourth practice, namely, KM strategy, and the fifth, training and development of employees for KM, are not very successful as predictors.

USMS- 16.16

Paper Title: Sustainable Buying Intentions Different Purchase Situations: A Study

Author(s): Gupta, S.¹ and Sinha, N.²

Affiliation(s): ¹Delhi School of Business, Pitampura, Delhi; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

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USMS- 16.17

Paper Title: Globalization and Corporate Social Responsibility Disclosure (CSRD) Reporting Practices: An Investigation of Power and Oil & Gas Sector in India

Author(s): Sinha, N. and Gupta, R.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: European Journal of Business and Management, Vol. 7(34), (2015), pp 80-92

ISSN No.: 2222-1905

Abstract: An ever increasing number of Corporations are addressing the ethical and social responsibility issues in cross-cultural settings due to globalization of the markets. The Corporations that desire to be more socially responsible require social accounting information both to aid their management decisions and to inform the stakeholders. The National Association of Accountants Committee on Accounting for Corporate Social Performance identified four major areas of social performance viz. Community Development (CD), Human Resources (HR), Service and Product Contribution (SPC), and Physical Resources and Environment Contribution (PREC). This study examines the Corporate Social Responsibility Disclosure (CSRD) reporting practices and the preference chosen by Power and Oil & Gas Sector companies in India with respect to these dimensions in an attempt to comprehend and gain insight into attitude and disclosures of companies towards various aspects of Corporate Social Responsibility Disclosure (CSRD) through content Analysis.

USMS- 16.18

Paper Title: Mobile for Development (M4D) to Create Customer Wealth

Author(s): Verma, P.¹ and Sinha, N.²

Affiliation(s): ¹School of Retail Management, FDDI, Noida, U.P.; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Business & Management, Vol. 4(3), (2016), pp 334-341

ISSN No.: 2321-8916

Abstract: Mobile for development (M4D) is a well documented field of study. At the aggregate level the impact of adoption of mobile phone based services is analyzed comprehensively but at an individual level it is not well documented. If we consider the user as a customer of mobile based services, impact of adoption of mobile phone based services in creation of wealth for this customer has not been researched. In this paper we define the constructs of customer wealth and develop the conceptual model linking intention to use and customer wealth.

USMS- 16.19

Paper Title: Effect of TQM principles on Performance of Indian SMEs: The Case of Automotive Supply Chain

Author(s): Sinha, N.,¹ Garg, A.K.² and Dhall, N.³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Fairleigh Dickinson University-Vancouver, Canada Masters of Administrative Sciences; ³Jagan Institute of Management Studies Management.

Source: The TQM Journal, Vol. 28 (3), (2016), pp 338-359

ISSN No.: 1754-2731

Abstract: The purpose of this paper is to investigate the effect of Total Quality Management (TQM) principles on organizational performance in small and medium enterprises (SMEs) in Indian auto component sector. Design/methodology/approach – The paper is based on survey data collected from quality heads of 120 Auto component SMEs in India and uses correlation and regression analysis to test the relationships between quality management principles (QMPs) and organizational performance. Findings – The study provides evidence that application of TQM principles such as “Process Approach,” “Mutually Beneficial Supplier Relationship” and “Factual Approach to Decision-Making” has a positive influence on the performance of Indian auto component SMEs. Practical implications – This study presents a number of managerial implications, specifically for quality managers in Indian auto component SMEs. The focus of these organizations should be on strengthening the supply chain and operations. The quality managers need to align processes and resources based on factual approach to decision making for achieving higher organizational performance. Management of the organizations should also analyze why the soft aspects of TQM, namely, Involvement of People, Customer Focus and Leadership are not contributing to the organizational performance in Indian auto component SMEs. Originality/value – This paper identifies the key QMPs that can influence organizational performance in SMEs in the Indian auto component sector whereas most existing studies have focused only on Tier-1 organization in this sector. Unlike previous studies on this subject, the present study highlights the significant impact of predominantly hard factors of TQM such as “Process Approach” and “Factual Approach to Decision-Making” with only one soft factor of TQM, namely, “Mutually Beneficial Supplier Relationship” being significant.

USMS- 16.20

Paper Title: Product Innovation and Measuring Its Effectiveness

Author(s): Verma, P.¹ and Sinha, N.²

Affiliation(s): ¹School of Retail Management, FDDI, Noida, U.P., ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

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USMS- 16.21

Paper Title: A Study on Mobile Banking and its Impact on Customer's Banking Transactions: A Comparative Analysis of Public and Private Sector Banks in India

Author(s): Singh, N¹ and Sinha, N.²

Affiliation(s): ¹Jaipuria Institute of Management; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: FIIB Business Review, Vol. 5 (2), (2016), pp 57-70

ISSN No.: 2319-7145

Abstract: In India, we have more than 900 million mobile users but 40 million customers use still mobile banking approximately. There can be various reasons behind this, such as need of active collaboration between banks and Telecom Company, lack of accessibility to customers, cost, awareness about the mobile banking app etc. Banks have to work on creating mobile banking awareness among the customers. They need to promote the benefits of mobile banking and its effectiveness. In this paper, we aim to determine customer perception about mobile banking services of banks. Customer has different views on mobile banking services provided by their service providers. We examine the expectations of customers from banks towards mobile banking system. In this paper we also evaluate the impact of mobile banking on customer experience after using mobile banking. This paper reflects the change in transactions mode of customers through mobile banking. This paper also shares the initiatives taken by customers in their banking usage after switching to mobile banking. For the survey, we have selected ten banks (five public sector and five private sector banks) and tried to identify the characteristics of mobile banking system of these banks.

USMS- 16.22

Paper Title: Mapping the Linkage between Organizational Culture and TQM: The Case of Indian Auto Component Industry

Author(s): Dhall, N.,¹ Sinha, N.,² Dhingra, S.² and Garg, A.³

Affiliation(s): ¹Jagan Institute of Management Studies Management; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Fairleigh Dickinson University-Vancouver, Canada Masters of Administrative Sciences

Source: Benchmarking: An International Journal, Vol. 23(1), (2016), pp 208-235

ISSN No.: 1463-5771

Abstract: The purpose of this paper is to examine the impact of Organisational Culture (OC) on total quality management (TQM) implementation in Indian small and medium enterprises (SMEs) in the auto component sector. Specifically; it attempts to propose a model linking OC and TQM for this sector. Design/methodology/approach – Survey method was used for data collection by targeting the whole population of 482 Indian auto component SMEs drawn from Auto Component Manufacturers Association members 'database. Out of 482, 150 completely filled questionnaires were taken for data analysis. Proposed relationships among identified dimensions of OC and TQM interventions have been validated through parameter estimation statistics and goodness-of-fit statistics using path analysis technique of structural equation modelling using AMOS 18.0. Findings – Based on the results, a culture influenced TQM model has been developed. The model demonstrates a linkage between cultural dimensions and TQM interventions, thereby suggesting that OC characterised by “openness”, “confrontation”, “trust”, “authenticity”, “proaction”, “autonomy”, “collaboration” and “experimentation” has a significant and positive impact on TQM implementation. Practical implications – The study presents many practical implications, specifically for quality managers in Indian auto component SMEs. The study has developed a culture influenced TQM model which identifies dimensions of OC that promote TQM implementation. The study also identifies various interventions of TQM in their order of significance, which can be used by SMEs in mapping the critical links between OC and TQM through this model. Thus, findings of the present study will help SMEs in this sector to move up the value chain and sustain their global competitiveness. Originality/value – The study provides a culture influenced TQM model which would assist managers in quality implementation in Indian auto component SMEs

USMS- 17.01

Paper Title: Do Macro-economic Variables Move in Tandem: Evidence from India and Sri Lanka

Author(s): Sharma, G. D. Singh, S. and Mahendru, M.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Asian Journal of Information Management, Vol. 6(1), (2012), pp 1-15

ISSN No.: 1819-334X

Abstract: Macroeconomic variables like Economic output, Unemployment and Inflation etc. play a vital role in the economic performance of a country. For the past three decades, evidence of key macroeconomic variables helping predict the time series of stock returns has accumulated in direct contradiction to the conclusions drawn by the Efficient Market Theory. This paper studied the pattern of Consumer Price Index (CPI), Wholesale Price Index (WPI), Gross Domestic Product (GDP), Gross

National Income (GNI) and rate of interest in India and Sri Lanka. Monthly data from 2002 onwards to 2009 has been used in case of all the variables. The econometrics tools i.e., unit root test, Granger causality test, cointegration test, vector auto regression and variance decomposition analysis have been used for the analysis purpose. All the tools don't lead us to any common result. Granger model and VAR model indicates that CPI, WPI and exchange rate does not have any influence on each other in the case of both of the countries but the Variance decomposition model shows visible impact of macroeconomic variables on each other in some of the cases in Indian and Sri Lankan data. The present study finds that the macro-economic variables i.e., exchange rates, bank rates, WPI, CPI, GNI and balance of payments play a pivotal role in determining the Gross Domestic Product (GDP) in India and Sri Lanka.

USMS- 17.02

Paper Title: Rewards and Risks in Stock Markets: A Case of South Asia

Author(s): Sharma, G. D. and Bodla, B.S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Journal of Applied Economics and Finance, Vol. 6(2), (2012), pp 37-52

ISSN No. 2077-2149

Abstract: This study various insights into the returns provided by the stock markets under study and also summarizes the risk behavior of the stock exchanges of South Asia, i.e., India, Sri Lanka, Bangladesh, Pakistan, Nepal and Maldives. The study aims at finding out whether the return and risk associated with the stock markets of South Asian nations have been significantly different over time. Finally, the study attempts to suggest to the investor as to which of the stock markets from amongst the SAARC nations provide the investor with a potentially profitable avenue. The study presents the descriptive statistics including Mean percent return (per year and over the entire reference period), Average annual return, maximum and minimum return, Standard deviation, Skewness, Kurtosis and Jarque Bera statistic for the stock exchanges under study. The study finds that the Indian stock markets emerge as a preferable potential avenue for the global investors. Secondly, Bangladesh and Sri Lanka also come across as good investment avenues because of the relatively stable political and economic systems besides offering a high return and reasonable risk.

USMS- 17.03

Paper Title: Impact of Economic Indicators on FDI: A Case of India

Author(s): Singh, S., Sharma, G. D. and Mahendru, M.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: SSRN Electronic Journal, (2012), 2087644

ISSN No.: 1556-5068

Abstract: It is known that the growth in FDI is increasing at the global scenario. Especially in the developing countries the FDI is increased in last two decades. The current study will investigate the effect of the economic indicators on the Foreign Direct Investment in India. Research Methodology: The data of FDI, GDP growth, Consumer Price Index, Exchange Rate (US\$) and Inflation (WPI) from 2000-2001 to 2010-2011 have been used for the purpose of study. Various statistical tools i.e., Mean, Standard Deviation, Variance, Kurtosis, Skewness have been used to check

the normality of the data. Correlation and Regression analysis have been used to study the relationship and dependency of these variables. Findings: The findings revealed that there is a visible effect of the economic indicators of India on the Foreign Direct Investment. The result of the correlation and regression analysis shows the significant impact of the economic indicators in the FDI. Originality: The study is original and it's investigated the impact of the economic indicators of India on the FDI with the use of current statistics.

USMS- 17.04

Paper Title: Are the Stock Exchanges of Emerging Economies Interlinked ?: Evidence from Brics

Author(s): Sharma, G. D., Mahendru, M. and Singh, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Finance, Vol. 7(1), (2013), pp 26-37

ISSN No.: 0973-8711

Abstract: This paper studies the interlinkages between stock markets of Brazil, Russia, India, China and South Africa (BRICS) with the help of benchmark indices of these stock exchanges. Daily closing levels of the benchmark indices in the five countries were taken for a period from April 1, 2005 to March 31, 2010. Line charts and unit-root tests were applied to check the stationary nature of the series; Regression Analysis, Granger's Causality Model, Vector Auto Regression (VAR) Model, and Variance Decomposition Analysis were performed to find out the linkages between the markets under study. The analysis revealed that the stock markets under study were influenced by each other, but not to a great extent. It implies that there exists opportunities for diversification of the investors among the stock exchanges of BRICS. The paper also observed that there are domestic factors (macro-economic variables) that influence the stock markets.

USMS- 17.05

Paper Title: Emergence of Search Engine Optimization as an Advertising Tool

Author(s): Mahendru, M.², Singh, S. and Sharma, G. D.¹

Affiliation(s): ²Thapar University; ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; Chandigarh University

Source: Global Journal of Enterprise Information System, Vol. 6(1), (2014), pp 18-28

ISSN No.: 2690-822

Abstract: SEO considers how search engines work, what people search for, the actual search terms typed into search engines and which search engines are preferred by their targeted audience. Optimizing a website may involve editing its content and HTML and associated coding to increase its relevance to specific keywords and to remove barriers to the indexing activities of search engines. Promoting a site to increase the number of back links, or inbound links, is another SEO tactic. The initialism 'SEO' can refer to 'Search Engine Optimizers,' a term adopted by an industry of consultants who carry out optimization projects on behalf of clients, and by employees who perform SEO services in-house. Search engine optimizers may offer SEO as a stand-alone service or as a part of a broader marketing campaign. This paper evaluates the impact of SEO on the advertisement of firm. The sample size for the research is 100 managers from different IT companies of North India. The paper uses analytical tools including Correlation, Regression, Anova and Chi Square.

USMS- 17.06

Paper Title: Month of the Year Anomalies in Stock Markets: Evidence from India

Author(s): Sharma, G. D., Mittal, S. and Khurana, P.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Journal of Applied Economics and Finance, Vol. 8(3), (2014), pp 82-97

ISSN No.: 1991-0886

Abstract: Judging the importance of existence of calendar anomalies in the stock market to the investors, the paper attempts to find out monthly anomalies in the market. The presence of seasonal effects in monthly returns in the Indian market has been reported by many researchers in the past. This study attempts to examine whether the month-of-the-year anomaly still exists in the Indian Stock Market. For this purpose, two indices, S&P CNX Nifty and S&P CNX Nifty Junior and top nine companies (according to market capitalisation) from both the indices have been selected. The daily closing prices of the respective indices and stocks have been taken and the logarithm return of these prices has been calculated. Line charts and unit-root test are applied to check the stationary nature of the series. The Dummy Variable Regression Model has been applied on the returns to find out any statistically significant deterrent month in the year. The paper observes that both the indices and some of the selected companies reflect the month-of-the-year anomalies in the Indian Stock Market. Mainly, the monthly anomaly is found at the end of a quarter for the given period

USMS- 17.07

Paper Title: The Goal of Business-A Review Paper

Author(s): Singh, S., Bawa, J., and Sharma, G. D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Management and Business Research, Vol. 15(11), (2015), pp 7-12

ISSN No.: 0975-5853

Abstract: The main aim of business is to fulfill the need of the human beings to create a harmony. Though this aim is debatable right since its origin. The scholars defines the goals of business in their studies differently. A numerous studies evaluated the concept of sustainable business and its social responsibility towards society and the nature. Wheeler & McKague (2002) evaluates the role of the business in development and evaluates the function and responsibility of the NGOs, development agencies and government in the same. The study also evaluates the Social-Global Economic Trends. Nelson & Prescott (2003) inspects the role of Business and its role in the Millennium development of the world society. Study attempts the questions that what are the business goals how are they relevant and how the business can achieve them. Fitzgerald KBE &Mandy Cormak (2005), Modesto & Oliveira (2006) &Terziev (2012), attempts to investigate the role of the business organizations in the society and their social responsibility towards.

USMS- 17.08

Paper Title: Risk-Return Patterns in Stock Markets and Currency Markets: A Study of NSE's Nifty and US Dollar

Author(s): Sharma, G. D. and Aggarwal, N.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Accounting Review, Vol. 18(2), (2015), pp 24-37

ISSN No.: 0972-1754

Abstract: This paper studies the return behaviour at National Stock Exchange, India and the Rupee-Dollar exchange rate, using NSE's Nifty as the benchmark for stock returns, while INR-USD rate is used as the benchmark for exchange rate. The daily closing levels of the two benchmarks for a period beginning on 1 January 2008 through 31 December 2013 are considered the reference period. Data have been analyzed using econometric tools. The paper uses the Descriptive statistics, Augmented Dickey-Fuller Unit Root Test, Granger's Causality, Vector Auto Regression, Variance Decomposition Analysis and Impulse Response Function to analyze the data. The study finds that returns in stock prices have an impact on the returns in currency market.

USMS- 17.09

Paper Title: Impact of Macro-Economic Indicators on FDI Inflows in Emerging Economies: Evidence from BRICS

Author(s): Sharma, G. D. and Joshi, M.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Global Economics, Management and Business Research, Vol. 4(1), (2015), pp 44-54

ISSN No.: 2454-2504

Abstract: In this paper an attempt has been made to analyse the impact of Inflation on per capita income of emerging economies. In order to achieve the objective of the study the researchers have taken five major emerging countries of the world which are the members of BRICS. For the purpose of analysis, the data of thirteen years has been taken from 1999 to 2011. After employing the regression model, the results confirm that independent variable (inflation) does not statistically influence the dependent variable (Per Capita Income) in three countries which are India, Brazil and South Africa. However, in the other two countries (China and Russia) the findings affirm the independent variable (Inflation) does statistically influence the dependent variable (Per Capita Income). Therefore, it can be concluded that a change in the inflation rate can not necessarily bring a change in the per capita income of a country.

USMS- 17.10

Paper Title: Does the Pre-open Auction Market Improve Efficiency of Price Discovery in Stock Markets? Evidence from India

Author(s): Sharma, G. D. and Gupta, M.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Finance, Vol. 9(11), (2015), pp 19-32

ISSN No.: 0973-8711

Abstract: The paper analyzed the impact of opening call auction on the efficiency of price discovery at the National Stock Exchange (NSE), India by studying the returns and volatility behavior of one benchmark index (NSE's Nifty) and 10 Nifty component companies selected on random. The paper used the closing prices for the period 3 years before and 3 years after the introduction of the call auction market in 2010. Descriptive statistics, one-way ANOVA, augmented Dickey-Fuller unit-root Test, and ARCH-GARCH type methodology was employed for the analysis. The paper found no significant difference in the returns during the two periods, though a reduction in volatility was observed. The introduction of the pre-open auction market resulted in an improvement in the efficiency of price discovery of various stocks. The findings of the paper offer valuable inputs for stock market regulators as well as investors.

USMS- 17.11

Paper Title: Impact of Sales, Net Profit, and EPS on Stock Behavior in Emerging Markets: A Study of Indian Companies

Author(s): Sharma, G. D.¹, Mahendru, M.² and Singh, S.³

Affiliation(s): ¹University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Faculty, ICFAI Business School, Gurgaon; ³Faculty in Management, Chandigarh University, Gharuan, Punjab

Source: Indian Journal of Research in Capital Markets, Vol. 2(42), (2015), pp 8-18

ISSN No.: 2394-3459

Abstract: The present study investigated the effects of sales, net profit, and earnings per share on the stock behavior of NSE listed companies. Thirty five major companies were chosen from the companies listed at NSE. The study is based on quarterly data of sales, net profit, and EPS from the period of 2001 to 2010. Descriptive statistics, correlation, regression, unit root test, and Granger's causality were used for data analysis. The study found no visible effect of sales, earnings per share, and net profit on the future stock prices. These results indicated that no abnormal profits could be made by trading in the stocks on the basis of sales, earnings per share, and net profit.

USMS- 17.12

Paper Title: Return Linkages and Volatility Spillover Effect Between Stock Markets and Currency Markets

Author(s): Sharma, G. D. and Mishra, N.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Review of Market Integration, Vol. 7(3), (2015), pp 175-197

ISSN No.: 0974-9292

Abstract: This article undertakes the analysis of volatility and volatility spillover between stock market and currency market in India. Daily closing levels of the benchmark

indices are taken for the period 1 April 2003–31 December 2013. The data are analysed through unit root tests, Autoregressive Conditionally Heteroskedastic (ARCH) family models, Johansen's cointegration test, vector error correction model and diagonal Vector Error Correction Heteroskedastic (VECH) model. The results indicate a bidirectional volatility spillover between the Indian stock market and a currency market. The findings of the study also suggest that both the markets move in tandem with each other and there is a long-run relationship between these two markets.

USMS- 17.13

Paper Title: **Impact of Economic Indicators on FDI: A Case of India**

Author(s): Singh, S., **Sharma, G.D.** and Mahendru, M.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Mangalmy Journal of Management & Technology, SSRN Electronic Journal, 2087644, Vol.7, (2013), pp 13-21

ISSN No.: 0973-7251

Abstract: It is known that the growth in FDI is increasing at the global scenario. Especially in the developing countries the FDI is increased in last two decades. The current study will investigate the effect of the economic indicators on the Foreign Direct Investment in India. Research Methodology: The data of FDI, GDP growth, Consumer Price Index, Exchange Rate (US\$) and Inflation (WPI) from 2000-2001 to 2010-2011 have been used for the purpose of study. Various statistical tools i.e., Mean, Standard Deviation, Variance, Kurtosis, Skewness have been used to check the normality of the data. Correlation and Regression analysis have been used to study the relationship and dependency of these variables. Findings: The findings revealed that there is a visible effect of the economic indicators of India on the Foreign Direct Investment. The result of the correlation and regression analysis shows the significant impact of the economic indicators in the FDI. Originality: The study is original and it's investigated the impact of the economic indicators of India on the FDI with the use of current statistics.

USMS- 17.14

Paper Title: **A Case Study on Corporate Social Responsibility in Nestlé, TATA, ITC**

Author(s): Singh, S., Bawa, J. and **Sharma, G.D.**

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: ADR Journals, Vol. 3(4), (2016), pp 1-16

ISSN No.: 2454-3268

Abstract: Since the times of the barter system to present era of plastic money, the mankind has stridden out long path. There is no doubt in this that "profitability" has always been the primary force and main motivation behind all this development. This motive actually increased cut throat competition between the business forms. Because of this competition, the companies started exploiting the quality of product as well as the environmental concern. Slowly and gradually the business houses realized that they have to give back to the society because they are surviving because of the society only. This realization gives the birth to the concept of Corporate Social Responsibility. However, the companies started using this concept for brand building more than delivering it as a responsibility. The studies also revealed that the companies used the corporate social responsibility for enhancing their profit as well.

This present study attempts to investigate about the core concept of corporate social responsibility (CSR), and finding out its scope taking the case study of the TATA Group, ITC and NESTLE.

USMS- 17.15

Paper Title: Towards Configured Intrusion Detection Systems

Author(s): Kumar, V. and Sharma, G.D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Computer Science and Technology, Vol. 16(4), (2016), pp 1-10

ISSN No.: 0975-4172

Abstract: This paper studies the challenges in the current intrusion detection system and comparatively analyzes the active and passive response systems. The paper studies the existing IDS and their usefulness in detecting and preventing attacks in any type of network and control traffic with the performance of the system to be improved. The study also evaluates the emerging avenues in Intrusion Detection System and explores the possible future avenues in intrusion detection scheme. It is observed that the detection-based systems have started to gain popularity in the IT security domain. The paper highlights the need to implement an appropriately configured IDS since an optimally configured IDS deters hackers, thus, reducing the need for investigation by security experts for security violations.

USMS- 17.16

Paper Title: A Review Paper on Integral Humanism: Comparison of DeenDayaal Upadhyay and his Counterparts

Author(s): Singh, S., Bawa, J. and Sharma, G.D.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of in Multidisciplinary and Academic Research , Vol. 5(2), (2016), pp 1-7

ISSN No.: 2309-3218

Abstract: Since the inception of human society there was a discussion initiated on the style to live a prosperous life and to make the others (society) living prosperous too. In this regard a number of philosophers, intellectuals, leaders and religious gurus gave their thoughts time to time and added value in the concept. DeenDayal Upadhyay who was one of the leading Indian philosopher, economist, sociologist, historian, journalist, and political scientist gave the concept of Integral humanism who developed the doctrine of integral humanism. The theme was initially delivered in the form of four lectures in Bombay during April 22-25, 1965. According to him "Humankind had four hierarchically organized attributes of body, mind, intellect and soul which corresponded to four universal objectives, kama (desire or satisfaction), artha (wealth), dharma (moral duties) and moksha (total liberation or 'salvation'). While none could be ignored, dharma is the 'basic', and moksha the 'ultimate' objective of humankind and society. He claimed that the main problem with both capitalist and socialist ideologies is this that they only consider the needs of body and mind, and were hence based on the materialist objectives of desire and wealth".

USMS- 17.17

Paper Title: **Determinants and Indicators of Women Empowerment: A Walk-Through Psychological Patterns and Behavioural Implications**

Author(s): **Sharma, G.D.** and Bansal, S.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Research Journal of Business Management, Vol. 11(1), (2016), pp 15-27

ISSN No.: 1819-1932

Abstract: Background: This study makes an attempt to identify, understand, interpret and analyse various determinants and indicators of women empowerment. Materials and Methods: This conceptual study analyses psychological patterns and their behavioural implications to women empowerment. Results: This study highlights different aspects that hinder women empowerment and suggests appropriate measures to overcome traditional and stereotype patterns. The study frames three determinants (psychological patterns of society, family and women) that affects six indicators (education, educational freedom, economic contribution, economic freedom, household management and decision making, perceived status within the household and health) that directly influence the status of women empowerment. Conclusion: The policy implications of this study suggest that women herself need to take action for their rights and strongly raise their voices about equality in order to separate herself from the traditional paradox that woman is a commodity to be kept at home

USMS- 17.18

Paper Title: **Risk and Return Linkages Among Stock Markets of Selected Asian Countries**

Author(s): Srivastava, M. and **Sharma, G.D.**

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: TSME Journal of Management, Vol. 6(1&2), (2016), pp 1-16

ISSN No.: 2249-6092

Abstract: This paper studies inter-linkages among returns from stock markets in Hong Kong, South Korea, Japan, India, China and Pakistan. Daily closing levels of benchmark indices in six countries are taken for period 6th January 2003 to 21st September 2013. Augmented Dickey-Fuller unit-root test is applied to check stationary nature of the series; Regression analysis, Granger's causality model, Vector Auto Regression model, and Variance Decomposition Analysis are made to find out the linkages between returns. The study leads to two major findings. First, that there exist opportunities for diversification for the investors, and second is the domestic factors (macro economic variables) that influence stock markets.

USMS-18.01

Paper Title: **Sports Betting in India (if you can't stop it, legalize it?)**

Author(s): Sehrawat, K.¹ and **Talan, G.**²

Affiliation(s): ¹Jesus and Mary College, University of Delhi; ²University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Commerce, Business and Management, Vol. 3(3), (2014), pp 475-480

ISSN No.: 2319-2828

Abstract: The New Encyclopedia Britannica defines gambling as the betting or staking of something of value with consciousness of risk and hope of gain on the outcome of a game, a contest, or an uncertain event the result of which may be determined by chance. The terms "wager" and "bet" essentially mean money or other consideration being risked on an uncertain event or a promise to pay money or other consideration

on the occurrence of an uncertain event. The above definition associate gambling with betting on the outcome of a game in which a person may win by chance and not by using skills. Indian law also seems to follow this approach. Gambling is a generic word to describe the activity of placing wages on particular outcomes or events taking place while betting is the term used to refer to agreement between two parties where one party makes a prediction and loses or makes money if his prediction turns to be true. The other party forfeits the amount waged or has to return many times more as per the agreement.

USMS-18.02

Paper Title: Implication of Work Life Balance and Job Stress

Author(s): Maurya, A., Talan, G. and Sehwat, K.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research in Commerce, Economics & Management, Vol. 5 (7), (2015), pp 34-38

ISSN No.: 2231-4245

Abstract: While work-life imbalance and job stress are not new problems, however they have been receiving more attention in the recent times than ever before. Together, these two problems pose risks to workers 'well-being as well as to organizational performance. To come up with effective solutions, decision-makers need solid evidence on the scope and nature of the problems they face. Also, a clear understanding of what employers and employees view as potential solutions will be helpful to formulate successful business strategies. This paper attempts to show the trends which are pressuring employees at work – resulting in stress and imbalance in their lives, and pressuring employers to think their human resource programs and practices. To help employers and employees respond effectively to these pressures, this study uses survey evidence to answer a series of key questions and examine the practical implications for employers.

USMS-19.01

Paper Title: A Study of Business Impact Analysis Tools for Health Care Facilities

Author(s): Jafar, E. and Taneja, U.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Public Health Research & Development, Vol. 5(1), (2014), pp 95-100

ISSN No.: 0976-0245

Abstract: Objective: To review the existing literature on Business Impact Analysis (BIA) for health care facilities and recommend tools for BIA in the health sector in India.
Method: Extensive literature review of journals, publications, research papers and conference proceedings was done by searching on the Internet and libraries.
Conclusion: The hospital safety index developed by World Health organization is a comprehensive tool that looks at most of the aspects of business impact. This can prove to be a good model with regional contextualization.

USMS-19.02

Paper Title: **Consumer Buying Behavior in the Growing Indian Used Car Market: An Exploratory Study.**

Author(s): Tayal, A., **Taneja, U.** and Gakhar, D.V.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Management & Change, Vol. 17(1&2), (2013), pp 1-21

ISSN No. : 0974-0902

Abstract: The car markets for both new and used cars have grown at a phenomenal rate in the past few years in India. This is attributed to the increasing middle-class population with rising incomes. There have been many studies that have sought to evaluate the buying behavior of consumers for new cars. There is not much reported in the literature on the buying behavior for used cars. This research seeks to fill this gap for the used car market that is slowly shifting from being an unorganized sector to an organized one. An extensive literature survey was carried out to identify the possible factors that would affect the purchase decisions for used cars. The purpose of this exploratory study was to identify and rank these factors so that companies can focus on the more important ones from the consumers' perspective while developing strategies to enter this fast-growing market. A survey instrument was designed and tested for its validity and reliability. A cross-sectional study with a purposive sample size of 50 was conducted in the National Capital Region of New Delhi, India. The research instrument used was a structured and non-disguised questionnaire. The relative importance of different factors affecting purchase decisions for used cars was determined. Exploratory factor analysis reduced the initial 30 components to 9 factors. The top three factors that have emerged from this study are perceived need including price and income (affordability); running costs of the car, i.e., fuel and maintenance costs; and in third position is car attributes including brand equity. Ability to finance, information channels and dealers' facilities were ranked fourth, fifth and sixth respectively. The last three factors were, after sales service, contingencies, and, credit card acceptance.

USMS-19.03

Paper Title: **PERFORM: A Mixed Methods Framework for Measuring Information System Interventions in Specialty Healthcare Units**

Author(s): Gulati, S. and **Taneja, U.**

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Journal's Research Journal of Social Science & Management, Vol. 3(8), (2013), pp 195-200

ISSN No.: 2251-1571

Abstract: In a closely connected world, awareness from across the globe leads to constant increase in one's expectations. This is more so true from a consumer mindset where expectations are always for superior service and value for money consistent experience. Patient expectations from healthcare service experiences are no different, thus leading to the transformation of traditional healthcare provider models into speciality healthcare units or hospitals. Information systems play a key role in ensuring strategic operational support to these cost intensive units. For long term success and sustainable investments, it is critical to measure the effectiveness of information system interventions in these speciality healthcare units. Since each patient has different healthcare needs, service models could vary; thus, the need of a

mixed methods research framework to play a strong role in solving and understanding the inherent complexities for deriving maximum benefits from information system interventions.

USMS-19.04

Paper Title: **Speciality Healthcare in India: A Research Design Review of Mixed Methods Approach**

Author(s): Gulati, S. and Taneja, U.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Business Management & Social Sciences Research, Vol. 2(10), (2013), pp 49-56

ISSN No.: 2319-5614

Abstract: The growth of India as a central hub in all key sectors & operational functions has ensured a strong next generation young community with disposable income to spend for best products and services. Healthcare industry is no different where an informed consumer now wants to spend for best-in-class experience during medical treatments and preventive programs alike. This strong consistently available pool of consumers & growing medical tourists offer a viable profitable opportunity to the corporate health providers in the country. Despite all the perceptive positives, healthcare is a sector with inherent challenges, consistent need of investments and zero tolerance for operational errors. In such context, Mixed Methods Research plays a key role to identify key opportunity areas, critical success factors and based on these strategic planning for success.

USMS-19.05

Paper Title: **Critical Success Factors for eHealthcare**

Author(s): Taneja, U.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Journal's Research Journal of Social Science & Management, Vol. 2(12), (2013), pp 83-90

ISSN No. : 2251-1571

Abstract: As healthcare enterprises move towards a sustainable healthcare delivery model, an ehealthcare strategy is being adopted. In this study, the critical success factors for an ehealthcare strategy were identified. Their relative importance was determined based on increasing access to healthcare and reducing its cost. To succeed in ehealthcare initiatives the necessary factors are appropriate government policies, literacy levels, and telecommunications and power infrastructure. The focus should not be on technology; instead, factors such as healthcare provider and consumer mindsets should be addressed to increase the acceptance of ehealthcare services.

USMS-19.06

Paper Title: **THINK: Transforming Healthcare Through Innovation Based on Consumer Knowledge**

Author(s): Gulati, S. and Taneja, U.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Journal's Research Journal of Social Science & Management, Vol. 2(11), (2013), pp 105-111

ISSN No. : 2251-1571

Abstract: Based on the definitions existing on multiple web sources, Innovation is defined as the continuous process of creating incremental value for customers through newer processes, marketing strategies or refined business priorities. This informed social media age customer could include healthcare consumers or patients. In a developing country like India, rising per capita incomes across households have empowered these healthcare consumers to demand and expect only the best products and services. They expect to be taken care of by the best medical professionals in the most modern healthcare facilities. This increasing demand has been identified as a viable business opportunity by many healthcare providers for providing specialized care to the prospective consumers or patients. However, with increasing infrastructure, personnel and equipment costs, it is increasingly becoming tough for the healthcare providers to draw an optimum balance between sustained revenues and cost viable quality health services. A strong focus on innovation helps the providers in achieving this optimum balance. It is of paramount importance though that the innovative strategies revolve around or are based on consumer knowledge.

USMS-19.07

Paper Title: **Factors Affecting the Efficiency of Public Private Partnerships for Healthcare Delivery in India**

Author(s): Birla, B. and Taneja, U.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Public Health Research & Development, Vol. 4(4), (2012), pp 27-33

ISSN No.: 0976-0245

Abstract: **Objective:** The present study aims to identify the factors that are considered important while assessing the efficiency of healthcare delivery units which are operating as Public Private Partnerships, as well as to rank these factors.
Materials and Methods: A literature survey was done to identify various input and output factors used in different studies for measuring the efficiency of healthcare units. A pilot questionnaire was developed to test these amongst a group of healthcare professionals and 9 input factors and 9 output factors were selected. The healthcare professionals were asked to rank these factors in the order of their importance in increasing the efficiency of healthcare partnerships.
Result: The ranking obtained in the study shows that in terms of input factors, the strength of human resources is the most important factor for efficient functioning of a PPP. In terms of output factors, the number of healthy deliveries, discharges because of recovery, the number of medical admissions, and occupancy rates are important factors. With the given resources or inputs in terms of human, capital, and technology, these PPPs need to deliver the best possible outputs and outcomes.

Conclusion: The top-ranking input and output factors, if improved, can help achieve higher efficiency. The more efficient the PPP model, the more the chances for sustainability of the model.

USMS 20.01

Paper Title: A Study of Influencing Factors in Fashion Retail Impulse Buying.

Author(s): Sharma, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Emerging Technologies and Innovative Research, Vol.2 (7), (2015), pp 1208-1214

ISSN No.: 2349-5162

Abstract: Marketers are continuously studying their consumers. Consumer behaviour is a topic that these marketers are becoming increasingly interested in as they aim to make their products and services more appealing to consumers. Marketers have always been fascinated by consumers' spontaneous purchase behaviour. Because many consumer purchases are made at the spur of the moment, it's critical to understanding the elements that influence this type of behaviour. The major goal of the study is to figure out how impulse buying behaviour influences the purchase of fashion retail items.

USMS 20.02

Paper Title: Influence of Social Media on Consumer Decisions: A Critical Study.

Author(s): Sharma, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Creative Research Thought, Vol. 3(3) (2015), pp 204-214

ISSN No.: 2320-2882

Abstract: Different types of social media platforms are available to a user which have peculiar characteristics of their own. Also, this field being very dynamic, newer platforms keep on adding on a continuous basis. All this adds to more complexity and confusion. The core of all these platforms is network relationships. The major reason people take part in these activities is to build new relationships and sustain the existing ones. Initially, only a few organisations used social media, that too as a means for communicating with their customers, as they were unsure about the usefulness as a marketing tool. But in the last decade, they have woken up to the fact that social media can be used in a big way as a promotion tool to influence consumer behaviour. We see many companies creating their profiles on various social media platforms for engaging their present and prospective customers. The pace of change in this context is quite fast; that is why companies always have to look for new and innovative marketing strategies to match up with the changing trends in the market. This paper aims to study the influence of social media on consumer decisions. The study will also assess how social media is being used as a promotion and marketing tool to impact consumer decision-making.

Paper Title: Investigating the Factors Influencing the Effectiveness of Social Media Advertisements.

Author(s): Sharma, A.

Affiliation(s): University School of Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research and Analytical Reviews, Vol. 2(4), (2015), pp 941-951

ISSN No.: 2348-1269

Abstract: Social media has helped people to communicate and interact with each other easily in cyberspace. It has also provided an opportunity for marketers to use it as a medium for advertising and reach their target customers, with minimal barriers. Marketers need to assess the effectiveness of the advertisements they are using in their social media campaigns. They need to look into the factors that influence the effectiveness of their advertisements on social media, to maximise the return on their investment. This paper explores the factors influencing the effectiveness of social media ads for consumers. The data was collected using purposive sampling, a structured questionnaire with Likert scale statements and analysed using Factor analysis. The four factors identified were Social Media ad Celebrity Presence, Look & Style, Entertainment and Information. A model for the phenomenon has been proposed, as well as marketing implications are discussed.

**UNIVERSITY SCHOOL OF
CHEMICAL TECHNOLOGY
(USCT)**

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| 4. | Sarkar, B. | USCT 4.01 – 4.07 |
| 5. | Sharma, S.K. | USCT 5.01 – 5.07 |

USCT-1.01

Paper Title: Production and characterization of biocrude and biochar obtained from non-edible de-oiled seed cakes hydrothermal conversion

Author(s): Kumar, D.¹ and Pant, K.K.²

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Chemical Engineering, IIT, Delhi

Source: Journal of Analytical and Applied Pyrolysis, Vol. 115,(2015), pp 77–86

ISSN No.: 0165-2370

Abstract: Hydrothermal conversion coupled with high pressure water and steam of three de-oiled non-edible seed cakes of *Jatropha curcusa*, *Pongamia pinnata* and *Tung* to biocrude is explored in this work. The cakes were characterized for proximate, ultimate and ligno-cellulosic compositions using ASTM and TAPPI standard methods. All studies were conducted at high temperature and pressure in a semi-batch autoclave. Highest conversion with maximum biocrude yield (~35.3%) was obtained with *P. pinnata* cake. Silica adsorption chromatography result showed higher oxygenated aromatics subfraction in both *Tung* biocrude and *Jatropha* biocrude. GC/MS qualitative analysis confirmed the presence of heavy, oxygenated/nitrogenous and poly aromatic hydrocarbons with carbon number ranging from C5-C47 in the biocrude. The viscosity, pH, density, total acidic number (TAN) and water content of biocrudes were evaluated using various standard methods. 34.2 to 45.8% increases in the calorific value is observed for biomass to biocrude. Biochar obtained were characterized using proximate and ultimate analysis and SEM, TGA techniques. Higher calorific values (24.7–26.3 MJ/kg) of all the biochar make them suitable for their potential application as briquettes in the furnace for power generation.

USCT-1.02

Paper Title: Pyrolysis of Babool seeds (*Acacia nilotica*) in a fixed bed reactor and bio-oil characterization

Author(s): Garg, R., Anand and N., Kumar, D.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Renewable Energy, Vol. 96, (2016), pp 167-171

ISSN No.: 0960-1481

Abstract: With the growing awareness of environmental issues, production of biofuel has a potential to provide an alternative source of renewable energy sources. In the present work, the effect of pyrolysis temperature, particle size and sweep gas flow rate (N₂) was investigated for production of bio-oil from pyrolysis of babool seeds (*Acacia nilotica*). Optimum conditions obtained for the maximum liquid and bio-oil yield (~49% & 38.3%, respectively) were 500 °C, 100 cm³/min sweep gas flow rate (N₂) and particle size range upto 0.4 mm. Bio-oil with a calorific value of 36.45 MJ/kg was characterized by FT-IR, ¹H NMR, GC/MS. The characterization of bio-oil indicates that it can be an alternative fuel for transportation sector

USCT-1.03

Paper Title: Insitu upgradation of biocrude vapor generated from non-edible oilcake's hydrothermal conversion over aluminated mesoporous catalysts

Author(s): Kumar, D.¹ and Pant, K.K.²

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Chemical Engineering, IIT, Delhi

Source: Renewable Energy, Vol. 95, (2016), pp 43-52

ISSN No.: 0960-1481

Abstract: In this work, biocrude vapors generated from hydrothermal conversion of Pongamia pinnata cake using high pressure reactor at 400 °C and 25 kg/cm² were upgraded over three mesoporous catalyst namely SBA-15, KIT-6 and FDU-12. The catalysts were synthesized, aluminated and characterized using X-Ray Diffraction, N₂ adsorption-desorption, SEM techniques. A decrease in the surface area was observed on all three mesoporous catalyst after alumina loading with negligible effect on the pore diameter. Purely siliceous catalysts were found to give negligible effect on the yield of different product phases. Alumina supported SBA-15 (SAR 30) was observed as the suitable catalyst as compared to Al/FDU-12 (SAR 30) and Al/KIT-6 (SAR 30) for maximizing the biocrude yield with low heavy hydrocarbons (46.3 ± 2.2%), polyaromatic hydrocarbons (17.1%) and acidic compounds (9.1%) content. Therefore series of SBA-15 were synthesized by varying silicon to alumina ratio between 20 and 50 for maximizing hydrocarbons with boiling cut fractions between 195 and 317 °C corresponding to gasoline range hydrocarbons. Al/SBA-15 (SAR 40) was found to give highest biocrude yield (~34.8%) with highest selectivity towards gasoline fraction (23.7 ± 1.9%). GC/MS analysis was used to confirm the presence of aliphatic and aromatics. Highest asphaltene content was observed with Al/SBA-15 (SAR 50).

USCT-1.04

Paper Title: Biorefinery solid cake waste to biocrude via hydrothermal treatment: optimization of process parameters using statistical approach

Author(s): Kumar, D.¹ and Pant, K.K.²

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Chemical Engineering, IIT, Delhi

Source: Biomass Conv. Bioref., Vol. 6, (2016), pp 9–90

ISSN No.: 2190-6823

Abstract: Conversion of Pongamia de-oiled seed cake to liquid biofuel at hydrothermal conditions is reported in this work. The main objectives were to identify an approach that would enable us to understand and optimize the relationships between process parameters. In this work, estimation of the optimized conditions for the maximization of two responses namely biocrude yield and transportation grade fuel (TGF) selectivity has been reported. Plackett–Burman design was used for parameter screening on seven different process parameters for biocrude yield. Further, central composite design and response surface methodology approach were used to develop the quadratic models to study the effect of individual and combined interactions on the biocrude yield as well as TGF selectivity on four parameters. Quadratic models were modified for the significant ($p < 0.05$) individual, quadratic, and interaction terms. Based on the statistical results, it is concluded that temperature is the most significant individual parameter for biocrude yield, whereas for TGF selectivity, all

four parameters, considered for statistical analysis, are important. Temperature with pressure and temperature with time are the major interaction with $p \leq 0.05$ for biocrude yield. In the case of TGF selectivity, temperature and pressure are the only significant interaction. Superimposed contour plots and predicted model confirmed 400 °C (temperature), 25 kg/cm² (pressure), 35 min (reaction time) and 2W/B ratio as optimal conditions for the maximum biocrude yield (~38.9 %) and TGF selectivity (~29.6 %). Verification experiments confirmed the validity of the predicted model. The predicted and experimentally obtained yields for biocrude and TGF selectivity were comparable with an error of ± 12.5 and ± 8.5 %, respectively. TGF fraction obtained at these conditions was characterized by silica gel adsorption chromatography, calorific value, total acidic number elemental composition and FTIR analysis, which showed a high percentage of oxygenated compounds.

USCT-2.01

Paper Title: Effect of Electrode geometry and Current Source on Performance of Electrocoagulation

Author (s): Khandegar, V. and Sarah, A.K.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Chemical Engineering, Indian Institute of Technology, Delhi Hauz Khas, New Delhi-110016

Source: Int. J. Adv. Res. Sci. Eng., Vol.5(3), (2016), pp 376-379

ISSN No.: 2456-1908

Abstract: Electrocoagulation is a versatile technique for treating various types of industrial effluent. The heart of the electrocoagulation process is the material of construction of the electrodes and the geometry of the electrodes. Presently plane electrodes have been used in the electrocoagulation. Therefore, in the present study, efforts have been made to investigate the effect of the shape of the electrodes on the contaminant removal efficiency by performing experiments using punched-hole electrodes. The effect of number of the holes on the dye removal efficiency was investigated. An increase in the dye removal efficiency was obtained with the punched-hole electrodes as compared to the plane electrodes.

USCT-2.02

Paper Title: Effect of Electrode geometry and Current Source on Performance of Electrocoagulation

Author (s): Khandegar, V.¹ and Saroha, A.K.²

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Chemical Engineering, Indian Institute of Technology, Delhi Hauz Khas, New Delhi-110016

Source: J. Hazard. Toxic Radioact. Waste, Vol. 20, (2016), pp 1–4

ISSN No.: 2153-5493

Abstract: Electrocoagulation is a versatile technique used for treating various types of industrial effluent. The material of the construction and shape of the electrodes are crucial in the electrocoagulation process. The effect of the electrode shape on the performance of the electrocoagulation has been studied by performing experiments for the removal of the dye from the synthetic dye solution using punched electrodes and the results have been evaluated in terms of color removal efficiency. The effect of the number of holes, the diameter of the hole, and the configuration of the holes (square, triangular, and random pitch of the holes) on the color removal efficiency was investigated. An increase in the color removal efficiency was obtained using the

punched electrode compared with the plane electrode. The effect of the current source (direct and alternating current) on the performance of the electrocoagulation was studied and no significant effect of the current source on the performance of the electrocoagulation was noticed.

USCT-3.01

Paper Title: Electrically induced swelling and methylene blue release behaviour of poly (N isopropylacrylamide-co-acrylamido-2-methylpropyl sulphonic acid) hydrogels

Author(s): Mandal, U.K., Saikia, A.K.¹ and Aggarwal, S.²

Affiliation(s): University School of Chemical Technology, ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Colloid and Polymer Science, Vol. 293 (12), (2015), pp 3533-3544

ISSN No.: 1435-1536

Abstract: Hydrogels composed of poly (ethylene glycol) (PEG)/poly (*N*-isopropylacrylamide-co-acrylamido-2-methylpropyl sulphonic acid) exhibited electro-responsive behaviour. The swelling properties of hydrogels were influenced by the content of negatively charged ionic groups inside the network structure, cross-linking density, electric field intensity and electrolyte solution. The swelling ratio (SR) increased from 92.4 to 188.08, and normalized swelling ratio (NSR) increased from 2.88 to 3.62 depending on 2-acrylamido-2-methylpropane sulphonic acid (AMPS) concentration under electric field intensity 429 V/m. The swelling process of hydrogels in deionized water followed non-Fickian diffusion in the absence of electric field and Super Case II transport model in presence of electric field. The methylene blue (MB) was used as a model drug, and the influence of various factors like loading percent of MB, AMPS concentration in hydrogels, pH of the release medium and applied electric field was investigated on the release profiles of the MB. The release study showed that the interaction between hydrogels and MB, pH of the medium and electric field are the parameters that affect the releasing behaviour of methylene blue. The partition coefficient (K_d) of MB in hydrogels increased with increasing AMPS content in the hydrogels. The application of external electric field has increased the time response of swell and release of methylene blue through hydrogels.

USCT-3.02

Paper Title: Synthesis and Thermal Properties of Polyaniline-TiO₂ nanocomposites PVA Based Film.

Author(s): Mandal, U.K.¹, Arora, R.², Sharma, P.³ and Srivastav, A.⁴

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078, ²Department of Mechanical Engineering, Invertis University, Bareilly, India, ³Jaypee University of Information Technology Solan, Himachal Pradesh, India, ⁴Middle East College, Knowledge Oasis Muscat, Muscat, Oman

Source: Materials Today: Proceedings, Vol.2, (2015), pp 2215–2225

ISSN No.: 2214-7853

Abstract: Thermal Properties of Polyaniline (PANI) Composite Film Synthesized by Nanocomposite Material TiO₂ and Polyvinyl Alcohol has been investigated by thermogravimetric analysis (TGA), differential scanning calorimetry (DSC), dc conductivity analyses. The results clearly demonstrate that the composite film of nanocomposite material (encapsulated nano-TiO₂ and Polyaniline) and poly-vinyl alcohol are more stable at higher temperature than pure polyaniline.

USCT-3.03

Paper Title: TiO₂/PANI nanocomposite loaded in PVA for anticorrosive applications

Author(s): Mandal, U.K.¹, Arora, R.², Sharma, P.³ and Srivastav, A.⁴

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078, ²Department of Mechanical Engineering, Invertis University, Bareilly, India, ³Jaypee University of Information Technology Solan, Himachal Pradesh, India, ⁴Middle East College, Knowledge Oasis Muscat, Muscat, Oman

Source: Materials Science-Poland, Vol. 34(4), (2016), pp 721-725

ISSN No.: 2083-134X

Abstract: We report the morphological and electrical study of a composite of polyvinyl alcohol (PVA) and nanotitanium dioxide (TiO₂-50 nm) in conducting polymer polyaniline (PANI). The composite was synthesized using in-situ polymerization technique. The composite was characterized in terms of morphology and electrical properties using scanning electron microscopy and DC electrical conductivity (σ_{dc}). We observed that the DC electrical conductivity of the composite film increased with increasing the loading of nanocomposite material from 20 % to 40 % into PVA stabilizer. The DC conductivity results showed that the molecular chain contribution of the nanocomposite material (nano-TiO₂+ PANI) was the prominent carrier in the composite film made of the nanocomposite and PVA stabilizer.

USCT-4.01

Paper Title: Prediction of permeate flux during ultrafiltration of polysaccharide in a stirred batch cell.

Author(s): Sarkar, B¹., and Sharma, P.²

Affiliation(s): ¹University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078, ²Jaypee University of Information Technology Solan, Himachal Pradesh, India,

Source: Food and Bioprocess Technology, Vol. 6, (2013), pp 3634–3643

ISSN No.: 1935-5149

Abstract: Ultrafiltration of polysaccharide macromolecule has been carried out in a stirred batch cell using a fully retentive membrane over a wide range of operating conditions. An unsteady state mass transfer model in conjunction with resistance-in-series model is developed using film theory. The proposed model is used to predict the transient permeate flux decline behavior in gel controlled ultrafiltration. This model is also able to quantify the variation of bulk volume as well as the bulk concentration of solute with time. The variation of viscosity as a function of solute concentration is included in the model. A model parameter is used in this model and is evaluated by optimizing the experimental flux profiles with calculated flux profiles. The model predictions are successfully compared with the experimental data. A parametric study has been performed to observe the effect of different process parameters on the filtration performance in terms of transient permeate flux decline behavior. The proposed model in general will provide a better understanding of gel-controlled ultrafiltration.

USCT-4.02

Paper Title: A combined complete pore blocking and cake filtration model during ultrafiltration of polysaccharide in a batch cell.

Author (s): Sarkar, B.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Food Engineering, (2013), pp333-343

ISSN No.: 0260-8774

Abstract: Ultrafiltration experiments of polysaccharide macromolecule have been performed in a batch, stirred as well as unstirred membrane cell using a fully retentive membrane over a wide range of operating conditions. A model based on Hermia's approach for constant pressure dead-end filtration laws is proposed to analyze the flux decline behavior during ultrafiltration in a batch cell. Two model parameters, namely complete pore blocking coefficient and cake filtration coefficient are obtained by minimizing the error involved between calculated and experimental flux data. These parameters along with known operating conditions, membrane permeability and physical properties of feed enable one to predict the transient permeate flux decline. The effect of various operating conditions, such as feed solute concentration, stirrer speed and transmembrane pressure on the flux decline is studied. Experimental results show that operating conditions have significant effect on the onset of cake formation as well as on the flux decline behavior. Model predicted results are successfully compared with the experimental data.

USCT-4.03

Paper Title: Modelling of permeate flux decline during, ultrafiltration of polyvinyl alcohol in a batch cell.

Author (s): Sarkar, B. and Balyan U.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Desalination and Water Treatment, (2013), pp1-12

ISSN No.: 1944-3986

Abstract: Ultrafiltration (UF) of polyvinyl alcohol from aqueous solution is studied in a batch cell over a wide range of operating conditions. The unsteady state nature of the permeate flux decline during UF is caused by changes in the hydraulic boundary condition at the membrane surface due to gel layer formation. An unsteady state mass transfer model is developed for gel-controlled UF in an unstirred cell starting from the basic fluid mechanical analysis of the system. An integral method of solution is used for the solution of the concentration profile in the developing mass transfer boundary layer. The model is used to predict the transient permeate flux decline profile. The transient state behavior in the presence of stirring is estimated by using a model available in literature. The predictions are found to be in good agreement with the experimental flux.

USCT-4.04

Paper Title: Enhanced cross-flow ultrafiltration of apple juice using electric field,
Author (s): Sarkar, B.
Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwark, New Delhi-110078
Source: Journal of Food Processing and Preservation, (2014), pp 1-13
ISSN No.: 1745-4549
Abstract: Electric field-enhanced cross-flow ultrafiltration of enzyme-treated apple juice is studied in a rectangular cell using a 30 kDa molecular weight cut-off flat sheet polyethersulfone membrane under turbulent flow conditions for various operating conditions. Application of direct current (DC) electric field has resulted in a significant augmentation of permeate flux. Using classical film theory, a steady-state gel polarization model incorporating the effect of electric field and pressure-dependent mass transfer coefficient is proposed for the prediction of permeate flux. From the steady-state model, gel layer concentration, effective diffusivity and effective viscosity of gel-forming solute in apple juice are estimated. A gel layer model based on resistance-in-series theory is proposed and numerically solved to quantify the transient flux decline and development of gel layer thickness over the membrane surface. The model predictions are successfully compared with the experimental results.

USCT-4.05

Paper Title: Enhanced separation of polyethylene glycol from bovine serum albumin using electro-ultrafiltration.
Author (s): Sarkar, B. and Balyan, U.
Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwark, New Delhi-110078
Source: Separation Science and Technology, Vol. 50, (2015), pp 1846–1859
ISSN No.: 1520-5754
Abstract: Electric field-enhanced separation of polyethylene glycol (PEG) from an aqueous electrolyte solution of bovine serum albumin has been carried out. Experimental results show significant improvements in both the permeate flux and the PEG transmission with the application of a suitable d.c. electric field. A mass transfer model based on film theory is proposed for prediction of permeate flux and observed retention of PEG. The model uses a single parameter, namely real retention (R_r2) of the PEG which is evaluated by optimizing the experimental values of steady state permeate flux and the permeate concentration. Model predictions are in good agreement with the experimental data

USCT-4.06

Paper Title: Analysis of flux decline during ultrafiltration of apple juice in a batch cell,
Author(s): Sarkar, B. and Verma, S.P.
Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: Food and Bioproducts Processing, Vol.94, (2015), pp 147-157
ISSN No.: 0960-3085
Abstract: In the present work, ultrafiltration of enzyme pre-treated apple juice is studied under batch concentration mode in a stirred batch cell. Response surface methodology (RSM) is used to study the effects of incubation temperature, incubation time and enzyme concentration and their mutual interaction effects on the physical

characteristics of apple juice such as alcohol insoluble solid (AIS), viscosity, clarity, total polyphenol, flavonoid and protein during enzyme treatment of apple juice. A central composite design (CCD) is employed to develop the quadratic model and optimizing the operating conditions of the enzyme treatment process for obtaining the desired characteristics of juice. During ultrafiltration enzyme pre-treated apple juice, the flux decline behavior is modeled using Hermia's approach for constant pressure dead-end filtration laws. Two model parameters, namely intermediate pore blocking coefficient and cake filtration coefficient are obtained by minimizing the error involved between calculated and experimental flux data. These parameters along with known operating conditions, membrane permeability and physical properties of feed enable one to predict the transient permeate flux decline. The effect of various operating conditions, such as feed temperature, stirrer speed and transmembrane pressure on the flux decline is demonstrated. Experimental results show that operating conditions have significant effect on the onset of cake formation as well as on the flux decline behavior. The model predictions are in good agreement with the experimental data

USCT-4.07

Paper Title: Integrated membrane process for purification and concentration of aqueous *Syzygiumcumini* (L.) seed extract,

Author (s): Balyan, U. and Sarkar, B.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Food and Bioproducts Processing, (2016), pp 29–43.

ISSN No.: 0960-3085

Abstract: The aim of the present study was to investigate the potentiality of an integrated membrane process for the purification and the concentration of phenolic compounds from aqueous jamun (*Syzygiumcumini* L.) seed extract. The aqueous seed extract obtained at optimal condition (temperature: 49.2 °C, time: 89.4min, and liquid to solid ratio: 51.6:1mL/g) was submitted to cross flow ultrafiltration for initial clarification, followed by concentration using nanofiltration under batch concentration mode. A detailed parametric study was carried out to investigate the effect of various process parameters such as transmembrane pressure, cross-flow velocity (or stirrer speed) on the permeate flux and permeate quality. Using classical film theory, a steady state gel polarization model incorporating the effect of transmembrane pressure difference and viscosity variation was proposed for the prediction of permeate flux during cross flow ultrafiltration of aqueous seed extract. The predicted flux values were successfully compared with the experimental results. Experimental results showed that the operating conditions had significant effect on permeate flux, recovery of polyphenols, purity and antioxidant activity of phenolic extract. Ultrafiltration experiments at lower operating pressures (276 and 414 kPa) using 100 kDa membrane resulted in the recovery of 59–66.7% of total polyphenol content in the clarified extract with the purity of 49–58.3% starting from an extract purity of 39.2%. The clarified extract could be successfully concentrated about three times higher using 250 Da nanofiltration membrane at volume concentration ratio of three. The present study revealed that the UF/NF integrated membranes process was successful in clarifying and concentrating phenolic extract obtained from jamun seed with enhanced purity and antioxidant activity.

USCT-5.01

Paper Title: Kinetics and thermodynamics of gossypol extraction from defatted cottonseed meal by ethanol

Author(s): Sharma, S.K., Saxena and D.K., Sami, S.S.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwark, New Delhi-110078

Source : Polish Journal of Chemical Technology, Vol. 14 (2), (2012), pp 29-34

ISSN No.: 1509-8117

Abstract: Gossypol is polyphenolic aldehyde, a toxic substance naturally present in cotton plant to protect it from insects, pests and diseases. Maximum gossypol is concentrated in the seed. After extraction of oil from the cottonseed, the defatted cottonseed meal which contains both the gossypol and proteinous matter is left behind. A number of attempts have been made using different solvents to extract gossypol from the seeds. However, all these efforts have remained in the realm of academic activity only as none of them could be commercialized. If a pilot plant or commercial scale plant is to be developed then the data on the kinetics and thermodynamics of the extraction process is required. In this study ethanol has been used as the solvent at temperature below 323K for removal of gossypol from the defatted seed. This study finds the effects of parameters viz. temperature, solvent to solid ratio (SR) and extraction time on the gossypol extraction efficiency. The data obtained are used to establish the kinetics and thermodynamics of the extraction process.

USCT-5.02

Paper Title: Removal of Copper (II) ions from effluent stream using Activated Charcoal and Kinetic studies of adsorption

Author(s): Sharma, S.K. and Singh, S.S.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Engineering & Technology education, Vol. 8(1), (2014), pp 29-34

ISSN No.: 2229-631X

Abstract: Batch adsorption of Cu (II) on activated charcoal was undertaken in this work. The effect of key parameters i.e. temperature, pH, contact time and initial adsorbate concentration on adsorption were studied. The concentration range studied in this work was 5 to 25 mg/L with optimum parameters of pH 6, adsorbent dose 5g/L, temperature of 288 ± 1 K and contact time of 3.0 hours. An increase in adsorption of Cu (II) ions with time was observed which attained saturation in about 3 hours. The effect of temperature was also studied and as the temperature was increased, a decrease in the rate of adsorption was observed. Adsorption isotherms were plotted and equilibrium adsorption data were tested for the Langmuir, and Freundlich isotherms. Maximum adsorption capacity of 25 mg/g of activated charcoal was obtained. Different kinetic models viz first order, second order, pseudo first order, pseudo second order and power function model were applied to the experimental data to find the best fit equation. The best fit was obtained with the Lagergren or pseudo first-order model. Thermodynamic parameters were evaluated which confirmed the spontaneous nature of adsorption.

USCT-5.03

Paper Title: Cadmium and Chromium Adsorption on Activated Carbon

Author(s): Sharma, S.K., Sharma, I. and Sambi, S.S.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Chemical Engineers, Vol. 56, (2014), pp 97-105

ISSN No. : 0975-007X

Abstract: Removal of heavy metal ions has received considerable attention due to the toxicological effects of these ions on ecosystem, human health and agriculture. Commercially activated carbon is widely used as an adsorbent for the removal of heavy metal ions from industrial wastes though its cost is a restricting factor. The present study explores the effectiveness of activated carbon obtained from sources other than wood, such as corncob and coconut shell for the removal of cadmium and chromium ions from aqueous wastes. Batch scale equilibrium adsorption studies were carried out for the removal of cadmium and chromium ions on the activated carbon obtained by pyrolysis. Adsorption studies were carried out at various pH values and for a range of initial concentrations of cadmium and chromium. Higher iodine value for activated carbon obtained at 800°C from coconut shell compared to corncob suggests that the use of coconut shell may be preferred.

USCT-5.04

Paper Title: Kinetics and Thermodynamics of Gossypol Extraction from Defatted Cottonseed Meal by Ethanol Acidified by Oxalic Acid

Author(s): Sharma, S.K., Saxena, D.K. and Sambi, S.S.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Science and Research (IJSR), Vo.4(8), pp 1967-1971

ISSN No. : 2319-7064

Abstract: Cotton crop is grown to meet the basic requirement of fabrics. After de-linting the cotton ball, seed is left which is a good source of oil approx.18% and protein approx.25%. After extraction of oil from the seed, the left over cake is a rich source of good quality protein but presence of gossypol, a highly toxic substance, makes it unfit for human consumption. A number of earlier attempts to extract gossypol from the seeds using different solvents have been made to reduce the gossypol content within the prescribed maximum FDA limit of 450 ppm. In most of the cases, gossypol extraction had been carried out at low temperatures to minimize its binding with lysine (an essential amino acid present in the protein of the seed), as higher temperature accelerated the binding process which resulted in reduced digestibility of the protein. Ethanol acidified with mild organic acids has been reported to prevent complexing of gossypol with lysine at relatively higher temperatures. Present studies are undertaken to extract gossypol from the defatted cotton seed meal using green solvent (ethanol) acidified by mild organic oxalic acid at temperatures up to 343K to improve extraction efficiency. Up to 92.4% gossypol could be extracted from the defatted cottonseed meal using acidic ethanol as against 61.55% extraction with pure ethanol thus making the seed meal suitable for food uses. The data obtained were analyzed to establish kinetics and thermodynamics of the extraction process which would be helpful in scaling up the process to pilot/ commercial scale.

USCT-5.05

Paper Title: Removal of lead(II) from waste water on zeolite-NaX

Author(s): Sharma, S.K., Pandey, P.K. and Sambi, S.S.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Environmental Chemical Engineering, Vol. 3(4), pp 2604-2610

ISSN No. : 2213-3437

Abstract: In this work sorption of Pb(II) on zeolite-NaX was studied. Zeolites NaX is characterized by large surface area because of its highly porous nature. High surface area and ordered pore structure of zeolite-NaX result in adsorption of large quantities of adsorbate depending on adsorbate size, aperture size, temperature and surface acidity of zeolites. Therefore, equilibrium isotherms were obtained using batch study by varying operating parameters such as pH, initial concentration, temperature, adsorbent dosage and the contact time. The optimum condition thus obtained are: pH-6, concentration 10 mg/L and temperature of 303 K. The adsorption mechanism and the characterizing parameters were analyzed using two parameter (Dubinin–Radushkevich (DR), Temkin, Freundlich–Langmuir) and three parameter (Khan, Toth, Sips and Redlich–Peterson) isotherm models. Kinetics of the process was studied using Pseudo first order, Pseudo second order, First order reversible reaction, Elovich equation, intra-particle diffusion and Bangham equation. Dubinin–Radushkevich (DR) fitted the experimental data very well amongst the two parameter models. The three parameter isotherms show high determination coefficient compared to two parameter isotherms in the following order i.e., Sips > Toth > Redlich–Peterson > Khan. The separation parameter, RL, values of less than 1.0 indicate that adsorption of Pb(II) on zeolite-NaX is favorable. The estimated values of thermodynamic parameters indicate the exothermic nature of adsorption of Pb(II) on zeolite-NaX. This study supports the view that zeolite-NaX could be an efficient adsorbent for removal of Pb(II) from aqueous solution.

USCT-5.06

Paper Title : Extraction of Gossypol from Cottonseed

Author(s): Singh, S., Kansal S.K. and Sharma, S. K.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Reviews in Advanced Sciences and Engineering, Vol. 4(4), pp 301-318

ISSN No. : 2157-913X

Abstract: Cost effective and efficient separation of gossypol from cottonseed has been an important and trivial issue for the researchers worldwide. Oil and gossypol from cottonseed have been separated using different methods but the quality of oil produced and nutritional value of cottonseed protein available after extraction process has been a major concern. Also the environmental and health concerns while utilizing commercial solvents, yield of gossypol, recovery of solvents and costs involved are the practical issues which affect the separation of oil, gossypol and protein from cottonseed. Gossypol which is a peculiar pigment of cottonseed and a polyphenolic compound, imparts a dark color to the extracted oil during processing and causes toxicity to the meal due to its tendency to bind with meal protein. The most widely used technique to separate oil and gossypol from cottonseed is solvent extraction although mechanical fractionation, liquid cyclone process, adsorption, membrane separation and super critical CO₂ extraction have also been applied to recover gossypol. Various organic and inorganic, polar and non-polar, single and

mixed solvents have been employed for the purpose of solvent extraction. The main requirements of the solvent extraction system are to produce light color oil with high quality meal protein, lowest possible gossypol levels and low cost. Extraction temperature, moisture content, solvent to seed or flake ratio, particle size, pH, cooking time and heat treatment are the parameters affecting the solvent extraction process. The present review elaborates the detailed progress on the extraction and separation methods, solvents employed and their combinations utilized, residual gossypol levels achieved, amounts of total and free gossypol in meal after extraction and factors affecting separation of gossypol. The present work would give forth the guidelines and critical parameters to be examined for design of more robust engineering systems to accomplish the efficient and optimized separation of gossypol from cottonseed.

USCT-5.07

Paper Title : Ground water assessment and its electrochemical treatment

Author(s): Acharya, S. and Sharma, S.K.

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Int. J. Adv. Technol. Eng. Sci, Vol. 4(3), (2016), pp 21-30

ISSN No.: 2348-7550

Abstract: In the present study, groundwater quality assessment and its electrochemical treatment was carried in Dwarka district, Delhi. Water samples were collected and analyzed to find out its suitability for drinking purpose. Different parameters such as pH, electrical conductivity, total dissolved solids (TDS), total hardness, nickel, chromium were analysed. The results obtained were compared with the Indian standard drinking water specifications (IS: 10500). The results showed that the ground water quality was not suitable for drinking purpose. Recently, researches have revealed electrochemical (Electrocoagulation) as an attractive and suitable treatment method for water including groundwater because of the various benefits which include environmental compatibility, flexibility, energy efficiency, safety, selectivity, amenability to automation, and cost effectiveness. Therefore, electrocoagulation was carried out to remove hardness from groundwater. The removal efficiency was measured in terms of hardness with time and current density as variables. The results show that electrocoagulation may also be used for water hardness reduction

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USBT-1.01

Paper Title: Variation in the Cadherin Gene Sequence of Cry1Ac Susceptible and Resistant *Helicoverpa armigera* (Lepidoptera: Noctuidae) and the Identification of Mutant Alleles in Resistant Strains

Author(s): Nair R.^{1,2}, Kalia, K.¹, Aggarwal, K.K.² and Gujar G.T.¹

Affiliation(s): ¹Division of Entomology Indian Agriculture research Institute, New Delhi-110012; ²University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi -110078

Source: Current Science, Vol. 104 (2), (2013), pp 215-223

ISSN No.: 0011-3891

Abstract: Variations in the cadherin gene sequence between Cry1Ac-resistant BH-R strain showing 227.9-fold resistance and the wild susceptible VA-S strain of *Helicoverpa armigera* were identified. Amplification of exon 26 from *H. armigera* cadherin gene identified two mutant alleles, r9 (553 bp) and r10 (717 bp) against the wild S allele (588 bp). Sequence analysis of r9 showed a deletion of 45 bp in the intron region and mutation in the 5'-splice site of exon 26 resulted in an additional amino acid. While in the r10 allele a premature stop codon resulted in the putative translation into two different proteins of 1343 and 335 amino acids relative to a single protein of 1756 amino acids of the susceptible strain. The segregation of these mutant alleles was examined in F2 progenies derived from matings of Cry1Ac-resistant and susceptible individuals and found to be associated with Mendelian principles. Cadherin genotyping showed that resistance to Cry1Ac, survival on Cry1Ac-treated diet and frequency of mutant r allele of cadherin gene were high in the selected strain than the unselected strain and were completely absent from susceptible VA-S strain. DNA-based screening of *H. armigera* collected in India failed to detect a single r9 or r10 allele in the populations collected from vegetable-growing areas of Delhi. However, very low frequency of mutant alleles was detected in Bt cotton-growing areas of Anand, indicating that these mutations are likely to be rare in the field.

USBT-1.02

Paper Title: Selection of Reference Genes for qRT-PCR Normalization to Study Hif1 α and Hif2 α Expression in Hypobaric Hypoxia Susceptible and Tolerant Rats Lung

Author(s): Sharma, P.¹, Kumar, S.¹, Bansal, A.², Nimker, C.², Aggarwal, K.K.¹ and Sharma, P.C.¹

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Division of Experimental Biology, Defence Institute of Physiology and Allied Sciences (DIPAS), Defence Research and Development Organization (DRDO), Timarpur, Delhi - 110054

Source: Current Trends in Biotechnology and Pharmacy, Vol. 8 (4), (2014), pp 336-349

ISSN No.: 0973-8916

Abstract: Acute hypobaric hypoxia may damage brain and lung tissues due to the development of disorders such as High Altitude Cerebral Edema (HACE) and High Altitude Pulmonary Edema (HAPE). Rats, like humans, exhibit susceptibility and tolerance in the same population to such extreme conditions. We selected reference genes to normalize the qRT-PCR study in order to evaluate whether a change in expression of Hif1 α and Hif2 α occurs in lungs of such rats exposed to acute hypobaric hypoxia. The hypobaric hypoxia susceptible (HHS) and tolerant (HHT) Sprague-Dawley rat groups, formed on the basis of their gasping time, were exposed to a simulated altitude of 9144 m at 24°C in a decompression chamber for a short duration of one hour. A set of reference genes including Gapdh, Actb, Rpl11, Rpl10a, Rps15 and Ppia was examined for normalization in qRT-PCR study to analyse expression of target genes Hif1 α

and Hif2 α in the lungs of these groups as compared to the normoxic control. Rpl11, Actb and Rps15 genes in combination represented the most suitable reference genes based upon GeNorm, NormFinder and BestKeeper analyses. Expression of Hif1 α and Hif2 α genes was reduced in both HHS and HHT rat lungs. However, enhanced protein expression of HIF-1 in HHS group, and weak expression of HIF-2 protein in both groups was recorded. Our findings suggest that HIF-1 may play a significant role in mediating early responses towards acute hypobaric hypoxia in lung samples of HHS as well as HHT rats, with its profound protein expression in the former.

USBT-1.03

Paper Title: Gut Protease Profiles of Different Instars of *Helicoverpa armigera* (Lepidoptera: Noctuidae)

Author(s): Kipgen, L and Aggarwal, K.K

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi -110078

Source: International Journal of Tropical Insect Science, Vol. 34 (3), (2014), pp 172–178

ISSN No.: 1742-7592

Abstract: Pest control strategies against *Helicoverpa armigera* (Hübner) using protease inhibitors have relied on the gut protease profile of the later larval stages of the insect, with serine proteases being considered predominant. Little is known about the gut protease profile of early larval instars. Therefore, the aim of the present study was to detect the levels of gut protease activities in the third-, fourth-, fifth- and late fifth-instar larvae of *H. armigera* reared on an artificial diet using specific substrates and inhibitors. The analysis of the gut protease profiles of different instars revealed different levels of protease activities at different instar stages. Significant variations were also observed in the specific activities of trypsin, chymotrypsin, cysteine protease, carboxypeptidase-A and aminopeptidase-N across the instars. In general, the activities of the proteases increased from the third to the fifth instar and then decreased at the onset of pupation in the late fifth instar. Proteolytic activity was optimal at pH 12 for gut extracts from the third-, fourth- and fifth-instar larvae. Bioassays with phenylmethylsulphonyl fluoride (PMSF), a serine–cysteine protease inhibitor, revealed high mortality, and that with sodium ethylenediaminetetraacetic acid (EDTA-Na), a metalloprotease inhibitor, also showed retarded larval growth. The inhibition induced by 0.05% PMSF and 0.05% EDTA-Na in combination was similar to that induced by 0.1% PMSF alone.

USBT-1.04

Paper Title: Shape Complementarity in Serine Protease-Inhibitor Complexes Correlate to Inhibition Constants

Author(s): Kipgen, L and Aggarwal, K.K

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi -110078

Source: Current Enzyme Inhibition, Vol. 10 (2), (2014), pp 94-97

ISSN No.: 1573-4080

Abstract: Natural proteinaceous protease inhibitors inhibit through non-productive binding to proteases and steric blockage of active sites. These complexes are among the most structurally complementary protein-protein interactions. To see if complementarity is correlated to activity, we scored the shape complementarity in 15 serine protease-inhibitor complexes through in silico docking and compared the scores against their

reported inhibition constants (K_i). A statistically significant, moderate and positive correlation was observed between shape complementarity and K_i ($R = 0.58$; $P = 0.023$). We also analyzed other physicochemical factors involved in serine protease-inhibitor interactions for correlation, but no other factor was correlated to K_i . However, significant correlations were observed between hydrogen bonds and interface areas ($R = 0.762$; $P = 0.0004$); and between hydrophobic interactions and free energies of solvation ($R = -0.634$; $P = 0.011$).

USBT-1.05

Paper Title: Esculetin Downregulates the Expression of AML1-ETO and C-Kit in Kasumi-1 Cell Line by Decreasing Half-Life of mRNA

Author(s): Sawney, S.^{1,2}, Arora, R.², Aggarwal, K.K¹ and Saluja, D²

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Dr. B.R. Ambedkar Center for Biomedical Research University of Delhi, Delhi 110007

Source: Journal of Oncology, Vol. 2015, (2015), pp 1-8

ISSN No.: 1687-8450

Abstract: One of the most frequent genetic aberrations in acute myeloid leukemia (AML) is chromosomal translocation between AML1/RUNX1 on chromosome 21 and ETO gene on chromosome 8 resulting in the expression of chimeric oncogene AML1-ETO. Although patients with t (8;21) translocation have good prognosis, 5-year survival is observed only in 50% of the cases. AML1- ETO translocation is usually accompanied by overexpression of mutant C-Kit, a tyrosine kinase, which contributes to uncontrolled proliferation of premature blood cells leading to relapse and poor prognosis. We illustrate the potential use of esculetin on leukemic cell line, Kasumi-1, bearing t (8;21) translocation and mutated C-Kit gene. Esculetin decreases the expression of AML1-ETO at both protein and transcript level within 24 hours of treatment. Half-life of AML1-ETO mRNA was reduced from 7 hours to 1.5 hours. Similarly, half-life of C-Kit mRNA was reduced to 2 hours from 5 hours in esculetin treated cells. Esculetin also perturbed the expression of ectopically expressed AML1-ETO in U937 cells. The decreased expression of AML1-ETO chimeric gene was associated with increased expression of LAT1 and RUNX3 genes, targets of AML1. We envisage that discovery of a drug candidate which could target both these mutated genes would be a considerable breakthrough for future application.

USBT-1.06

Paper Title: Esculetin Induces Apoptosis in Human Leukemia Kasumi-1 cells through Caspase 3 Activation

Author(s): Sawney, S.^{1,2}, Arora, P.¹, Steffi, C.¹, Chandra, V.¹, Ali, M.¹, Aggarwal, K.K². and Saluja, D¹

Affiliation(s): ¹Dr. B.R. Ambedkar Center for Biomedical Research, University of Delhi, Delhi-110007; ²University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of innovations in pharmaceuticals and biological sciences, Vol. 2 (3), (2015), pp 273-289

ISSN No.: 2395-1095

Abstract: Objective: AML alone accounts for 20% cases of acute leukemia in children and 80% cases in adults. Among many genetic alterations, the most frequently reported translocation is between chromosomes 8 and 21, t(8; 21) or AML1-ETO. In the past decade, the anti- proliferative effect of various natural compounds including

esculetin (a coumarin), has been reported in several leukemic cell lines. We have recently shown that esculetin reduces the half-life of AML1-ETO chimeric mRNA as well as mutated c-Kit transcripts in human monocytic leukemia kasumi-1 cell line harbouring the t (8;21) translocation. In the present study we established the antiproliferating activity of esculetin on kasumi-1 cell line. Methods: In this study, cytotoxicity of the esculetin on kasumi-1 cells was investigated. The ability of esculetin to induce cell cycle arrest, alter mitochondrial potential, activate Caspase cascade and to express apoptotic markers was investigated through western blotting analysis and flow cytometry methods. Results and conclusion: The half maximal inhibitory concentration of esculetin in kasumi-1 cells was found to be 100 μ M. Esculetin arrested the cell cycle at G0/G1 phase in kasumi-1 cells. A significant increase in mitochondrial membrane potential and cytosolic release of cytochrome C was observed in esculetin treated kasumi-1 cells. This was accompanied with activation of Caspase 3 and Caspase 8 and enhanced cleavage of phospholipase C (PLC) γ -1. Annexin V apoptotic assay further corroborated our results that esculetin mediated cytotoxicity which is accompanied by cleavage of Caspase 3 is due to apoptosis in kasumi-1 cells.

USBT-1.07

Paper Title: Acute Hypobaric Hypoxia Induced Early Phase Biochemical and Histological Changes in Susceptible and Tolerant Rat Lung Tissue

Author(s): Sharma, P.¹, Singh, D.P.², Kumar, S.¹, Bansal, A.², Aggarwal, K.K¹. and Sharma, P.C¹

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Source: Currents Trends in Biotechnology and Pharmacy, Vol. 9 (1), (2015), pp 5-15

ISSN No.: 0973-8916

Abstract: Aim: Oxidative stress during early phase of acute hypobaric hypoxia may predispose an individual susceptible to critical altitude illness while ascending rapidly to high altitudes. We assessed the biochemical parameters and examined the histological changes to check the oxidative stress status of the lung tissues of Sprague-Dawley rats, susceptible and tolerant to acute hypobaric hypoxia during early phase of exposure. Methods: A simulated acute hypobaric hypoxia of one hour at 9144 m and 24°C was given to susceptible male, normal male (moderate), tolerant male and female groups of rats. Reactive oxygen species (ROS) levels, malondialdehyde (MDA) and oxidized glutathione (GSSG) content, total catalase (CAT) activity, superoxide dismutase (SOD) inhibitory activity and glutathione peroxidase (Gpx) activity were measured using standard protocols in lung tissue samples isolated from the different groups of hypoxia stressed and normoxic rats. Histological changes were also studied by haematoxylin and eosin staining in these tissue samples. Results: Marked neutrophil infiltration, alveolar wall collapse and interstitium thickening was visible in susceptible lung tissues showing maximum ROS levels, MDA equivalents and GSSG activity comparative to other test samples. Although SOD inhibitory activity increased in susceptible and normal groups in comparison to both the tolerant groups, however, Gpx activity showed an opposite trend. Catalase activity was recorded highest in the normal rat group as compared to other groups. Conclusion: Increased neutrophil infiltration coupled with higher oxidant's levels in susceptible rat lungs, and increased antioxidant enzyme activity in normal and

tolerant rats demonstrate the differential physiological states in lung tissues, which could be diagnosed even in early phase of acute hypobaric hypoxia stress.

USBT-2.01

Paper Title: Biofuel Precursor from Potato Waste

Author(s): Ghosal A.¹, Banerjee S.² and Chatterjee S.³

Affiliation(s): ¹DRDC, DIL, Delhi; ²Department of Food Technology, Techno, Salt Lake, Kolkata, West Bengal; ³University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research in Engineering and Technology, Vol. 2 (3), (2013), pp 213-219

ISSN No.: 2319-1163

Abstract: Depleting fossil fuels and alarming rise in levels of greenhouse gases in the atmosphere has forced for the search of alternative renewable sources of energy. With agricultural activities spreading across the globe, biomass residue generated can indeed form a useful energy source. And also, the 'wastes' from specific kinds of agricultural industries have great potential to be converted into fuels. Biofuels especially ethanol produced from biomass has already received worldwide attention and along with solving energy problems it is also proved to be environmental friendly. Since ours is an agricultural country where agricultural wastes are dumped in large volumes, ethanol derived from biomass may serve as a viable option. And stream pollution by waste effluents from food processing plants has also become one of the major importance in today's world. The potato starch processing industry contributes considerably to this problem. The objective of this work is utilization of the waste i.e., starch which is an effluent of various processes of a potato starch processing industry, by converting the starch into ethanol which can be used as an energy source for that particular industry itself. While sugar based raw materials like cane juice or molasses can be directly fermented, a two-step process needs to be followed for the production of alcohol from starch based raw materials. The starch is liquefied using alpha-amylase and then saccharified using amyloglucosidase. The fuel ethanol is recovered by distillation after anaerobic fermentation using yeast primarily species of *Saccharomyces cerevisiae*. The process described would reduce the amount of waste and ethanol used as energy source would cover the cost of the process. Further their improvement in the process is being developed by changing the reaction environment to increase the rate constant of the reactor system.

USBT-2.02

Paper Title: To Optimize the Process of Alcohol Production from Banana Peel

Author(s): Jain M., Gupta A.K. and Chatterjee S.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Recent Advances in Bioenergy Research, Vol. 3, (2014), pp 208-217

ISSN No.: 978-81-927097-2-7

Abstract: With day by day increase in demand of fuel and price hike, has forced the world to use an alternative source of fuel. There are two global bio renewable transportation fuels that might replace oil derived gasoline and diesel fuel. These are bioethanol and biodiesel. Even in few countries like Brazil, United States they are in use as a fuel alternative since 2006. Currently the popular raw materials for preparation of biofuel are corn, sweet potato, potato, sugarcane molasses etc. The aim of our study was to use banana waste as a raw material for the production of alcohol which also targets

another global problem of waste disposal. Using banana peel for alcohol production provides a way to use waste material efficiently in addition to that fuel produce through banana waste is eco-friendly, cheap and easily renewable. MTCC178 strain of *Saccharomyces cerevisiae* yeast was used for fermentation to produce alcohol. To optimize the production of alcohol from banana peel different conditions i.e. temperature, pH and yeast concentration were varied with the help of Response Surface Methodology (RSM). The results obtained from the design expert software shows that the production of alcohol from the banana peel was optimized at 35.78 °C temperature, 3.81 pH, 9.57 yeast concentration and the yield of alcohol obtained was 7.43% v/v.

USBT-2.03

Paper Title: Structural Modelling of α -Subunit of Ring-hydroxylating Dioxygenases (RHDs) from Microbial Sources

Author(s): Meena S.S., Chatterjee S. and Aggarwal K.K.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Current Microbiology and Applied Sciences, Vol. 4 (11), (2015), pp 740-752

ISSN No.: 2319-7706

Abstract: Polyaromatic hydrocarbons (PAHs) are ubiquitously spread and persistent organic pollutants responsible for various disease and toxicity. Microbial species have been found that can degrade PAHs utilizing ring-hydroxylating dioxygenases (RHDs) also known as Rieske dioxygenases (RDOs) are multi-component catalysts. Microbes can utilize PAHs as the carbon source, in the absence of simpler form of carbon, for their survival. The enzyme has catalytic activity against PAHs and other toxic elements. Thus, it has a very good potential as a bioremediation tool against PAHs. Thus, study of its structure may reveal better understanding towards the in-situ degradation of PAHs. In the present study structures of α -subunit protein sequences of RHDs belonging to different microbial species were modelled. National Centre for Biological Information (NCBI) database search retrieved 12,537 α -subunit protein sequences of RHDs belonging to 213 microbial species. As a representative of every species, only one bacterial sequence from every species was chosen for the homology modelling. The structures of these proteins were modeled using SWISS-MODEL. Ramachandran plot was used for the models quality estimation.

USBT-3.01

Paper Title: Identification of Microsatellite Markers Linked to Leaf Rust Resistance Gene Lr25 in Wheat

Author(s): Singh, A.^{1,2}, Pallavi, J.K.², Gupta, P.¹ and Prabhu, K.V.²

Affiliation: ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Division of Genetics, Indian Agricultural Research Institute, New Delhi-110012

Source: Journal of Applied Genetics, Vol. 53 (1), (2012), pp 19-25

ISSN No.: 1234-1983

Abstract: The leaf rust resistance gene Lr25, transferred from *Secale cereale* L. into wheat and located on chromosome 4B, imparts resistance to all pathotypes of leaf rust in South-East Asia. In an F₂-derived F₃ population, created by crossing TcLr25 that carries the gene Lr25 for leaf rust resistance with leaf rust-susceptible parent Agra Local, three microsatellite markers located on the long arm of chromosome 4B were found to be

linked to the Lr25 locus. The donor parent TcLr25 is a near-isogenic line derived from the variety Thatcher. The most virulent pathotype of leaf rust in the South-East Asian region, designated 77-5 (121R63-1), was used for challenging the population under artificially controlled conditions. The marker Xgwm251 behaved as a co-dominant marker placed 3.8 cM away from the Lr25 locus on 4BL. Two null allele markers, Xgwm538 and Xgwm6, in the same linkage group were located at a distance of 3.8 cM and 16.2 cM from the Lr25 locus, respectively. The genetic sequence of Xgwm251, Lr25, Xgwm538, and Xgwm6 covered a total length of 20 cM on 4BL. The markers were validated for their specificity to Lr25 resistance in a set of 43 wheat genetic stocks representing 43 other Lr genes.

USBT-3.02

- Paper Title:** Screening Methanolic Extracts of *Beta vulgaris* Roots for Photoprotective Activity
- Author(s):** Kapur, A¹., Sati, S¹., Ranjan, A² and Gupta, P.¹
- Affiliation:** ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University,, Dwarka, New Delhi-110078; ²Alternate Hydro Energy Centre, Indian Institute of Technology, Roorkee
- Source:** International Journal of Pharmacy and Pharmaceutical Sciences, Vol. 4 (4), (2012), pp 124-127
- ISSN No.:** 2656-0097
- Abstract:** Herbal cosmetic products incorporated with botanical extracts have become very popular in the market due to their effectiveness and intrinsic satisfaction that even after their routine use, they do not lead to any side effects. The present study involved the photoprotective analysis of the gel formulation prepared from the extract of *Beta vulgaris*. The methanolic extract of cortical region of beet root was assessed for the concentration of flavonoids (29.04±1.46 mg/gm), total phenolics (660.5±29.41mg/gm) and free radical scavenging potential (IC₅₀ = 8.02mg/ml). Photo-protective activity of the extract was confirmed when addition of beet root extract to paprika containing jelly delayed its discolouration on exposure to UV radiation. The sunscreen efficiency of the herbal gel was then assessed by evaluating SPF and comparing its absorbance with photoprotective cream already being marketed. The investigations clearly indicate its use as a potential sunscreen agent.

USBT-4.01

- Paper Title:** Role of DNA Methylation in Growth and Differentiation in *Physcomitrella patens* and Characterization of Cytosine DNA Methyltransferases
- Author(s):** Malik, G.¹, Dangwal, M.¹, Kapoor, S.² and Kapoor, M.¹
- Affiliation(s):** ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Plant Molecular Biology, Interdisciplinary Centre for Plant Genomics, University of Delhi
- Source:** The FEBS Journal, Vol. 279 (21), (2012), pp 4081-94
- ISSN No.:** 1742-464X
- Abstract:** Epigenetic mechanisms such as DNA methylation are known to regulate important developmental processes in higher eukaryotes. However, little is known about the necessity and role of this process in early land plants. Using the methyltransferase (MTase) inhibitor zebularine (1-(β-d-ribofuranosyl)-1,2-dihydropyrimidine-2-one), the impact of loss of genome-wide methylation on the overall development in *Physcomitrella patens* was analyzed. It is observed that various aspects of growth and differentiation during gametophyte development become aberrant. A search for

the core molecular components of methylation machinery, cytosine DNA MTases, revealed the presence of seven loci in the *P. patens* genome. Five of the loci code for MTases that are similar to corresponding proteins in higher plants, while two MTases appear specific to *P. patens* and are closely related to human DNMT3a and DNMT3b, respectively. These proteins possess all the conserved catalytic motifs characteristic of MTases and a domain of unknown function, DUF3444. Association of these highly conserved motifs with a DUF has not been reported in any of the MTases known so far. All the seven genes are differentially but ubiquitously expressed in gametophytes at low levels. Subcellular localization of GFP-fused proteins shows patterns of distribution that can be correlated with their putative cellular functions. This work bridges the knowledge of MTases in *P. patens* and makes this simple model plant accessible for studies on epigenetic aspects that remain intractable in higher plants.

USBT-4.02

Paper Title: **De novo Methyltransferase, OsDRM2, Interacts with the ATP-Dependent RNA Helicase, OseIF4A, in Rice**

Author(s): Dangwal, M.¹, Malik, G.¹, Kapoor, S.² and **Kapoor, M.¹**

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Plant Molecular Biology, Interdisciplinary Centre for Plant Genomics, University of Delhi

Source: Journal of Molecular Biology, Vol. 425 (16), (2013), pp 2853-2866

ISSN No.: 0022-2836

Abstract: Domains rearranged methyltransferases (DRMs) are the de novo methyltransferases that regulate cytosine methylation in plants in a manner similar to the animal de novo methyltransferases, DNMT3a and DNMT3b. These enzymes catalyze the establishment of new methylation patterns and are guided to target sites by small RNAs through the process of RNA-directed DNA methylation (RdDM). In the current accepted view for RdDM, intricate interactions among transcription factors/chromatin modifying proteins and the large subunits of plant-specific polymerases, Pol IV and Pol V, regulate the 24-nt small interfering RNA guided de novo methylation of cytosines. The RNA-induced silencing complex assembled on Pol-V-transcribed non-coding RNA finally facilitates the recruitment of DRM2 by unknown mechanism/protein interactions to chromatin sites. In an attempt to determine the cellular proteins that specifically interact with DRM2, a yeast two-hybrid screen was performed using young rice panicles. We report that rice DRM2 interacts with the ATP-dependent RNA helicase, eIF4A. Direct interaction between the two proteins is demonstrated in vivo by bimolecular fluorescence complementation method and in vitro by histidine-pull-down assays. Deletion analysis reveals that interaction between OsDRM2 and OseIF4A is specifically mediated through ubiquitin-associated domain of OsDRM2 while, both domains 1 and 2 of OseIF4A are critical for mediating strong interaction with OsDRM2 in vivo. Interaction between Arabidopsis eIF4AI and eIF4AII with OsDRM2 and nuclear localization of these complexes suggests possible conservation of functional interaction between de novo methyltransferases and the translation initiation factor, eIF4A, in RdDM across plant species.

USBT-4.03

Paper Title: **Post-translational Regulation of Rice MADS29 Function: Homodimerization or Binary Interactions with Other Seed-expressed MADS Proteins Modulate its Translocation into the Nucleus**

Author(s): Nayar, S.¹, Kapoor, M.² and Kapoor, S.³

Affiliation(s): ¹Interdisciplinary Centre for Plant Genomics and Department of Plant Molecular Biology, University of Delhi South Campus, New Delhi; ²University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Interdisciplinary Centre for Plant Genomics and Department of Plant Molecular Biology, University of Delhi South Campus, New Delhi

Source: Journal of Experimental Botany, Vol. 65 (18), (2014), pp 5339-50

ISSN No.: 0022-0957

Abstract: OsMADS29 is a seed-specific MADS-box transcription factor that affects embryo development and grain filling by maintaining hormone homeostasis and degradation of cells in the nucellus and nucellar projection. Although it has a bipartite nuclear localization signal (NLS) sequence, the transiently expressed OsMADS29 monomer does not localize specifically in the nucleus. Dimerization of the monomers alters the intracellular localization fate of the resulting OsMADS29 homodimer, which then translocates into the nucleus. By generating domain-specific deletions/mutations, we show that two conserved amino acids (lysine (23) and arginine (24)) in the NLS are important for nuclear localization of the OsMADS29 homodimer. Furthermore, the analyses involving interaction of OsMADS29 with 30 seed-expressed rice MADS proteins revealed 19 more MADS-box proteins, including five E-class proteins, which interacted with OsMADS29. Eleven of these complexes were observed to be localized in the nucleus. Deletion analysis revealed that the KC region (K-box and C-terminal domain) plays a pivotal role in homodimerization. These data suggest that the biological function of OsMADS29 may not only be regulated at the level of transcription and translation as reported earlier, but also at the post-translational level by way of the interaction between OsMADS29 monomers, and between OsMADS29 and other MADS-box proteins.

USBT-4.04

Paper Title: **The PpCMTChromomethylase Affects Cell Growth and Interacts with the Homolog of like Heterochromatin Protein 1 in the Moss Physcomitrella patens**

Author(s): Dangwal, M.¹, Kapoor, S.² and Kapoor, M.¹

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Plant Molecular Biology, Interdisciplinary Centre for Plant Genomics, University of Delhi

Source: The Plant Journal, Vol. 77 (4), (2014), pp 589-603

ISSN No.: 0960-7412

Abstract: Chromomethylases (CMTs) are plant-specific cytosine DNA methyltransferases that are involved in maintenance of CpNpG methylation. In seed plants, histone methylation and interaction of CMT with LIKE HETEROCHROMATIN PROTEIN 1 (LHP1) is essential for recruitment of CMT to target sites. LHP1 has been characterized as a putative component of the POLYCOMB REPRESSIVE COMPLEX1 (PRC1) in plants, and functions downstream of PRC2 to maintain genes in repressed state for orchestrated development. In the present study, we show that targeted disruption of PpCMT results in an approximately 50% reduction in global cytosine methylation levels. This affects growth of apical cells, predominantly growth of side branch initials emerging from chloronema cells. In some places, these

cells develop thick walls with plasmolyzed cellular contents. Transcript accumulation patterns of genes involved in apical cell extension and metabolism of hemicelluloses, such as xyloglucans, in the primary cell walls decreased many folds in ppcmt mutant lines, as determined by real-time PCR. Using yeast two-hybrid method and bimolecular fluorescence complementation assay, we show that PpCMT and PpLHP1 interact through their chromo domains, while PpLHP1 homodimerizes through its chromo shadow domain. The results presented in this study provide insight into the role of the single chromomethylase, PpCMT, in proliferation of protonema filaments, and shed light on the evolutionary conservation of proteins interacting with these methylases in the early land plant, *Physcomitrella patens*.

USBT-5.01

Paper Title: Optimization of De Novo Short Read Assembly of Seabuckthorn (*Hippophae rhamnoides* L.) Transcriptome

Author(s): Ghangal, R.¹, Chaudhary, S.¹, Jain, M.², **Purty, R.S.¹** and Sharma, P.C.¹

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²National Institute of Plant Genome Research, New Delhi

Source: PLoS ONE, Vol. 8 (8), (2013), pp 1-7

ISSN No.: 1932-6203

Abstract: Seabuckthorn (*Hippophae rhamnoides* L.) is known for its medicinal, nutritional and environmental importance since ancient times. However, very limited efforts have been made to characterize the genome and transcriptome of this wonder plant. Here, we report the use of next generation massive parallel sequencing technology (Illumina platform) and de novo assembly to gain a comprehensive view of the seabuckthorn transcriptome. We assembled 86,253,874 high quality short reads using six assembly tools. At our hand, assembly of non-redundant short reads following a two-step procedure was found to be the best considering various assembly quality parameters. Initially, ABySS tool was used following an additive k-mer approach. The assembled transcripts were subsequently subjected to TGICL suite. Finally, de novo short read assembly yielded 88,297 transcripts (> 100 bp), representing about 53 Mb of seabuckthorn transcriptome. The average length of transcripts was 610 bp, N50 length 1198 BP and 91% of the short reads uniquely mapped back to seabuckthorn transcriptome. A total of 41,340 (46.8%) transcripts showed significant similarity with sequences present in nr protein databases of NCBI (E-value < 1E-06). We also screened the assembled transcripts for the presence of transcription factors and simple sequence repeats. Our strategy involving the use of short read assembler (ABySS) followed by TGICL will be useful for the researchers working with a non-model organism's transcriptome in terms of saving time and reducing complexity in data management. The seabuckthorn transcriptome data generated here provide a valuable resource for gene discovery and development of functional molecular markers.

USBT-5.02

Paper Title: DNA Barcoding: An Effective Technique in Molecular Taxonomy

Author(s): **Purty, R.S.** and Chatterjee, S.

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Source: Austin Journal of Biotechnology and Bioengineering, Vol. 3(1), (2016), 1059

ISSN No.: 2378-3036

Abstract: Global warming is affecting regional climate, ecosystem and diversity array of species by causing physical and biological changes throughout the planet. Therefore, there is a need to develop a technique which can identify organisms and differentiate between very closely related species in order conserve species diversity. Classical taxonomy has accelerated its progress with the adoption of new molecular techniques like DNA barcoding to cope with the huge population of organisms and biodiversity available in this planet. DNA barcoding uses short gene sequences which are well classified portion of the genome. With the advent of high throughput sequencing technology such as Next-Generation Sequencing (NGS) technology the DNA barcoding has become more accurate, fast and reliable in the last decade. The Consortium for the Barcode of Life (CBOL) has given a platform for taxonomists across all the countries to collaborate, identify and preserve the biodiversity across the globe. In this review we summarized the recent advances and developments in the DNA barcoding attempts across animals, plants, bacteria, fungi, viruses and protists. We have also attempted to present the popular tools used in DNA barcoding in a chronological order of their development.

USBT-5.03

Paper Title: SalTol QTL and Their Role in Salinity Tolerance in Rice

Author(s): Waziri, A., Kumar, P. and Purty, R.S.

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Source: Austin Journal of Biotechnology and Bioengineering, Vol. 3 (3), (2016), 1067

ISSN No.: 2378-3036

Abstract: Salinity is one of the major abiotic stresses that reduce the yield of several crop species including rice. However, there are several traditional cultivars such as Pokkali, Nona Bokra, Cheriveruppu and Getu that are saline tolerant but possess poor agronomic characteristics. Pokkali is widely used as a donor in many breeding program and salt tolerance related studies. A major Quantitative Trait Loci (QTL), Saltol has been mapped on chromosome 1 in one of the Recombinant Inbred Lines (RILs) ie, FL478, obtained from a cross between Pokkali and IR29, was responsible for maintaining low Na⁺, high K⁺, and Na⁺/K⁺ homeostasis in shoots of rice. Since salinity stress is a multigenic trait and involves activity of many genes working in co-ordination. In order to provide salinity tolerance to some elite rice varieties plant breeders have transferred whole Saltol QTL using Marker Assisted Backcrossing and Marker Assisted Selection, whereas molecular biologists have attempted to find candidate genes within Saltol QTL that play crucial role in providing salinity tolerance. This paper provides a comprehensive review of Saltol QTL and their role in providing tolerance to salinity stress.

USBT-6.01

Paper Title: National Vaccine Policy in the Era of Vaccines Seeking Diseases and Governments Seeking Public Private Partnerships

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Source: Current Science, Vol. 102 (4), (2012), pp 557-558

ISSN No.: 0011-3891

Abstract: This vaccine policy is more about spending and coverage, than about protecting children. It is not designed to enhance national public capacities for public

immunization programmes, but to justify spending public money on public private partnerships (PPPs) or privately produced vaccines in the name of protection from diseases, whose incidence figures and public health statistics are dubious and industry manufactured.

USBT-6.02

Paper Title: Nitrogen Cycle Sustainability and Sustainable Technologies for Nitrogen Fertilizer and Energy Management

Author(s): Abrol, Y.P.¹, Pandey, R.², **Raghuram, N.**³ and Ahmad, A.¹

Affiliation(s): ¹Molecular Ecology Laboratory, Department of Botany, Hamdard University, New Delhi; ² Division of Plant Physiology, Indian Agricultural Research Institute, New Delhi; ³University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of the Indian Institute of Science, Vol. 92 (1), (2012), pp 17-36

ISSN No.: 0970-4140

Abstract: Nitrogen (N) is necessary for all forms of life and a crucial component in the increased production of food to feed the continuously increasing human and animal populations. In many ecosystems on land and sea, the supply of nitrogen controls the nature and diversity of plant life, the population dynamics of both grazing animals and their predators, and vital ecological processes such as plant productivity and the cycling of carbon and soil minerals. Since the beginning of the last century, mankind has injected increasing amounts of reactive nitrogen into the environment, intentionally as fertilizer and unintentionally as a by-product of combusting fossil fuels. As a result, nitrogen cycle is being altered causing possible grave impacts on biodiversity, global warming, water quality, human health, and even the rate of population growth in several parts of the world. The key N management technology for sustainable and profitable crop production is the synchronization of N supply with crop demand. Aiming at improving N-use efficiency in high-input cropping systems, the focus should be on higher yield with less fertilizer N. In low-input systems, additional use of N fertilizer may be required to increase yield level and yield stability. Realigning the time and rate of N application with help of modern tools, like SPAD meter, LCC, Green seeker, Simulation modeling, GIS and remote sensing as per spatial-indigenous nutrient supply capacity and temporal variability of soil enhances the synchronization between N supply and plant demand. Site specific N application with balanced fertilization and integration of locally available organic manures further improves the N use efficiencies in cropping system. Sustainable strategies for N management in energy sector are the development of technologies that either increases efficiency of fuel combustion or removes N oxides from the exhaust stream. The complete solutions, however, are closely linked to the development of non-polluting alternative energy sources. Research and development efforts needs to be strengthened to find out more effective technological solutions and try to balance them against cost and efficiency.

USBT-6.03

Paper Title: Flux-Based Classification of Reactions Reveals a Functional Bow-Tie Organization of Complex Metabolic Networks

Author(s): Singh, S.^{1,2}, Samal, A.^{1,3,4}, Giri, V.¹, Krishna, S.⁵, **Raghuram, N.⁶** and Jain, S.^{1,7,8},

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Source: Physical Review, Vol. E 87, 052708, (2013), pp 1-11

ISSN No.: 2470-0045

Abstract: Unraveling the structure of complex biological networks and relating it to their functional role is an important task in systems biology. Here we attempt to characterize the functional organization of the large-scale metabolic networks of three microorganisms. We apply flux balance analysis to study the optimal growth states of these organisms in different environments. By investigating the differential usage of reactions across flux patterns for different environments, we observe a striking bimodal distribution in the activity of reactions. Motivated by this, we propose a simple algorithm to decompose the metabolic network into three subnetworks. It turns out that our reaction classifier, which is blind to the biochemical role of pathways, leads to three functionally relevant subnetworks that correspond to input, output, and intermediate parts of the metabolic network with distinct structural characteristics. Our decomposition method unveils a functional bow-tie organization of metabolic networks that is different from the bow-tie structure determined by graph-theoretic methods that do not incorporate functional it.

USBT-6.04

Paper Title: Molecular Characterization of Nitrate Uptake and Assimilatory Pathway in *Arthrospira platensis* Reveals Nitrate Induction and Differential Regulation

Author(s): Lochab, S., Kumar, P.A. and **Raghuram, N.**

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Source: Archives of Microbiology, Vol. 196 (6), (2014), pp 385-394

ISSN No.: 0302-8933

Abstract: The nitrate assimilation pathway and its regulation in the high-protein nutraceutical cyanobacterium, *Arthrospira* (Spirulina), were studied. A complete characterization of the genes of the nitrate uptake and assimilatory pathway in *Arthrospira platensis* strain PCC 7345 was done including cloning, sequencing, phylogenetic analysis and expression studies. Genomic localization studies revealed that their clustering is different from the operons known in other cyanobacteria; only nrtP and narB are organized together, while nirA, glnA and gltS exist in separate genomic locations. The presence of both types of nitrate transporters (nrtP/ABC types) in *A. platensis* is rare, as their occurrence is usually specific to marine and freshwater microorganisms, respectively. The positive effect of nitrate on transcript accumulation of narB, nirA

and nrtP genes in N-depleted and N-restored cultures confirmed nitrate induction, which is abolished by the addition of ammonium ions into the medium. Gene expression studies in response to nitrate, nitrite, ammonium and glutamine provided the first evidence of differential regulation of multiple genes of nitrate assimilatory pathway in *Arthrospira*.

USBT-6.05

Paper Title: Transcriptome Analysis of Arabidopsis GCR1 Mutant Reveals its Roles in Stress, Hormones, Secondary Metabolism and Phosphate Starvation

Author(s): Chakraborty, N.¹, Sharma, P.¹, Kanyuka, K.², Pathak, R.R.¹, Choudhury, D.³, Hooley, R.A.⁴ and Raghuram, N.¹

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Source: PLoS ONE, Vol. 10 (2), (2015), pp 1-17

ISSN No.: 1932-6203

Abstract: The controversy over the existence or the need for G-protein coupled receptors (GPCRs) in plant G-protein signalling has overshadowed a more fundamental quest for the role of AtGCR1, the most studied and often considered the best candidate for GPCR in plants. Our whole transcriptome microarray analysis of the GCR1-knock-out mutant (gcr1-5) in *Arabidopsis thaliana* revealed 350 differentially expressed genes spanning all chromosomes. Many of them were hitherto unknown in the context of GCR1 or G-protein signalling, such as in phosphate starvation, storage compound and fatty acid biosynthesis, cell fate, etc. We also found some GCR1-responsive genes/processes that are reported to be regulated by heterotrimeric G-proteins, such as biotic and abiotic stress, hormone response and secondary metabolism. Thus, GCR1 could have G-protein-mediated as well as independent roles and regardless of whether it works as a GPCR, further analysis of the organism-wide role of GCR1 has a significance of its own.

USBT-6.06

Paper Title: G-Protein α -Subunit (GPA1) Regulates Stress, Nitrate and Phosphate Response, Flavonoid Biosynthesis, Fruit/Seed Development and Substantially Shares GCR1 Regulation in *A. thaliana*

Author(s): Chakraborty, N.¹, Sharma, P.¹, Kanyuka, K.², Pathak, R.R.¹, Choudhury, D.³, Hooley, R.⁴ and Raghuram, N.¹

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Source: Plant Molecular Biology, Vol. 89, (2015), pp 559–576

ISSN No.: 573-5028

Abstract: Heterotrimeric G-proteins are implicated in several plant processes, but the mechanisms of signal-response coupling and the roles of G-protein coupled receptors in general and GCR1 in particular, remain poorly understood. We isolated a knock-out mutant of the Arabidopsis G-protein α subunit (gpa1-5) and analysed its

transcriptome to understand the genome wide role of GPA1 and compared it with that of our similar analysis of a GCR1 mutant (Chakraborty et al. 2015, PLoS ONE 10(2): e0117819). We found 394 GPA1-regulated genes spanning 79 biological processes, including biotic and abiotic stresses, development, flavonoid biosynthesis, transcription factors, transporters and nitrate/phosphate responses. Many of them are either unknown or unclaimed explicitly in other published GPA1 mutant transcriptome analyses. A comparison of all known GPA1-regulated genes (including the above 394) with 350 GCR1-regulated genes revealed 114 common genes. This can be best explained by GCR1–GPA1 coupling, or by convergence of their independent signaling pathways. Though the common genes in our GPA1 and GCR1 mutant datasets constitute only 26 % of the GPA1-regulated and 30 % of the GCR1-responsive genes, they belong to nearly half of all the processes affected in both the mutants. Thus, GCR1 and GPA1 regulate not only some common genes, but also different genes belonging to the same processes to achieve similar outcomes. Overall, we validate some known and report many hitherto unknown roles of GPA1 in plants, including agronomically important ones such as biotic stress and nutrient response, and also provide compelling genetic evidence to revisit the role of GCR1 in G-protein signalling.

USBT-6.07

Paper Title: G-protein Signaling Components GCR1 and GPA1 Mediate Responses to Multiple Abiotic Stresses in *Arabidopsis*

Author(s): Chakraborty, N., Singh, N., Kaur, K. and Raghuram, N.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Frontiers in Plant Science, Vol. 6 (1000), (2015)

ISSN No.: 1664-462X

Abstract: G-protein signaling components have been implicated in some individual stress responses in *Arabidopsis*, but have not been comprehensively evaluated at the genetic and biochemical level. Stress emerged as the largest functional category in our whole transcriptome analyses of knock-out mutants of GCR1 and/or GPA1 in *Arabidopsis* (Chakraborty et al., 2015a, b). This led us to ask whether G-protein signaling components offer converging points in the plant's response to multiple abiotic stresses. In order to test this hypothesis, we carried out detailed analysis of the abiotic stress category in the present study, which revealed 144 differentially expressed genes (DEGs), spanning a wide range of abiotic stresses, including heat, cold, salt, light stress etc. Only 10 of these DEGs are shared by all the three mutants, while the single mutants (GCR1/GPA1) shared more DEGs between themselves than with the double mutant (GCR1-GPA1). RT-qPCR validation of 28 of these genes spanning different stresses revealed identical regulation of the DEGs shared between the mutants. We also validated the effects of cold, heat and salt stresses in all the 3 mutants and WT on % germination, root and shoot length, relative water content, proline content, lipid peroxidation and activities of catalase, ascorbate peroxidase and superoxide dismutase. All the 3 mutants showed evidence of stress tolerance, especially to cold, followed by heat and salt, in terms of all the above parameters. This clearly shows the role of GCR1 and GPA1 in mediating the plant's response to multiple abiotic stresses for the first time, especially cold, heat and salt stresses. This also implies a role for classical G-protein signaling pathways in stress sensitivity in the normal plants of *Arabidopsis*. This is also the first genetic and biochemical evidence of abiotic stress tolerance rendered by knock-out mutation of GCR1 and/or

GPA1. This suggests that G-protein signaling pathway could offer novel common targets for the development of tolerance/resistance to multiple abiotic stresses.

USBT-7.01

Paper Title: Use of Quantitative Membrane Proteomics Identifies a Novel Role of Mitochondria in Healing Injured Muscles

Author: Sharma, N.^{1,2}, Medikayala, S.², Defour, A.², Rayavarapu, S.², Brown, K.J.², Hathout, Y.² and Jaiswal J.K.^{1,3}

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Source: Journal of Biological Chemistry, Vol. 287 (36), (2012), pp 30455-30467

ISSN No.: 0021-9258

Abstract: Skeletal muscles are proficient at healing from a variety of injuries. Healing occurs in two phases, early and late phase. Early phase involves healing the injured sarcolemma and restricting the spread of damage to the injured myofiber. Late phase of healing occurs a few days postinjury and involves interaction of injured myofibers with regenerative and inflammatory cells. Of the two phases, cellular and molecular processes involved in the early phase of healing are poorly understood. We have implemented an improved sarcolemmal proteomics approach together with in vivo labeling of proteins with modified amino acids in mice to study acute changes in the sarcolemmal proteome in early phase of myofiber injury. We find that a notable early phase response to muscle injury is an increased association of mitochondria with the injured sarcolemma. Real-time imaging of live myofibers during injury demonstrated that the increased association of mitochondria with the injured sarcolemma involves translocation of mitochondria to the site of injury, a response that is lacking in cultured myoblasts. Inhibiting mitochondrial function at the time of injury inhibited healing of the injured myofibers. This identifies a novel role of mitochondria in the early phase of healing injured myofibers.

USBT-7.02

Paper Title: Rpb4 and Rpb7: Multifunctional Subunits of RNA Polymerase II

Author: Sharma N.¹ and Kumari R².

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Source: Critical Reviews in Microbiology, Vol. 39(4), (2013), pp 362-372.

ISSN No.: 1040-841X

Abstract: The 12-subunit RNA polymerase II enzyme in yeasts and higher eukaryotic cells is important for transcription of protein-coding genes. Its fourth and seventh largest subunits named Rpb4 and Rpb7, respectively, display some unique features that distinguish them from the remaining subunits of this enzyme. These two subunits also bind to each other forming a complex in archaebacteria, yeasts, plants and humans. Our knowledge about the structure and functions of this complex has greatly advanced in recent years. These subunits were initially considered to be important only for initiation of transcription and stress response. However, recent evidence suggests that they are not only involved in transcription, but also in DNA repair, mRNA export and decay as well as translation, highlighting the roles of this

heterodimer in diverse biological processes. In this article, we review the current status of these two subunits and discuss attributes of their structure and function across organisms.

USBT-7.03

Paper Title: Mechanism of Ca²⁺ -triggered ESCRT Assembly and Regulation of Cell Membrane Repair

Author: Scheffer L.L.¹, Sreetama S.C.¹, Sharma N.^{1,2}, Medikayala S.¹, Brown K.J.^{1,3} Defour A.¹ and Jaiswal J.K.^{1,3}

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Source: Nature Communications, Vol. 5, (2014), pp 5646

ISSN No.: 2041-1723

Abstract: In muscle and other mechanically active tissue, cell membranes are constantly injured and their repair depends on the injury induced increase in cytosolic calcium. Here we show that injury-triggered Ca²⁺ increase results in assembly of ESCRTIII and accessory proteins at the site of repair. This process is initiated by the calcium binding protein - Apoptosis Linked Gene (ALG)-2. ALG-2 facilitates accumulation of ALG-2 interacting protein X (ALIX), ESCRT III, and Vps4 complex at the injured cell membrane, which in turn results in cleavage and shedding of the damaged part of the cell membrane. Lack of ALG-2, ALIX, or Vps4B each prevents shedding, and repair of the injured cell membrane. These results demonstrate Ca²⁺-dependent accumulation of ESCRTIII-Vps4 complex following large focal injury to the cell membrane and identify the role of ALG-2 as the initiator of sequential ESCRTIII-Vps4 complex assembly that facilitates scission and repair of the injured cell membrane.

USBT-7.04

Paper Title: Modulating the Level of the Rpb7 Subunit of RNA Polymerase II Affects Cell Separation in *Schizosaccharomyces pombe*

Author(s): Kumar, D. and Sharma, N.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Research in Microbiology, Vol. 166 (1), (2015), pp 20-27

ISSN No.: 0923-2508

Abstract: The rpb7(+) gene encodes the seventh largest subunit of RNA polymerase II and is essential for survival of yeast cells. To gain insight into its functions, we expressed rpb7(+) under the control of the nmt1 promoter and investigated its role in regulating multiple phenotypes in *Schizosaccharomyces pombe*. We observed that low rpb7(+) levels resulted in slow growth of cells under optimum growth conditions. However, no growth defect was observed under different stress conditions tested in this study. Our results also showed that the most prominent phenotype of cells expressing reduced rpb7(+) is a defect in cell separation. Quantitative real-time PCR analysis further revealed that the transcription of specific cell septation genes was significantly reduced in these cells. Collectively, results presented in this study highlight the distinct role of Rpb7p in regulating cell separation in *S. pombe*.

USBT-8.01

Paper Title: Expressed Sequence Tag-Based Identification and Expression Analysis of Some Cold Inducible Elements in Seabuckthorn (*Hippophae rhamnoides* L.)

Author(s): Ghangal, R.¹, Raghuvanshi, S.² and Sharma, P.C.¹

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi -110078; ²Department of Plant Molecular Biology, University of Delhi South Campus, New Delhi - 110021

Source: Plant Physiology and Biochemistry, Vol. 51, (2012), pp 123-128

ISSN No.: 0981-9428

Abstract: A cDNA library was constructed from the mature leaves of seabuckthorn(*Hippophae rhamnoides*). Expressed Sequence Tags (ESTs) were generated by single pass sequencing of 4500 cDNA clones. We submitted 3412 ESTs to dbEST of NCBI. Clustering of these ESTs yielded 1665 unigenes comprising of 345 contigs and 1320 singletons. Out of 1665 unigenes, 1278 unigenes were annotated by similarity search while the remaining 387 unannotated unigenes were considered as organism specific. Gene Ontology (GO) analysis of the unigene dataset showed 691 unigenes related to biological processes, 727 to molecular functions and 588 to cellular component category. On the basis of similarity search and GO annotation, 43 unigenes were found responsive to biotic and abiotic stresses. To validate this observation, 13 genes that are known to be associated with cold stress tolerance from previous studies in Arabidopsis and 3 novel transcripts were examined by Real time RT-PCR to understand the change in expression pattern under cold/freeze stress. In silico study of occurrence of microsatellites in these ESTs revealed the presence of 62 Simple Sequence Repeats (SSRs), some of which are being explored to assess genetic diversity among seabuckthorn collections. This is the first report of generation of transcriptome data providing information about genes involved in managing plant abiotic stress in seabuckthorn, a plant known for its enormous medicinal and ecological value.

USBT-8.02

Paper Title: Implication of Microsatellite Instability in Human Gastric Cancers

Author(s): Shokal, U. and Sharma, P.C.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Medical Research, Vol.135, (2012), pp 599-613

ISSN No.: 0971-5916

Abstract: Microsatellite instability, one of the phenomena implicated in gastric cancer, is mainly associated with the expansion or contraction of microsatellite sequences due to replication errors caused most frequently by mutations in the mismatch repair (MMR) and tumour suppressor genes. Tumours exhibiting microsatellite instability are proven to have truncated products resulting from frequent mutations in mononucleotide or dinucleotide runs in coding and non-coding regions of the targeted genes. Epigenetic changes like hypermethylation of the promoter region of MMR genes as well as gene silencing are also responsible for the microsatellite instability phenotypes. Assessing microsatellite instability in tumours has proved to be an efficient tool for the prognosis of various cancers including colorectal and gastric cancers. Such tumours are characterized by distinct clinicopathological profiles. Biotic agents like Epstein Barr Virus and H. pylori along with other factors like family history, diet and geographical location also play an important role in the onset of gastric carcinogenesis. Instability of mitochondrial DNA has also been

investigated and claimed to be involved in the occurrence of gastric cancers in humans. Development of simplified but robust and reproducible microsatellite instability based molecular tools promises efficient prognostic assessment of gastric tumours.

USBT-8.03

Paper Title: Searching Microsatellites in DNA Sequences: Approaches Used and Tools Developed

Author(s): Grover, A.¹, Aishwarya, V.² and Sharma, P.C.³

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Source: Physiology and Molecular Biology of Plants, Vol. 18 (1), (2012), pp 11-19

ISSN No.: 0971-5894

Abstract: Microsatellite instability associated genomic activities and evolutionary changes have led to a renewed focus on microsatellite research. In last decade, a number of microsatellite mining tools have been introduced based on different computational approaches. The choice is generally made between slow but exhaustive dynamic programming-based approaches, or fast and incomplete heuristic methods. Tools based on stochastic approaches are more popular due to their simplicity and added ornamental features. We have performed a comparative evaluation of the relative efficiency of some microsatellite search tools with their default settings. The graphical user interface, the statistical analysis of the output and ability to mine imperfect repeats are the most important criteria in selecting a tool for a particular investigation. However, none of the available tools alone provides complete and accurate information about microsatellites, and a lot depends on the discretion of the user.

USBT-8.04

Paper Title: Sequence Similarity-Based Identification of Abiotic Stress Responsive Genes in Chickpea (*Cicer arietinum* L.)

Author(s): Roorkiwal, M. and Sharma, P.C.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi -110078

Source: Bioinformation, Vol. 8 (2), (2012), pp 92-97

ISSN No.: 0973-8894

Abstract: Chickpea (*Cicer arietinum* L.) is an important food legume crop, particularly for the arid regions including Indian subcontinent. Considering the detrimental effect of drought, temperature and salt stress on crop yield, efforts have been initiated in the direction of developing improved varieties and designing alternate strategies to sustain chickpea production in adverse environmental conditions. Identification of genes that confer abiotic stress tolerance in plants remains a challenge in contemporary plant breeding. The present study focused on the identification of abiotic stress responsive genes in chickpea based on sequence similarity approach exploiting known abiotic stress responsive genes from model crops or other plant species. Ten abiotic stress responsive genes identified in other plants were partially amplified from eight chickpea genotypes and their presence in chickpea was confirmed after sequencing the PCR products. These genes have been functionally

validated and reported to play significant role in stress response in model plants like Arabidopsis, rice and other legume crops. Chickpea EST sequences available at NCBI EST database were used for the identification of abiotic stress responsive genes. A total of 8,536 unique coding long sequences were used for identification of chickpea homologues of these abiotic stress responsive genes by sequence similarity search (BLASTN and BLASTX). These genes can be further explored towards achieving the goal of developing superior chickpea varieties providing improved yields under stress conditions using modern molecular breeding approaches.

USBT-8.05

Paper Title: Tandem Repetitions in Transcriptomes of Some Solanaceae Species

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Source: American Journal of Molecular Biology, Vol. 2, (2012), pp 140-152

ISSN No.: 2121-6620

Abstract: Characterization of occurrence, density and motif sequence of tandem repeats in the transcribed regions is helpful in understanding the functional significance of these repeats in the modern genomes. We analyzed tandem repeats present in expressed sequences of thirteen species belonging to genera Capsicum, Nicotiana, Petunia and Solanum of family Solanaceae and the genus Coffea of Rubiaceae to investigate the propagation and evolutionary sustenance of these repeats. Tandem repeat containing sequences constituted 1.58% to 7.46% of sequences analyzed. Tandem repetitions of size 2, 15, 18 and 21 bp motifs were more frequent. Repeats with unit sizes 21 and 22 bp were also abundant in genomic sequences of potato and tomato. While mutations occurring in these repeats may alter the repeat number, genomes adjust to these changes by keeping the translated products unaffected. Surprisingly, in majority of the species under study, tandem repeat motif length did not exceed 228 bp. Conserved tandem repeat motifs of sizes 180, 192 and 204 bp were also abundant in the genomic sequences. Our observations lead us to propose that these tandem repeats are actually remnants of ancestral megasatellite repeats, which have split into multiple repeats due to frequent insertions over the course of evolution.

USBT-8.06

Paper Title: Purifying Selection Bias Against Microsatellites in Gene Rich Segmental Duplications in the Rice Genome

Author(s): Sharma, P.C.¹, Roorkiwal, M.^{1, 2} and Grover, A.^{1, 3}

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Source: International Journal of Evolutionary Biology, Vol. 2012, (2012), pp 1-8

ISSN No.: 2090-052X

Abstract: Little data is available on microsatellite dynamics in the duplicated regions of the rice genome, even though efforts have been made in the past to align genome sequences of its two sub-species. Based on the coordinates of duplicated sequences in the indica genome as available in the public domain, we identified microsatellites

in these regions. CCG and GAAAA repeats occurred most frequently. In all, 259 microsatellites could be identified in the duplicated sequences using the criteria of minimum 90% align ability spread over a minimum of 1 Kb sequence. More than 25% of the repeats in duplicated regions occurred in the genic sequences. Only 45 (17%) of these 259 microsatellites were found conserved in the duplicated paralogues. Among these repeats, 40% maintained both sequence and length conservation. The effect of mutability of nearby regions could also be clearly seen in microsatellite regions. The overall purpose of this study was to investigate, whether microsatellites follow an independent course of evolutionary dynamics subsequent to events like genome reshuffling that simply drives these elements to different locations in the genome. To the best of our knowledge, this is the first comprehensive analysis of microsatellite conservation in the duplicated regions of any genome.

USBT-8.07

Paper Title: DNA Fingerprinting of Saffron (*Crocus sativus* L.) by RAPD

Author(s): Qadri, H.¹, Sharma, P.C.², Qureshi, A.³, Singh, S.P.¹. and Nehvi, F.A.³

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Source: Vegetos, Vol. 25, (2012), pp 194-197

ISSN No.: 0970-4078

Abstract: The present investigation was carried out at Lethpora area of Kashmir region (J and K) to compare the diversity estimated through D2 analysis and molecular markers. A set of 200 saffron genotypes from different saffron growing areas of Kashmir were collected and were grown at Lethpora village during 2006. Observations (individual and pooled) were taken for morphological traits. Mahalanobis distribution pattern employing Tocher's method classified 200 genotypes in sixteen clusters with 171 genotypes in cluster I, 9 genotypes in cluster V, 7 genotypes in cluster VI and one genotype each in rest of the clusters. RAPD analysis of 20 selected genotypes was carried out. In all, 20 out of 25 primers were selected on the basis of amplification robustness, clarity and scorability of banding patterns, which provided 1562 repeatable fragments. DNA fingerprinting using RAPD markers during the present study showed considerable genetic variability among 20 different saffron genotypes.

USBT-8.08

Paper Title: Mining of Microsatellites Using Next Generation Sequencing of Seabuckthorn (*Hippophae rhamnoides* L.) Transcriptome

Author(s): Jain, A., Chaudhary, S., and Sharma, P.C.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Physiology and Molecular Biology of Plants, Vol. 20, (2014), pp 115-123

ISSN No.: 0974-0430

Abstract: Gene based microsatellite markers are becoming more popular as compared to traditional random genomic microsatellite markers due to rapid and inexpensive method of isolation and their cross-species portability. The present study documents occurrence of microsatellites in the transcriptome of seabuckthorn, a plant with immense medicinal, nutritional and ecological value. De novo assembly of over 80 million high quality short reads generated by high throughput next generation

sequencing yielded 88297 putative unigenes. Of these, 7.69 % unigenesharbored microsatellite repeats with an average of one microsatellite per 6.704 Kb transcriptome. Dinucleotide repeats were most abundant followed by trinucleotide repeats. Microsatellites were densely populated in coding regions followed by 3' and 5' untranslated regions. AG and AAG type repeats were most frequently represented. Of the microsatellite positive unigenes, 48.81 % could be assigned gene ontology (GO) terms in order to assess associations between microsatellite containing unigenes and biological role of known genes. Utility of unigene specific microsatellites was assessed on the basis of polymorphism(s) detected in 18 seabuckthorn collections from Leh (India) using a set of randomly selected 25 unigene specific microsatellites. The findings presented here are likely to find immense use in future breeding and molecular biology research projects in seabuckthorn aiming at its overall development as a crop.

USBT-8.09

Paper Title: Genetic Dissection of Drought and Heat Tolerance in Chickpea Through Genome-wide and Candidate Gene-based Association Mapping Approaches

Author(s): Thudi, M.¹, Upadhyaya, H.D.¹, Rathore, A.¹, Gaur, P.M.¹, Krishnamurthy, L.¹, Roorkiwal, M.^{1,2}, Nayak, S.N.¹, Chaturvedi, S.K.³, Basu, P.S.³, Gangarao, N.V. P. R.⁴, Fikre, A.⁵, Kimurto, P.⁶, **Sharma, P.C.**², Sheshashayee, M.S.⁷, Tobita, S.⁸, Kashiwagi, J.⁹, Ito, O.¹⁰, Killian, A.¹¹, and Varshney, R.K.¹

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Source: PLoS ONE, Vol. 9 (5), (2014), pp 1-12

ISSN No.: 1932-6203

Abstract: To understand the genetic basis of tolerance to drought and heat stresses in chickpea, a comprehensive association mapping approach has been undertaken. Phenotypic data were generated on the reference set (300 accessions, including 211 mini-core collection accessions) for drought tolerance related root traits, heat tolerance, yield and yield component traits from 1–7 seasons and 1–3 locations in India (Patancheru, Kanpur, Bangalore) and three locations in Africa (Nairobi, Egerton in Kenya and Debre Zeit in Ethiopia). Diversity Array Technology (DArT) markers equally distributed across chickpea genome were used to determine population structure and three sub-populations were identified using admixture model in structure. The pairwise linkage disequilibrium (LD) estimated using the squared-allele frequency correlations (r^2 ; when $r^2 \geq 0.20$) was found to decay rapidly with the genetic distance of 5 cm. For establishing marker-trait associations (MTAs), both genome-wide and candidate gene-sequencing based association mapping approaches were conducted using 1,872 markers (1,072 DArTs, 651 single nucleotide polymorphisms [SNPs], 113 gene-based SNPs and 36 simple sequence repeats [SSRs]) and phenotyping data mentioned above employing mixed linear model (MLM) analysis with optimum compression with P3D method and kinship matrix. As a result, 312 significant MTAs were identified and a maximum number of MTAs (70) was identified for 100-seed

weight. A total of 18 SNPs from 5 genes (ERECTA, 11 SNPs; ASR, 4 SNPs; DREB, 1 SNP; CAP2promoter, 1 SNP and AMDH, 1SNP) were significantly associated with different traits. This study provides significant MTAs for drought and heat tolerance in chickpea that can be used, after validation, in molecular breeding for developing superior varieties with enhanced drought and heat tolerance.

USBT-8.10

Paper Title: Allele Diversity for Abiotic Stress Responsive Candidate Genes in Chickpea Reference Set Using Gene-based SNP Markers

Author(s): Roorkiwal, M.^{1,2}, Nayak, S.N.^{1,3}, Thudi, M.¹, Upadhyaya, H.D.¹, Brunel, D.⁴, Mournet, P.⁵, This, D.⁶, **Sharma, P.C.**² and Varshney, R.K.¹

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Source: Frontiers in Plant Science, Vol. 5, (2014), pp 1-11

ISSN No.: 1664-462X

Abstract: Chickpea is an important food legume crop for the semi-arid regions, however, its productivity is adversely affected by various biotic and abiotic stresses. Identification of candidate genes associated with abiotic stress response will help breeding efforts aiming to enhance its productivity. With this objective, 10 abiotic stress responsive candidate genes were selected on the basis of prior knowledge of this complex trait. These 10 genes were subjected to allele specific sequencing across a chickpea reference set comprising 300 genotypes including 211 genotypes of chickpea mini core collection. A total of 1.3 Mbp sequence data were generated. Multiple sequence alignment (MSA) revealed 79 SNPs and 41 indels in nine genes while the CAP2 gene was found to be conserved across all the genotypes. Among 10 candidate genes, the maximum number of SNPs (34) was observed in abscisic acid stress and ripening (ASR) gene including 22 transitions, 11 transversions and one tri-allelic SNP. Nucleotide diversity varied from 0.0004 to 0.0029 while polymorphism information content (PIC) values ranged from 0.01 (AKIN gene) to 0.43 (CAP2 promoter). Haplotype analysis revealed that alleles were represented by more than two haplotype blocks, except alleles of the CAP2 and sucrose synthase (SuSy) gene, where only one haplotype was identified. These genes can be used for association analysis and if validated, may be useful for enhancing abiotic stress, including drought tolerance, through molecular breeding.

USBT-8.11

Paper Title: Genome Wide Survey of Microsatellites in ssDNA Viruses Infecting Vertebrates

Author(s): Jain, A., Mittal, N. and **Sharma, P.C**

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Gene, Vol. 552, (2014), pp 209-218

ISSN No.: 0378-1119

Abstract: Microsatellites or Simple Sequence Repeats (SSRs) are tandem iterations of one to six base pairs, non-randomly distributed throughout prokaryotic and eukaryotic genomes. Limited knowledge is available about distribution of microsatellites in single stranded DNA (ssDNA) viruses, particularly vertebrate infecting viruses. We studied microsatellite distribution in 118 ssDNA virus genomes belonging to three

families of vertebrate infecting viruses namely Circoviridae, Parvoviridae, and Anelloviridae, and found that microsatellites constitute an important component of these virus genomes. Mononucleotide repeats were predominant followed by dinucleotide and trinucleotide repeats. A strong positive relationship existed between number of mononucleotide repeats and genome size among all the three virus families. A similar relationship existed for the occurrence of DTTPH (di-, tri-, tetra-, penta- and hexa-nucleotide) repeats in the families Anelloviridae and Parvoviridae only. Relative abundance and relative density of mononucleotide repeats showed a strong positive relationship with genome size in Circoviridae and Parvoviridae. However, in the case of DTTPH repeats, these features showed a strong relationship with genome size in Circoviridae only. On the other hand, relative microsatellite abundance and relative density of mononucleotide repeats were negatively correlated with GC content (%) in Parvoviridae genomes. On the basis of available annotations, our analysis revealed maximum occurrence of mononucleotide as well as DTTPH repeats in the coding regions of these virus genomes. Interestingly, after normalizing the length of the coding and non-coding regions of each virus genome, we found relative density of microsatellites much higher in the non-coding regions. We understand that the present study will help in the better characterization of the stability, genome organization and evolution of these virus classes and may provide useful leads to decipher the etiopathogenesis of these viruses.

USBT-8.12

Paper Title: Antioxidant Defense Enzymes Activity in Hypobaric Hypoxia Susceptible and Tolerant Sprague-Dawley Rats

Author(s): Kumar, S.¹, Sharma, P.¹, Bansal, A.², Sharma, P.C.¹ and Aggarwal, K.K.¹

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Source: International Journal of Pharmaceutical Research and Analysis, Vol. 4, (2014), pp 478-483

ISSN No.: 2249-779X

Abstract: Antioxidant enzymes are known defense molecules, which eliminate reactive oxygen species (ROS) and free radicals that damage useful enzymes in the cell under various stress conditions. Significant efforts have been made to explore these antioxidant enzymes as a potential candidate for the diagnosis of certain diseases. Hypobaric hypoxia is a condition of oxidative stress leading to various diseases through the involvement of free radicals. In the present study, we have analyzed the expression of antioxidant enzymes in the plasma of male albino rats (185 ±10 g) that were segregated into hypobaric-hypoxia susceptible (HHS) and tolerant (HHT) on the basis of their 'gasp time'. After one week of normalization, both HHS and HHT rats were exposed to 30,000 ft for 1 h and sacrificed to collect the blood sample. Catalase (CAT) and peroxidase showed 3.9 and 2-fold increased enzymatic activity, respectively in HHT rats as compared to HHS rats. There was no significant difference in superoxide dismutase (SOD) activity in HHT when compared with HHS rats. Differential activity of CA and peroxidase in HHS and HHT rats under hypoxia stress was also confirmed by zymography. Thus, differential activity of these antioxidant enzymes in HHS and HHT may have a regulatory role under hypobaric hypoxic conditions.

USBT-8.13

Paper Title: Hypobaric Hypoxia-Mediated Protein Expression in Plasma of Susceptible and Tolerant Rats

Author(s): Kumar, S.¹, Sharma, P.¹, Bansal, A.², **Sharma, P.C¹** and Aggarwal, K.K¹

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Source: Indian Journal of Medical Research, Vol. 140, (2014), pp 756-765

ISSN No.: 0971-5916

Abstract: Background and objectives: Low availability of oxygen at high altitudes has a great impact on the human life processes. There is a widespread interest and need to find out protein(s) that are possibly involved in mediating tolerance to hypobaric hypoxia. We undertook this study to identify and characterize protein expression in plasma of hypoxia susceptible and tolerant rats. Methods: Male albino Sprague Dawley rats were segregated into susceptible and tolerant groups on the basis of their gasping time when exposed to simulated hypobaric hypoxia of 32,000 ft (9,754 m) at 32°C. Comparative proteome profiling of blood plasma of hypoxia susceptible and tolerant individuals was performed using 2-dimensional (2-D) gel electrophoresis. Results: Three proteins with higher expression levels were selected separately from tolerant and susceptible samples. Characterization of these proteins from tolerant sample using MALDI-TOF/TOF and MASCOT search indicated their homology with two different super-families viz. NADB-Rossmann superfamily (Rab GDP dissociation inhibitor β) and Transferrin superfamily (two Serotransferrins), having potential role in imparting tolerance against hypoxia. Three high level upregulated proteins were characterized from blood plasma of hypoxia susceptible animals showing similarity with threonine tRNA ligase (mitochondrial), carbohydrate sulphotransferase 7 and aspartate tRNA ligase (cytoplasmic) that play a role in ATP binding, carbohydrate metabolism and protein biosynthesis, respectively. Interpretation and conclusions: Our results indicated that rats segregated into hypoxia sensitive and tolerant based on their gasping time showed differential expression of proteins in blood plasma. Characterization of these differentially expressed proteins will lead to better understanding of molecular responses occurring during hypoxia and subsequently development of biomarkers for categorization of hypoxia susceptible and tolerant individuals.

USBT-8.14

Paper Title: DeepSAGE Based Identification of Differentially Expressed Genes in Response to Cold and Freeze Stress in Seabuckthorn (*Hippophae rhamnoides* L.)

Author(s): Chaudhary, S. and **Sharma, P.C.**

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: PLoS ONE, Vol. 10 (3), (2015), pp e0121982

ISSN No.: 1932-6203

Abstract: Seabuckthorn (*Hippophae rhamnoides* L.), an important plant species of Indian Himalayas, is well known for its immense medicinal and nutritional value. The plant has the ability to sustain growth in harsh environments of extreme temperatures, drought and salinity. We employed DeepSAGE, a tag-based approach, to identify differentially expressed genes under cold and freeze stress in seabuckthorn. In total 36.2 million raw tags including 13.9million distinct tags were generated using Illumina sequencing platform for three leaf tissue libraries including control (CON),

cold stress (CS) and freeze stress (FS). After discarding low quality tags, 35.5 million clean tags including 7 million distinct clean tags were obtained. In all, 11922 differentially expressed genes (DEGs) including 6539 up regulated and 5383 down regulated genes were identified in three comparative setups i.e., CON vs CS, CON vs FS and CS vs FS. Gene ontology and KEGG pathway analysis were performed to assign gene ontology term to DEGs and ascertain their biological functions. DEGs were mapped back to our existing seabuckthorn transcriptome assembly comprising of 88,297 putative unigenes leading to the identification of 428 cold and freeze stress responsive genes. Expression of randomly selected 22 DEGs was validated using qRT-PCR that further supported our DeepSAGE results. The present study provided a comprehensive view of global gene expression profile of seabuckthorn under cold and freeze stresses. The DeepSAGE data could also serve as a valuable resource for further functional genomics studies aiming selection of candidate genes for development of abiotic stress tolerant transgenic plants.

USBT-8.15

Paper Title: RNA-seq-based Transcriptome Profiling Reveals Differential Gene Expression in the Lungs of Sprague-Dawley Rats During Early Phase Acute Hypobaric Hypoxia

Author(s): Sharma, P.¹, Bansal, A.² and Sharma, P.C.¹

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Source: Molecular Genetics and Genomics, Vol. 290 (6), (2015), pp 2225-2240

ISSN No.: 1617-4615

Abstract: Individuals subjected to hypobaric hypoxia at high altitudes may exhibit differential physiological responses in terms of susceptibility and tolerance to the development of hypoxia-related disorders. We studied early-phase gene expression in the lungs of Sprague-Dawley rats exhibiting such differential physiological responses after exposure to acute hypobaric hypoxia for 1 h at a simulated altitude of 9144 m. RNA-seq transcriptome profiling of lung tissues revealed differential gene expression in tolerant and susceptible groups, subsequently validated by qRT-PCR for ten selected differentially expressed genes. The gene expression pattern indicated hypometabolism and negative regulation of vasoconstriction in all groups except susceptible rats, coupled with altered MAPK, p53 and JAK-STAT signaling. Upregulation of early-phase response genes including Dusp1 (dual specificity phosphatase), Cdkn1a (cyclin-dependent kinase inhibitor 1A), Txnip (thioredoxin-interacting protein), Rgs1 (regulator of G-protein signaling 1) and Rgs2 (regulator of G-protein signaling 2) in susceptible rats indicated a progression toward growth arrest and apoptosis. Enhanced expression of cell adhesion molecules, wound healing and repair bioprocesses was observed in tolerant males. Upregulated Kcnj15 (potassium inwardly rectifying channel subfamily j membrane 15) and Vsig4 (V-set and Ig domain containing 4) variants in tolerant females suggested adaptation to hypoxia possibly by fluid reabsorption to avoid edematous conditions and suppression of T cell proliferation to avoid acute lung inflammation. Our study might help in understanding the molecular-physiological mechanisms associated with progressive damage in the lung tissues of susceptible and tissue-protective measures in tolerant rats during acute hypobaric hypoxia.

USBT-8.16

Paper Title: Development and Use of Molecular Markers: Past and Present

Author(s): Grover, A.¹ and Sharma, P.C.²

Affiliation(s): ¹Biotechnology Division, Defence Institute of Bio Energy Research, Goraparao, P.O. Arjunpur, Haldwani, Uttarakhand; ²University School of Biotechnology, Guru Gobind Singh Indraprastha University,, Dwarka, New Delhi -110078

Source: Critical Reviews in Biotechnology, Vol. 36 (2), (2016), pp 290-302

ISSN No.: 0738-8551

Abstract: Molecular markers, due to their stability, cost-effectiveness and ease of use provide an immensely popular tool for a variety of applications including genome mapping, gene tagging, genetic diversity, phylogenetic analysis and forensic investigations. In the last three decades, a number of molecular marker techniques have been developed and exploited worldwide in different systems. However, only a handful of these techniques, namely RFLPs, RAPDs, AFLPs, ISSRs, SSRs and SNPs have received global acceptance. A recent revolution in DNA sequencing techniques has taken the discovery and application of molecular markers to high-throughput and ultrahigh-throughput levels. Although, the choice of marker will obviously depend on the targeted use, microsatellites, SNPs and genotyping by sequencing (GBS) largely fulfill most of the user requirements. Further, modern transcriptomic and functional markers will lead the ventures onto high-density genetic map construction, identification of QTLs, breeding and conservation strategies in times to come in combination with other high throughput techniques. This review presents an overview of different marker technologies and their variants with a comparative account of their characteristic features and applications.

USBT-8.17

Paper Title: Next Generation Sequencing Based Exploration of Genomes and Transcriptomes of Medicinal Plants

Author(s): Chaudhary, S. and Sharma, P.C.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Plant Physiology, Vol. 21, (2016), pp 489-503

ISSN No.: 0019-5502

Abstract: Medicinal plants are known for their therapeutic potential and have been associated with human history for their use in traditional medicine systems in different countries. Recent advances in next generation sequencing (NGS) technologies have accelerated research on medicinal plants with reduced cost and efforts. NGS technologies not only provide opportunity for high throughput whole genome sequencing, they also facilitate direct RNA sequencing. The sequence data-sets generated can further be explored for application in various areas of research such as comparative genomics, data mining for small and long non-coding RNAs, mining of molecular markers, gene discovery, etc. Continuous efforts are being made by commercial sequencing service providers in improving technology to overcome bioinformatics challenges in NGS data analysis. In recent past, genome sequence projects on various medicinal plants have been successfully accomplished and few others are in pipeline. Similarly, enormous NGS-based transcriptome data have been generated in a number of medicinal plants. In the present review, we have briefly attempted to address advancement in NGS technology, genomic and transcriptomics studies on medicinal plants with special emphasis on seabuckthorn (*Hippophae* sp.), a medicinally important plant of Indian Himalayas. Moreover, the scope of

implementation of NGS based research on medicinal plants have been explored for the selection of candidate genes involved in particular biosynthesis pathways. The identified genes can be exploited for engineering medicinal plants for producing improved quality biologically active phytochemicals.

USBT-9.01

Paper Title: Increased Levels of Circulating and Tissue mRNAs of Oct-4, Sox-2, Bmi-1 and Nanog in ESCC Patients: Potential Tool for Minimally Invasive Cancer Diagnosis

Author(s): Bahl, K.¹, Saraya, A.² and Sharma, R.¹

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Source: Biomarker Insights, Vol. 7, (2012), pp 27-37

ISSN No.: 1177-2719

Abstract: Background: Early stages of esophageal cancer lack a specific symptom, a reliable biomarker and accurate non-invasive diagnostic modalities prompting the pressing need for identification of a marker for early diagnosis of this disease. Methods: In the present study we investigated the levels of circulating and tissue mRNAs of Oct-3/4, Sox-2, Nanog and Bmi-1 in esophageal cancer patients using Reverse-Transcription Polymerase Chain Reaction (RT-PCR) with the aim of evaluating their potential as minimally invasive diagnostic markers. Result: Increased transcript levels of Oct-4, Sox-2, Bmi-1 and Nanog were detected in (92%), (95%), (75%) and (67%) of the esophageal cancer tissues, respectively as compared with the matched distant normal. Conclusion: Interestingly, most of the preneoplastic tissues exhibited increased transcript levels of these stemness markers suggesting their role in early stages of esophageal tumorigenesis. Furthermore, the detection of elevated levels of circulating mRNAs of Oct-4 and Nanog in sera of esophageal cancer patients emphasizes their potential as minimally invasive diagnostic markers for esophageal cancer.

USBT-9.02

Paper Title: siRNA-Mediated Downregulation of TC21 Sensitizes Esophageal Cancer Cells to Cisplatin

Author(s): Hasan, R.,¹ Chauhan, S.S.,¹ Sharma, R.² and Ralhan, R.^{3,4}

Affiliation(s): ¹Department of Biochemistry, All India Institute of Medical Sciences, New Delhi; ²University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Department of Otolaryngology-Head and Neck Surgery, Joseph and Mildred Sonshine Family Centre for Head and Neck Diseases, Mount Sinai Hospital, Toronto, ON M5G 1X5, Canada; ⁴Department of Pathology and Laboratory Medicine, Alex Simona Shnaider Laboratory for Molecular Oncology, Mount Sinai Hospital, Toronto, ON M5G 1X5, Canada

Source: World Journal of Gastroenterology, Vol. 18 (31), (2012), pp 4127-35

ISSN No.: 1007-9327

Abstract: Aim: To determine the functional significance of TC21 in esophageal squamous cell carcinoma (ESCC). Methods: TC21 siRNA transfection was carried out using Hyperfectamine to knock down TC21, and transcripts were analyzed by reverse transcription-polymerase chain reaction and protein by Western blotting. We demonstrated the effect of TC21 downregulation of cell signaling in esophageal cancer cells by assessing the phosphorylation status of its downstream targets,

phosphoinositide 3-kinase (PI3K), phosphatase and tensin homolog (PTEN), protein kinase B (pAkt), nuclear factor- κ B (NF- κ B) and cyclinD1 using specific antibodies. Cell survival analysis after cisplatin treatment was carried out by cell viability assay and cell cycle analysis using flow cytometry. Results: TC21 knockdown in human ESCC cell line TE13 cells, showed only a marginal increase (14.2%) in cell death compared with control cells. The expressions of the signaling proteins PI3K and pAkt, transcription factor NF- κ B, and cell cycle protein cyclin D1 were markedly decreased in response to TC21 downregulation, whereas the level of pPTEN, an antagonist of PI3K, was increased. In addition, we evaluated the potential of TC21 as a putative target for sensitizing ESCC cells to the chemotherapeutic agent cisplatin. Increased cell death (38.4%) was observed in cells treated with cisplatin after TC21 knockdown compared with cells which were treated with cisplatin alone (20% cell death). Conclusion: Results suggest that TC21 mediates its effects via the PI3K-Akt pathway, NF- κ B and cyclin D1, and enhances chemoresistance in esophageal cancer cells.

USBT-9.03

Paper Title: MIR107 (MicroRNA 107)

Author(s): Sharma, P. and Sharma, R.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Atlas of Genetics and Cytogenetics in Oncology and Haematology, Vol. 18 (8), (2014), pp 559-564

ISSN No.: 1768-3262

Abstract: Review on MIR107, with data on DNA/RNA and where the gene is implicated.

USBT-9.04

Paper Title: Decreased Levels of Circulating and Tissue miR-107 in Human Esophageal Cancer

Author(s): Sharma, P.¹, Saraya, A.², Gupta, P.¹ and Sharma, R.¹

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Gastroenterology, All India Institute of Medical Science, Ansari Nagar, New Delhi

Source: Biomarkers, Vol.18 (4), (2013), pp 322-30

ISSN No.: 1354-750X

Abstract: Context: Aberrant expression of miRNAs has emerged as an important hallmark of cancer. Objectives: We evaluated the clinical significance of circulating and tissue miR-107 expression in esophageal squamous cell carcinoma (ESCC) patients. Materials and methods: Quantitative real-time PCR was used to analyze the expression of miR-107 and its bioinformatically identified targets, PIM-1 and CDC42. Results: Significant downregulation of miR-107 was observed in neoplastic and preneoplastic esophageal tissues ($p = 0.004$). Relative levels of circulating miR-107 significantly distinguished ESCC patients from normal subjects ($p = 0.007$). Significant inverse correlation was observed between miR-107 and PIM1 expression ($r = -0.398$; $p = 0.015$) suggesting PIM1 to be the downstream target of miR-107. Discussion and conclusion: Our results, for the first time, document that the miR-107 levels may discriminate ESCC patients from healthy individuals emphasizing its diagnostic potential.

Paper Title: Slug is a Predictor of Poor Prognosis in Esophageal Squamous Cell Carcinoma Patients

Author(s): Hasan, R¹, Sharma, R², Saraya, A³, Chattopadhyay, T.K.⁴, Datta Gupta, S⁵, Walfish, P.G.^{6,7,8,9,10}, Chauhan, S.S.¹ and Ralhan, R.^{1,6,7,8,9}

Affiliation(s): ¹Department of Biochemistry, All India Institute of Medical Sciences, New Delhi; ²School of Biotechnology, Guru Gobind Singh Indraprastha University, New Delhi-110078; ³Department of Gastroenterology, All India Institute of Medical Sciences, New Delhi; ⁴Department of Gastrointestinal Surgery, All India Institute of Medical Sciences, Ansari Nagar, New Delhi; ⁵Department of Pathology, All India Institute of Medical Sciences, New Delhi; ⁶Department of Medicine, Endocrine Division, Mount Sinai Hospital and University of Toronto, Toronto, Ontario, Canada; ⁷Alex and Simona Shnaider Research Laboratory in Molecular Oncology, Department of Pathology & Laboratory Medicine, Mount Sinai Hospital, Toronto, Ontario, Canada; ⁸Department of Pathology and Laboratory Medicine, Mount Sinai Hospital, Toronto, Ontario, Canada; ⁹Joseph and Mildred Sonshine Family Centre for Head and Neck Diseases, Department of Otolaryngology, Head and Neck Surgery, Mount Sinai Hospital, Toronto, Ontario, Canada; ¹⁰Department of Otolaryngology, Head and Neck Surgery, University of Toronto, Toronto, Ontario, Canada

Source: PLoS One, Vol.18, 8(12), (2013) pp e82846

ISSN No.: 1932-6203

Abstract: Background: Slug, a regulator of epithelial mesenchymal transition, was identified to be differentially expressed in esophageal squamous cell carcinoma (ESCC) using cDNA microarrays by our laboratory. This study aimed to determine the clinical significance of Slug overexpression in ESCC and determine its correlation with clinicopathological parameters and disease prognosis for ESCC patients. Methods: Immunohistochemical analysis of Slug expression was carried out in archived tissue sections from 91 ESCCs, 61 dysplastic and 47 histologically normal esophageal tissues. Slug immunopositivity in epithelial cells was correlated with clinicopathological parameters and disease prognosis over up to 7.5 years for ESCC patients. Results: Increased expression of Slug was observed in esophageal dysplasia [cytoplasmic, 24/61 (39.3%) cases, $p = 0.001$, odd's ratio (OR) = 4.7; nuclear, 11/61 (18%) cases, $p < 0.001$, OR = 1.36] in comparison with normal esophageal tissues. The Slug expression was further increased in ESCCs [cytoplasmic, 64/91 (70.3%) $p < 0.001$, OR = 10.0; nuclear, 27/91 (29.7%) $p < 0.001$, OR = 1.42]. Kaplan Meier survival analysis showed significant association of nuclear Slug accumulation with reduced disease-free survival of ESCC patients (median disease-free survival (DFS) = 6 months, as compared to those that did not show overexpression, DFS = 18 months; $p = 0.006$). In multivariate Cox regression analysis nuclear Slug expression [$p = 0.005$, Hazard's ratio (HR) = 2.269, 95% CI = 1.289 - 3.996] emerged as the most significant independent predictor of poor prognosis for ESCC patients. Conclusions: Alterations in Slug expression occur in early stages of development of ESCC and are sustained during disease progression. Slug may serve as a diagnostic biomarker and as a predictor of poor disease prognosis to identify ESCC patients that are likely to show recurrence of the disease.

Paper Title: Mitogen Activated Protein Kinase Kinase Kinase 3 (MAP3K3/MEKK3) Overexpression is an Early Event in Esophageal Tumorigenesis and is a Predictor of Poor Disease Prognosis

Author(s): Hasan, R¹, Sharma, R², Saraya, A³, Chattopadhyay, T.K.⁴, Datta Gupta, S⁵, Walfish, P.G.^{6,7,8,9,10}, Chauhan, S.S.¹ and Ralhan, R.^{1,6,7,8,9}

Affiliation(s): ¹Department of Biochemistry, All India Institute of Medical Sciences, New Delhi; ²School of Biotechnology, Guru Gobind Singh Indraprastha University, New Delhi-110078; ³Department of Gastroenterology, All India Institute of Medical Sciences, New Delhi; ⁴Department of Gastrointestinal Surgery, All India Institute of Medical Sciences, Ansari Nagar, New Delhi; ⁵Department of Pathology, All India Institute of Medical Sciences, New Delhi; ⁶Department of Medicine, Endocrine Division, Mount Sinai Hospital and University of Toronto, Toronto, Ontario, Canada; ⁷Alex and Simona Shnaider Research Laboratory in Molecular Oncology, Department of Pathology & Laboratory Medicine, Mount Sinai Hospital, Toronto, Ontario, Canada; ⁸Department of Pathology and Laboratory Medicine, Mount Sinai Hospital, Toronto, Ontario, Canada; ⁹Joseph and Mildred Sonshine Family Centre for Head and Neck Diseases, Department of Otolaryngology, Head and Neck Surgery, Mount Sinai Hospital, Toronto, Ontario, Canada; ¹⁰Department of Otolaryngology, Head and Neck Surgery, University of Toronto, Toronto, Ontario, Canada

Source: BMC Cancer, Vol. 14 (2), (2014), pp 1-7

ISSN No.: 1471-2407

Abstract: Background: Mitogen-activated protein kinase kinasekinase 3 (MAP3K3/MEKK3) was identified to be differentially expressed in esophageal squamous cell carcinoma (ESCC) using cDNA microarrays by our laboratory. Here in we determined the clinical significance of MEKK3 in ESCC. Methods: Immunohistochemical analysis of MEKK3 expression was carried out in archived tissue sections from 93 ESCCs, 47 histologically normal and 61 dysplastic esophageal tissues and correlated with clinicopathological parameters and disease prognosis over up to 7.5 years for ESCC patients. Results: MEKK3 expression was significantly increased in esophageal dysplasia and ESCC in comparison with normal mucosa (ptrend< 0.001). Kaplan Meier survival analysis showed significantly reduced median disease-free survival median DFS = 10 months in patients with MEKK3 positive ESCCs compared to patients with no immunopositivity (median DFS = 19 months, p = 0.04). ESCC patients with MEKK3 positive and lymph node positive tumors had median DFS = 9 months, as compared to median DFS = 21 months in patients who did not show the alterations (p = 0.01). In multivariate Cox regression analysis, combination of MEKK3 overexpression and node positivity [p = 0.015, hazard ratio (HR) = 2.082, 95% CI = 1.154 - 3.756] emerged as important predictor of reduced disease-free survival and poor prognosticator for ESCC patients. Conclusions: Alterations in MEKK3 expression occur in early stages of development of ESCC and are sustained during disease progression; MEKK3 in combination with lymph node positivity has the potential to serve as adverse prognosticator in ESCC.

USBT-9.07

Paper Title: Increased Levels of Sperm Protein 17 mRNA and Circulating Antibodies in Periapullary Carcinoma Patients

Author(s): Singh, S.¹, Saraya, A.² and Sharma, R.¹

Affiliation(s): ¹University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Gastroenterology, All India Institute of Medical Science, Ansari Nagar, New Delhi

Source: International Journal of Clinical Oncology, Vol. 20 (4), (2015), pp 736-44

ISSN No.: 1341-9625

Abstract: Background: Present-day diagnostic modalities for detecting periapullary carcinoma are suboptimal, and currently used proven markers lack specificity and sensitivity. Methods: In order to assess the diagnostic potential of sperm protein 17, a cancer testis antigen, quantitative real-time PCR was performed to evaluate the expression of sperm protein 17 in tissue and sera specimens collected from periapullary carcinoma patients and normal subjects. Additionally, circulating levels of anti-sperm protein 17 antibodies were determined in sera of periapullary carcinoma patients and normal subjects using ELISA. Results: Aberrant expression of sperm protein 17 was found in 14/15 (93 %) periapullary cancer tissues when compared with distant matched nonmalignant tissues (P = 0.006, Mann-Whitney U test). None of the distant matched nonmalignant tissues showed increased expression of sperm protein 17 mRNA. Area under the curve, sensitivity, and specificity were 0.791, 87, and 73 %, respectively. Increased levels of sperm protein 17 mRNA were demonstrated in sera of periapullary carcinoma patients (P = 0.020, Student's t test). Circulating levels of anti-sperm protein 17 antibody were found to be significantly elevated in 27/30 (90 %) periapullary carcinoma patients (P < 0.001, Student's t test). Area under the curve, sensitivity, and specificity were 0.954, 86.7, and 96.3 %, respectively. Only two of the normal subjects (7 %) showed elevated levels of anti-sperm protein 17 antibody. Conclusion: For the first time, our findings suggest that high levels of sperm protein 17 mRNA as well as increased circulating anti-sperm protein 17 antibodies can be used to distinguish periapullary cancer patients from healthy individuals, highlighting the diagnostic potential of sperm protein 17.

USBT-9.08

Paper Title: miRNA-mRNA Crosstalk in Esophageal Cancer: From Diagnosis to Therapy

Author(s): Sharma, P. and Sharma, R.

Affiliation(s): University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Critical Reviews in Oncology/ Hematology, Vol. 96 (3), (2015), pp 449-62

ISSN No.: 1040-8428

Abstract: The asymptomatic nature of esophageal cancer (EC) at early stages results in late clinical presentation leading to poor prognosis and limited success of therapeutic modalities. Efforts to identify diagnostic/prognostic markers have proven to be unsuccessful for translation into clinics. Hence, there is a pressing need for establishment of novel non-invasive biomarker for early diagnosis/better prognosis of EC. Recently, alteration in microRNA (miRNA) expression has emerged as an important hallmark of cancer. This review summarizes the differential expression of miRNAs in EC and addresses how their aberrant expression influences crucial biological processes such as apoptosis, cell proliferation, invasion and metastasis. Additionally, this review highlights the current status of circulating miRNA-based

diagnostic/prognostic markers. An effort has been made to find a connection between different miRNAs involved in EC and a detailed analysis has been done to screen out microRNAs involved in prognosis and multidrug resistance. Further, investigation of these miRNAs would not only provide a gene therapy-based strategy to prevent/treat cancer but also to reverse multidrug resistance leading to decreased requirement of harmful chemotherapeutic drugs.

**UNIVERSITY SCHOOL OF
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USEM-1.01

Paper Title: Fuelwood Dependence Around Protected Areas: A Case of Suhelwa Wildlife Sanctuary, Uttar Pradesh

Author(s): Jaiswal, J. and **Bhattacharya, P.**

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Human Ecology, Vol. 42(2), (2013), pp 177-186

ISSN No.: 2456-6608

Abstract: Forests have been very important natural resource for rural livelihood in India providing variety of products and services. In most Indian villages, local people are heavily dependent on forests mainly for fuelwood which is the only dependable energy alternative they have, sometimes it also works as potential cash earning sources for households. This paper examines the nature and extent of fuelwood dependence in the protected area of Suhelwa Wildlife Sanctuary and its buffer area by local people living in nearby villages. In this study, a field survey of 1636 households from 55 villages located within 5 kilometres proximity to forest was conducted for collecting primary data about the basic household's attributes, fuel use pattern, dependency on fuelwood, consumption and collection pattern of fuelwood. Simple descriptive methods are used to analyse the data. The result shows that fuelwood contributes 91.6% of total domestic fuel requirement for cooking in the study area. While comparing various rural energy sources, fuelwood ranked first, followed by dung cakes and crop residues. Similarly the average monthly consumption figures were also high for fuelwood that was 426 kg, 113 kg for animal dung and 69 kg for crop residues while the monthly consumption figure for LPG was found to be 16 kg amongst the LPG users. The mean consumption of fuelwood per capita in the area was 1.8 kg per day while mean consumption per household was 14.2 kg per day. The result shows that fuelwood availability, collection and consumption depend on the family size, distance from forest area, transportation opportunity and economic condition of the household. Nearly 87% of the households fulfil their fuelwood requirement completely from forest while rest procure it from various sources like home gardens, roadside trees, from agricultural farms. After the establishment of the Wildlife Sanctuary local people are facing serious problems in collection of fuelwood from native forests, which has initiated some conflict with the Forest Department.

USEM-1.02

Paper Title: Presence and Effectiveness of Material Benefit Provisions under Joint Forest Management in India: the Cases of World Bank-aided Village Forest Committees in Madhya Pradesh

Author(s): Ota, M.¹, Antil, S.², **Bhattacharya, P.**³ and Masuda, M.⁴

Affiliation(s): ¹Embassy of Japan in Indonesia, Jl. M.H. Thamrin No. 24, Jakarta 10350, Indonesia; ²Delhi Pollution Control Committee, ISBT Building, Kashmere Gate, Delhi-110 006; ³University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ⁴Faculty of Environmental Sciences, University of Tsukuba, Tennodai 1-1-1, Tsukuba, Ibaraki-305-8572, Japan

Source: Forests, Trees and Livelihoods, Vol. 23(3), (2014), pp 159-174

ISSN No.: 1472-8028

Abstract: Provision of material benefits by external agencies has been widely adopted in developing countries' forest management, although their effectiveness in improving local livelihoods and conservation has been controversial. We provide empirical

evidence of the presence and effectiveness of material benefit provisions under Joint Forest Management in a forest division of Madhya Pradesh State, India. We conducted an extensive survey of 18 World Bank-aided Village Forest Committees and case studies of two committees, one tribal and one non-tribal. Material benefit provisions by the forest department were the most predominant type of economic activity. Provisions were dispensed in a top-down manner lacking communication and facilitation, and consequently were not sufficiently effective in improving local livelihoods and conservation, especially in tribal communities. The policy implications we derived are the following: the provision of material benefits should be properly explained to beneficiaries for them to be effective as conservation incentives, technical assistance for the maintenance of the dispensed materials should be provided by village development specialists, and collective forest-based activities should be gradually promoted so that beneficiaries gain a sense of ownership for forest resources and programs. These improvements should be implemented with particular attention to disadvantaged or marginalized populations.

USEM-1.03

Paper Title: Influence of Macro-scale Environmental Variables on Diversity and Distribution Pattern of Lichens in Badrinath Valley, Western Himalaya

Author(s): Gupta, S.^{1,2}, Khare, R.^{1,3}, Rai, H.^{1,3}, Upreti, D. K.³, Gupta, R. K.¹, Sharma, P. K.², Srivastava, K.⁴ and **Bhattacharya, P⁵**

Affiliation(s): ¹Department of Botany Pt. L.M.S. Government Post Graduate College, Rishikesh (Dehradun), Uttarakhand-249201; ²Department of Environmental Science, Graphic Era University, 566/6, Bell Road, Clement Town, Dehradun, Uttarakhand-248002; ³Lichenology laboratory; Plant Diversity, Systematics and Herbarium Division; CSIR-National Botanical research Institute, Lucknow, Uttar Pradesh-226001; ⁴Information System and Services Division, Indian Meteorological Department, Ministry of Earth Sciences, Mausam Bhavan, Lodhi Road, New Delhi-110003; ⁵University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Mycosphere, Vol. 5(1), (2014), pp 229–243

ISSN No.: 2077-7019

Abstract: Morphological growth forms confer ecological adaptability to lichens species and are indicators of habitat conditions and various climatic as well as zooanthropogenic pressures. Lichens samples from six sites in two locations of Badrinath valley were studied in order to assess the influence of macro-scale environmental variables (i.e. altitude, relative humidity and temperature) on diversity and distribution of lichens, using ordination (PCA and hierarchical clustering) and correlation analysis. The study recorded 106 lichen species in the valley. Parmeliaceae was a dominant family. Lichen species constitution in sites resulted in different groups, which were determined by the dominant growth forms and substrate preferences. Lichen growth form distribution was significantly correlated with studied macro-scale environment variables. On rock (saxicolous) substrate was the main substrate of lichen inhabitancy in the valley. The study concluded that macro-scale environmental variables play determining role in lichen community constitution of alpine habitats in Himalayas

USEM-1.04

Paper Title: Urban Biodiversity Green Spaces in Delhi: A Comparative Study of New Settlement with Lutyens' Delhi

Author(s): Bhalla, P. and Bhattacharya, P.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: Journal of Human Ecology, Vol. 52(1&2), (2015), pp 83-96

ISSN No.: 2456-6608

Abstract: The paper presents a comparative scenario of green space planning in Lutyens' Delhi, an old colonial area, with the Dwarka sub-city of Delhi. A mixed methods approach using field based surveys and questionnaires for randomly selected residential areas, parks and roads was employed to understand the urban tree species distribution, its planning and management practices and the people's perception regarding urban forestry. Urban trees encountered in Lutyens' Delhi appeared quite diverse, with 125 species as compared to 26 species in Dwarka. In Dwarka, shisham (*Dalbergia sissoo*) and jamun (*Syngizium cumini*) together constitute about three-fourth of the total population of the sampled avenue trees, whereas neem (*Azadirachta indica*) and imli (*Tamarindus indica*) constitute about half of the total sampled avenue trees in Lutyens' Delhi. Further, species selection is compromised in lieu of fast growing tree species. Though awareness related to benefits of urban trees was found high among sampled residents, low faunal biodiversity remains a bigger concern. Census and periodic monitoring of urban trees besides expansion of green spaces, while formulating infrastructure related policies can improve the urban forestry status of Delhi

USEM-1.05

Paper Title: Population Structure and Regeneration Study in Forests of Bareilly and Sohagpur, Madhya Pradesh, India

Author(s): Devi, S. and Bhattacharya, P.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: Indian Journal of Tropical Biodiversity, Vol. 23(1), (2015), pp 106-112

ISSN No.: 0971-4642

Abstract: The study deals with the phytosociological analysis and regeneration status of tree species in the forests of Bareilly Range and Sohagpur Range in Madhya Pradesh, India. The tree density varied between 1095/ha to 1050/ha. The value of Shannon-Weaver index (H') varied between 2.26 and 2.71, which falls in line with the diversity value of temperate forests rather than tropical forest. Seedling and sapling density per hectare was low for Sohagpur, where forest floor is dominated by the invasive species *Lantana camara*. Few species like *Sterculia urens*, *Terminalia chebual*, *Terminalia arjuna* and *Soymida febrifuga* that are important as non-timer forest product species have shown critically low regeneration raising serious questions about the availability and supply of these NTFPs in near future.

USEM-1.06

Paper Title: Sound Levels Assessment in An Ecotourism Destination: A Case Study on Binsar Wildlife Sanctuary of Indian Himalayan Region

Author(s): Bhalla P., **Bhattacharya, P.**, and Gupta, N.C.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Scientific and Research Publications, Vol. 5(7), (2015), pp 1-7

ISSN No.: 2250-3153

Abstract: Travelling to relatively pristine or natural areas is rapidly growing among visitors worldwide, which not only stimulates impacts on landscape and its wildlife but affects the visitors 'experience -as well. Considering sound associated with anthropogenic activities as an impact causing indicator, the present study reports and discusses the result of monitoring sound levels in Binsar Wildlife Sanctuary, an ecotourism destination situated in mid of Kumaon Himalayas. The equivalent sound pressure level (Leq) was determined both in presence and absence of visitors, at key locations within high usage tourism sites of different zones of Binsar. The results indicated that the ambient noise level remains within the prescribed standard limit being stable around 50 dB in the absence of visitors, which increases up to 70dB in the presence of visitors. Using LN statistics five sites reported to exceed 50 dB of sound level for 10% of the recorded time. The outcome suggests non-violation of standard limits within sanctuary; however, it necessitates control of visitor activities by sanctuary management at locations where animal habitats exist, considering increasing visitation.

USEM-1.07

Paper Title: Lichen as a Bio-Indicator Tool for Assessment of Climate and Air Pollution Vulnerability: Review

Author(s): Kuldeep, S.¹ and **Bhattacharya, P.**²

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Source: International Journal of Environmental Sciences. Vol. 4(12), (2015), pp 107-117

ISSN No.: 2319-1414

Abstract: The study of climate change and air pollution is very important in present circumstances throughout the world. Several methods including biological methods are being used for monitoring of environment to assess the climate and air pollution vulnerability. Among the biological methods the use of lichens as a bio-indicator has been very popular for such studies. Lichen, being a natural indicator of climate change and air pollution effects, is very useful for these studies particularly in mountain region. Therefore, a review of the work done in different parts of the world to study the climate change, air pollution and heavy metals using lichen as natural indicator has been presented and the gap areas have been identified for further studies in connection to climate change and air pollution vulnerability using lichen as an indicator.

USEM-1.08

Paper Title: Water Predicament at Mountain Ecotourism Destination: The Binsar Wildlife Sanctuary Case

Author(s): Bhalla, P. and **Bhattacharya, P.**

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-11078

Source: Indian Journal of Applied Hospitality and Tourism Research, Vol. 8, (2016), pp 20-30

ISSN No.: 0975-4954

Abstract: This paper focuses on the inevitable impact of tourism on the natural water resource of the mountain destination situated in the middle Indian Himalayan Region. With the shrinking Binsar's broad leaf oak (*Quercus* sp.) forest, having pivotal role in water regulation, the Binsar Wildlife Sanctuary was established for its conservation. After sanctuary declaration the nature-based tourism started engulfing the landscape, creating impacts. Therefore, this particular study was taken to examine the surface freshwater natural resource condition in Binsar through review of fresh water direct consumption in tourism from both quantitative and qualitative viewpoints. Water pollution sources were identified and present water quality of natural water sources was assessed. The sampling was done during the 2014 peak tourism season (April to June) and within the four different designated zones of Binsar WLS. A total of 18 water samples from natural water springs (control) and from hotel effluents (impact) were obtained and tested for physicochemical and microbiological analysis. Suitability of water for drinking purpose was also subsequently derived. Physicochemical parameters were determined using field-based water testing instrument whereas; the microbiological parameters were tested in laboratory and reported for either presence or absence only. The obtained values were compared with the World Health Organisation water quality standards and interpretations made. Results indicate tourist accommodation as significant contribution in contaminating Binsar's spring water. All control samples showed presence of bacterial contamination, highlighting anthropogenic pressures on this landscape, suggesting it unfit to drink without purification or proper treatment; seldom practiced presently. Responsibility of taking adequate water resource management steps among all concerned stakeholders is required, if (eco) tourism industry has to survive.

USEM-1.09

Paper Title: Risk Assessment of Benzene in Ambient Air of Delhi

Author(s): Garg, A.¹, Tyagi, S. K.² and **Bhattacharya, P.**¹

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078; ²Central Pollution Control Board (MoEFCC), Parivesh Bhawan, East Arjun Nagar, New Delhi-110032

Source: International Journal of Current Research, Vol. 8(8), (2016), pp 37532-37538

ISSN No.: 0975-833X

Abstract: Globally different countries in the world use environmental risk assessment as a tool to evaluate the toxicity of a pollutant in the environment. Health risk assessment is done to evaluate the possible adverse health effects of benzene on human health. The concentration of benzene was measured at two locations in Delhi, a global city, during 2011-2015. The cancer risk in ambient air of Delhi was calculated at CEXPavg, CEXP50, and CEXP90. From the year 2011 to 2015 at CEXPavg and CEXP50 cancer risk varies from 1.71 to 9.26 per 10⁶ and at CEXP90 cancer risk

varies from 3.9 to 24.12 per 106 which were higher in comparison with mean and median concentrations. The cancer risk calculated in this study is comparable with the studies conducted in Kolkata, India and few other European countries. The annual average exposure concentration of benzene ranges from 3.02 µg/m³ in 2015 to 16.3 µg/m³ in 2011. The mean value found in 2015 was less than National Ambient Air Quality Standards (NAAQS) of benzene i.e. 5µg/m³. Our study revealed that there is a decrease in the level of benzene from 2011 to 2015 at two locations in Delhi which may be attributed to the implementation of Auto Fuel Policy 2003, by the Government in reducing benzene contents in the gasoline from the source and subsequent environmental measures in Delhi.

USEM-1.10

Paper Title: Homestays 'Contribution to Community-based Ecotourism in the Himalayan Region of India

Author(s): Bhalla P.¹, Coghlan, A.² and Bhattacharya, P.¹

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078; ²Department of Tourism, Sport and Hotel Management, Griffith University, Gold Coast, Australia

Source: Tourism Recreation Research, Vol. 41(2), (2016), pp 213-228

ISSN No.: 2320-0308

Abstract: This article investigates how villagers' participation in the homestay programme can influence attitudes and behaviours related to ecotourism objectives within a wildlife sanctuary. Initially, it provides a historical context of the development of the homestay programme within the Binsar Wildlife Sanctuary, situated in Kumaon Hills of the Indian Himalayan region using a case-study approach. Based on interviews with each household head conducted within the Sanctuary, the paper explores the links between villagers' homestay involvement, attitudes, and behaviours related to the Sanctuary's ecotourism objectives. The findings suggest that contextual variable such as occupation significantly influences villagers' attitudes towards the homestay programme while human-wildlife interactions additionally influence the villagers' attitudes towards ecotourism development. Furthermore, positive attitudes towards homestays have been manifested as positive ecotourism-directed behaviours resulting in villagers' engagement in public-private partnerships, their involvement in tourism-related cultural programmes and willingness to contribute towards nature interpretation activities to support ecotourism objectives in the Sanctuary. While the homestay programme has encouraged local guardianship behaviour, opportunities to improve and expand conservation efforts with the help of communities in the region could be further developed, and require greater cooperation from concerned stakeholders in both public and private sectors.

USEM-2.01

Paper Title: Ecological Observations on the Indian Spiny-tailed Lizard *Saara hardwickii* (Gray, 1827) (Reptilia: Squamata: Agamidae) in Tal Chhapar Wildlife Sanctuary, Rajasthan, India

Author(s): Das, S.K.¹, Dookia, S.¹, Das, K.¹ and Dutta, S.K.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Centre for Ecological Sciences, New Biological Sciences Building, Indian Institute of Science, Bengaluru, Karnataka-560012

Source: Journal of Threatened Taxa, Vol. 5(1), (2013), pp 3516-3526

ISSN No.: 0974-7907

Abstract: Observations on the Indian spiny-tailed lizard *Saara hardwickii* (Gray, 1827) were undertaken in Tal Chhapar Wildlife Sanctuary, Rajasthan, India during the monsoons (July) following quadrat sampling that was time-constrained. The study revealed that the area is one of the preferable habitats for the species. A population analysis showed that the relative abundance of the subadults was higher, followed by juveniles and adults during the study period. The beginning of activity of the lizards was found to vary over the study period depending on prevailing weather conditions. The activity pattern was bimodal, except across rain events. The study revealed two important ecological findings about these lizards; complete sealing of burrow during rains which differed from partial sealing on normal days and complete diurnal cycle of body colour changes during the monsoon. Feeding was the predominant activity of this lizard followed by basking, resting and chasing each other. The adult lizards were found to be strictly herbivorous, in spite of an abundance of insects available in the area during the period. Subadults and juveniles were found to eat both plant parts, as well as insects. Microhabitat use such as inside grass clumps was found to be higher followed by barren ground, under shade and on stones.

USEM-2.02

Paper Title: Three New Species of *Idiops* Perty, 1833 (Araneae: Idiopidae) from India.

Author(s): Gupta, N.¹, Ganeshkumar, M.², Das, S.K.¹ and Siliwal, M.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Forest College and Research Institute, Tamil Nadu Agriculture University, Coimbatore-641003, Tamil Nadu; ³Wildlife Information Liaison Development Society, 9-A, Lal Bahadur Colony, Peelamedu, Coimbatore 641004, Tamil Nadu

Source: Zootaxa, Vol. 3635(3), (2013), pp 237-250

ISSN No.: 1175-5334

Abstract: Three new species of the front-eyed trapdoor genus *Idiops*, viz., *Idiops joida* sp. nov. from the Western Ghats of Karnataka, *I. mettupalayam* sp. nov. from the foothills of the Western Ghats in Tamil Nadu and *I. oriya* sp. nov. from Odhisa, are described. Natural history information for all these species is provided as an identification key to *Idiops* species from South and Southeast Asia.

USEM-2.03

Paper Title: Preliminary Checklist of Spiders of Keoladeo National Park, Bharatpur, Rajasthan with First Record of *Ptocasius strupifer* Simon, 1901 (Araneae: Salticidae) from India

Author(s): Kaur, M.¹, Das, S.K.¹, Anoop, K.R.² and Siliwal, M.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Director, Keoladeo National Park, Bharatpur-321001, Rajasthan; ³Wildlife Information Liaison Development Society, 9-A, Lal Bahadur Colony, Gopalnagar, Peelamedu, Coimbatore 641004, Tamil Nadu

Source: Munis Entomology and Zoology, Vol. 9(1), (2014), pp 501-509

ISSN No.: 1306-3022

Abstract: A preliminary checklist of spiders of the Keoladeo National Park (KNP), Bharatpur, Rajasthan is provided here based on a short term study undertaken in June-July, 2011. A total 30 species belonging to 26 genera and 11 families were recorded from the area, which forms a baseline information for spiders of KNP. Among these, Salticidae, Araneidae and Lycosidae families were found to be dominant in the area. *Ptocasius strupifer* Simon, 1901 was first time reported from India during the study, for which we provide taxonomic description in this paper. The study also revealed association of a red mite exclusively on bodies of particular spider species during the period.

USEM-2.04

Paper Title: An Unusual Observation on Searching for a Missing Young One and Parental Provisioning in Purple Sunbird (*Nectarinia asiaticus* Latham, 1790)

Author(s): Saini, K.C.¹ and Das, S.K.²

Affiliation(s): ¹Modi Institute of Technology and Science, Lakshmangarh, Sikar, Rajasthan-332311; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Science, Environment and Technology, Vol. 3(2), (2014), pp 630-633

ISSN No.: 2278-3687

Abstract: Here we provide an observation on searching by the parents of purple sunbird (*Nectarinia asiaticus* Latham, 1790) for their missing young one followed by parental provisioning by them. This case was unusual as both the parents were searching the young one even after one day past and the female parent fed the young one freely sitting on the hand of the young bird's care taker. The observation also confirms that both the parents of this bird provide parental care. The juvenile bird was reaching the fledging stage and in the entire observation it was fed by the female parent alone; that supports that the male parent withdraws himself from feeding activity as the young reaches the fledging state.

USEM-2.05

Paper Title: An Attitude Assessment of Human-elephant Conflict in a Critical Wildlife Corridor within the Terai Arc Landscape, India

Author(s): Jasmine, B.¹, Ghose, D.² and Das, S.K.³

Affiliation(s): ¹Sustainable Development and Conservation Biology, 1213E H.J. Patterson Hall, University of Maryland, College Park, MD 20742-3281, USA; ²World Wide Fund for Nature-India, Lodhi Road, Lodi Estate, New Delhi-110003; ³University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Threatened Taxa, Vol.7(2), (2015), pp 6843-6852

ISSN No.: 0974-7907

Abstract: This study entails an attitude assessment of the local people living at Mankanthpur Village, one of the bottlenecks in the Bailparao-Kotabagh corridor, Terai West Forest Division, on the issue of elephant conservation, human-(wildlife) elephant

conflict, and the measures to mitigate it. Data was collected through a questionnaire survey and several group discussions among the villagers. The frequency of crop raids and group size of elephants were calculated. Sixty-two crop raids took place during the study period (February–April 2010), and a mean sighting of 1.08 elephants per day was recorded. Data from the survey reflects that about 3.53ha of crop land was damaged by the elephants during the survey period. The people residing on the fringes of the park and in the villages along the Bailparao-Kotabagh Corridor were surveyed about the conflict impact. Survey results indicate that the most effective management measures used were a combination of loud noise and scaring away elephants using fire. Local peoples' views regarding the current status of elephant raids and conservation were also documented. Peoples' reaction to compensation schemes was studied; 89% of the respondents feel an effective approach to compensation is a way to reduce sufferings due to conflict with wildlife. Attempts to reduce the conflict by forming local elephant control teams and enclosing the affected village with a tall cemented wall are under trial. The underlying assumption in this study is that if damage severely affects the livelihood of local communities, getting their active support, which is essential for conservation, will be difficult.

USEM-2.06

Paper Title: Assessment and Impact of Industrial Effluents on River Yamuna Ecosystem

Author (s): Rajlaxmi.¹, Arya, S.¹, Sultana, A.² and Das, S.³

Affiliation(s): ¹Institute of Environment and Development Studies, Bundelkhand University, Jhansi, UP-284128; ²Centre for Environmental Management of Degraded Ecosystems, School of Environmental Studies, Delhi University, New Delhi-110007; ³University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Current Research, Vol. 7(9), (2015), pp 19956-19963

ISSN No.: 0975-833X

Abstract: The water of river Yamuna caters to diverse needs for the survival of the people. With rapid expansion of industrialization and urbanization the quality of the river is severely affected due to indiscriminate discharge of untreated industrial sludge and some extent to mixing of domestic wastewater with free flowing obnoxious effluents containing multi-level heavy metals, pesticides residue, disinfectants and their byproducts contaminants from the drains into the river which are badly affecting river's overall ecology. Due to the absence of proper disposal facilities for effluents which directly disposed off onto surrounding land, surface water and even groundwater along the bank of river Yamuna through drains without recommended treatment. As a result of this, hazardous chemicals and metal ions will seep into the groundwater and devastate the water quality across huge areas, and finally leads to serious effects on the health, and the harvest, of the river Yamuna. Hence, the broad concept of healthy river Yamuna ecosystem and lack of proper management needs the research work to assess the concentration level of industrial effluents, distribution and enrichment of contaminated heavy metals which shows their bio-toxic impacts on biodiversity and also highlighted the deterioration of water quality of river Yamuna.

USEM-2.07

Paper Title: Spider (Arachnida: Araneae) Fauna of Delhi with First Description of Cobweb Spider *Argyrodes bonadea* (Karsch, 1881) from India

Author(s): Malik, S.¹, Das, S.K.¹ and Siliwal, M.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Wildlife Information Liaison Development Society, 96 Kumudham Nagar, Villankurichi Road Coimbatore-641035, Tamil Nadu

Source: Indian Journal of Arachnology, Vol. 4(2), (2015), pp 31-36

ISSN No.: 2278-1587

Abstract: The present study deals with spider inventory in Delhi carried out from 2012 to 2015. During the study 26 species of spiders belonging to 26 genera and 12 families were added to the existing spider fauna of Delhi. After the present study, the spider fauna of Delhi comprises a total of 51 species belonging to 41 genera and 15 families. Among these, species richness was found to be highest for family Araneidae (13 spp.) followed by Salticidae (9 spp.), and Lycosidae (6 spp.). One species of a cobweb spider *Argyrodes bonadea* (Karsch, 1881) was first time reported from India and taxonomic description of the species is provided here. This paper also gives information about distribution of spiders so far reported from Delhi.

USEM-2.08

Paper Title: Natural History of the Trapdoor Spider *Idiops joida* et al 2013 (Araneae: Idiopidae) from the Western Ghats in India

Author(s): Gupta, N.¹, Das, S.K.¹ and Siliwal, M.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Wildlife Information Liaison Development Society, 96 Kumudham Nagar, Villankurichi Road Coimbatore 641035, Tamil Nadu

Source: Journal of Asia Pacific Biodiversity, Vol. 8, (2015), pp 38-42

ISSN No.: 2287-884X

Abstract: We studied the habitat preferences and burrow characteristics of trapdoor spiders, *Idiops joida* Gupta et al 2013, within Dandeli Wildlife Sanctuary and nearby reserve forests of Uttara Kannada district of Karnataka, Western Ghats, India, from January 2010 to April 2010. We sampled 293 plots using 5 m² quadrats, randomly placed in six habitat types at four localities. Spiders showed patchy distribution throughout the study area. The density of *I. joida* was highest in uncanopied habitats having sparse vegetation or bare grounds. Steep slopes were strongly preferred by spiders. Burrow characteristics of *I. joida*, such as burrow diameter, depth, and lid thickness, were independent of habitat type.

USEM-2.09

Paper Title: A New Spider Species of the Genus *Stenaelurillus* Simon, 1886 (Araneae: Salticidae: Aelurillinae) from India

Author(s): Vidhel, B. P.¹, Malik, S.¹, Sabata, B.C.² and Das, S.K.¹

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Environment, Government of N.C.T. Delhi

Source: International Journal of Science and Research, Vol. 4(7), (2015), pp 2332-2336

ISSN No.: 2319-7064

Abstract: A new jumping spider species of the genus *Stenaelurillus* Simon, 1886, *S. jagannathae* sp. nov. is described from Delhi, India. A detailed taxonomic description of both the sexes is provided here along with the natural history information. Also keys for *Stenaelurillus* species of Asia is provided in this paper.

USEM-2.10

Paper Title: A Preliminary Report on the Bat (Chiropteran: Mammalia) Fauna of Sariska National Park, Rajasthan, India

Author(s): Joshi, M.¹, Das, S.K.¹ and Kataria, P.S.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Zoology, Government Dungar College, Bikaner, Rajasthan

Source: International Journal of Fauna and Biological Studies, Vol. 2(4), (2015), pp 86-88

ISSN No.: 2347-2677

Abstract: More than 1125 bat species are found worldwide and India supports 119 species; of which 26 species are reported from Rajasthan. In Rajasthan, except Thar desert portion, documentation of this faunal group is either lacking or very poor in other parts of Rajasthan including Sariska National Park, Alwar. The present study reports 3 bat species from Sariska National Park that provides baseline data about chiropteran fauna of this Protected Area. With this reporting the chiropteran fauna of Alwar district also goes up to 8 species.

USEM-2.11

Paper Title: First Description of Male Lynx Spider *Oxyopes bharatae* Gajbe, 1999 (Araneae: Oxyopidae)

Author (s): Malik, S.¹, Das, S.K.¹ and Siliwal, M.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Wildlife Information Liaison Development Society, 9-A, Lal Bahadur Colony, Gopalnagar, Peelamedu, Coimbatore-641004, Tamil Nadu

Source: Munis Entomology and Zoology, Vol. 11(2), (2016), pp 473-476

ISSN No.: 1306-3022

Abstract: The male of lynx spider *Oxyopes bharatae* Gajbe, 1999 is first time described here along with detailed taxonomic description of female. Also natural history of the species is provided.

USEM-2.12

Paper Title: First Report of Cobweb Spider *Phycosoma altum* (Keyserling, 1886) from Asia

Author(s): Malik, S.¹, Das, S.K.¹ and Siliwal, M.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Wildlife Information Liaison Development Society, 96 Kumudham Nagar, Villankurichi Road Coimbatore-641035, Tamil Nadu

Source: Journal of Entomology and Zoology Studies, Vol. 4(5), (2016), pp 1094-1095

ISSN No.: 2320-7078

Abstract: The cobweb spider *Phycosoma altum* was previously reported from Mexico to Brazil and Hawaii. In this paper, we report male of *P. altum* from India and with this report the distribution range of this species extends from America to Asia. Taxonomic description of the male is provided here along with the natural history information.

USEM-2.13

Paper Title: Moth (Lepidoptera: Heterocera) Fauna of Delhi with Notes on Their Role as Potential Agricultural Pests

Author(s): Paul, M.¹, Das, S.K.¹, Singh, R.¹ and Shashank, P.R.².

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Division of Entomology, Indian Agricultural Research Institute (ICAR), Pusa, New Delhi- 110012

Source: Journal of Entomology and Zoology Studies, Vol. 4(2), (2016), pp 435-438

ISSN No: 2320-7078

Abstract: The present study deals with moth inventory in Delhi carried out from 2014 to 2015. During the study 36 species of moths belonging to 31 genera and 7 families were added to the existing moth fauna of Delhi. After the present study, the moth fauna of Delhi comprises a total of 47 species belonging to 42 genera and 9 families. Among these, species richness was found to be highest for family Noctuidae (17 spp.) followed by Erebidae (11 spp.) and Sphingidae (6 spp.). The paper also provides information about moths acting as potential agricultural pests of common vegetables and crops of Delhi region based on secondary data

USEM-3.01

Paper Title: Ecology of Indian Fox *Vulpes bengalensis* (Shaw, 1800) In and Around Tal Chhapar Wildlife Sanctuary, Rajasthan, India

Author(s): Dookia, S., Das, S.K. and Rajlakshmi

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Forester, Vol.138(10), (2012), pp 891-896

ISSN No.: 0019-4816

Abstract: The present study deals with ecological observations on Indian fox (*Vulpes bengalensis*) in the Tal Chhapar Wildlife Sanctuary, Rajasthan during monsoon season that coincides with pup rearing period of this animal. Though the sanctuary holds a small population of about three breeding pairs of Indian fox, it serves as a safe breeding ground for source population of the nearby areas. The study showed if the temperature is mild and food is abundant, as on rainy days, the fox may also hunt at mid-day and show bimodal activity in the absence of large predators and any kind of other disturbances. During pup rearing season, most of the time the animal spent in sitting/resting, followed by searching for food and other minor activities. Parental

care also found in this animal. Preference for particular den opening by the adults was observed for entry and exist which suggests that adults are well versed of their dens to escape from their predators. Both from food availability sampling and scat analysis, insects were found to be the main food item of this animal during the study period which shows that they are selective in their food habit in the monsoon season, as the availability of insects is all time high in these days. The basic social unit of this animal was found to be restricted to individual family level.

USEM-3.02

Paper Title: Recent Sightings of Ruddy Mongoose *Herpestes smithii* in Eserna hillrange, Jalore, Rajasthan, India: Northwest Extension of Its Known Range

Author(s): Dookia, S.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Small Carnivore Conservation, Vol. 49, (2013), pp 25-27

ISSN No.: 1019-5041

Abstract: Three photo-documented sightings of Ruddy Mongoose *Herpestes smithii* in the Eserna hill range, in the western part of the Aravalli hills, Rajasthan, India, constitute a north-westward extension of its known range from the nearest known population, in Kumbhalgarh Wildlife Sanctuary, Rajasthan, which lies roughly 100 km to the east.

USEM-3.03

Paper Title: Ecology and Behaviour of Indian Peafowl (*Pavocristatus*) in Keoladeo National Park, Bharatpur, Rajasthan, India

Author(s): Dookia, S¹., Kumari, R¹. and Anoop, K.R².

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha, University, Dwarka, New Delhi-110078; ²Field Director, Keoladeo National Park, Bharatpur, Rajasthan

Source: International Journal of Fauna and Biological Studies, Vol. 2(4), (2015), pp 99-105

ISSN No.: 2347-2677

Abstract: The Indian Peafowl (*Pavo cristatus*) is national bird of India and currently facing various threats in its entire distribution range. A short study was conducted to understand the general ecology and behavior of Indian Peafowl, to assess its habitat, roosting preference and activity pattern during breeding time in and around Keoladeo National Park (KNP), Bharatpur, Rajasthan, India. It was found that male peafowl spent their maximum time in walking, calling and displaying in open areas to attract females in the study period. The sex ratio is highly skewed towards females. The roosting pattern reveals that the highest number of female peafowl roost together on the trees of *Acacia nilotica* (babul) and *Neolamarckia cadamba* (kadam), whereas males roost singly on the top of large trees. In the countryside, it is particularly partial to feed on crops and garden plants. Since last 10 years, data suggest that in the KNP, the peafowl population is declining due to increased trading of train-feathers, use of pesticides and herbicides in crop-fields. These are also major causes of the population decline; hence need adequate conservation attention and public participation.

USEM-3.04

Paper Title: High Resource Availability and Lack of Competition Have Increased Population of a Meso-carnivore-A case study of Golden Jackal in Keoladeo National Park, India

Author(s): Singh, A.¹, Mukherjee, A.², Dookia S.¹ and Kumara, H.N.²

Affiliation(s): ¹Guru Gobind Singh Indraprastha University, University School of Environment Management, Dwarka, New Delhi-110078; ²Sálim Ali Centre for Ornithology and Natural History, Anaikatty, Coimbatore-641108, Tamil Nadu.

Source: Mammalian Research, Vol. 61, (2016), pp 209-219

ISSN No.: 2199-2401

Abstract: The dynamic relationship between a species and availability of its food resource is one of the important subjects in ecology due to its universal existence and importance. We estimated the density of golden jackal (*Canis aureus*), assessed the food profile, and reported the food resource availability and use in Keoladeo National Park (KNP). We used distance sampling to estimate the density of golden jackal and its prey species. Scat analysis was adapted to assess the food profile of jackal. The estimated density of golden jackal is 14.84 individuals/km². Scat analysis showed equal dominance of plant and animal matter in their diet. Remains of nilgai, rodents, chital, and feral cattle frequently occurred in the scat. The presence of wide array of food items in the diet of golden jackal ascertains its generalist habit. Among prey species, the estimated density of chital is the highest (52.37/km²) followed by feral cattle (33.66/km²). The total biomass estimate of prey species is 10,892.68 kg/km². The ungulate species contributed a total biomass of 4833.88 kg/km². The feral cattle alone contributed biomass density of 6058.80 kg/km². The present study reveals highest density of golden jackal ever reported from any protected area around the world, and also lack of any major competitor and high food resource availability has led to a several fold increase in the population size of golden jackal in a span of 3 decades.

USEM-4.01

Paper Title: Novel Application of Mahua (*Madhuca p.*) Flowers for Augmented Protease Production from *Aeromonas* sp. S1

Author(s): Bhattacharya, A., Saini, V. and Gupta, A.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110078

Source: Natural Products Communication, Vol. 7(10), (2012), pp 1359-1362

ISSN No.: 1934-578X

Abstract: The present study explored the utilization of Mahua (*Madhuca* sp.) flowers, a major non-timber forest product (NTFP) of India, as a low-cost, natural substrate for protease production under submerged fermentation. Bacterial strain *Aeromonas* sp. S1, previously reported by us, was used as the protease producer. Using Mahua flower extract (MFE) as the medium additive, the protease production could successfully be enhanced by 5.6-fold (564.5 U/mL) after 24 h of fermentation under optimized conditions compared with initial production of 99.9 U/mL in the absence of MFE. The cultural parameters for optimum production of protease were determined to be: incubation time-24 h; pH-7.0; MFE concentration-5% (v/v); inoculum size-0.3% (v/v) and agitation rate-200 rpm. The results obtained demonstrate the potential of cheaper and abundantly available Mahua flowers for induction of proteases, and thus offer a new approach for value addition to this biomass through industrial enzyme production.

USEM-4.02

Paper Title: Enhanced Lipase Production from *Aeromonas* sp. S1 Using Sal Deoiled Seed Cake As Novel Natural Substrate for Potential Application in Dairy Wastewater Treatment

Author(s): Mahdi, B., Bhattacharya, A., and Gupta, A.

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Source: Journal of Chemical Technology and Biotechnology, Vol. 87, (2012), pp 418-426

ISSN No.: 0268-2575

Abstract: Background: Sal (*Shorea robusta*) deoiled seed cake extract (SDOCE) was assessed for its suitability as a cheap natural substrate for lipase production under submerged fermentation. The bacterial isolate *Aeromonas* sp. S1 isolated from dairy industry was used for lipase production. Both the isolate and its lipase were shown to be potential tools for treatment of dairy wastewater containing higher organic load. Results: On substituting tributyrin with SDOCE, lipase production was enhanced 24-fold (195 U mL^{-1}) compared with the initial 8.13 U mL^{-1} lipase activity. Maximum lipase production was obtained at pH 8.0 and incubation temperature 30°C . The lipase had pH and temperature optima of 10.0 and 55°C , respectively. The isolate and its crude enzyme preparation were checked separately for applicability in dairy wastewater treatment. The isolate was able to reduce chemical oxygen demand (COD) by 93%, oil and grease (O&G) by 75%, and total suspended solids (TSS) by 47% after 96 h of treatment. Enzymatic preparation gave 86% reduction of COD after 12 h and 75 and 45% reduction of O&G and TSS, respectively, after 96 h of treatment. Conclusion: Overall, the study shows the usefulness of Sal seed deoiled cake, a cheap agro-industrial by-product for the production of lipase. The isolate and its lipase can also be used effectively for the treatment of dairy wastewater.

USEM-4.03

Paper Title: Effectiveness of Sal Deoiled Seed Cake As An Inducer for Protease Production from *Aeromonas* sp. S1 for Its Application In Kitchen Wastewater Treatment

Author(s): Saini, V., Bhattacharya, A. and Gupta, A.

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Source: Applied Biochemistry and Biotechnology, Vol. 170, (2013), pp 1896-1908

ISSN No.: 0273-2289

Abstract: The present study is an attempt to demonstrate the feasibility of sal (*Shorearobusta*) deoiled cake—a forest-based industrial by-product—as a cheaper media supplement for augmented protease production from *Aeromonas* sp. S1 and application of protease in the treatment of kitchen wastewater. Under optimized conditions, protease production could successfully be enhanced to 5.13-fold (527.5 U mL^{-1}) on using saldeoiled seed cake extract (SDOCE), as medium additive, compared to an initial production of 102.7 U mL^{-1} in its absence. The culture parameters for optimum production of protease were determined to be incubation time (48 h), pH (7.0), SDOCE concentration (3 % (v/v)), inoculum size (0.3–0.6 % (v/v)), and agitation rate (100 rpm). The enzyme was found to have an optimum pH and temperature of 8.0 and 60°C , respectively. The protease preparation was tested for treatment of organic-laden kitchen wastewater. After 96 h of wastewater treatment under static condition, enzyme preparation was able to reduce 74 % biological oxygen demand, 37 % total suspended solids, and 41 % oil and grease. The higher and improved level of protease obtained using saldeoiled seed cake-based media

hence offers a new approach for value addition to this underutilized biomass through industrial enzyme production. The protease produced using this biomass could also be used as pretreatment tool for remediation of organic-rich food wastewater.

USEM-4.04

Paper Title: Efficacy of *Acinetobacter* sp. B9 for Simultaneous Removal of Phenol and Hexavalent Chromium from Co-contaminated System

Author(s): Bhattacharya, A.¹, Gupta, A.¹, Kaur, A.¹ and Malik, D.²

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Source: Applied Microbiology and Biotechnology, Vol. 98, (2014), pp 9829-984

ISSN No.: 0175-7598

Abstract: The present study shows the feasibility of a newly isolated strain *Acinetobacter* sp. B9 for concurrent removal of phenol and Cr (VI) from wastewater. The experiments were conducted in a batch reactor under aerobic conditions. Initially, when mineral salt solution was used as the culture medium, the strain was found to utilize phenol as sole carbon and energy source while no Cr (VI) removal was observed. However, the addition of glucose as co-carbon source resulted in the removal of both toxicants. This co-removal efficiency of the strain was further improved with nutrient-rich media (NB). Optimum co-removal was determined at 188 mg L⁻¹ of phenol and 3.5 mg L⁻¹ of Cr (VI) concentrations at pH 7.0. Strain B9 followed the orthometabolic pathway for phenol degradation. Transmission electron microscopy (TEM) and Fourier transform infrared spectroscopy (FT-IR) studies showed sorption of chromium as one of the major mechanisms for Cr (VI) removal by B9 cells. *Acinetobacter* sp. B9 was later on checked for bioremediation of real tannery wastewater. After 96 h of batch treatment of tannery effluent containing an initial 47 mg L⁻¹ phenol and 16 mg L⁻¹ Cr (VI), complete removal of phenol and 87 % reduction of Cr (VI) were attained, showing high efficiency of the bacterial strain for potential application in industrial pollution control.

USEM-4.05

Paper Title: Comparative Fermentation Studies on Amylase Production by *Aspergillus flavus* TF-8 using Sal (*Shorea robusta*) Deoiled Seed Cake as Natural Substrate: Characterization for Potential Application in Detergency

Author(s): Singh, S. and Gupta, A.

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Source: Industrial Crops and Products, Vol. 57, (2014), pp 158-165

ISSN No.: 0175-7598

Abstract: Media engineering for cost-effective and optimized production of industrially important enzymes is customary nowadays. In the present study, comparative production of amylase by solid state (SSF), modified solid state (mSSF) and submerged fermentation (SmF) was investigated using Sal deoiled cake (Sal DOC) as novel substrate. Amylase titers under SSF, mSSF and SmF were 1.82, 0.36 and 2.51 IU/mL, respectively by *Aspergillus flavus* TF-8 isolate. To increase amylase yield, SmF conditions were further optimized; enhancing the enzyme production to 10.51, 14.49 and 73.28 times higher (26.38 IU/mL) as compared to initial SmF, SSF and mSSF conditions, respectively. It was found to be more than 80% stable at wide

range of pH 4.0–8.5, (optimum pH 5.5), high temperature (optimum temperature; 60 °C), common detergents and bleaching agents. The TF-8 amylase was found to be more effective than detergent, in removing starch based stains when used in combination with detergent. These properties make it a very promising candidate as detergent additive.

USEM-4.06

Paper Title: Evaluation of *Acinetobacter* sp. B9 for Cr (VI) Resistance and Detoxification with Potential Application in Bioremediation of Heavy-metals-rich Industrial Wastewater

Author(s): Bhattacharya, A. and Gupta, A.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Environmental Science and Pollution Research, Vol. 20, (2014), pp 6628-6637

ISSN No.: 1614-7499

Abstract: Present work demonstrates Cr (VI) detoxification and resistance mechanism of a newly isolated strain (B9) of *Acinetobacter* sp. Bioremediation potential of the strain B9 is shown by simultaneous removal of major heavy metals including chromium from heavy-metals-rich metal finishing industrial wastewater. Strain B9 tolerate up to 350 mg L⁻¹ of Cr (VI) and also shows level of tolerance to Ni (II), Zn (II), Pb (II), and Cd (II). The strain was capable of reducing 67 % of initial 7.0 mg L⁻¹ of Cr (VI) within 24 h of incubation, while in presence of Cu ions 100 % removal of initial 7.0 and 10 mg L⁻¹ of Cr (VI) was observed with in 24 h. pH in the range of 6.0–8.0 and inoculum size of 2 % (v/v) were determined to be optimum for dichromate reduction. Fourier transform infrared spectroscopy and transmission electron microscopy studies suggested absorption or intracellular accumulation and that might be one of the major mechanisms behind the chromium resistance by strain B9. Scanning electron microscopy showed morphological changes in the strain due to chromium stress. Relevance of the strain for treatment of heavy-metals-rich industrial wastewater resulted in 93.7, 55.4, and 68.94 % removal of initial 30 mg L⁻¹ Cr (VI), 246 mg L⁻¹ total Cr, and 51 mg L⁻¹ Ni, respectively, after 144 h of treatment in a batch mode.

USEM-4.07

Paper Title: Assessment of Phenol-degrading Ability of *Acinetobacter* sp. B9 for Its Application in Bioremediation of Phenol-contaminated Industrial Effluents

Author(s): Bhattacharya, A.¹, Gupta, A.¹, Kaur, A.¹ and Malik, D.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Biochemistry, Shivaji College, University of Delhi, New Delhi-110 027

Source: Chemistry and Ecology, Vol. 31, (2015), pp 607-621

ISSN No.: 0275-7540

Abstract: Successful bioremediation of a phenol-contaminated environment requires application of those microbial strains that have acquired phenol tolerance and phenol-degrading abilities. A newly isolated strain B9 of *Acinetobacter* sp. was adapted to a high phenol concentration by growing sequentially from low- to high-strength phenol. The acclimatised strain was able to grow and completely degrade up to 14 mM of phenol in 136 h. The degradation rates were found to increase with an increase in the phenol concentration from 2.0 to 7.5 mM. The strain preferred neutral to alkaline pH range for growth and phenol degradation, with the optimum being pH

8.0. The optimum temperature for phenol degradation was found to be in the range of 30–35°C. Transmission electron micrographs showed a disorganised and convoluted cell membrane in the case of phenol-stressed cells, showing a major effect of phenol on the membrane. Enzymatic and gas chromatography-mass spectrometry studies show the presence of an ortho-cleavage pathway for phenol degradation. Efficient phenol degradation was observed even in the presence of pyridine and heavy metals as co-toxicants showing the potential of strain in bioremediation of industrial wastes. Application of strain B9 to real tannery wastewater showed 100% removal of initial 0.5 mM phenol within 48 h of treatment.

USEM-4.08

Paper Title: Valorization of Sal Deoiled Cake as Media for Acidic Amylase and Invertase Co-production by *Aspergillus niger* NJ-1: Optimization by Response Surface Methodology and Application in Oligosaccharide Synthesis

Author(s): Singh, S., Gupta, N., Kaur, J. and Gupta, A.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Food Processing and Preservation, Vol. 39, (2015), pp 2548-2561

ISSN No.: 0145-8892

Abstract: Valorization of Sal deoiled cake (DOC) was studied by using it as cheap nutrient source for the co-production and statistical optimization of two carbohydrases, acidic amylase and invertase, using a newly isolated strain *Aspergillus niger* NJ-1 and assessment of produced enzymes in oligosaccharides synthesis. Initially, 4% (w/v) of Sal DOC and incubation time of 120 h were found to be the best for optimum enzymes production. Statistical optimization using Plackett–Burman design involved 11 important variables among which five were further optimized by central composite design. Peptone played important role in enzymes co-production. Both enzymes were stable at acidic pH of 3.0 and 50°C temperature. After optimization, amylase and invertase titers increased to ninefold (9.63 IU/mL) and 19-fold (9.96 IU/mL) compared with unoptimized conditions. Amylase produced maltotrioses and maltopentoses while invertase was able to form kestose during enzymatic hydrolysis.

USEM-5.01

Paper Title: The Leaching Characteristics of Trace Elements in Coal Fly Ash and an Ash Disposal System of Thermal Power Plants

Author(s): Singh, R.K.¹, Gupta, N.C.¹ and Guha, B.K.²

Affiliation(s): University School of Environment Management, GGS Indraprastha University, Dwarka, New Delhi-110078; ²Department of Chemical Engineering, IIT Delhi, Hauz Khas, New Delhi

Source: Energy Sources, Part A: Recovery, Utilization and Environmental Effects, Vol. 34(7), (2012), pp 602-608

ISSN No.: 1556-7036

Abstract: The present investigation was conducted to study the leaching characteristics of trace elements in coal fly ash and the ash disposal system of thermal power plants. The batch experiment for the fly ash collected from the hopper of the electrostatic precipitator of the thermal power plant, Delhi, was carried out to study the leaching characteristics of Fe, Cr, Cu, Pb, Cd, and Ni. Four leaching time intervals were selected, ranging from 1 week to 4 weeks. From the experiments, leaching behavior of trace elements was investigated and it was observed that 'Cr' and 'Ni' have a

relatively higher leachability in extraction solution than aqueous and buffer solution. Furthermore, with the leaching time, the leachability of 'Cu 'is increased in aqueous and extraction solution. The leachability of 'Cd 'increased with leaching time in aqueous and buffer solution. With the increase of leaching time, the leachability of 'Fe 'in extraction fluid increased with time with small fluctuation.

USEM-5.02

Paper Title: Clean Development Mechanism- An Overview for Indian Scenario and A Case Study of Road Transportation Sector, Delhi

Author(s): Kumar, P. and Gupta, N.C.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110 078

Source: Pollution Research, Vol. 31(1), (2012), pp 1-6

ISSN No.: 0257-8050

Abstract: India is expected to capture between 20 to 30 per cent of the CDM market, bringing in up to US\$300 million in revenue. Several favorable enabling factors have contributed to India's preeminent position in the CDM market such as good technical base and a pro-active national CDM authority. Projects in renewable energy, improved industrial efficiency and industrial processes, fuel switching and municipal solid waste disposal can offer the greatest potential for CDM. Greenhouse gas emissions in developing countries are increasing more rapidly in the transportation sector. Even people with low income are meeting their need for mobility, and projected income growth over the next two decades suggests that many more will acquire personal modes of transport in future. How would this affect the earth's climate is a great concern. According to World Bank and Asian Development Bank joint study of air pollution for 20 major Asian cities between 2000 and 2003 Delhi is also one of the most polluted city of the Asia. Delhi faces the same transportation, economic, and environmental challenges like other metropolises of the world.

USEM-5.03

Paper Title: Solar Global Ultraviolet and Broadband Global Radiant Fluxes and Their Relationships with Aerosol Optical Depth at New Delhi

Author(s): Bano, T.¹, Singh, S.¹, Gupta, N.C.² and John, T.¹

Affiliation(s): ¹Radio and Atmospheric Science Division, National Physical Laboratory, CSIR, New Delhi; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Climatology, Vol. 33, (2013), pp 1551-1562

ISSN No.: 1097-0088

Abstract: The solar global ultraviolet (GUV) and broadband global (G) radiation flux obtained on a horizontal plane in Delhi, during April 2010 to March 2011 have been used to investigate the temporal variability of these radiations and their ratio, fraction of UV (FUV). For the first time the clearness index (KT) has been estimated over Delhi and its variability during different months of the year and season has been studied in detail. The impact of atmospheric aerosols on KT has also been studied. It has been found that for every unit increase in aerosol optical depth (AOD) at 340 nm, KT decreases by 0.06. A strong anti-correlation with correlation coefficient -0.75 is observed between AOD and KT. On the basis of our field experience and observations at Delhi it is found that for highly cloudy and overcast conditions $0 \leq KT \leq 0.15$, for partial cloudy or hazy conditions $0.15 \leq KT \leq 0.21$ and $KT > 0.21$ for clear sky conditions. In addition, during foggy days in winter we have found KT

values lying in the range 0.12–0.18 at Delhi. The day-time daily-averaged fluxes GUV and G varied in the range 0.15–1.23 MJ m⁻² and 3.36–27.02 MJ m⁻², respectively. The GUV and G showed similar pattern during the year except for the wet season when the FUV increased possibly due to an increase in water vapour concentration.

USEM-5.04

Paper Title: Physical Characterization and Comparison of Biodiesel Produced From Edible and Non-edible Oils of *Madhuca indica* (mahua), *Pongamia pinnata* (karanja), and *Sesamum indicum* (til) Plant Oilseeds

Author(s): Gautam, K.¹, Gupta, N.C.² and Sharma, D.K.¹

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Source: Biomass Conversion and Biorefinery, Vol. 04, (2014), pp 193-200

ISSN No.: 2190-6815

Abstract: Increase in anthropogenic energy needs has led the world to look for alternate energy sources. Biodiesel from plant oilseeds is a promising and environmentally sustainable option. In the present study, biodiesel is prepared from the oils of *Pongamia pinnata* (karanja), *Madhuca indica* (mahua), and *Sesamum indicum* (til) oilseeds. A two-step catalytic process is used for the conversion of triacylglycerides into fatty acid methyl esters. The biodiesel produced from the three oils were tested for properties such as density, viscosity, calorific value, acid value, cloud point, pour point, fire point, flash point, cold filter plugging point, thermal gravimetric analysis, and differential scanning calorimetry. It was found that til oil produced maximum amount of biodiesel followed by karanja and mahua oil. Interestingly, the calorific value of til biodiesel was highest followed by mahua and karanja biodiesel. However, blending of biodiesel with conventional diesel fuel could improve the calorific value and increase the fire and flash point rendering it safer for handling and transportation. Comparing the properties of the biodiesels, it could be concluded that all the three oils can produce good quality biodiesel; however, they exhibit variable properties for engine application.

USEM-5.05

Paper Title: Characteristics of Ambient Ammonia Over Delhi, India

Author(s): Sharma S.K.¹, Kumar, M.², Rohtash¹, Gupta, N.C.², Saraswati¹, Saxena, M.¹ and Mandal, T.K.¹

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Source: Meteorology and Atmospheric Physics, Vol. 124, (2014), pp 67-82

ISSN No.: 0177-7971

Abstract: In the present paper, we have characterized the ambient ammonia over Delhi along with other trace gases (NH₃, NO, NO₂, SO₂ and CO) and particulates (PM_{2.5} and PM₁₀) measured during December 2011 to June 2012. The average mixing ratios of ambient NH₃, NO, NO₂, SO₂ and CO were recorded as 21.2 ±5.4, 19.5 ±4.9, 17.4 ±1.4, 1.7 ±0.5 ppb and 1.6 ±0.7 ppm, respectively, during winter, whereas the average mixing ratios of ambient NH₃, NO, NO₂, SO₂ and CO were recorded as 20.8 ±4.7, 21.7 ±6.3, 16.8 ±3.1, 2.2 ±0.8 ppb and 1.8 ±0.9 ppm, respectively,

during summer. In the present case, non-significant seasonal and diurnal variations of NH₃, NO, NO₂, SO₂ and CO were observed during both the seasons. The average monthly NH₃/NH₄⁺ ratios varied from 0.28 to 2.56 with an average value of 1.46 in winter. The higher NH₃/NH₄⁺ ratio (3.5) observed in summer indicates the abundance of NH₃ in the atmosphere during summer. The higher fraction of particulate NH₄⁺ observed in winter than summer attributes to the conversion of gaseous NH₃ into NH₄⁺. The results emphasized that the traffic could be one of the significant sources of ambient NH₃ at the urban site of Delhi as illustrated by positive correlations of NH₃ with traffic-related pollutants (NO, NO₂ and CO). Surface wind analysis and wind directions also support the road side traffic and agricultural activities at the nearby area indicating possible major sources of ambient NH₃ at the study site.

USEM-5.06

Paper Title: pH Dependence Leaching Characteristics of Selected Metals from CoaFly Ash and its Impact on Ground Water Quality

Author(s): Singh, R.K.¹, Gupta N.C.¹ and Guha B.K.²

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Source: International Journal of Chemical and Environmental Engineering, Vol. 5(4), (2014), pp 218-222

ISSN No.: 2078-0737

Abstract: Coal combustion in thermal power plants leads to concentration of various metals in the fly ash. The fly ash requires proper handling, disposal and monitoring in order to control their harmful effects on environment. Leachability of few metals have been examined in fly ash at different pH conditions in the laboratory. The results obtained from shake tests at different pH value exhibit that during leaching period the selected elements register their presence. The mobility of the selected elements present in fly ash is markedly pH dependent. The leaching experiments conducted for three different pH with different leaching period of time showed that pH is more important than the leaching interval in controlling the amount of metals leached out from fly ash. At some locations, Cd, Cr, Cu and Fe have crossed the prescribed standard of drinking water quality in ground water samples collected from the nearby area of ash pond. The elements available in drinking water may have adverse health impact on human being as well as on surrounding ecosystem.

USEM-5.07

Paper Title: Assessment of Ground Water Contamination for Heavy Metals in the Proximity of Ash Ponds

Author(s): Singh, R.K.¹, Gupta N.C.¹ and Guha B.K.²

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Source: Elixir Pollution, Vol. 75, (2014), pp 28016-28019

ISSN No.: 2229-712X

Abstract: Heavy metals on fly ash surface has tendency to leach and contaminate the ground water, which will affect the human by entering food chain. Present study has been carried out to assess the ground water contamination in the surrounding villages closer to two thermal power plants in Delhi, India. Ground water samples from

different location within the 2Km radius of both thermal power plants were collected and analyzed for heavy metals (Cd, Cr, Cu, Fe, Ni and Pb). This study indicates that the bore well and pond water within the study area is contaminated with higher concentration level of these heavy metals. The concentrations of these selected heavy metals are crossing the prescribed standard of drinking water quality in India. Supernatant of ash ponds contain heavy metals, needs remediation before discharging into the environment.

USEM-5.08

Paper Title: **Commuter Exposure to Inhalable, Thoracic and Alveolic Particles in Various Transportation Modes in Delhi**

Author(s): Kumar, P. and **Gupta, N.C.**

Affiliation: University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: Science of the Total Environment, Vol. 541, (2016), pp 535-541

ISSN No.: 1879-1026

Abstract: A public health concern is to understand the linkages between specific pollution sources and adverse health impacts. Commuting can be viewed as one of the significant-exposure activity in high-vehicle density areas. This paper investigates the commuter exposure to inhalable, thoracic and alveolic particles in various transportation modes in Delhi, India. Air pollution levels are significantly contributed by automobile exhaust and also in-vehicle exposure can be higher sometime than ambient levels. Motorcycle, auto rickshaw, car and bus were selected to study particles concentration along two routes in Delhi between Kashmere Gate and Dwarka. The bus and auto rickshaw were running on compressed natural gas (CNG) while the car and motorcycle were operated on gasoline fuel. Aerosol spectrometer was employed to measure inhalable, thoracic and alveolic particles during morning and evening rush hours for five weekdays. From the study, we observed that the concentration levels of these particles were greatly influenced by transportation modes. Concentrations of inhalable particles were found higher during morning in auto rickshaw ($332.81 \pm 90.97 \mu\text{g}/\text{m}^3$) while the commuter of bus exhibited higher exposure of thoracic particles ($292.23 \pm 110.45 \mu\text{g}/\text{m}^3$) and car commuters were exposed to maximum concentrations of alveolic particles ($222.37 \pm 26.56 \mu\text{g}/\text{m}^3$). We observed that in evening car commuters experienced maximum concentrations of all sizes of particles among the four commuting modes. Interestingly, motorcycle commuters were exposed to lower levels of inhalable and thoracic particles during morning and evening hours as compared to other modes of transport. The mean values were found greater than the median values for all the modes of transport suggesting that positive skewed distributions are characteristics of naturally occurring phenomenon.

USEM-6.01

Paper Title: **Statistical Analysis of Landslide in South District, Sikkim, India: Using Remote Sensing and GIS**

Author(s): Rawat, M.S.¹, Rawat, B.S.², **Joshi, V.³** and Kimothi, M.M.¹

Affiliation(s): ¹Uttarakhand Space Application Centre Dehradun, Uttarakhand; ²D.B.S.PG College, Dehradun; ³University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Environmental Science, Toxicology and Food Technology, Vol. 2(3), (2012), pp 47-61

ISSN No. : 2319-2402

Abstract: Landslides are among the most costly and damaging natural hazards in mountainous region, triggered mainly under the influence of earthquakes and/or rainfall. In the present study, Landslide Hazard Zonation (LHZ) of South district, Sikkim State was carried out using Remote Sensing and Geographic Information System (GIS). Various thematic layers namely slope, photo-lineament buffer, thrust buffer, relative relief map, geology and land use / land cover map were generated using remote sensing data and GIS. The weighting rating system based on the relative importance of various causative factors as derived from remotely sensed data and other thematic maps were used for the LHZ. The different classes of thematic layers were assigned the corresponding rating value as attribute information in the GIS and an "attribute map "was generated for each data layer. Each class within a thematic layer was assigned an ordinal rating from 0 to 9. Summation of these attribute maps were then multiplied by the corresponding weights to yield the Landslide Hazard Index (LHI) for each cell. Using trial and error method the weight-rating values have been re-adjusted. A LHZ map was prepared showing the five zones, namely "very low hazard", "low hazard", "moderate hazard", "high hazard "and "very high hazard "by using the "slicing "operation.

USEM-6.02

Paper Title: An Inventory of Recent (18th September 2011) Earthquake Triggered Landslides in the Sikkim Himalaya

Author(s): Ghosh, G.K.¹, Ghosh, K.¹, De, S.K.¹, Rawat, M.S.², Joshi, V.³ and Ayala, I.A.⁴

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Source: Journal of Geo-Environment Observer, Vol. 1(2), (2012), pp 1-13

ISSN No.: 2277-6141

Abstract: A shallow focus (depth 19.7 km: USGS) earthquake measuring 6.8 on the Richter scale with its epicentre near the India-Nepal border (27.73N, 88.08 E, 68 km NW of Gangtok, Sikkim, India) shook the Northeast and large parts of northern and eastern India at 18hrs 10 minutes 47 seconds on 18-09-2011 that has resulted to a great disaster in Sikkim Himalayan region. The Sikkim earthquake (18th September, 2011) triggered about 421 landslides in Sikkim Himalaya that has caused heavy damage to property, disruption of the road network, loss of human lives, and various other civil engineering structures. The estimated volume of landslide produced materials is about 270237 m³. Most of the earthquake induced landslides are rock fall or rock-cum debris slide in nature. The main objective of the present study is to find out the nature of landslides that were caused by the recent Sikkim earthquake. The field study reveals that the most of the landslide have been occurred along the different roads stretches mainly Chungthang-Lacmsjwqdkjhung Road, JNM (Gangtok-sherathang-Nathula Road) NH 31A-Sevok-Gangtok Road.

USEM-6.03

Paper Title: Rainfall Variability and Indices of Extreme Rainfall Analysis and Perception Study for Two Stations Over Central Himalaya, India

Author(s): Joshi, S.¹, Kumar, K.¹, Joshi, V.² and Pande, B.³

Affiliation(s): ¹Watershed Processed and Management Theme, G. B. Pant Institute of Himalayan Environment and Development, Kosi-Katarmal, Almora 263643; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³D.S.B. Campus, Kumaun University, Nainital

Source: Natural Hazards, Vol. 72, (2013), pp 361-374

ISSN No.: 0921-030X

Abstract: The analysis of rainfall pattern and indices of extreme rainfall events is performed for two meteorological stations located in the Central Himalayan Region which is highly vulnerable to rain-induced hazards. The records of these rain-induced disasters suggest that such events are generally observed in later part of monsoon season, when soil is saturated after monsoon rains. An attempt is made here to test trends of 19 different extreme rainfall indices that have been widely used in the literature, using daily rainfall data for two urban centres (Nainital and Almora) over the period 1992–2005. We have used statistical tools such as Sen's method and Mann–Kendall test for detection of trend in annual rainfall, monsoon rainfall, number of rainy days and 1-day extreme rainfall. Principal component analysis gives the correlation between different extreme rainfall indices. Time series of principal components are representing the trends of extreme indices, their variation and interrelation between different indices. The perception study conducted in the same sites indicates that extreme rainfall events and change in rainfall amount and timing are well perceived by the local people.

USEM-6.04

Paper Title: Study of Rock Mass and Slope Mass Rating in the Part of East Sikkim Himalaya, India

Author(s): Rawat, M.S.¹, Joshi, V.² and Sundriyal, Y.P.³

Affiliation(s): ¹Uttarakhand Space Application Centre, Department of Science and Technology, Dehradun, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³H.N.B. Garhwal University, Srinagar, Uttarakhand

Source: Indian Journal of Scholarly Research, Vol. 2(1), (2013), pp 58-65

ISSN No.: 2278-8271

Abstract: The study area, located on east district of Sikkim, a part of the Lesser Himalaya and Higher Himalaya, was chosen for the rock mass and slope mass characterization. The area was divided into 161 grids of equal size in the study area for the slope stability analysis based on rock mass and slope mass characterization. Structural mapping was carried out for data on rock types, their attitude and quality condition i.e. weathering conditions. The type of failure was assessed on the basis of stereographic analysis of discontinuities. The results make it evident that rock mass quality is significantly affected by the weathering and alteration of the rock mass, as the rock mass falling in weak range of rock mass characterization is also invariably associated with the weathered zones.

USEM-6.05

Paper Title: Use of Engineering and Bioengineering Measures for Landslide Mitigation

Author(s): Rawat, M.S.¹ and Joshi, V.²

Affiliation(s): ¹Uttarakhand Space Application Centre, Department of Science and Technology, Dehradun, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Periodic Research, Vol. 1(3), (2013), pp 160-173

ISSN No.: 2231-0045

Abstract: Sikkim- is predominantly a mountainous State where road transport is the backbone of development. The geography of Sikkim presents a fragile and rugged landscape but it will not be an exaggeration that the country's progress largely hinges on the expansion of the road networks. This resulted in disturbance of the marginally stabilized, long, steep and geologically weak slopes. A heavy monsoon rainfall is causing triggering of slope failures. Bio-engineering, a low-cost technology, if applied in conjunction with civil engineering technology, could give a cheap yet, effective solutions to a range of slope stability problems. In the Bojeck landslide traditional practices like rip rap drain, filling of cracks and modification of slope applied in the Bojeck slide. In many cases these methods are expensive, ineffective or socially unacceptable. An alternative approach is Bioengineering a method of construction using live plants alone or combined with dead or inorganic materials, to produce living, functioning systems to prevent erosion, control sediment and provide habitat. Bioengineering uses combinations of structural practices and live vegetation to provide erosion protection for Bojeck slide. Bio-engineering is the use of vegetation, either alone or in conjunction, with civil engineering structures, to reduce instability and erosion on slopes. Bio-engineering is an effective way of enhancing civil engineering structures to increase stability as far as possible. It is relatively low in cost uses local materials and skill, and provides livelihoods benefits through. Economically useful products A study has shown that Bojeck slide suffer from a range of instability and erosion problems, which was conducive to the use of low-cost remedies. This paper describes possibility of using Plantation as a treatment option to safeguard the landslide and reduce long term maintenance. The study shows that roadside slope instabilities and erosion problems exist in the road alignment due to presence of highly weathered rocks and high cut slope angles. On the basis of slope length, slope angle, material drainage, and site moisture condition, the erosion control measures were suggested. Jute netting with grass lines plantation, site seedling of shrub and trees are recommended bio-engineering measures for controlling instabilities and erosion problems along the road.

USEM-6.06

Paper Title: Forest Fire As a Potential Environmental Threat in Recent Years in Sikkim, Eastern Himalaya, India

Author(s): Sharma, S.¹, Joshi, V.² and Chhetri, R.K.³

Affiliation(s): ¹Avian Biodiversity and Bioacoustics Laboratory, Department of Zoology and Environmental Sciences, Faculty of Life Sciences, Gurukula Kangri University, Haridwar-249404, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Meteorological Centre, Indian Meteorological Department, Balwakhani, Gangtok-737 103, Sikkim

Source: Climate Change and Environmental Sustainability, Vol. 2(1), (2014), pp 55-61

ISSN No.: 2320-642X

Abstract: Forest fires of short to medium return intervals are quite common during the winter seasons in the state of Sikkim, Eastern Himalayas, India. The forest fires of different intensities were reported from various locations of three districts of Sikkim in the years 2009 to 2011. This paper discusses and analyses the causes of occurrence of forest fires of different severity, in terms of forest area burnt by the formation of conducive atmosphere by the climatic variables such as rainfall, temperature, sunshine hours and humidity during the fire season from 2009 to 2011. These variables were analysed from the forest fire prone months November to April of the years 2009 to 2011. It further highlights that the forest fire disaster is a potential environmental threat in recent years and suggests certain short-term and long-term strategies for mitigation of forest fire in the state.

USEM-6.07

Paper Title: Investigation of Hill Slope Stability and Mitigation measures in Sikkim Himalaya

Author(s): Rawat, M.S.¹, Joshi, V.², Uniyal, D.P.¹ and Rawat, B.S.³

Affiliation(s): ¹Uttarakhand State Council for Science & Technology (UCOST) Department of Science & Technology, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³DBS(PG) College, Dehradun

Source: International Journal of Landslide and Environment, Vol. 3(1-3), (2015), pp 8-15

ISSN No.: 2350-8663

Abstract: Survey of India toposheets, cloud free satellite data and field survey with the help of handheld GPS were carried out along major road of Sikkim for landslide investigation. The geological and geotechnical analysis carried out for the major trouble shooting spots in the eastern Himalayas along National Highway (NH-31A), North Sikkim Highway (NSH) and Singtam-Dikchu road, Gangtok-Nathula Highway, and a perennial trouble spot at Bojeck on Jorhang-Hilly state highway undertaken to understand the factors affecting triggering of landslides in the respective areas. The study identified lithology or rock type, structure of the bedrocks (i.e. orientation of the rock foliations and faults), excessive rainfall and human interference like diversion of streams as the main factors triggering the landslides in the region. The areas with weak rocks which are susceptible to weathering, i.e. schist, mudstone and slate and the areas, where rock and/or fault foliations are favorable with respect to the road cuts, are found to be vulnerable to landslide. During continuous heavy rainfall, the weathering process is accelerated reducing schists and mudstones into silts and fine sands, and subsequent washout fine materials triggers landslides. Rainfall threshold study carried out for Bakthang slide using rainfall data for the year 2010 and minimum threshold for landslide initiation was 35mm/day. In the Bojeck slide the suggested slope mitigation measures include diversion of run-offs, plugging of cracks and crevices, construction of filters and horizontal drains at different elevations along the slopes to prevent washout of fines and safe passage of the water, rock bolting, avoiding human interference and judicious alignment of the roadways.

USEM-6.08

Paper Title: Applications of Hydrological Model SWAT on the Upper Watershed of River Subarnarekha with Special Reference to Model Performance and its Evaluation

Author(s): Kumar, P. and Joshi, V.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi 110078

Source: Journal of Basic and Applied Engineering Research, Vol. 2(13), (2015), pp 1128-1134

ISSN No.: 2350-0255

Abstract: The investigation of geo hydrological features of drainage basin is necessary for planning and implementation of various watershed development programmes. The visual interpretation techniques coupled with morphometric analysis is used in the present study to evaluate the geomorphic process of upper watershed of river Subarnarekha in the state of Jharkhand, India. Various spatial information is extracted with the help of remote sensing and GIS techniques, which provided an understanding of precise scenario related to basin development. Morphometric analysis reveals that the upper watershed of river Subarnarekha is of eighth order with dendritic drainage pattern. The study also concludes that the geomorphic development of drainage basin is highly affected by slope and elevation, whereas the development of stream segments is affected by rainfall pattern and infiltration. The mean bifurcation ratio of the basin is 5.62 that is an indicator of flash flooding during the heavy rain and storm. The DEM reveal that the lowest basin elevation is of 48 mt in the plains and highest of 1,043 mt in the plateau region. The ruggedness number of 0.78 indicates steep slope of the basin. The value of elongation ratio in the study area is found to be 0.64 indicating relatively moderate relief and elongated shape. Based on drainage frequency and density analysis, the basin has moderate to low surface run off and high infiltration capacity. The subsoil is permeable indicating good groundwater recharge rate. This study will help the policy makers for watershed prioritization and identification of ground water potential zones.

USEM-6.09

Paper Title: Study of Landslide Hazard Zonation in Mandakini Valley, Rudraprayag District, Uttarakhand Using Remote Sensing and GIS

Author(s): Rawat, M.S.¹, Uniyal, D.P.¹, Dobhal, R.¹, Joshi, V.², Rawat, B.S.³, Bartwal, A.⁴, Singh, D.⁵ and Aswal, A.⁵

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Source: Current Science, Vol. 109(1), (2015), pp 158-170

ISSN No.: 0011-3891

Abstract: The Mandakini Valley of Rudraprayag district, Uttarakhand witnessed unprecedented damage to life, property, infrastructure and landscape on 16 and 17 June 2013 due to torrential rains. Run-off discharge data indicate that antecedent rainfall exceeded the limit and the overflow of rivers led to landslide in the region and flash floods in the downstream areas. Fragile geology of the area, close to Main Central Thrust (MCT), degradation processes and torrential rains are responsible for triggering landslides and flash floods. A landslide inventory was carried out in the

affected areas based on pre- and post-flood high resolution satellite data (LISS-IV and Cartosat-2). A total of 290 landslides were identified from pre-flood satellite LISS IV (2011) imagery and 1665 were identified in post-flood satellite imagery along major rivers. Using remote sensing and geographic information system techniques, thematic layers were generated. Using the weightage rating system, a landslide hazard zonation map of the area was prepared. Each class within a thematic layer was assigned an ordinal rating from 1 to 9. Summation of these attribute values was then multiplied by the corresponding weights to yield different zones of landslide hazard. A landslide hazard zonation map having five different zones ranging from very low hazard zone to very high hazard zone was prepared with the objective to create a reliable database for post-disaster management and for planning developmental activities in the district.

USEM-6.10

Paper Title: **Characterization of Hydro Geological Behavior of the Upper Watershed of River Subarnarekha Through Morphometric Analysis Using Remote Sensing and GIS Approach**

Author(s): Kumar, P. and Joshi, V.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Environmental Sciences, Vol. 6(2), (2015), pp 429- 447

ISSN No.: 0976-4402

Abstract: The investigation of geo hydrological features of drainage basin is necessary for planning and implementation of various watershed development programmes. The visual interpretation techniques coupled with morphometric analysis is used in the present study to evaluate the geomorphic process of upper watershed of river Subarnarekha in the state of Jharkhand, India. Various spatial information is extracted with the help of remote sensing and GIS techniques, which provided an understanding of precise scenario related to basin development. Morphometric analysis reveals that the upper watershed of river Subarnarekha is of eighth order with dendritic drainage pattern. The study also concludes that the geomorphic development of drainage basin is highly affected by slope and elevation, whereas the development of stream segments is affected by rainfall pattern and infiltration. The mean bifurcation ratio of the basin is 5.62 that is an indicator of flash flooding during the heavy rain and storm. The DEM reveal that the lowest basin elevation is of 48 mt in the plains and highest of 1,043 mt in the plateau region. The ruggedness number of 0.78 indicates steep slope of the basin. The value of elongation ratio in the study area is found to be 0.64 indicating relatively moderate relief and elongated shape. Based on drainage frequency and density analysis, the basin has moderate to low surface run off and high infiltration capacity. The subsoil is permeable indicating good groundwater recharge rate. This study will help the policy makers for watershed prioritization and identification of ground water potential zones.

USEM-7.01

Paper Title: **Water Quality Assessment of Yamuna River in Delhi Region Using Index Mapping**

Author(s): Katyal, D., Qader, A., Ismail, A.H. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: Interdisciplinary Environmental Review, Vol. 13(2/3), (2012), pp 170-186

ISSN No.: 1521-0227

Abstract: Water quality indices (WQI) were introduced with the aim of reducing great amount of parameters into a simpler expression and enabling easy interpretation of monitoring data. In this study, an attempt has been made to devise a methodology to integrate the WQI with geographic information system (GIS) for an effective interpretation of the quality status of the river. River Yamuna in Delhi has been taken as a case study and the physical and chemical analysis has been interpreted using WQI. Final elucidation of the water quality has been done on a map using GIS. Water samples were collected from Yamuna River from Wazirabad barrage to ITO barrage and were analysed for physiochemical parameters. Based on the results of the analyses, spatial distribution maps of selected water quality parameters were prepared using ArcInfo software. The overall index of pollution (OIP) based on the individual index values was estimated giving the values in terms of pollution indices.

USEM-7.02

Paper Title: Assessment of Methane Variability from Natural Wetlands of Uttar Pradesh, India-Implications for Tropical Countries

Author(s): Bansal, S.¹, Chakraborty, M.², Katyal, D.¹ and Garg, J. K.¹

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²CSIR-National Physical Laboratory, New Delhi-110012

Source: Research Journal of Environmental Sciences, Vol. 9(3), (2015), pp 101-118

ISSN No.: 1819-3412

Abstract: Tropical wetlands are one of the most dynamic natural sources of atmospheric methane (CH₄) but the CH₄ emission data is still scanty to quantify and elaborate the process of CH₄ emissions from natural freshwater tropical wetlands. In view of this, the present study attempts to estimate the CH₄ emissions from two natural tropical wetlands of Uttar Pradesh, India to further augment the CH₄ database for tropical countries for improved understanding of CH₄ cycling in tropical wetlands. This study elucidates the importance of temporal, site specific and zone-wise dependence of CH₄ emission in a wetland. Significantly higher CH₄ flux in summer season than monsoon and winter season at both the locations ($p < 0.05$ for shallow water, deep water and exposed wetland soil zone) clearly define the importance of temperature, water depth, dissolved oxygen, redox potential, biological oxygen demand and plant biomass is regulating the seasonal CH₄ flux. Spatial analysis revealed that higher mean annual CH₄ flux from the Nawabganj lake ($153.5 \pm 23.2 \text{ mg m}^{-2} \text{ day}^{-1}$) as compared to the Keetham lake ($80.0 \pm 11.8 \text{ mg m}^{-2} \text{ day}^{-1}$), is attributed to enhanced anoxic conditions at Nawabganj lake owing to shallow, static and shrinking water base, high plant mediated CH₄ flux and boosted autochthonous organic matter production by dense aquatic vegetation present in the lake chiefly including *Eleocharis dulcis*, *Nelumbo nucifera*, *Ipomoea aquatic*. Zone-wise, shallow water zone contributes maximum to CH₄ flux that deep water and exposed wetland soil zones at both the sites due to high biological oxygen demand, heavy vegetation infestation and decreased values for water depth, dissolved oxygen and redox potential.

USEM-7.03

Paper Title: A Multivariate Statistical Analysis to Assess the Groundwater Quality of Delhi Region, India
Author(s): Tomer, T., **Katyal, D.** and Joshi, V
Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: Journal of Global Ecology and Environment, Vol. 3(2), (2015), pp 117-126
ISSN No.: 2454-2644
Abstract: Pearson correlation matrix, Hierarchical cluster and principal component analysis (PCA) were simultaneously applied to 22 groundwater hydrochemical data of Delhi region collected during post monsoon 2013. Using the Kaiser criterion, principle component (PC) was extracted from the data and rotated using varimax normalization for 22 locations. From the analysis, concentration of EC, TDS, Cl^- , Mg^{2+} , TH, Fe^{2+} , F^- , Na^+ and K^+ having higher values. Correlation analysis of hydro chemical data suggests that the aquifer is mainly controlled by EC, TDS, Cl^- , Mg^{2+} , TH, Na^+ , SO_4^{2-} and K^+ . In principal component analysis, the first 2 factors explain 85.67 % of the total variance. HCA grouped sample sites into four statistically significant clusters. The combined use of PCA and HCA technique resulted in more reliable interpretation of the hydrochemistry. The results of this study clearly demonstrate the usefulness of multivariate statistical techniques in hydrochemical analysis.

USEM-7.04

Paper Title: Assessment of Water Quality of Hindon River in Ghaziabad and Noida, India By Using Multivariate Statistical Methods
Author(s): Rizvi, N., **Katyal, D.** and Joshi, V.
Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078
Source: Journal of Global Ecology and Environment, Vol. 3(2), (2015), pp 80-90
ISSN No.: 2454-2644
Abstract: The Hindon River is an important River of western Uttar Pradesh. The river is highly polluted due to industrial, municipal and agricultural activities. In the present study, water quality of river Hindon is assessed by using Multivariate statistical methods. Water quality data obtained from eight different sampling stations has been subjected to Pearson correlation, principal component analysis and cluster analysis. Principal component analysis yields three major components which were responsible for 84% of total variance within the data set. First factor which is controlled by Total Dissolved Solids, Total Hardness, and chloride explains 36.85% of total variance. The second factor, having strong positive loading of temperature and pH explains 28.34% of the total variance and third factor that can be attributed to organic pollution is responsible for 19.71% of total variance. Hierarchical cluster analysis was carried out to classify sampling stations of certain similarity which grouped eight different sites into two clusters. Thus, the present study has helped to recognize the major components contributing to water quality and has further illustrated the significance of multivariate techniques for analysis and elucidation of water quality data.

USEM-7.05

Paper Title: Methane Flux from A Subtropical Reservoir Located in the Floodplains of River Yamuna, India

Author(s): Bansal, S.¹, Chakraborty, M.², **Katyal, D.¹** and Garg, J.K.¹

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078; ²CSIR-National Physical Laboratory, New Delhi-110012

Source: Applied Ecology and Environmental Research, Vol. 13(2), (2015), pp 597-613

ISSN No.: 1589-1623

Abstract: Tropical and subtropical reservoirs are considered to be a strong anthropogenic source of methane (CH₄) emissions worldwide due to high temperature, augmented carbon and nutrient loadings. Thus, CH₄ emission estimation from tropical/subtropical reservoirs is critical for preparation of green house gas emission budgets. The Present study estimates CH₄ flux from a subtropical freshwater man made Okhla reservoir located on the river Yamuna, National Capital Region, India. Results showed that Okhla reservoir transformed into a potential CH₄ emission source after flooding as the CH₄ flux increased by 3.81 orders of magnitude with a net contribution of 171.96 mgm(-2)d(-1). Enhanced CH₄ flux is primarily attributed to elevated organic and nutrient loadings to reservoir via river's inflow water, high percentage of shallow areas and presence of dense aquatic vegetation mainly Eichhornia crassipes and Typha angustifolia. These aquatic weeds not only facilitate vascular CH₄ transport but also provide substantial amounts of biomass for methanogens to generate CH₄. Results also revealed that the summer season exhibited significantly higher CH₄ flux (Kruskal-Wallis H-Test; p < 0.05) as compared to monsoon and winter seasons due to prevalence of more favorable water and soil conditions for CH₄ emissions including temperature, redox potential, water depth, dissolved oxygen, biological oxygen demand and plant biomass.

USEM-7.06

Paper Title: Transport and Retention of Carbon-based Engineered and Natural Nanoparticles Through Saturated Porous Media

Author(s): Hedayati, M.¹, Sharma, P.², **Katyal, D.³** and Fagerlund, F.¹

Affiliation(s): ¹Department of Earth Sciences, Uppsala University, Uppsala, Sweden; ²School of Ecology and Environment Studies, Nalanda University, Rajgir, Nalanda, Bihar-803116; ³University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: Journal of Nanoparticle Research, Vol. 18(3), (2016), pp 1-11

ISSN No.: 1388-0764

Abstract: Carbon-based engineered nanoparticles have been widely used due to their small size and unique physical and chemical properties. At the same time, the toxic effects of these nanoparticles on human and fish cells have also been observed; therefore, their release and distribution into the surface and subsurface environment is a subject of concern. The aim of this research is to evaluate and compare the transports and retentions of two types of engineered nanoparticles (multiwalled carbon nanotubes and C₆₀) and the natural carbon nanoparticles collected from a fire accident. Several laboratory experiments were conducted to observe the transport behavior of nanoparticles through a column packed with silica sand. The column experiments were intended to monitor the effect of ionic strength on transport of nanoparticles as a function of their shapes. It was observed that the mobilities of both types of engineered nanoparticles were reduced with the increasing ionic strength from 1.34

to 60 mM. However, at ionic strengths up to 10.89 mM, spherical nanoparticles were more mobile than cylindrical nanoparticles, but the mobility of the cylindrical nanoparticles became significantly higher than spherical nanoparticles at the ionic strength of 60 mM. In comparison with natural fire-born nanoparticles, both types of engineered nanoparticles were much less mobile under the selected experimental condition in this study. Furthermore, inverse modeling was used to calculate parameters such as attachment efficiency, the longitudinal dispersivity, and capacity of the solid phase for the attachment of nanoparticles. The results indicate that the combination of the shape and the solution chemistry of the NPs are responsible for the transport and the retention of nanoparticles in natural environment; however, fire-burned nanoparticles can be highly mobile at the natural groundwater chemistry.

USEM-7.07

Paper Title: **Hydrochemical Characterization and Evaluation of Groundwater Quality of Delhi Region**

Author(s): Tomer, T., **Katyal, D.** and Joshi, V.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: Journal of Water Resources Engineering And Management, Vol. 3(2), (2016), pp 32-41

ISSN No.: 2349-4336

Abstract: A hydrochemical study was conducted in Delhi to identify the chemical composition of ground water and water quality with respect to drinking purpose. 22 groundwater samples from various locations in Delhi region were investigated. The various physico-chemical parameters such as pH, total dissolved solids, total hardness, calcium, magnesium, total alkalinity, chloride, fluoride, nitrate, sulphate, sodium and iron were determined. Piper diagram and water quality index were used to determine hydrochemical characteristics and water quality. Results revealed that water quality of study area ranges from good to poor but at some places water is unfit for consumption. The dominant hydrochemical facies are $\text{HCO}_3\text{-Na}$, $\text{HCO}_3\text{-Mg}$, Na-Cl and mixed types. It can be inferred from the hydrochemical facies that the groundwater chemistry in the area is influenced by the dissolution/precipitation.

USEM-7.08

Paper Title: **Study of Groundwater Contamination due to Agricultural Activity Under Pravara Left Bank Canal, Maharashtra**

Author(s): Natraj, V.M.¹, **Katyal, D.**² and Gorntiwar, S.¹

Affiliation(s): ¹Department of Irrigation and Drainage, MPKV, Rahuri, Dist: Ahmednagar (MS); ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: International journal of Advance Research and Innovative Ideas in Education, Vol. 2(5), (2016), pp 491-500

ISSN No.: 2395-4396

Abstract: Indian economy is agriculture based and chemical fertilizer application has grown exponentially. Studies have shown that agricultural activity, coupled with conventional irrigation method, disposal practices, has resulted in deterioration of groundwater quality. Groundwater is the chief water source for various requirements in many part of the country. Groundwater sample for 2 cases, i.e during no flow in canal and during flow in canal, are collected from agriculturally dominant regions of Pravara left bank canal command consisting of 5 taluka of Ahmednagar district.

Laboratory analysis is done to study the groundwater quality. The study show that Nitrate(NO_3^-), (K), sodium (Na^+), calcium (Ca^{2+}), pH, Electrical Conductivity (EC), in groundwater sample was under acceptable limit of BIS & WHO, magnesium (Mg^{2+}) and Sulphate (SO_4^{2-}), was within maximum permissible limit of BIS & WHO. SAR value in 96% of water samples showed water to be of good quality. However Bicarbonate (HCO_3^-), Chloride (Cl^-), Phosphate (PO_4^{3-}) and RSC in majority of samples showed values above maximum permissible limit of BIS & WHO. Statistical analysis have shown significant correlation between Sodium & SAR, Bicarbonate & RSC, Chloride and Sulphate and moderate correlation between EC and Magnesium, Calcium and Sulphate.

USEM-7.09

Paper Title: Seasonal and Spatial Variation in the Water Quality of River Hindon at NCR India

Author(s): Rizvi, N., Katyal, D. and Joshi, V.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: International Journal of Current Research Vol. 8(5), (2016), pp 31282-31289

ISSN: 0975-833X

Abstract: River Hindon is an important river catering the demand of highly populated and industrial cluster of western Uttar Pradesh, India. Water quality of river Hindon is constantly deteriorating at an alarming rate due to various industrial, municipal and agricultural activities taking place along the course of the river. The present study investigates the seasonal and spatial variation in the water quality parameters at eight different sites for two consecutive years (2013-2015) along the selected stretch of the river. The physicochemical parameters such as pH, temperature, turbidity, total hardness (TH), total dissolved solids (TDS), total solids (TS), dissolved oxygen (DO), biological oxygen demand (BOD), chloride, nitrate, phosphate and fecal Coliform were analyzed for the river water quality. One way analysis of variance (ANOVA) was used to investigate the statistically considerable spatial and seasonal difference. Results of ANOVA suggest that there exist a statistically significant seasonal variation in the water quality of river with respect to pH, temperature, nitrate, sulphate, phosphate and DO. Whereas, the significant spatial variation was shown by TDS, TS, TH and chloride. Water quality index (WQI) was calculated for each site using the National sanitation foundation water quality index (NSFWQI) method. WQI results in the present study reveals that the water quality varies “bad” to “very bad” category at all sites in pre monsoon season. In post monsoon water quality comes under “bad” category at all sampling locations. The significant seasonal variation ($p < 0.05$) was recorded between the WQI of pre monsoon and post monsoon.

USEM-7.10

Paper Title: Assessment of Aquifer Parameters under Pravara Canal Precinct Using Pumping and Recovery Test Data
Author(s): Natraj .V.M.¹, Katyal, D.² and Sunil Gorntiwar, S.²

Affiliation(s): ¹Department of Irrigation and Drainage, MPKV, Rahuri, Dist: Ahmednagar (MS);
²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, Delhi-110078

Source: *Universal Journal of Environmental Research and Technology, Vol. 6(1), (2016), pp 8-18*

ISSN No.: 2249-0256

Abstract: Indian economy is agriculture based and chemical fertilizer application has grown exponentially. Studies have shown that agricultural activity, coupled with conventional irrigation method, disposal practices, has resulted in deterioration of groundwater quality. Groundwater is the chief water source for various requirements in many part of the country. Groundwater sample for 2 cases, i.e during no flow in canal and during flow in canal, are collected from agriculturally dominant regions of Pravara left bank canal command consisting of 5 taluka of Ahmednagar district. Laboratory analysis is done to study the groundwater quality. The study show that Nitrate(NO₃-),(K),sodium (Na+)), calcium (Ca²⁺),pH, Electrical Conductivity (EC),in groundwater sample was under acceptable limit of BIS &WHO, magnesium (Mg²⁺) and Sulphate (SO₄²⁻), was within maximum permissible limit of BIS & WHO. SAR value in 96% of water samples showed water to be of good quality. However Bicarbonate (HCO₃⁻), Chloride (Cl⁻), Phosphate (PO₄³⁻) and RSC in majority of samples showed values above maximum permissible limit of BIS &WHO. Statistical analysis have shown significant correlation between Sodium & SAR, Bicarbonate & RSC, Chloride and Sulphate and moderate correlation between EC and Magnesium, Calcium and Sulphate.

USEM-8.01

Paper Title: Heavy Metal Pollution of the Yamuna River: An Introspection

Author(s): Malik, D., Singh, S., Thakur, J., Singh, R.J., Kaur, A. and Nijhawan, S.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Current Microbiology and Applied Sciences, Vol. 3(10), (2014), pp 856-863

ISSN No.: 2319-7706

Abstract: The Yamuna river, which is the lifeline of Delhi, is one of the most-polluted river in the country. About 85 percent of the pollution is caused by domestic and industrial sources. The quality of the river is severely affected by the discharge of untreated domestic and industrial effluents. The water quality is not fit for bathing, underwater life and domestic supply. A wide range of contaminants are continuously introduced into the river and their toxicity is a problem of increasing significance for ecological, evolutionary, and environmental reasons. Among these contaminants, heavy metals due to their toxicity, accumulation and non-degradable nature, constitute one of the most dangerous groups. Heavy metals viz., Lead (Pb), Copper (Cu), Cadmium (Cd), Chromium (Cr), Zinc (Zn), Nickel (Ni) and Arsenic (As) have adverse effects on human metabolism and health. Bioaccumulation of the heavy metals may cause damage to the central nervous system, lungs, kidneys, liver, endocrine glands, and bones. The prevailing condition of the river is of serious concern, and there is an

urgent need to take strict measures to ensure cleansing of the river and prevent further contamination.

USEM-8.02

Paper Title: A Comparative Analysis of the Physico-chemical Properties and Heavy Metal Pollution in Three Major Rivers across India

Author(s): Singh, S., Malik, D., Thakur, J., **Kaur, A.**, Singh, R.J. and Nijhawan, S.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Science and Research, (2014), pp 1936-1941

ISSN No.: 2319-7064

Abstract: There is severe deterioration in the quality of water due to the discharge of municipal and industrial effluents into the rivers. The municipal pollutants majorly comprise of untreated domestic and sewage wastes, while the industrial pollutants constitute the discharge of heavy metals into the river which is responsible for the increase in metal load in water. In this study we have carried out a comparative analysis of the various physico-chemical parameters and heavy metal load in three major rivers of India. The water quality of the Ganges river at Kanpur and Varanasi, the Yamuna river at Delhi and the Sabarmati river at Ahmedabad were analyzed for the determination of metal load (Lead, Copper, Zinc, Chromium, Cadmium and Nickel) and biological load (physico-chemical parameters like pH, Total dissolved solids, Total suspended solids, Biological oxygen demand, Chemical oxygen demand and Total coliform). Our study indicates that, of the four stations, the levels of Chromium exceeded the acceptable levels in the Yamuna river (0.08mg/L). The levels of Cadmium and Lead were found to be within permissible limits, however, as they tend to persist in the system for a long time, they undergo bioaccumulation and biomagnification. This leads to severe nephrosis and liver damage over a long period of time.

USEM-8.03

Paper Title: Nanocomposite Electrode Microbial Fuel Cell: A Promising Technology for Enhanced Power Generation from Yamuna Water

Author(s): Malik, D., Thakur, J., Singh, S., Singh, R.J., Kapur, A., **Kaur, A.**, Nijhawan, S. and Kumar, A.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Science and Research, (2014), pp 641-646

ISSN No.: 2319-7064

Abstract: Microbial Fuel Cell (MFC) is a promising and a futuristic technology for generating electrical energy from anaerobic fermentation of organic and inorganic matter present in the waste water. The performance of MFCs are dependent on various factors like the type of proton exchange system, the type of electrodes, the use of mediators and nitrogen gas sparging. MFCs for waste water treatment incur high cost of components which is a major barrier in commercializing the fuel cells. In this study we examined several parameters which could affect MFC operation. Anode performance and proton exchange membranes are important factors in deciding the efficiency of MFCs for large scale applications. Highly efficient Ni-coated carbon cloth electrodes that are electrometrically and biologically stable were synthesized at a much lower cost by chemical vapour deposition. These nanocomposite electrodes led to almost tenfold increase in the columbic efficiency as compared to the conventional electrodes. The use of the salt bridge which attributes to the higher internal resistance was replaced by the Nafion membrane leading to an increase in

the current output. The rate of electron transport from the substrate to the anode by the bacterias showed a significant increase in the power generation by the use of redox mediator like Methylene blue. Thus, our current study demonstrates that using Yamuna water with nanocomposite electrodes in MFCs is a promising technology for the enhanced production of bioenergy.

USEM-8.04

Paper Title: **Restoration and Management Study of Water Bodies in the West District of NCT Delhi**

Author(s): Kumari, R., **Kaur, A.**, Malik, D., Singh, R.J. and Nijhawan, S.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Current Microbiology and Applied Sciences, (2014), pp 938-944

ISSN No.: 2319-7706

Abstract: Since 1912, when declared as the capital of India, Delhi has been witnessing a phase of developmental changes in the form of rapid urbanization and industrialization. At present, water demand in Delhi is about 1000 MGD (million gallons per day) while what it gets stand closer to 829 MGD. This demand-supply gap is increasing day by day & has put immense pressure on the urban public water supply & groundwater resource. Community resources such as traditional ponds, lakes etc can play a great deal in mitigating the above problem of water crisis at least to some positive extent, provided they are being appropriately managed to reap optimal benefits. The present study is a small endeavor to address the much bigger issue of restoration of water bodies in the NCT-Delhi region. Five natural water bodies have been selected as a case study from the West District of NCT- Delhi. The present water quality status of all the water bodies are currently facing severe water quality deterioration in terms of color, odour, BOD, COD, TSS, TDS, Turbidity, MPN etc. The main reason for the deterioration of the water quality is due to surrounding encroachment, sewage discharge, construction debris & garbage dumping, open defecation, cattle intrusion, local s inactiveness & influence of anti- social elements. Adoption & implementation of stringent laws pertaining to regional planning, encroachment, slum development, industrial establishment, solid waste dumping, sewage & effluent disposal will facilitate restoration of water bodies to a great extent.

USEM-8.05

Paper Title: **Identification of Suitable Site for Possible Ground Water Recharge in South-West District of Delhi**

Author(s): Kundu, J., **Kaur, A.**, Malik, D., Singh, R.J., Chadha, D.K. and Nijhawan, S.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal for Research in Applied Science and Engineering Technology, (2014), pp 24-29

ISSN No.: 2321-9653

Abstract: India is endowed with a rich and vast diversity of natural resources, water being one of them. The Average Annual Runoff available in India is 1869 BCM (Billion Cubic Meter) of which only 1123 BCM is estimated as utilizable Water Resource. The National capital of Delhi belongs to one of the most populous cities of the world. The growth of the township in the last few decades from 9.4 million in 1991 to 14 million in 2001 has surpassed all comparisons with the other mega cities. The development

in terms of infrastructure facilities to match the international standards and to accommodate the changing socio-economic conditions has resulted into a phenomenal growth in overall perspective of Delhi. In today's scenario, the most complex issue is to ensure sustainable water supply. The South-West district of NCT, Delhi covers 420 Sq. Km area characterized by unconsolidated quaternary alluvium deposits out of which 18 Sq Km area is covered by denudation hills specially in the Eastern part of the district. The rate of decline is highly variable in space (1-2 m/yr) depicting the variations in excessive pumpage over natural recharge. This is mainly a result of faulty water supply system (all water treatment plants are located in North Delhi only) coupled with high rate of economic growth in South Delhi which has resulted in ground water depletion in South and South Western districts of NCT, Delhi. Unplanned development of groundwater has disturbed the hydrological balance, leading to decline in productivity of wells, increasing pumping cost, more energy requirement, brackish water upcoming etc. The line of fresh-saline interface also varies greatly in the entire area.

USEM-9.01

Paper Title: Chromium and Cobalt Sequestration Using Exopolysaccharides Produced by Freshwater Cyanobacterium *Nostoc linckia*

Author(s): Sharma, M.¹ and Kaushik, A.²

Affiliation(s): ¹G.J. University of Science and Technology, Hisar; ²University School of Environment Management, Guru Gobind Singh, Indraprastha University, New Delhi-110078

Source: Ecological Engineering, Vol. 82, (2015), pp 121-125

ISSN No.: 1872-6992

Abstract: This study investigated biosorption of chromium(VI) and cobalt(II) by *exopolysaccharides* (EPS) of a cyanobacterium, *Nostoc linckia* HA-46 from *aqueous solution*. Experiments were performed in batch mode to determine the adsorption dynamics of the cyanobacterial EPS. The adsorption capacity for Cr(VI) and Co(II) ions by EPS is found to be dependent on pH, contact time and initial *metal ion* concentration. The uptake kinetics of the metal ions follow pseudo-second order model. The maximum adsorption coefficient of determination (0.993Cr and 0.997Co) for Langmuir model indicates best fitness of this model in explaining the *sorption* as a multilayer process. The maximum adsorption capacities of the EPS were 14.3 mg Cr g⁻¹ (at pH 2.0) and 17.9 mg Co g⁻¹ (at pH 4.0) at an initial concentration of 20 mg L⁻¹. The EPS of *Nostoc linckia* shows better biosorption capacity for Co(II) than Cr(IV) metal ion.

USEM-9.02

Paper Title: Screening Metal-dye-tolerant Photoautotrophic Microbes from Textile Wastewaters for Biohydrogen Production

Author(s): Sharma, M.¹ and Kaushik, A.²

Affiliation(s): ¹G.J. University of Science & Technology, Hisar; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: Journal of Applied Phycology, Vol. 27, (2015), pp 1185-1194

ISSN No.: 1573-5176

Abstract: In the present study, tolerance of ten microalgal strains isolated from wastewaters of different textile mills in relation to two metals and dyes was studied based on cell

growth estimated spectrophotometrically. Three cyanobacterial strains that were found to tolerate both Cr(VI) and Co(II) along with the dyes reactive red 198 (RR 198) and crystal violet (CV) were investigated further for the concentration of various photosynthetic pigments and exopolymer production in the presence of the dyes and metals. All three tolerant species—*Nostoc linckia* HA-46, *Myxosarcina spectabilis* HP-43 and *Gloeocapsa calcarea* HP-45—showed a significantly higher concentration ($P < 0.05$) of various pigments when the medium was spiked with metals or dyes. Production of extracellular proteins and particularly extracellular polysaccharides by the tolerant strains increased significantly ($P < 0.05$) in the presence of metals. The effect of dyes was, however, not always statistically significant ($P > 0.05$). Production of hydrogen by these photoautotrophic microbes was moderate ($19\text{--}28\text{ nmol h}^{-1}\text{ mg}^{-1}\text{ dry wt}$). The best performing strain, *N. linckia*, when examined further for its hydrogen production potential in the presence of the two dyes and metals, showed significantly higher rates of hydrogen production in the presence of Cr, Co and RR 198. Its hydrogenase activity also followed the same trend. Immobilization of the microbe into alginate beads almost doubled the hydrogen production by the organism in the control as well as in the presence of suitable concentrations of the two metals (10 mg L^{-1}) and dyes (50 mg L^{-1}).

USEM-9.03

Paper Title: FTIR Spectroscopy and Scanning Electron Microscopic Analysis of Pretreated Biosorbent to Observe the effect on Cr (VI) Remediation

Author(s): Kiran, B.¹, Rani, N.¹ and Kaushik, A.²

Affiliation(s): ¹Department of Environmental Science and Engineering., G.J. University of Science and Technology, Hisar; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: International Journal of Phytoremediation, Vol. 18(11), (2016), pp 1067-1074

ISSN No.: 1549-7879

Abstract: Various chemical and physical treatments have been applied to indigenously isolated cyanobacterial strain, *Lyngbya putealis* HH-15, to observe the effect on chromium removal capacity. Pretreatment with hydrochloric acid (99.1%) and nitric acid (98.5%) resulted in enhanced chromium removal as compared to untreated control biosorbent (98.1%). Pretreatment with acetic acid (97.9%), methanol (97.0%), calcium chloride (96.0%), hot water (95.2%), and sodium hydroxide (93.9%) did not improve the chromium removal capacity of biosorbent. Fourier transform infrared spectrometry (FTIR) and scanning electron microscopy (SEM) analysis identified changes in biomass functionality and availability after physical and chemical modification-the results of which were in agreement with metal removal studies. In conclusion, this acid-treated biosorbent represents a suitable candidate to replace conventional removal technologies for metal-bearing wastewaters.

USEM-9.04

Paper Title: Evaluation and Statistical Optimization of Methane Oxidation Using Rice Husk Amended Dumpsite Soil as Biocover

Author(s): Bajar, S.¹, Singh, A.¹, Kaushik, C.P.¹ and Kaushik, A.²

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Source: Waste Management, Vol. 53, (2016), pp 136-148

ISSN: 0956-053X

Abstract: A laboratory scale study was conducted to investigate the effect of rice husk amended biocover to mitigate the CH₄ emission from landfills. Various physico-chemical and environmental variables like proportion of amended biocover material (rice husk), temperature, moisture content, CH₄ concentration, CO₂ concentration, O₂ concentration and incubation time were considered in the study which affect the CH₄ bio-oxidation. For the present study, sequential statistical approach with Plackett Burman Design (PBD) was used to identify significant variables, having influential role on CH₄ bio-oxidation, from all variables. Further, interactive effect of four selected variables including rice husk proportion, temperature, CH₄ concentration and incubation time was studied with Box-Behnken Design (BBD) adopting Response Surface Methodology (RSM) to optimize the conditions for CH₄ oxidation. In this study, the maximum CH₄ oxidation potential of 76.83 μgCH₄g(-1)dwh(-1) was observed under optimum conditions with rice husk amendment of 6% (w/w), 5h incubation time at 40°C temperature with 40% (v/v) initial CH₄ concentration. The results for CH₄ oxidation potential also advocated the suitability of rice husk amendment in biocover system to curb emitted CH₄ from landfills/open dumpsite over conventional clay or sand cover on supplying CH₄ and O₂ to microbes on maintaining proper aeration.

USEM-10.01

Paper Title: Wetlands and Climate Change: Issues and Challenges in Asia

Author(s): Dangwal, U and Pamposh

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: NeBIO, Vol. 4(6), (2013), pp 13-25

ISSN No.: 2278-2281

Abstract: Asia possesses some of our planet's richest natural ecosystems. Among these are many of the most important tropical wetlands which provide their ecological and hydrological services to human society, but the region is expected to be seriously affected by the adverse impacts of climate change since most economies rely on agriculture and natural resources. There is evidence of prominent increases in the intensity and/or frequency of many extreme events such as heat waves, tropical cyclones, prolonged dry spells, intense rainfall, tornadoes, snow avalanches, thunderstorms, and severe dust storms in the region which can affect many sectors which have different vulnerabilities to climate change, including agriculture, water, ecosystems and coastal zones. The wetlands have specific roles for adaptation and mitigation of effects of climate change; such as mitigation of floods, carbon sequestration, adaptation for increased frequency of droughts, sea level rise/coastal inundation, adaptation for increased frequency of storms. It is clear that changes in our climate are already occurring and will continue to occur in the future even under the most optimistic predictions for emission reduction. It is therefore essential and critically important that climate change considerations be incorporated into all conservation and development plans to conserve the wetlands for adaptation to mitigate the adverse effects of climate change.

USEM-10.02

Paper Title: Water Quality and Pollution Status of Najafgarh Jheel (DELHI) in Contemporary Urban Scenario

Author(s): Kaur, M.¹, Pamposh¹ and Kaul, M.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Botany, Hans Raj College, University of Delhi

Source: Asian Academic Research Journal of Multidisciplinary, Vol. 10, (2013), pp 326-336

ISSN No.: 2319-2801

Abstract: Over the past several years rapid industrialization and advanced agricultural activities have taken place in the areas around Najafgarh jheel that has resulted in deterioration of water quality making it unfit for various purposes. Najafgarh jheel lies in the South West of NCT Delhi. The economic growth of the area has accelerated the pace of industrialization and urbanization. The main sources of pollution of Najafgarh jheel are domestic and municipal waste, agro-chemicals, industrial effluents and solid waste disposal. All these activities are adding toxic substances, oxidized organics, inorganics, suspended solids, sewage and harmful pathogens to water disturbing the entire wetland ecosystem and its morphology. The pollution status of the Najafgarh jheel was investigated on the basis of various physico-chemical parameters in response to rapid urbanization. High levels of variation in the analysed parameters such as BOD, conductivity and TDS were recorded during analysis which was attributed to human activity and discharge of large amount of waste into the water body.

USEM-10.03

Paper Title: Algal Flora of Some Selected Water Bodies of Delhi

Author(s): Gupta, K. and Pamposh

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Biological Forum-An International Journal, Vol. 6(2), (2014), pp 181-188

ISSN No.: 2249-3239

Abstract: The freshwater algae show an ability to tolerate a wide range of environmental conditions. Under natural condition, they usually grow in the mixed community which may include many species and genera. The identification of freshwater algae from Delhi mostly belonging to Chlorophycean members is totally dependent on the physico-chemical characteristics of the water bodies at different time intervals. This communication deals with the dynamics of the freshwater algae from river, ponds and wetlands of some parts of Delhi such as Wazirabad, India Gate, Old Fort, Shanti Van, Campus of Guru Gobind Singh Indraprastha University at Dwarka, Okhla Bird Sanctuary and Sanjay Jheel. A total of about 18 algal genera, 8 belonging to Chlorophyceae, 5 belonging to Bacillorophyceae, 5 belonging to Cynophyceae were recorded. In Okhla Bird Sanctuary, Shanti Van and Dwarka the algal genera with *Lyngbya* sp., *Anacystis* sp., *Tetradon* sp., *Anabaena* sp., *Agmenellum* sp., *Navicula* sp., and *Nitzschia* sp. recorded and it was noticed that the presence of this algae in huge amount indicates that the water of all these sites is polluted, as they are good indicator of pollution whereas at other four sites it was found to be less polluted because of the presence of *Rhizoclonium* sp., *Oedogonium* sp. and *Pithophora* sp. which are indicators of clean water.

USEM-11.01

Paper Title: Feasibility of Typha and Canna for Pulp and Paper Mill Wastewater Treatment Through Small Wetlands

Author(s): Rani, N.¹, Singh, B.² and Kumar, V.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Water Supply and Environment Engineering, Arba Minch University, Ethiopia; ³Dept. of Paper Technology, IIT Roorkee, Saharanpur Campus, Saharanpur

Source: International Journal of Environmental Sciences, Vol. 6(3), (2015), pp 388-395

ISSN No.: 0976-4402

Abstract: The bucket reactors-based wetland system was adopted for the treatment of pulp and paper mill wastewater using two macrophytes namely Typha angustifolia and Canna indica. The study was carried out for the treatment of wastewater collected from primary clarifier overflow (E1) and wastewater after the partial aerobic treatment of primary clarifier overflow (E2). Effectiveness of the two macrophytes was studied and compared for the removal of COD, BOD₅, TS, and Colour at two hydraulic retention times (HRT). The comparison of inlet and outlet concentrations showed high removals of Color, TS, BOD₅ and COD during summer season. The best removals were obtained at 3.5 days HRT. Also the treatment efficiency of both plants was compared where Typha showed significant removal efficiency than Canna. However, the aerobic treatment provided showed the significant improvements in the removal efficiency of Canna. The aerobic treatment provided to the wastewater also showed significant increase in removal of BOD₅ in case of both macrophytes during summer as well as winters. According to these results, it can be concluded that wetland system utilised in this research could be a suitable solution for industrial wastewater treatment

USEM-12.01

Paper Title: Coal Mining Impact on Soil of Nokrek Biosphere Reserve, Meghalaya

Author(s): Sarma, K.¹ and Barik, S.K.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Botany, North-Eastern Hill University, Shillong, Meghalaya

Source: Indian Journal of Environmental Protection, Vol. 32(2), (2012), pp 104-116

ISSN No.: 0253-7141

Abstract: The charnockite series in general and in the study area as well includes pyroxene granulites and charnockites. The present study is taken up to enumerate the origin, evolution and properties of charnockite series of rocks from North Arcot district in South Indian shield. The pyroxene granulites in the study area are inter banded with charnockites and banded iron formations (BIF). Petrogenetically, the pyroxene granulites show tholeiitic trends with iron enrichment and incompatible elements, that is Zr, Nb, Hf, P, La, Ce showing a progressive trend with fractionation index, such as FeO/MgO ratio. More compatible elements, like Ni, Cr, Sr, shows depletion with respect to the index. This indicates a low pressure fractional crystallization of basaltic magma (suite) played a dominant role in controlling the chemistry of these rocks. The presence of garnet in the pyroxene granulites indicates the granulitic facies conditions. Hypersthene granite is referred to as charnockite. The charnockites form main body of rocks in the study area and entirely surround the granite gneisses in this area. The charnockites of the study area are divided into two as tonalitic charnockites having mineral assemblage of quartz, plagioclase, K-feldspar,

orthopyroxene, biotite, iron ore and apatite and granodioritic charnockites with felsics, like plagioclase, K-feldspar and quartz, mafics, like hypersthene, biotite and hornblende. Apatite is an accessory mineral. The charnockites of the study area have xenoliths of pyroxene granulites which indicates the former is younger.

USEM-12.02

Paper Title: Soil Erosion Vulnerability Mapping of Nokrek Biosphere Reserve, Meghalaya Using Geographic Information System

Author(s): Sarma, K.¹, Sarma, R.K.², and Barik, S.K.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Geology, Cotton College, Guwahati; ³Department of Botany, North-Eastern Hill University, Shillong, Meghalaya

Source: Disaster and Development, Vol. 6(1&2), (2012), pp 19-32

ISSN No.: 0973-6700

Abstract: The present study is undertaken to find out the soil erosion vulnerability of Nokrek biosphere reserve of Meghalaya using Geographic Information System. The aspects of slope, drainage density, soil characteristics, geology and land use/ cover are taken into consideration for the study. Landsat ETM Remote Sensing data are used for preparing the land use/ cover map. For slope and drainage density mapping source of data was SOI topographical maps. Geology and soil maps are prepared based on the available literatures. Classification of satellite imagery shows that about 86 percent area of the biosphere reserve is covered by forest. But about 9 percent area is utilized by shifting cultivation irrespective to the vulnerable geological, edaphic and geomorphological factors. The biosphere reserve attains more than 60% area with slope more than 22 degrees. It is again found that only about 11 % of the biosphere reserve area falls under low drainage density and could be considered as stable zones with good vegetation cover. Remaining areas are recognised as vulnerable if they do not have proper vegetative cover. Weighted overlay multicriteria analysis of GIS is applied to find out the spatial distribution of vulnerable areas in terms of soil erosion. By integrating all the thematic layers with proper weightages and influences an area of about 30 sq km from the biosphere reserve is designated as most vulnerable for soil erosion. Moderately high vulnerable area found in the study is about 77.5 sq km. The findings of this study regarding the identification of spatial distribution of areas under risk due to soil erosion could be useful for the management authority to check it from further deterioration.

USEM-12.03

Paper Title: Use of Geospatial Technology for Analysing Habitat Suitability of *Lophophorus impejanus* (Himalayan Monal Pheasant) in Churdhar Wildlife Sanctuary of Himachal Pradesh, India

Author(s): Sarma, K., Eliza, K. and Bhattacharya, P.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Agriculture and Biodiversity Research, Vol. 1(5), (2012), pp 70-77

ISSN No.: 2277-0836

Abstract: Wildlife is at the brink of destruction due to degradation of forests, environmental pollution, climatic changes and extensive hunting of wild floras and faunas. Himalayan Monal Pheasant (*Lophophorus impejanus*) species which is grouped under endangered and least concerned species, is in threat for survival due to

anthropogenic reasons and the destruction of natural habitats. The present study is carried out to predict suitable habitat for Himalayan Monal Pheasant species in Churdhar Wildlife Sanctuary of Himachal Pradesh of India using geospatial technology. Different thematic maps viz., land use/cover, forest types, drainage buffer, multiple ring buffers of sighting locations and multiple ring buffers of roads have been prepared to support the objective of the study. The weighted overlay analysis model is used for identifying different potential areas of habitat for this threatened species. The most suitable area for Himalayan Monal Pheasant within the wildlife sanctuary is found about 16.7% of the total area which could be due to the presence of coniferous forests, dense vegetation, least anthropogenic disturbances and high altitudinal location. The moderate and least suitable areas come about 45.7% and 37.6%, respectively. Identification of habitat potential areas for Himalayan Monal Pheasant species could be considered as one of the most important steps towards the conservation and geospatial technology could be utilized for any similar species for this purpose which are under threat.

USEM-12.04

Paper Title: Land Use Land Cover Mapping, Change Detection and Conflict Analysis of Nagzira-Navegaon Corridor, Central India using Geospatial Technology

Author(s): Yadav, P.K., Kapoor, M. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Remote Sensing and GIS, Vol. 1(2), (2012), pp 90-98

ISSN No.: 2319-3484

Abstract: Degradation of forest connectivity in between landscapes occurs due to fragmentation and anthropogenic activity, which causes biodiversity decline. Conservation of wildlife corridors requires complete knowledge of species habitat requirements. Information of land use/cover and conflicts supports the assessment of wildlife habitat and identification of corridor status. In the present research paper an attempt has been made to find out the status of ecological corridors between Nagzira Wildlife Sanctuary and Navegaon National Park using temporal remote sensing data. It is found that 6.22 percent dense forest is converted to open forest and 6.66 percent open forest to non forest between 1990 to 1999. After observation of change analysis, it is found that maximum deforestation occurred in the corridors. In the following decade (1999 to 2009), 1.81 percent dense forest is converted to open forest and 2.21 percent of the open forest to non forest. Water bodies have been decreasing continuously in both decades. Forest loss and degradation occur due to human interference, urbanization, cattle grazing, noise pollution, air pollution and so on. As per the details obtained from field survey regarding the conflict analysis in the corridor, it can be inferred that most of the sites along the NH-6, state highways and railway tracks show presence of human encroachment in terms of agriculture land and build-up area. Due to high frequency of traffic on roads/railway, wild animals often divert from their original dispersal route and enter these hamlets leading to conflict situations.

USEM-12.05

Paper Title: Impact of Slash-And-Burn Agriculture on Forest Ecosystem in Garo Hills Landscape of Meghalaya, North-East India

Author(s): Yadav, P.K., Kapoor, M. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Biodiversity Management and Forestry, Vol. 1(1), (2012), pp 1-6

ISSN No.: 2327-4417

Abstract: Slash-and-burn (*jhum*) is one of the primary causes of deforestation in tropics. In North-East India, increasing human population density has resulted in the practice of unsustainable form of slash-and-burn that includes shortening of the fallow period as well as permanent conversion of forest to permanent agricultural expansions. This unsustainable form of slash-and-burn leads to soil degradation, soil erosion, loss of forest vegetation and threatens the survival of wild flora and fauna. Garo Hills has the richest reservoir of plant diversity of India and is one of the biodiversity hotspots of the world. There are numerous sacred forest patches in the Garo Hills. The prominent pressure to native forest biodiversity in the Garo Hills is the increasing anthropogenic conversion of mature and primary forest to *jhum* land. The decreasing fallow period has a deep impact on the life sustainability in Garo Hills and has reduced the quality of soil and thereby reducing the possibility of vegetative restoration at the locality. There was a tremendous increase in slash-and-burn land, i.e. 5.15 percentage in the year 2010 when compared to only 0.83 percentage in the year 1991. The overall reduction in the forest, mainly due to *jhumming* can severely affect a viable forest habitat of the endangered fauna like the Asian elephant and Hoolock Gibbon. The need to understand the effect of slash-and-burn cycle and to differentiate between the ecological sound traditional methods of *jhum* from the current unsustainable forms is most important.

USEM-12.06

Paper Title: A Framework for Assessing the Impact of Urbanization and Population Pressure on Garo Hills Landscape of North-East India

Author(s): Yadav, P.¹, Sarma, K.² and Kumar, R.²

Affiliation(s): ¹G. B. Pant Institute of Himalayan Environment and Development Kosi-Katarmal, Almora 263643, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Wildlife Trust of India, Noida-201301, Uttar Pradesh

Source: International Journal of Conservation Science, Vol. 4(2). (2013), pp 212-222

ISSN No.: 2067-8223

Abstract: The important factors influencing landscape changes could be climate, geology, topography, plant succession, species extinction and species evolution. Human, since time immemorial, have influenced the landscape they live in a variety of ways resulting in varied land use changes. Increase in population leads to the expansion in agriculture land, built-up areas, uncontrolled forest fires, mining of minerals, extraction of timber and permanent plantations, which in turn are responsible for habitat degradation and loss of biodiversity. Garo hills districts of Meghalaya are endowed with rich biodiversity both in terms of flora and fauna. With the increasing of population there is pressure exerted on these natural resources for the livelihood as there is hardly any alternative available. In the meantime, small forest based urban centres were developed and with the expansion of these the requirement of the local people also changed. Due to urbanization and population pressure the traditional

shifting cultivation (jhum), which is still the only livelihood of many areas of the Garo hills; have been converted into permanent cash crop areas. This conversion has a reverse impact on the environment. In the traditional jhumming method the native forests which were slashed and burned for agriculture purposes could revive in 18 to 20 years 'time (Jhum cycle). But due to the introduction of economically sound plantation crops like areca nut, cashew nut and tea the native diversity of the forest area is in the verge of extinction. The present study reveals that rapid population growth is the solely responsible factor for changes the landscape of Garo hills of Meghalaya.

USEM-12.07

Paper Title: **Priority Areas for Conservation in Northeast India: A Case Study in Meghalaya Based on Plant Species Diversity and Endemism**

Author(s): Upadhaya, K.¹, Thapa, N.¹, Lakadong, J.N.¹, Barik, S.K.² and **Sarma, K.³**

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Source: International Journal of Ecology and Environmental Sciences, Vol. 39(2), (2013), pp 125-136

ISSN No.: 2320-5199

Abstract: For setting up priority sites for conservation, information on the distribution of species in the area is required. The present study provides first-hand information on the distribution of threatened and endemic species in Meghalaya, northeast India, which is a part of Indo-Burma hotspot. Distribution of species in different habitats reveals that primary forests are the main habitat of threatened and endemic species. The number of threatened species was high at low and medium-high altitude areas, whereas, endemic species showed high concentration at medium and medium-high altitude areas. Though the current protected area in the state is serving an important role in plant diversity conservation, it is inadequate because of smaller area and being restricted at low-medium altitude. High altitude areas in Meghalaya are poorly represented by protected category and a large number of threatened and endemic species occur in areas located outside the existing protected areas. Eleven priority sites are identified that contain 66 (80%) threatened and 274 (85%) endemic species, where conservation efforts need to be focused at the earliest. Closer monitoring of plant diversity including the populations of endemic and threatened species is suggested for effective conservation of such species.

USEM-12.08

Paper Title: **The Review of Biodiversity and Conservation Study in India Using Geospatial Technology**

Author(s): Yadav, P.K., **Sarma, K.** and Dookia, S.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Remote Sensing and GIS, Vol. 2(1), (2013), pp 1-10

ISSN No.: 2319-3484

Abstract: Geospatial techniques have been used to monitor the land use changes and have an important role in study of biodiversity as well as in determination of natural resources. This review study evaluates how widely geospatial tools can be used in conservation, management, monitoring and assessment of biodiversity in India.

Using remote sensing techniques to develop land use classification mapping is useful to improve the management of areas designed for wildlife habitat and biodiversity assessment. In observation of this, importance of geospatial techniques, which can be seen as a combination of integrating tools such as Geographic Information System (GIS), Remote Sensing (RS), Global Positioning System (GPS), and information and communication technologies are realized as complimentary systems to ground-based studies. However, advancement in the spatial and spectral resolutions of sensors are now available to conservation biologist, which is making the direct use of remote sensing at certain aspects of biodiversity starting from distinguishing species assemblages or even identifying species of individual trees. In the recent decades, with the increase in the number of earth observation satellites with better repetitively, improvement in spectral bands, wide range of spatial resolutions and unprecedented number of remote sensing tools enable the management authority for proper management and conservation of biodiversity.

USEM-12.09

Paper Title: Landscape Dynamics In Relation to Slope and Elevation in Garo Hills of Meghalaya, India Using Geospatial Technology

Author(s): Sarma, K.¹, Yadav, P.K.¹ and Sarmah, R.K.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Geology, Cotton College, Guwahati

Source: Global Journal of Human Social Sciences, Vol. 13(2), (2013), pp 17-25

ISSN No.: 2249-460X

Abstract: Garo hills region of northeast India is severely affected by sheet erosion mainly because of the age old tradition of shifting cultivation in the fragile hill slopes aided by other anthropogenic activities. Slope and elevation are important parameters that provide varieties of topographical feature for ecological patches. Vegetation is one of the major factors controlling soil erosion, while most soil erosion occurrences are due to the removal of vegetation and topsoil. Change matrix result indicates dynamic character of landscape. The present study is conducted to examine the landscape dynamics to relate vegetation cover with slope and elevation in three Garo hills districts of Meghalaya using temporal remote sensing data of 2001 and 2010. It is revealed that there is decrease in open forest during the study period while areas under dense forest and non-forest increased. This increased forest areas are confined in the high slopes which are inaccessible. Considerable portions in the vulnerable slopes are utilized for shifting cultivation which could be devastating. The present study shows more than a double fold increase in shifting cultivation in the high altitudinal area which is negative sign in terms of environment protection. Conversion of dense forest to open forest occurred in all the slope categories while alteration from open to dense forest predominated in the moderate and high slope categories. Maximum change from open to non-forest is in the slope categories of moderate and low. There is considerable change from current jhum to open forest mostly in the moderate slope category. The maximum exchange between dense to open and open to dense occurred in the moderate slope and elevation areas.

USEM-12.10

Paper Title: Geospatial modeling to assess geomorphological risk for relentless shifting cultivation in Garo hills of Meghalaya, North East India

Author(s): Yadav, P.K.¹, Sarma, K.² and Mishra, A.K.¹

Affiliation(s): ¹G.-B. Pant Institute of Himalayan Environment and Development Kosi-Katarmal, Almora-263643, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Environment, Vol. 2(1), (2013), pp 91-104

ISSN No.: 2091-2854

Abstract: Due to shifting cultivation, the overall structure and composition of ecological condition is affected, hence landscape study becomes important for maintaining ecological diversity and appropriate scientific planning of any area. Garo hills region of northeast India is suffering from Geomorphological risk like sheet erosion, landslide etc. due to the age old tradition of shifting cultivation in the fragile hill slopes aided by other anthropogenic activities. The present study was conducted to examine the role of shifting cultivation for deforestation and degradation with variant of slope and elevation to relate vegetation cover with slope and elevation in the Garo Hills landscape of Meghalaya using temporal remote sensing data of 1991, 2001 and 2010. It revealed that there is decrease in dense forest and open forest during the 1st decade while areas under dense forest and non-forest increased in 2nd decade. This increased forest area is confined in the high slopes, which are inaccessible. The study shows increase in shifting cultivation near-about double fold in high slope and more than a double fold in the high altitudinal area in last decade, which is negative sign in terms of Geomorphological protection.

USEM-12.11

Paper Title: A Framework for Indigenous Community-Based Climate Vulnerability and Capacity Assessment in the Garo Hills, North-East India

Author(s): Yadav P.K. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078.

Source: Journal of Biodiversity Management and Forestry, Vol. 2(3), (2013), pp 1-9

ISSN No.: 2327-4417

Abstract: The framework is part of the efforts to address vulnerability and adaptation to climate change. It is useful to eradicate poverty, fill productive employment and enhance social integration. Climate change will have the largest impact on areas that have high population density, significant historical exposure to climate related hazards, high household's vulnerability, poor governance, and low resilience to stress on natural resources. Indigenous community based climate vulnerability and capacity assessment (CBVCA) in the Garo hills has implications for livelihoods, food systems, ecological stress and perceive culture. This study characterizes CBVCA in the Garo hills of northeast India to climate change in the context of ongoing socio-economic and environmental challenges. The Garo indigenous communities have been identified as vulnerable in the climate change vulnerability analysis as they have high poverty levels, dependency on natural resources, food, water and livelihood, insecurity and lack of sustainable livelihood. They are frequently ravaged by cyclonic storms and alternate spells of drought which disrupt their cycle of cultivation and livelihood. Existing stresses in the community influence infrastructure, livelihoods, health, education and wellbeing. Strategies for adapting to adverse conditions have largely been tactical and short term, rather than planned

actions in anticipation of changes in climate. The framework indicates that majority of villages of Garo hills of Meghalaya currently and in near future are subject to climate induced vulnerability. A future adaptation planning and policy need to enable community involvement in the protection of important community attributes.

USEM-12.12

Paper Title: Evaluation of Groundwater Quality and Depth with Respect to Different Land Covers in Delhi, India

Author(s): Gupta, P. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Applied Sciences and Engineering Research, Vol. 2(6), (2013), pp 630-643

ISSN No.: 2277-9442

Abstract: Groundwater properties vary spatially and temporally with number of factors. In the present study, an attempt has been made to study the groundwater characteristics of Delhi with respect to different land covers. Four land covers were selected viz. protected forest, trees outside forest, maintained park and settlement area with two sites under each type of land cover. Groundwater quality and depth were found out for each site. Water samples were analyzed and compared with BIS drinking water standards and were used to determine water quality index (WQI). Chemical analysis revealed that Delhi groundwater is hard (120-1120 mg/L) and slightly alkaline (pH 7.32-8) in nature. Values of TDS and hardness were reported to exceed desirable limits for more than 50 percent samples. Sites under protected forest area were found to have least WQI values indicating good water quality. Minimum groundwater depth was reported from settlement area sites while contrary to this maximum water depth was reported from protected forest area sites. Groundwater depth was found negatively correlated with chemical parameters.

USEM-12.13

Paper Title: Landslide Susceptibility Zonation of Tawang District of Arunachal Pradesh Using Geospatial Technology

Author(s): Sarma, K.¹ and Barik, S.K.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Botany, North-Eastern Hill University, Shillong, Meghalaya

Source: Disaster and Development, Vol. 7(1&2), (2013), pp 97-113

ISSN No.: 0973-6700

Abstract: Tawang district of Arunachal Pradesh is geologically fragile and vulnerable in terms of seismicity and topography. The district is plagued by large scale landslides in many parts due to human-induced activities on these fragilities. The present study was undertaken to map the probable landslide susceptible areas of Tawang district using Geographic Information System (GIS). The aspects of geology, seismicity, slope, soil, drainage, elevation, existing landslide locations and the anthropogenic activities were taken into consideration for the study. Weighted overlay multicriteria analysis of GIS was applied to find out the spatial distribution of susceptible areas in terms of land slide. By integrating all the thematic layers with proper weightages and influences, an area of about 144 sq. km of the district is designated as highly susceptible to landslide. Moderate susceptible area is about 27.80 percent while about 65 percent area of the district falls under moderately low and low susceptibility

to landslide. The findings of this study regarding the spatial distribution of areas under risk due to landslide could be useful for the management authority for mitigation of landslide hazard.

USEM-12.14

Paper Title: Community Structure of Plant Species in Okhla Bird Sanctuary, Delhi, India

Author(s): Mukherjee, A. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Conservation Science Vol. 5(3), (2014), pp 397-408

ISSN No.: 2067-8223

Abstract: Okhla Bird Sanctuary (OBS) has been well known as the home of migratory birds and most of the studies have been so far focused on bird diversity and aquatic vegetation. The present study was conducted to find out the structure and composition of terrestrial vegetation of sanctuary in two Nature trails. The total number of terrestrial plant species recorded in the study area is 106, of which 48 are trees, 9 shrubs and 49 herbs. The density of tree species were recorded in Nature Trail 1 and Nature Trail 2 had almost similar value with 7.10 and 6.68 stems per ha while density of shrub species found were 5.51 and 6.29 individuals/m². The density of herbaceous species in both the trails enumerated were 50.93 and 46.89 individuals/m², respectively. In terms of importance value index, *Leucaena leucocephala* (IVI- 24.49; SDI-0.0067) was the dominant tree species in the Nature Trail 1, followed by *Ficus benghalensis* (IVI- 19.90; SDI- 0.0044), *Ficus* sp (IVI- 17.45; SDI- 0.0034) and *Melia azedarach* (IVI-14.35; SDI- 0.0023). In shrub layer, *Tabernaemontana divaricata* (IVI- 42.04; SDI- 0.0442), followed by *Abutilon indicum* (IVI- 39.98; SDI- 0.0400) and *Lantana camara* (IVI- 35.63; SDI-0.0317) were the most dominant species in Nature Trail 1. Among the herbaceous species, *Cynodon dactylon* (IVI- 65.9; SDI- 0.1087) was found to dominate the entire stretch of Nature trail 1, followed by *Cannabis sativum* (IVI- 20.8; SDI- 0.0108), *Oxalis corniculata* (IVI- 14.6; SDI- 0.0053) and *Chenopodium album* (IVI- 10.3; SDI- 0.0026). In case of basal area Nature Trail 2 was significantly higher (6.13 m²ha⁻¹) than Nature Trail 1 (6.03 m²ha⁻¹).

USEM-12.15

Paper Title: Status Identification and Prediction of Kaziranga-Karbi Anglong Wildlife Corridor of Assam, India Using Geospatial Technology

Author(s): Sharma, B. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078.

Source: Journal of Landscape Ecology, Vol.7(2), (2014), pp 45-58

ISSN No.: 1572-9761

Abstract: In the present study, an attempt has been made to discover the impacts of various developmental activities on the Kaziranga-Karbi Anglong wildlife corridor of Assam, India, using geospatial technology; as well as to predict the future status of the wildlife corridor by using the Cellular Automata Markov Model. Due to various anthropogenic activities the condition of the natural corridor has deteriorated, and in recent years many wild animals have been killed by road traffic accidents; in particular, greater one-horned (Indian) rhinoceros (*Rhinoceros unicornis*) are killed indiscriminately by the poachers, having been deviated from their regular routes. Changes were evident during the two decades between 1990 and 2010, when a large

number of dense forest areas were converted to open forest, combined with losses of areas of scrub and marshy land. The area under agriculture and plantation crop increased along with the grassland during the decades. It has been found that the forests in Kaziranga-Karbi Anglong corridor are fragmented, and the area within the corridor is shrinking. There is considerable increase in patchiness, proportion of edge, and a perforated reduction of core areas within the corridor. The predicted land use/cover map of Kaziranga-Karbi Anglong corridor shows expansion of agricultural land, as well as plantation areas. It is estimated that only 25.66 percent of the present dense forest and 20.72 percent of open forest will remain by 2030, while areas under agriculture and plantation will increase by 33.91 and 5.33 percent, respectively.

USEM-12.16

Paper Title: Assessment of Elephant (*Elephas Maximus*) Mortality Along Palakkad-Coimbatore Railway Stretch of Kerala and Tamil Nadu Using Geospatial Technology

Author(s): Jha, N., Sarma, K. and Bhattacharya, P.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Biodiversity Management and Forestry, Vol. 3(1), (2014), pp 1-7

ISSN No.: 2327-4417

Abstract: Asian elephants (*Elephas maximus*) are facing serious threats due to the train-hits and a major concern for the environmentalists and common man. Habitat fragmentation, degradation of habitat quality, forest cover loss and lacking in management of physical barriers could be attributed for these accidents. The present study is carried out in Palakkad-Coimbatore railway sector of Tamil Nadu and Kerala states of India to find out the problem sites of incidents using landscape matrices, detection of changes in land use/ cover using temporal remote sensing data and its relation with human elephant conflict and to predict the future scenario based on the present findings. The study reveals that there are noticeable conversion of forests from dense to open (7.12% and 2.75%) during 1989 to 1999 and 1999 to 2012. During 1989 to 1999 and 1999 to 2012 about 5 and 2 percent of the dense forests were changed to other non-forest type, respectively. These changes have great impacts on the forest fragmentation which leads to breaches of elephant corridors and caused deaths to the animals due to train-hits. The number of forest patches showed drastic deductions from 1989 to 2012 (2589 ha to 702 ha), also there is less number of patch density in the later years. From the future prediction study it is estimated that there will be hardly any changes in the dense forest areas by 2020. Mining areas is considered to be one of the key factors for habitat alteration in future as they are located inside the dense forests, which has been projected through matrix in the paper in relation to wildlife habitat.

USEM-12.17

Paper Title: Application of Geoinformatics for Assessment of Tropical Deforestation, Slash-and-burn Land and Their Impact on Climate in Garo Hills, Northeast India

Author(s): Yadav, P.K.¹ and Sarma, K.²

Affiliation(s): ¹G.B. Pant Institute of Himalayan Environment and Development Kosi-Katarmal, Almora-263643, Uttarakhand; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Expert Opinion on Environmental Biology, Vol. 3(1), (2014), pp 1-5

ISSN No.: 2325-9655

Abstract: Tree felling in tropical forests is done for the purpose of slashand-burn agriculture after which a forest may revive back to its natural condition or may lead to degraded land. The present study was carried out to assess the deforestation rates due to slashand-burn agriculture using temporal remote sensing data. The design framework is motivated by spatial analysis of deforestation and slash-and-burn driven by indiscriminate tropical forest patch removal. In the current study it is revealed that the area underslash-and-burn increased by many folds during the last two decades (0.83% in 1991 and 5.15% in 2010). During the decades again a large chunk of forests estimated about 2,585 sq km were lost due to burning of biomass for shifting cultivation. The rate of forest degradation in all the three districts of Garo hills are identical in both the decades, but due to the efforts made by agencies there was gain of forest areas in one of the Garo hills districts in the later decade. There is no doubt about the increase of CO₂ and other greenhouse gases due to burning of the tropical biomass in the Garo hills region of India. There are plenty of scopes left for undertaking scientific research in this field.

USEM-12.18

Paper Title: Anthropogenic Threats and Plant Diversity Conservation in Cherrapunji- One of the Wettest Places on Earth

Author(s): Upadhaya, K¹, Choudhury, G.¹ and Sarma, K.²

Affiliation(s): ¹Department of Basic Sciences and Social Sciences, North-Eastern Hill University, Shillong-793022; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Keanean Journal of Science, Vol. 3, (2014), pp 3-20

ISSN No.: 2321-6077

Abstract: The present study was conducted in Cherrapunji plateau covering an area of 792 sq km to assess the conservation significance of the area. It is one of the wettest places on earth with an average rainfall of 11,309 mm. The vegetation of the area may be classified as subtropical broad leaved forest. However, the dominant land use of the area is non forest or degraded grassland (64.2%) followed by open forest (19.4%) and dense forest (16.4%). The area has been degraded to a large extent due to a number of human activities and many previously forested slopes are now grasslands. Most of the forests are in inaccessible areas or in the form of patches preserved by the local people due to socio-religious practices. These remnant patches are rich in plant diversity. A preliminary investigation of rare and threatened plant species reveals the presence of 137 species belonging to 95 genera and 47 families. Human activities coupled by high rainfall have been attributed as the main factors responsible for the loss of biodiversity. An attempt has also been made to evolve effective strategies for conservation and management of plant diversity of the area.

USEM-12.19

Paper Title: Spatial Distribution of Various Parameters in Groundwater of Delhi, India

Author(s): Gupta, P. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Cogent Engineering, Vol. 3, (2016), pp 1-9

ISSN No.: 2331-1916

Abstract: The present study analyzed the spatial variability in groundwater quality and depth in National Capital Territory (NCT) of Delhi, India. The study classified the parameters into five distribution classes viz., low, moderately low, moderate, moderately high, and high. Spatial variability maps were generated using kriging tool in ArcGIS environment. Primary data collected seasonally during 2012–2014 were used for the generation of maps. Physico-chemical parameters were correlated with each other and groundwater depth. All the parameters were found to be negatively correlated with groundwater depth. Spatial distribution maps showed that maximum concentration of most parameters was found in the northern parts of the study area, while maximum depth was reported from the southern part. Maximum area of around 59% of total area of Delhi has low electrical conductivity, TDS, and hardness values. With groundwater depth improving toward north Delhi, groundwater quality is found to be improving toward south parts of Delhi.

USEM-12.20

Paper Title: Assessment of Land Use Dynamics of Okhla Bird Sanctuary, Delhi Using Geospatial Technology

Author(s): Mukherjee, A. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Biodiversity Management and Forestry, Vol. 5(1), (2016), pp 1-4

ISSN No.: 2327-4417

Abstract: Okhla Bird Sanctuary (OBS) is known as the home of migratory birds located within the territory of the Indian national capital, Delhi. The sanctuary is providing excellent contribution in terms of groundwater recharge for the city dwellers. Due to high demand of open land in the vicinity of the industrial and economic area, the sanctuary has been targeted for the expansion of those activities. As a result of that a good number of areas within the OBS have undergone changes in last few decades. Here, an attempt has been made to assess the changes in land uses within the sanctuary from 1977 to 2010 utilizing geospatial technology. It has been found the predominant activity in the OBS is agriculture ranging from 24 to 46 percent during all the years. The most targeted land use has been forest areas which were reduced to 1.08 percent, while during 1977 it covered more than 38 percent. However, the area under water body has been increased with the passes of time reason may be due to the construction of Okhla barrage in mid 1980s. It was observed during the study area that there was remarkable increase of fallow/ built up area during the period.

USEM-12.21

Paper Title: **Habitat Suitability Modelling for Koklass Pheasant Using Geospatial Technology in Churdhar Wildlife Sanctuary (H.P.) India**

Author(s): Eliza, K. and Sarma, K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Scientific Research in Environmental Sciences, Vol. 4(4), (2016), pp 0093-0101

ISSN No.: 2322-4983

Abstract: Pheasants are at the brink of destruction due to various anthropogenic activities such as deforestation, encroachment of their habitat area and excessive hunting. Koklass (*Pucrasiamacrolopha*) species is facing tremendous pressures due to poaching and destruction of habitat. This species is classified as least concern species with decreasing population trend according to IUCN Red List of Threatened Species and also classified under endangered species according to Red Data Book of Zoological Survey of India. There is need to understand and manage habitats of species in order to prevent extinction of endangered species. Wildlife habitat suitability analysis using GIS have been found to be successful in many studies. In the present study, habitat suitability model for Koklass Pheasant of Churdhar Wildlife Sanctuary, HP, India was developed using geospatial technology which predicts suitable habitat zone. Different thematic maps such as land use/cover, forest type, drainage, roads and sighting locations of Koklass Pheasant are overlaid using Weighted overlay analysis model. The Habitat Suitability model shows different habitat potential zones of this Pheasant which are 5.9%, 24.9%, 45.4% and 23.7% for least, moderate, moderately high and most suitable respectively. The least and moderate suitable zones could be due to various anthropogenic activities such as deforestation, road construction activities, grazing by domestic cattles, noise pollution and encroachment of land for agricultural purpose. Habitat suitability analysis of Koklass Pheasant can be considered as the initial phase towards the conservation approach of this species.

USEM-12.22

Paper Title: **Monitoring Dynamics of Land Use/land Cover Changes of the River Yamuna In Upper Stretch Using Multi-temporal Satellite data**

Author(s): Quareshi, S., Sarma, K. and Garg, J.K.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Current Research, Vol. 8(6), (2016), pp 32988-33000

ISSN No.: 2231-2196

Abstract: This paper describes the methodology and results of classifications of multi-temporal Landsat 4-5 Thematic Mapper data of the River Yamuna in upper stretch, India for the years 1999 and 2011 respectively. Seven different land cover/use categories have been used, named built-up Area/settlement, forest, agricultural land, scrub land, wetlands, river/streams/drains and railways. The overall classification accuracies were 78.46% and 81.23% and Kappa as 0.7470 and 0.7795 for the year 1999 and 2011 respectively. One of the important results for the classifications is the decrease in agricultural land and forest areas and a considerable increase in built-up area as a result of anthropogenic activities in the study area. The classifications have provided an economical and accurate way to quantify, map and analyze changes over time in land cover.

USEM-13.01

Paper Title: The Shifting Agricultural System (Jhum) and Strategies for Sustainable Agroecosystem in Northeast India

Author(s): Shimrah, T.¹, Rao, K.S.² and Saxena, K.G.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Botany, Delhi University, Delhi-110007; ³School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110067

Source: Agroecology and Sustainable Food Systems, Vol. 39(10), (2015), pp 1154-1171

ISSN No.: 2168-3565

Abstract: The purpose of this article is to examine how a traditional shifting agricultural system (locally known as jhum) in marginalized and remote areas in Northeast India has been practiced, and, over a period of time, how various changes have taken place in terms of population, climate, and policies. It is observed that, in spite of an increase in human population, production as well as species diversity have not been much affected. The traditional production system with some degree of modification that applies scientific knowledge can sustain the fragile mountain ecosystem of Northeast India. Moreover in order to maintain sustainable crop production without compromising environmental health, there should be more collaborative efforts between traditional cultivators and scientific communities to bring about win-win situations.

USEM-13.02

Paper Title: Soil Property Variations Under Different Land Use/cover types in Traditional Agricultural Landscape in Northeast India

Author(s): Shimrah, T.¹, Rao, K.S.² and Saxena, K.G.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Botany, Delhi University, Delhi-110007; ³School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110067

Source: Journal of Chemistry, Environmental Sciences and its Applications, Vol. 2(1), (2015), pp 73–97

ISSN No.: 2349-7564

Abstract: Clearing of forests and their subsequent conversion into croplands greatly influence soils in terms of its water holding capacity, structure stability and compactness, nutrient supply and storage as well as its biological life. Consequently, many agricultural soils in the tropics are now below their potential levels. In this paper we are reporting that there is expansion of agricultural land use in Northeast India at the expense of forest area in order to meet increasing human population and market demands. New land use/ cover types are also being introduced for commercial and well as subsistence purpose. On the other hand fallow period of shifting agriculture has been reduced. We suggest that a minimum fallow period of seven years is necessary sufficiency of soil nutrients and vegetation in this humid subtropical mountain landscape of Northeast India.

USEM-13.03

Paper Title: An Overview of Shifting Agriculture (Jhum) in Himalayan Region as A Component of Village Landscape

Author(s): Shimrah, T¹., Maikhuri, R.K²., Rao, K.S³. and Saxena, K.G⁴.

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²G.B. Pant Institute of Himalayan Environment and Development, Garhwal Unit, P. Box. 92, Srinagar (Garhwal); ³Department of Botany, Delhi University, Delhi-110007; ⁴School of Environmental Sciences, Jawaharlal Nehru University, New Delhi-110067

Source: Keanean Journal of Science, Vol. 4, (2015), pp 45-61

ISSN No.: 2321- 6077

Abstract: Shifting agriculture, locally known as 'Jhum' in north eastern part of India is one of the main components of village agroecosystem. It is subjected to various kinds of criticism such as the main cause of forest degradation and subsequent ecological imbalances in the region, apart from low productivity and economic returns to the farmers. But even all forms of agriculture taken as a whole in this region, it is still a minor land use in terms of spatial extent (net sown area being <20% of total geographical area). In term of dependencies by the traditional communities in Northeast India on shifting agroecosystem, it is the backbone of local livelihoods and ecosystem services. It is rather one of the complementary land uses in a larger frame of integrated ecosystem consisting of wet paddy cultivation, plantations and forests. Shifting agriculture practice involving controlled logging and limited extraction of biomass is sustainable in term of species regeneration and rejuvenation of forest.

USEM-14.01

Paper Title: Ethnoecology of Indian Ephedras

Author(s): Singh, R. and Sourabh, P.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Pleione, Vol.6(1), (2012), pp 81-86

ISSN No.: 0973-9467

Abstract: Present investigation documents the ecological and economical uses of *Ephedra* Tournefort ex Linnaeus (Ephedraceae) in India. *Ephedra* is known locally in the region of its occurrence as Soma or Somlata. All the species of *Ephedra* act as soil binder and enrich the soil in which they grow with silica. The dried resinous pith yields a number of alkaloids used in medicines. The fruit and fleshy bracts are edible.

USEM-14.02

Paper Title: Ethnomedicinal Use of Pteridophytes in Reproductive Health of Tribal Women of Pachmarhi Biosphere Reserve, Madhya Pradesh, India

Author(s): Singh, S. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Pharmaceutical Sciences and Research, Vol. 3(12), (2012), pp 4780-4790

ISSN No.: 0975-8232

Abstract: This paper describes the utilization of pteridophytes for the treatment of various gynecological and other related problems by the indigenous women of Pachmarhi Biosphere Reserve in Madhya Pradesh. The present study reveals that 23 species of

pteridophytes belonging to 15 families and 18 genera are traditionally used by tribal women of *Korku*, *Gond*, *Bharia*, *Bhil*, *Mauria*, *Maria*, *Paria*, *Bhatara* and *Baigas* communities in gynecological problems which contribute about 18.66% of total pteridophytic diversity (134 species) of the area.

USEM-14.03

Paper Title: Assam *Cycas* Pleads for Protection

Author(s): Singh, K.J. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Indian Forester, Vol. 138(12), (2012), pp 1110-1115

ISSN No.: 0019-4816

Abstract: Cycads are woody, palm like trees with distinctive appearance which is related to their primitiveness or antiquity. Cycads flourished in Phanerozoiceon and reached their peak in the Mesozoic era. At present, they are surviving by a single order Cycadales with three families Cycadaceae, Zamiaceae and Stangeriaceae, having 10 genera and about 300 species. These taxa are surviving in tropical and subtropical regions of the world. Indian cycads are represented by a single genus *Cycas* with nine species and one variety. *Cycas pectinata* Ham. was described from the Kamrup district of th Assam in 19th century. Widespread habitat destruction urbanisation and unsustainable harvesting of the species for horticulture, medicine and many socio-cultural rituals led *Cycas* population to become critically endangered in the state. In the present paper, discovery of a giant tree of cycad is reported. Threats to cycad populations and illegal trade of *Cycas* cones are highlighted in the paper.

USEM-14.04

Paper Title: Utilization of Pteridophytes of Achanakmar-Amarkantak Biosphere Reserve, Central India in Women's Health and Beauty Care Practices

Author(s): Singh, S. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: International Research Journal of Pharmacy, Vol. 4(1), (2013), pp 235-240

ISSN No.: 2230-8407

Abstract: This study describes and documents the information on tradition utilization of 17 species of pteridophytes belonging to 11 families and 13 genera (ferns and their allies) in the treatment of Women's health and beauty care practices by the tribal people of Achanakmar-Amarkantak Biosphere Reserve, Central India. Latin names, vernacular names, family along with their uses of all the species are described

USEM-14.05

Paper Title: **Phytochemistry and Identification of Bioactive Compounds of Ethnobotanically Important Species *Dryopteris cochleata* (D. Don) C. Chr.**

Author(s): Singh, S. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: NeBIO, Vol. 4(3), (2013), pp 65-71

ISSN No.: 0976-3597

Abstract: *Dryopteris cochleata* (D. Don) C. Chr. (Dryopteridaceae) is an important species to be used traditionally as medicine for various ailments by tribal people in Pachmarhi Biosphere Reserve, Madhya Pradesh. The paper elucidates its phytochemistry and potential bioactive compounds qualitatively. Phenolic content, Flavonoids, Flavonol, Tannin, Ascorbic acid, Protein, Carbohydrate, Vitamin-C, Steroids were detected from whole plant extracts. The GC-MS study supports the presence of many useful bioactive compounds like 2,3-Dihydro-Benzofuran (15.96%), 2,6-Cresotaldehyde (10.74%), 2-Hydroxy-gamma-butyrolactone (8.07%), Cyclopropyl methanol (6.66%), 2-Furan-carboxaldehyde, 5-(hydroxymethyl) - (5.58%), Guanosine (5.47%), 2,5-Dimethyl-4-hydroxy-3(2H)-furanone (4.77%), 2-Hexene (4.68%), Hexadecanoic Acid (4.21%) and 2-Cyclopenten-1-one, 2-hydroxy- (3.74%), which may be utilized by the pharmaceutical industries for quality evaluations, ensuring successful commercial drug

USEM-14.06

Paper Title: **Population Assessment and Distribution of *Cycas pectinata* Buchanan-Hamilton in Northeast India**

Author(s): Singh, K.J., and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Pleione, Vol. 8(1), 2014, pp 17-25

ISSN No.: 0973-9467

Abstract: Cycads are globally one of the most threatened groups of plants, with 62 % of all species listed on the IUCN Red List (Nagalingum et al. 2011; IUCN 2011). The ongoing decline of cycad populations in India is not well documented as compared to other cycads of the world. *Cycas pectinata* Buchanan-Hamilton (Cycadaceae) is one of the most wide spread cycad is now under threat and its populations are declining at pace as compared to any other species of *Cycas*. In Northeast India, the cycad populations has shrunk to such an extent that it is almost at the verge of extinction from the region. In the present study, cycad population in Assam, Manipur, Sikkim, West Bengal, Arunachal Pradesh and Tripura were extensively surveyed in the field during 2007 to 2014. The paper highlights the current population status, range of distribution, phenology and threats to *Cycas pectinata* in Northeast India.

USEM-14.07

Paper Title: Notes on Insect Diversity of Indian *Cycas* species

Author(s): Radha, P.¹, and Singh, R.²

Affiliation(s): ¹Centre for Plant Molecular Biology, Osmania University, Hyderabad, Andhra Pradesh, India; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078.

Source: International Journal of Interdisciplinary and Multidisciplinary Studies, Vol. 1(9), (2014), pp 78-85

ISSN No.: 2348-0343

Abstract: The question of an analogue evolution of plant - insect interaction in gymnosperms has remained unanswered until recently, in spite of indications of insect pollination in the extant cycad genera. Earlier observations on insect pollination have now been verified by convincing experiments with several cycads in which anemophilous pollination was excluded. Insects have long been known to visit cycad cones and now it is established that in rest of the cycad species where both male and female reproductive organs are organized in compact cones, these insects help in the pollination. But *Cycas* is the only genus where female megasporophylls do not form a cone and its pollination mechanism has not been fully comprehended. The present investigation was carried out in the natural habitats of *Cycas* species from the Western Ghats, India. Five coleopteran insects were found abundantly in the male cones of *Cycas* and our observations on the role of these insects led us to believe that *Cycas* among cycads which appear to be true remnants of pteridospermous line have somehow has also maintained mutualism with the primitive plant chewing insects like coleopterans could be the results of an ancient co-evolution.

USEM-14.08

Paper Title: A New Species, A New Combination and A New Subsection of *Cycas* from Odisha, Northern Eastern Ghats of India

Author(s): Singh, R.¹, Radha, P.², and Singh, K.J.³

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Centre for Plant Molecular Biology, Osmania University, Hyderabad-500007; ³Botanic Garden, CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow-226001

Source: Asian Journal of Conservation Biology, Vol. 4(1), (2015), pp 3-14

ISSN No.: 2278-7666

Abstract: *Cycas circinalis* var. *orixensis* Haines (Cycadaceae) is raised to species rank and a new species, *Cycas nayagarhensis* is described and illustrated from the state of Odisha in the northern Eastern Ghats of India. Both of these Odisha *Cycas* species described here, have characteristic megasporophylls having spinescent lateral teeth and a spear-like long apical spine. Male cones are the most peculiar in having microsporophylls with upturned, one to variously forked apical spines. *Cycas nayagarhensis* distinguished from *C. orixensis* by its massive arborescent stem, large male cones, with microsporophylls having entire or variously forked apical spine and radially compressed ovules. A comparative table of the northern Eastern Ghats *Cycas* and a key to all the Indian species are provided. The infrageneric classification of the genus *Cycas* is modified and a new Subsection Orixenses under Section *Cycas* is created here to accommodate these two morphologically distinct endemic taxa from Odisha.

USEM-14.09

Paper Title: Gymnosperms of Northeast India: Distribution and Conservation Status

Author(s): Singh, K.J.¹ and Singh, R.²

Affiliation(s): ¹Botanic Garden, CSIR-National Botanical Research Institute, Rana Pratap Marg, Lucknow-226001, Uttar Pradesh; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Pleione, Vol. 9(2), (2015), pp 283-288

ISSN No.: 0973-9467

Abstract: Plant diversity in Northeast India comprises elements of Himalayan and Indo-Malayan region. Gymnosperms of the region also share distribution with adjacent regions especially the coniferous plants. Northeast India has highest diversity of gymnosperms in India. With 24 species, conifers are the most diverse group followed by Gnetales with 6 species. Cycads are represented by only one species. In the paper, a list of gymnospermous plants with their range of distribution and conservation status is given and threats to the species are discussed.

USEM-14.10

Paper Title: Macropropagation of Medicinal Important Tree: *Stereospermum tetragonum* DC.

Author(s): Awasthi, K.K.¹, Nandini, D.², Suresh, G.², Singh, R.¹ and Haridasan, K.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²CCNR, Trans-Disciplinary University, FRLHT, Bengaluru, Karnataka

Source: International Journal of Advanced Research, Vol. 3(10), (2015), pp 586-592

ISSN No.: 2320-5407

Abstract: Unregulated amount of collection and trade of medicinal plants from the forests leads to the destruction of the plant species and *Stereospermum tetragonum* is under threat due to over-exploitation, there is a need for ex-situ Conservation of the species. *Stereospermum tetragonum* is usually propagated through seeds but has very poor rate of germination. Hence, an efficient, reproducible and systematic seed propagation technique using suitable treatment pre- treatments and sowing substrates has been standardized which can be helpful in its conservation strategy.

USEM-14.11

Paper Title: Pods and Seeds Traits in *Stereospermum tetragonum* DC.

Author(s): Awasthi, K.K.¹, Haridasan, K.², Nandini, D.² and Singh, R.¹

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²CCNR, Trans-Disciplinary University, FRLHT, Bengaluru, Karnataka

Source: International Journal of Current Research, Vol. 7(9), (2015), pp 19942-19946

ISSN No.: 0975-833X

Abstract: *Stereospermum tetragonum* DC. is a medicinal plant belonging to family Bignoniaceae. *S. tetragonum* is an important medicinal plant; therefore, it's planting and conservation has been recommended to prevent its extinction. In the present study we estimated the pod length and width, the number of seeds per pod, and number of seeds per kilograms of seeds using a descriptive analysis and the Analysis of Variance. We specified and estimated a regression model to study the relationship between the number of seeds per pod (dependent variable) and the pod length (independent variable). The estimated average pod length, pod width, seed number

per pod, weight of 100 seeds (gm) and number of seeds per kilograms of seeds are 32.5 ± 2.2 , 4.0 ± 0.2 , 27 ± 3 , 1.08 ± 0.02 and 92403 ± 1535 , respectively. With a 1% increase in average pod length, the average seed number per pod is estimated to increase by 0.9%. The results of this study will be useful for a yield improvement program of the plant, planning a sowing program, and in calculating the seed prices.

USEM-14.12

Paper Title: A New Species of *Ephedra* (Ephedraceae, Ephedrales) from India

Author(s): Sharma, P.¹ and Singh, R.²

Affiliation(s): ¹Department of Botany, University of Delhi, Delhi-110 007; ²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Phytotaxa, Vol. 218(2), (2015), pp 189-192

ISSN No.: 1179-3155

Abstract: *Ephedra* Linnaeus (1753: 1040) is a genus with approximately 40 species Christenhusz et al. (2011), although the estimates range from 31 Stapf (1889) to ca 50 Price (1996). Sahni (1990) lists eight species for India and adjoining regions, but three additional species (*E. kardangensis* P. Sharma & P.L. Uniyal in Sharma et al. 2010: 730, *E. khurickensis* P. Sharma & P.L. Uniyal in Sharma et al. 2010: 731, *E. sumlingensis* Sharma & Uniyal 2008: 179), have recently been added from the Western Himalayas since (Sharma & Uniyal 2014).

USEM-14.13

Paper Title: Use of Indigenous Plants in Traditional Health Care Systems and Economic Use by Mishng Tribe of Jorhat, Assam, India

Author(s): Pandey, A.¹, Singh, S.¹, Singh, R.¹ and Mavinkurve, R.G.²

Affiliation(s): ¹University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Research Associate, Centre for Conservation of Natural Resources, I-AIM, FRLHT, Bengaluru

Source: World Journal of Pharmacy and Pharmaceutical Sciences, Vol. 4(8), (2015), pp 1277-1289

ISSN No.: 2278-4357

Abstract: Background: The tribal People are custodian of unique traditional knowledge systems and their ambient flora and fauna. The Mishng community of Assam also has some traditional health care practices. Assam is very rich in plant biodiversity as well as in ethnic diversity and has great traditional knowledge based on plant resources. A survey on folk medicinal plants and folk healers of Mishng tribe was conducted in Jorhat district, Assam. Methods: Information was collected based on interview and field studies with local healers within the community. Identification of medicinal plants was done by the indigenous healers. Study was mainly with plants used to cure diseases and to enquire about different healing systems. Results: We were able to explore 30 indigenous plants used by Mishng tribe in the treatment of various diseases and their economic uses. Conclusion: Mishng tribe is very rich in indigenous health care practices and their healing techniques are not been scientifically validated till now. In support of the documented Traditional Healthcare Practices (THPs), herbarium specimens were collected for authentication and promotion of the safe and efficacious Local Health Practices. Analysis of the survey showed that such work is important and contributes for primary health care and also it is necessary to combat the diminishing indigenous knowledge and THPs.

USEM-14.14

Paper Title: Community Based Conservation of Ethno-medicinal Plants Used By the Chakma Community of Tripura, India

Author(s): Pandey, A., Singh, S. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Pharma and Bio Sciences, Vol. 6(4), (2015), pp 445-454

ISSN No.: 0975-9492

Abstract: This paper reports an ethno-botanical study conducted during the year 2012 in the tribal areas of North and South districts of Tripura, India where Chakma tribe inhabits. The study was aimed to document the traditional folklore knowledge of the local people about the use of different plants or their products. A large number of people belonging to various districts and villages were interviewed during field trips and asked questions regarding the traditional use of plants. The data collected reveals that about 20 plant species belonging to 13 different families find use in day to day life including medicinal, aromatic and cultural purpose.

USEM-14.15

Paper Title: A Review on Endemic Indian Resurrecting Herb *Selaginella bryopteris* (L.) Bak ‘Sanjeevani’

Author(s): Singh, S. and Singh, R.

Affiliation(s): University School of Environment Management Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Pharmaceutical Sciences and Research, Vol.6(1), (2015), pp 1000-1007

ISSN No.: 0975-8232

Abstract: *Selaginella bryopteris* (L.) Bak. usually known as “Sanjeevani”, is a lithophyte with remarkable resurrection capabilities and medicinal properties. It is traditionally used for curing wounds and irregular menstruation, uterine disorders and other internal injuries. It contains a variety of secondary metabolites such as alkaloids, phenol and terpenoids etc due to which it can act as antioxidants, anti-inflammatory, anti-cancer, anti-allergic, antimicrobial, antifungal, antibacterial, antiviral etc. It is also used as a strength tonic to improve fitness and to extend lifespan by the local tribal communities of India. The herbs are extensively exploited and sold throughout the country in different markets. There is an urgent need to aware the scientist, researchers, forest officials and local peoples about its medicinal properties, traditional knowledge, economic potential, endemic nature, horticultural and aesthetic value. Its distribution, medicinal and economic potential, taxonomy, ecology, causes of depletion and conservation strategies discussed in brief.

USEM-14.16

Paper Title: *Ethnobotany of Cycas pectinate Ham. in Northeast India*

Author(s): Singh, K.J.¹ and Singh, R.²

Affiliation(s): ¹Botanic Garden, CSIR-National Botanical Research Institute, Lucknow-226001;
²University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Encephalartos, Vol. 119, (2015), pp 18-23

ISSN No.: 1012-9987

Abstract: Gymnosperms are an ancient group of naked seeded plants. *Cycas* is a basal genus of Cycadophytes which is represented by 9 species and one variety in India. *Cycas pectinata* Ham. is the only species reported from Northeast India and listed as Vulnerable in the IUCN Red List. Geographically the species extends up to Southeast Asia. The wild populations of *Cycas pectinata* in Northeast India are disjunct, highly scattered and have diminished to the extent of rarity primarily due to deforestation, jhum cultivation, excessive harvesting of leaves for food, medicine and secondly, due to its wide use in religious and ceremonial rituals. The paper documents the traditional uses of *Cycas pectinata* Ham in the North-Eastern states of Assam, Manipur, Megha-laya, Sikkim, Tripura and West Bengal.

USEM-14.17

Paper Title: *Ephedra yangthangensis* (Ephedraceae), A New Species From Himachal Pradesh, India

Author(s): Sharma, P. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Bangladesh Journal of Plant Taxonomy, Vol. 23(2), (2016), pp 195-198

ISSN No.: 1028-2092

Abstract: A new species *Ephedra yangthangensis* Prabha Sharma & Rita Singh is described, and illustrated from Himachal Pradesh, India. This new species is most similar to *E. intermedia* Schr. & Meyer, from which it is distinguishable by its smaller male strobili, shorter length and curved synangiophore, yellowish orange fleshy bracts of bigger female strobili, fade orange scale leaves and light green robust stem as compared to the other flourishing species *E. intermedia*.

USEM-14.18

Paper Title: *Air Pollution Monitoring in Delhi City by Using Lichen Transplant Technique*

Author(s): Sharma, R. and Singh, R.

Affiliation(s): University School of Environment Management, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Cryptogam Biodiversity and Assessment, Vol. 1(1), (2016), pp 55-63

ISSN No.: 2456-0251

Abstract: Air pollution biomonitoring was first time done in Delhi by using lichen transplanted technique (LTT). Lichens are biomonitoring indicator and effect of atmospheric pollutants on physiological integrity was examined. Samples made of epiphytic foliose lichen *Pyxinecocoas*(Sw.) Nyl. were actively transplanted at five different sites in Delhi (bus-stop, residential area, commercial area, industrials area and highways) for monitoring the quantitative estimation of heavy metals (Al, As, Cd, Cr, Cu, Pb, Fe and Zn) contained in the lichen thallus at vertical positions and also potential quantum yield of photosystem II (fluorescence ratio Fv/Fm), change in the concentration of pigmentation and chlorophyll degradation ratio. The highest

concentration is of Iron (Fe) in all the sites and the lowest concentration is of Cadmium (Cd) in all the sites. Two metals Arsenic (As) and Chromium (Cr) were not detected (N.D) in any of the sites in the present study. Rain also interrupted the transplanted period. Bus-stop and highways are most polluted as compared to residential, commercial area. It was also evident from this study that vehicular emission played a significant role in the releasing of elements as pollutants in the surrounding environment.

**UNIVERSITY SCHOOL OF
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FACULTY INDEX NUMBER

| S.No | Faculty | Abstract No. |
|-------------|----------------------|---------------------|
| 1. | Chandra, S.R. | 1.01 |
| 2. | Sharma, S. | 2.01-2.02 |

USAP-1.01

Paper Title: Uplifting Traditional Skills To Professional Levels

Author(s): Chandra, S. R.

Affiliation(s): University School of Architecture and Planning, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The Research Journal: JA Journal of Architecture, CCA Research Cell, Copal Publication, Vol. 2(2), (2012), pp 82-87

ISSN No.: 2249-9326

Abstract: India is synonymous to diversity, and when it comes to its cultural heritage, the richness keeps on enhancing with cultural traditions diversifying every 10 miles! Each of these cultural landscapes is an embryo of vernacular traditional construction systems. The traditional vernacular building crafts in India are being passed down from generations to generations in the patriarchic society. Needless to say that they take into account the local climate, materials available and the strong cultural ethos binding the construction and maintenance process as away of life itself and building on a naturally thriving sustainable world. For instance, through a case study in one of the Living Heritage villages in World Heritage Site; Hampi I found out that the minor details of cultural preservations are taken into account by the carpenter. He would craft an entire door frame with the locally available termite proof Neemwood except for the threshold. Neem is sacred to both Hindus as well as Muslims, hence inauspicious to cross a neem threshold, thus another variety of local wood, Kikar is used instead. Many more such examples impress upon the need to consider these minute vernacular aspects while building in these regions. However, Insensitive global approach, intolerance towards time taking traditional processes, ignorance towards vernacular systems, non-patronage and lack of incentives for the local craftsmen, etc. is drastically depleting the acceptance of these vernacular systems. This shift although has been shrugged and designers and researchers are again returning to green buildings, at the rural, local and government level in India, the scenario very much remains the same. The Government of India is responsible for all major developmental projects in public interest, from building of infrastructure to housing for the poor. The government schemes though worked out with the best of intentions are so global in nature that they fail to provide contextual solutions. These schemes totally lack to incorporate or encourage any local craftsmen and their skill sets. This leads to underutilization of existing resources in terms of traditional knowledge systems, materials, and skilled manpower. Thus, there is a pressing need to sensitize the government towards these vernacular systems of building, a need to drive the government engine towards a sustainable system. The government system which is now reframed as a down top process should then include these traditional craftsmen at the grass root level. At the Panchayat level a team of such skilled craftsmen should be responsible to collaborate with the government for any development at local level, ensuring contextual cultural sustenance. To realize the above, both the traditional craftsmen and the technical professionals like architects, engineers and other inter departments of government should be brought at the same interactive level. Building this common platform is a challenge. Why does our education system only aim at building on Professionals having formal education as background, why can't we look at educating and training these craftsmen to a certain level so that they can shoulder the responsibility of building a bright sustainable future India. This thus sets the foreground and scope for a larger research into the current education system.

USAP-2.01

Paper Title: Economics of Urban Sprawl

Author(s): Sharma, S.

Affiliation(s): University School of Architecture and Planning, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian journal of Applied Research, Vol.(6), (2013), pp 19-21

ISSN No.: 2249-555X

Abstract: Our cities had witnessed a massive growth during real-estate boom in recent past, majorly around fringes. Availability of land and lesser prices per square unit along with higher inflow of finances (either from investors or from end users) were few factors triggering such a growth. Property prices too showed a sharp rise during the boom period especially around fringes. Further, fringe development mainly envisaged residential along with few pockets of commercial sector. The cities expanded around fringes which were some how realizing the dream of developers in terms of their business expansions and profit earning. Also, infrastructure projects and other nodal industries (economy generator) acted like sources of ripple, producing waves of growth and development that affected land value and also showed the direction & pattern of city growth. This paper is an attempt to understand the dynamics of economic interaction with city growth and to envisage fringe development converting urban sprawl in to smart growth with the help of a case study.

USAP-2.02

Paper Title: Impact of transportation projects on architecture

Author(s): Kumar, A¹, Pipralia, S², Sharma, S³ and Sharma, A⁴

Affiliation(s): ^{1,2}Dept. of Architecture and Planning, Malaviya National Institute of Technology Jaipur; ³University School of Architecture and Planning, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ⁴School of Architecture & Landscape Design, SMVDU Katra J&K

Source: International Journal of Enhanced Research in Science Technology & Engineering, Vol. 3(2), (2014), pp 281-286

ISSN No.: 2319-7463

Abstract: India, being a fast progressing country has many ongoing infrastructural projects (industrial, residential, commercial, and recreational) located in different regions. These require an efficient transportation network and system to support its activities. Different cities (majorly metropolitans, metros and state capitals) also requires very good transportation network to interlink them with each other and with smaller towns and villages. Even, within these cities roads are accommodating a large variety of vehicles ranging from bicycles to heavy vehicles. Different vehicles on same road give birth to a large spectrum of problem and leads to increasing trip time and wastage of valuable resources. To conquer the above mentioned problems government has proposed and implemented various transportation projects which focus on making an efficient transportation network and system within the city, in between cities and between cities and rural areas. These transportation projects influence the existing architecture style and character of the place to a greater extent. In this paper, transportation projects within the cities and road projects in between important cities are considered. The impact of proposing and implementing these projects on the architecture of the surrounding areas is highlighted and the changes in existing architectural controls are suggested so that built environment and

transportation networks cohesively contributes to increasing the aesthetic value of the cities or region

**UNIVERSITY SCHOOL OF BASIC &
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FACULTY INDEX NUMBER

| S. No | Faculty | Abstract No. |
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| 2. | Aggarwal, S. | USBAS 2.01-2.07 |
| 3. | Bagga, A. | USBAS 3.01-3.03 |
| 4. | Batra, K. | USBAS 4.01 |
| 5. | Bhardwaj, R. | USBAS 5.01-5.43 |
| 6. | Datta, A. | USBAS 6.01-6.05 |
| 7. | Gupta, R. S. | USBAS 7.01-7.13 |
| 8. | Gupta, S.M | USBAS 8.01-8.05 |
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| 10. | Khan, A.A. | USBAS 10.01-10.08 |
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| 13. | Kumar, R. | USBAS 13.01-13.31 |
| 14. | Mohapatra, S. | USBAS 14.01-14.34 |
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| 17. | Sharma, A. C. | USBAS 17.01 – 17.06 |
| 18. | Singh, V. | USBAS 18.01 – 18.02 |
| 19. | Tyagi, Y. K. | USBAS 19.01 – 19.07 |
| 20. | Venugopalan, A. | USBAS 20.01 – 20.02 |

USBAS 1.01

Paper Title: Application of Linear Programming with I-fuzzy sets to Matrix Games with I-fuzzy Goals

Author(s): Aggarwal A¹, Mehra A² and Chandra S²

Affiliation(s): ¹University School of Basic and Applied Science, Guru Gobind Singh Indraprastha University, Sector-16C, Dwarka, Delhi-110078 ²Department of Mathematics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016, India

Source: Fuzzy Optimization and Decision Making, Vol. 1(11), (2012), pp 465-480

ISSN No: 15732908

Abstract: In this paper we study a class of linear programming problems having fuzzy goals/constraints that can be described by (Atanassov's) I-fuzzy sets. Duality theory is developed for this class of problems in the I-fuzzy sense which is subsequently applied to define a new solution concept for two persons zero-sum matrix games with I-fuzzy goals.

USBAS 1.02

Paper Title: Application of Atanassov's I-fuzzy Set Theory to Matrix Games with Fuzzy Goals and Fuzzy Payoffs

Author(s): Aggarwal A¹, D. Dubey², S. Chandra² and A. Mehra²

Affiliation(s): ¹University School of Basic and Applied Science, Guru Gobind Singh Indraprastha University, Sector-16C, Dwarka, Delhi-110078 ²Department of Mathematics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016, India

Source: Fuzzy Information and Engineering, Vol.4, (2012), pp 401-414.

ISSN No: 16168658

Abstract: We aim to extend some results in [6, 7, 8, 2] on two person zero sum matrix games (TPZSMG) with fuzzy goals and fuzzy payoffs to I-fuzzy scenario. Because the payoffs of the matrix game are fuzzy numbers, the aspiration levels of the players are fuzzy as well. It is reasonable to believe that there is some indeterminacy in estimating the aspiration levels of both players from their respective expected pay offs. This situation is modeled in the game using Atanassov's I-fuzzy set theory. A new solution concept is proposed for such games and a procedure is outlined to obtain the degrees of suitability of the aspiration levels for each of the two players.

USBAS 1.03

Paper Title: On Solving Fuzzy Linear Programming Problems: A Revisit to Zimmermann's Approach

Author(s) S. Chandra¹ and Aggarwal A².

Affiliation(s): ¹Department of Mathematics, Indian Institute of Technology Delhi, Hauz Khas, New Delhi-110016, India. ²University School of Basic and Applied Science, Guru Gobind Singh Indraprastha University, Sector-16C, Dwarka, Delhi-110078 India

Source: Journal of Intelligent and Fuzzy Systems, (2014), Vol. 27, pp 2603-2610

ISSN No: 18758967

Abstract: The celebrated Zimmermann's approach for solving fuzzy linear programming problems is re-looked and apparently a new formulation leading to a new interpretation is presented. The basic feature of this formulation is that it attempts to trade-off between the twin objectives of 'satisfaction of fuzzy constraints' and 'attainment of the aspiration level of the objective function'. For this a bi-objective

optimization problem involving these twin objectives is constructed and its efficient solution is interpreted as a solution of the given fuzzy linear programming problem. As an outcome of this study a new two phase approach to solve fuzzy linear programming problems is obtained. This new two phase approach is different from those available in the literature and is in the true spirit of conventional two phase approach for solving crisp linear programming problems. Further, two additional models are also proposed on similar lines which also provide an efficient solution of the bi-objective optimization problem under consideration. Certain small numerical examples are included to illustrate the results.

USBAS 1.04

Paper Title: On solving matrix games with pay-offs of triangular fuzzy numbers : Certain observations and generalizations

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Source: European Journal of Operational Research, Vol. 246(12), (2015), pp 1-7

ISSN No: 0377-2217

Abstract: The purpose of this paper is to highlight a serious omission in the recent work of Li (Li, 2012) for solving the two person zero-sum matrix games with pay-offs of triangular fuzzy numbers (TFNs) and propose a new methodology for solving such games. Li (Li, 2012) proposed a method which always assures that the max player gain-floor and min player loss ceiling have a common TFN value. The present paper exhibits a flaw in this claim of Li (Li, 2012). The flaw arises on account of Li (Li, 2012) not explaining the meaning of solution of game under consideration. The present paper attempts to provide certain appropriate modifications in Li's model to take care of this serious omission. These modifications in conjunction with the results of Clemente et al. (Clemente et al., 2011) lead to an algorithm to solve matrix games with pay-offs of general piecewise linear fuzzy numbers.

USBAS 1.05

Paper Title: Solving matrix games with I-fuzzy pay-offs: a Pareto-optimal security strategies approach

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Source: Fuzzy Information and Engineering, Vol.6, (2016), pp 167-192.

ISSN No: 16168658

Abstract: A recent research work of Clemente et al. [12] on Pareto-optimal security strategies (POSS) in matrix games with fuzzy payoffs is extended to I-fuzzy scenario. Besides, the membership and the non-membership functions of the I-fuzzy values for both players are obtained by employing the technique of multiobjective optimization. The presented approach provides an efficient solution to a class of I-fuzzy matrix games with piecewise linear membership and non-membership functions. This class also includes I-fuzzy matrix games with triangular and trapezoidal I-fuzzy numbers as

special cases. Further, POSS approach also provides an approximate solution to I-fuzzy matrix games with payoffs as general I-fuzzy numbers.

USBAS 1.06

Paper Title: On Solving Atanassov's I-fuzzy Linear Programming Problems: some variants of Angelov's model

Author(s): Aggarwal, A. and Khan, I.

Affiliation(s): University School of Basic and Applied Science, Guru Gobind Singh Indraprastha University, Sector-16C, Dwarka, Delhi-110078 India

Source: Opsearch, Vol.53(2), (2016), pp 375-389

ISSN No: 00303887

Abstract: Angelov's approach is the most common approach to solve Atanassov's I-fuzzy linear programming problems. Here certain other variants of this basic model are studied. These variants are motivated by a recent study (Chandra and Aggarwal 2014) on fuzzy linear programming problems and follow very naturally from an associated bi-objective programming problem. This bi-objective programming problem aims to achieve a trade-off between the twin objectives of 'meeting the aspiration level' and 'satisfaction of the given constraints' which are defined in terms of their respective score functions. As an outcome of this study a new two phase approach to solve Atanassov's I-fuzzy linear programming problems is obtained. Further, two additional formulations are also proposed on similar lines which also provide an efficient solution of the associated bi-objective optimization problem. These efficient solutions have a natural interpretation for the given I-fuzzy linear programming problem. A small numerical example is included as an illustration.

USBAS 1.07

Paper Title: Solving Multi-objective Fuzzy Matrix Games Via Multi-objective Linear Programming Approach

Author(s): Aggarwal, A. and Khan, I.

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Source: Kybernetika, Vol. 52(1) (2016) pp 153-168

ISSN No: 00235954

Abstract: A class of multi-objective fuzzy matrix games is studied and it is shown that solving such a game is equivalent to solving a pair of multi-objective linear programming problems. This work generalizes an earlier study of Fernandez et al. from crisp scenario to fuzzy scenario on the lines of Bector et al. . Further certain difficulties with similar studies reported in the literature are also discussed.

UBAS 1.08

Paper Title: Solving I-fuzzy Bi-matrix Games with I-fuzzy Goals by Resolving Indeterminacy

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Source: Journal of Uncertain Systems, Vol. 10(3), (2016), pp 204-222

ISSN No: 1752-8909

Abstract: In this paper, we study I-fuzzy bi-matrix games with I-fuzzy goals. The indeterminacy factor in the I-fuzzy goal of each player is resolved using the Hurwicz optimism-pessimism rule. As a result, such an I-fuzzy bi-matrix game reduces to solving a fuzzy optimization problem with S-shaped membership functions. The latter problem is equivalently converted into its crisp counterpart using the conventional methods available in the literature of the fuzzy optimization. The resultant problem so obtained is devoid of any binary variable. A numerical example is presented to illustrate the proposed approach.

USBAS-2.01

Paper Title: Enhancing Input Energy in Dye-sensitized Solar Cell (DSSC) by Using Swift Heavy Ion (SHI) Irradiated ITO

Author (s): Aggarwal, S.

Affiliation(s): University School of Basic and Applied Science, GGSIP University, Delhi.

Source: Invertis Journal of Renewable Energy, Vol. 2 (4), (2012), pp 177-181

ISSN No.: 2231-3419.

Abstract: Dye-sensitized solar cell (DSSC) is the third-generation solar cell and has efficiency around 11%. It harnesses sun light by photo-sensitive dyes which are adhered on the porous surface of the wide band gap oxide material. To increase efficiency of DSSC, it is necessary to increase its input power and keeping such aim Indium-Tin-Oxide (ITO) substrate of photo anode is irradiated by Swift heavy ion (SHI) irradiation. Irradiated ITO is characterized by UV-Vis and Four-Probe method. UV-Vis transmittance mode spectra shows that transmittance increases 5 to 10% and Sheet resistance also increases but in acceptable limit with SHI irradiation. Therefore, SHI irradiation is good tool to increase the input power of the DSSC by modifying ITO substrate.

USBAS-2.02

Paper Title: Role of Mg in the thermoluminescence of LiF crystals grown by edge defined film fed growth (EFG) technique

Author (s): Seth, P.¹, Aggarwal, S.¹, Garg, L.², Bahl, S.³, Lochab, S.P.⁴ and Rao, S.M.⁵

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Source: Nuclear Instruments and Methods in Physics Research, Vol. 278 (2012), pp 46-49

ISSN No.: 0168-583X

Abstract: LiF crystals doped with different concentration of Mg from 0 to 2000 ppm have been grown by edge defined film fed growth technique. The X-ray diffraction measurement confirms the incorporation of the Mg in the lattice. Thermoluminescence and optical absorption measurements have been made on as-grown and annealed crystals after they were irradiated with a gamma dose of 15 and 1500 Gy, respectively. The TL glow peak temperature and intensity increase up to 500 ppm in case of the as-grown crystals and up to 1000 ppm in the annealed crystals and decrease thereafter. The normalized peak height of the annealed crystals is nearly three times that of the as grown crystals for the particular concentration. Corresponding optical absorption spectra of the crystals exhibit prominent bands at 250 and 310 nm. The 310 nm band increases with increase in concentration of Mg and also with annealing. The changes in the TL glow curves are correlated with those of the optical absorption bands to conclude that the 310 band is due to the Mg related Z2 center.

USBAS-2.03

Paper Title: Thermoluminescence study of rare earth ion (Dy³⁺) doped LiF: Mg crystals grown by EFG technique

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Affiliation(s): ¹University School of Basic and Applied Science, Guru Gobind Singh Indraprastha University, New Delhi 110078; ²Department of Physics, Punjabi University, Patiala 110078

Source: Journal of Rare Earth, Vol. 30 (2012), pp 641-646

ISSN No.: 1002-0721

Abstract: This work describes investigation of radiation dosimetry characteristics of magnesium (Mg) doped lithium fluoride (LiF) crystals co-doped with different concentrations of dysprosium (Dy). These crystals were grown by edge defined film fed crystal growth (EFG) technique. Thermoluminescence (TL) measurements were made on as grown (AG) and annealed (AN) crystals after they were irradiated with a gamma dose of 15 Gy. The influence and advantage of optimized Dy³⁺ concentration in enhancing the thermoluminescence (TL) properties of LiF:Mg samples were discussed. The normalized peak height of the annealed crystals was nearly 3 times that of the as grown crystals for the particular concentration samples irradiated with Co60 gamma source showed linearity up to 10 Gy. Thermoluminescence signal observed over a period of one month showed negligible fading. Thermoluminescence glow curve structure of optimized phosphor remained stable for higher doses of gamma rays of 103 Gy. Glow curve was analyzed using computer glow curve deconvolution (CGCD) method and trapping parameters were calculated.

USBAS-2.04

Paper Title: Study of SHI irradiation effect on Rhodamine 6G dye for Dye Sensitize Solar Cell application

Author(s): Singh, H.K.¹, Aggarwal, S.¹, Agrawal, D.C.², Kulria, P.², Tripathi, S.K.³ and Avasthi, D.K.²

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Source: Vacuum, Vol. 87, (2013), pp 21-25

ISSN No.: 0042-207X

Abstract: The Rhodamine 6G (R6G) dye sample synthesized by thermal evaporation method is irradiated by 120 MeV Ag⁹⁺ ions at different fluences from 1×10^{11} ion/cm² to 3×10^{12} ion/cm². These samples are characterized by X-ray diffraction (XRD), ultraviolet-visible (UV-Vis) absorption spectroscopy and photo-conductivity measurements. In XRD, it is observed that amorphous nature of dye films increases with fluence and hence aggregates of dye molecules spread homogeneously on the substrate after irradiation. The absorption spectroscopy and photoconductivity results show maximum absorption and minimum photoresistivity at lowest fluence. The properties of the dye films such as increase in amorphous nature, increase in absorption peak area and marginal increase in photoconductivity are favorable for Dye-sensitize solar cell (DSSC) applications.

USBAS-2.05

Paper Title: The growth of LiF: Mg, Cu, P phosphor using EFG technique and study the effect of annealing

Author(s): Seth, P.¹, Aggarwal, S.¹ and Rao, S.M.²

Affiliation(s): ¹University School of Basic and Applied Sciences, GGSIPU, Delhi

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Source: Radiation Measurement, Vol. 51 (2013), pp 1-6.

ISSN No.: 1350-4487

Abstract: LiF crystal doped with magnesium (Mg), copper (Cu) and phosphorous (P) was grown in the form of multicrystalline sheet using Edge-defined film-fed growth (EFG) technique for dosimetry application. These crystals were grown in argon gas atmosphere using graphite crucible and stainless-steel die. Dosimetry peak was observed at 210 °C for as-grown crystal. As reported earlier LiF:Mg, Cu, P is a highly sensitive material but losses its sensitivity if annealed at temperature above 240 °C. In this paper, the effect of annealing temperature on thermoluminescence glow-curve structure, maximum peak temperature, peak height and integrated area of the glow peak of EFG grown samples was investigated in detail. Annealing temperature range from 220 °C to 500 °C was considered for the study. Experimental results of the obtained glow curve show that with increase in annealing temperature, glow peak shift towards higher temperature region with substantial increase in TL intensity. Annealing at 500 °C for 10 min gave maximum TL intensity with main dosimetry peak positioned at 233 °C. Change in the defect structure with different pre-annealing temperature was analysed using trapping parameters.

USBAS-2.06

Paper Title: Effect of swift heavy ion (SHI) irradiation on transparent conducting oxide electrodes for dye-sensitized solar cell applications

Author(s): Singh, H.K.¹, Avasthi, D.K.² and Aggarwal, S.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, New Delhi; ²Inter University Accelerator Center, Post Box 10502, New Delhi

Source: Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Vol. 352 (2015), pp 35-41

ISSN No.: 0168-583X

Abstract: Transparent conducting oxides (TCOs) are used as electrodes in dye-sensitized solar cells (DSSCs) because of their properties such as high transmittance and low resistivity. In the present work, the effects of swift heavy ion (SHI) irradiation on various types of TCOs are presented. The objective of this study is to investigate the effect of SHI on TCOs. For the present study, three different types of TCOs are considered, namely, (a) FTO (fluorine-doped tin oxide, SnO₂:F) on a Nippon glass substrate, (b) ITO (indium tin oxide, In₂O₃:Sn) coated on polyethylene terephthalate (PET) on a Corning glass substrate, and (c) ITO on a Corning glass substrate. These films are irradiated with 120 MeV Ag⁹⁺ ions at fluences ranging from 3.0×10^{11} ions/cm² to 3.0×10^{13} ions/cm². The structural, morphological, optical and electrical properties are studied via X-ray diffraction (XRD), atomic force microscopy (AFM), UV-Vis absorption spectroscopy and four-probe resistivity measurements, respectively. The ITO-PET electrode is found to exhibit superior conductivity and transmittance properties in comparison with the others after irradiation and, therefore, to be the most suitable for solar cell applications.

USBAS-2.07

Paper Title: Investigations of thermoluminescence properties of multicrystalline LiF: Mg, Cu, Si phosphor prepared by edge defined film fed growth technique

Author (s): Seth, P., Rajput, S., Rao, S.M. and Aggarwal, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi 110078

Source: Radiation Measurements, Vol.84 ,(2016), pp 9-14

ISSN No.: 1350-4487

Abstract: Thermoluminescence (TL) properties of LiF: Mg, Cu, Si phosphor prepared in multicrystalline form using edge defined film fed growth (EFG) technique has been investigated. The effect of preparation route on TL properties and thermal stability has been studied. To improve the TL dosimetry properties, phosphor is subjected to different annealing temperatures ranging from 250 °C to 450 °C. The shape of the glow curve structure and peak temperature remains similar at different annealing temperatures, however peak intensities vary. The consistency in the glow curve structure with annealing temperature elucidate that TL trapping states are stable in nature. Thermal annealing at 300 °C for 10 min gives maximum TL intensity with main dosimetry peak at 209 °C. The TL intensity of the main dosimetry peak is increased by a factor of five as compared to as-grown crystal. The thermal stability of LiF: Mg, Cu, Si is found to be better than LiF: Mg, Cu, P. Trapping parameters are calculated to have an insight study of defect states. A simple glow curve structure, tissue equivalency, thermal stability, low residual signal, linear response and reusability makes LiF: Mg, Cu, Si a suitable phosphor for radiation therapy, radio diagnostics and personnel dosimetry applications.

USBAS-3.01

Paper Title: Tailoring of Seebeck coefficient with surface roughness effects in silicon sub-50-nm films

Author(s): Kumar, M.¹, Bagga, A.² and Neeleshwar, S.²

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Source: Nanoscale Research Letters, Vol. 7, (2012), pp 169-176

ISSN No.: 1931-7573

Abstract: The effect of surface roughness on the Seebeck coefficient in the sub-50-nm scale silicon ultra thin films is investigated theoretically using nonequilibrium Green's function formalism. For systematic studies, the surface roughness is modelled by varying thickness periodically with square wave profile characterized by two parameters: amplitude (A_0) and wavelength (λ). Since high Seebeck coefficient is obtained if the temperature difference between the ends of device produces higher currents and higher induced voltages, we investigate how the generated current and induced voltage is affected with increasing A_0 and λ . The theoretical investigations show that pseudoperiodicity of the device structure gives rise to two effects: firstly the threshold energy at which the transmission of current starts is shifted towards higher energy sides and secondly transmission spectra of current possess pseudobands and pseudogaps. The width of the pseudobands and their occupancies determine the total generated current. It is found that current decreases with increasing A_0 but shows a complicated trend with λ . The trends of threshold energy determine the trends of Seebeck voltage with roughness parameters. The increase in threshold energy makes the current flow in higher energy levels. Thus, the Seebeck voltage, i.e. voltage required to nullify this current, increases. Increase in Seebeck

voltage results in increase in Seebeck coefficient. We find that threshold energy increases with increasing A_0 and frequency ($1/\lambda$). Hence, Seebeck voltage and Seebeck coefficient increase vice versa. It is observed that Seebeck coefficient is tuneable with surface roughness parameters.

USBAS-3.02

Paper Title: Controlling wave function localization in a multiple quantum well structure

Author(s): Bagga, A. and Venugopalan, A.

Affiliation(s): University School of Basic and Applied Sciences, GGS Indraprastha University, Dwarka, New Delhi 110078

Source: Journal of Applied. Physics, Vol. 113, (2013), pp 054310-054315

ISSN No.: 0021-8979

Abstract: The dynamics of a wave function describing a particle confined in a multiple quantum well potential is studied numerically. In particular, the case of four wells and six wells has been studied for the first time. As a consequence of quantum mechanical tunneling, an initial wavefunction designed to be localized in one well can localize in the others after a certain time and hop between wells at times which depends on the height and width of the barriers separating the wells. This control over the evolution of the wavefunction with time has direct implications in applications based on carrier dynamics in multiple quantum well nanostructures and can also provide novel mechanisms in solid state quantum computation for information storage and processing. The ability to include any number of wells and control the carrier dynamics in them through easily accessible parameters in our study makes this a particularly attractive system from the point of view of applications.

USBAS-3.03

Paper Title: Controlling wave function localization in a multiple quantum well structure

Author (s): Bagga, A., Venugopalan A.

Affiliation(s): University School of Basic and Applied Sciences, GGS Indraprastha University, Dwarka, New Delhi, 110078

Source: Journal of Applied Physics, Vol. 113, (2013), pp 054310

Abstract: The dynamics of a wave function describing a particle confined in a multiple quantum well potential is studied numerically. In particular, the case of four wells and six wells has been studied for the first time. As a consequence of quantum mechanical tunneling, an initial wavefunction designed to be localized in one well can localize in the others after a certain time and hop between wells at times which depends on the height and width of the barriers separating the wells. This control over the evolution of the wavefunction with time has direct implications in applications based on carrier dynamics in multiple quantum well nanostructures and can also provide novel mechanisms in solid state quantum computation for information storage and processing. The ability to include any number of wells and control the carrier dynamics in them through easily accessible parameters in our study makes this a particularly attractive system from the point of view of applications

USBAS-4.01

Paper Title: Quantum Ring states in magnetic field and delayed half cycle pulses

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Source: Pramana-J.Phys. Vol. 87, (2016), pp 29(1-10)

ISSN No.: 0973-7111

Abstract: The present work is dedicated to the time evolution of excitation of a quantum ring in external electric and magnetic fields. Such a ring of mesoscopic dimensions in an external magnetic field is known to exhibit a wide variety of interesting physical phenomena. We have studied the dynamics of the single electron quantum ring in the presence of a static magnetic field and a combination of delayed half-cycle pulse pair. Detailed calculations have been worked out and the impact on dynamics by variation in the ring radius, intensity of external electric field, delay between the two pulses, and variation in magnetic field have been reported. A total of 19 states have been taken and the population transfer in the single electron quantum ring is studied by solving the time-dependent Schrödinger equation (TDSE), using the efficient fourth-order Runge–Kutta method. Many interesting features have been observed in the transition probabilities with the variation of magnetic field, delay between pulses and ring dimensions. A very important aspect of the present work is the persistent current generation in a quantum ring in the presence of external magnetic flux and its periodic variation with the magnetic flux, ring dimensions and pulse delay.

USBAS-5.01

Paper Title: Use of SWIRLS Nowcasting System for quantitative precipitation forecast using Indian DWR data

Author(s): Srivastava, K.¹; Lau, S. S.Y.²; Yeung, H.Y.²; Cheng, T. L.². and Bhardwaj, R.³; Kannan, A.M.¹; Bhowmik, S.K. Roy¹ and Singh, H¹

Affiliation(s): ¹India Meteorological Department, New Delhi 110003; ²Hong Kong observatory, Hong Kong, ³Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Mausam, Vol.63(1), (2012), pp 1-16

ISSN No. : 2529-416

Abstract: Local severe storms are extreme weather events that last only for a few hours and evolve rapidly. Very often the mesoscale features associated with these local severe storms are not well-captured synoptically. Forecasters have to predict the changing weather situation in the next 0-6 hrs based on latest observations. The operational process to predict the weather in the next 0-6 hrs is known as “nowcast”. Observational data that are typically suited for nowcasting includes Doppler Weather Radar (DWR), wind profiler, microwave sounder and satellite radiance. To assist forecasters, in predicting the weather information and making warning decisions, various nowcasting systems have been developed by various countries in recent years. Notable examples are Auto-Nowcaster (U.S.), BJ-ANC (China-U.S.), CARDS (Canada), GRAPES-SWIFT (China), MAPLE (Canada), NIMROD (U.K.), NIWOT (U.S.), STEPS (Australia), SWIRLS (Hong Kong, China), TIFS (Australia), TITAN (U.S.) (Dixon and Wiener, 1993) and WDSS (U.S.). Some of these systems were

used in the two forecast demonstration projects organized by WMO for the Sydney 2000 and Beijing 2008 Olympic. A common feature of these systems is that they all use rapidly updated radar data, typically once every 6 minutes. The nowcasting system SWIRLS (“Short-range Warning of Intense Rainstorms in Localized Systems”) has been developed by the Hong Kong Observatory (HKO) and was put into operation in Hong Kong in 1999. Since then system has undergone several upgrades, the latest known as “SWIRLS-2” to support the Beijing 2008 Olympic Games. SWIRLS-2 is being adapted by India Meteorological Department (IMD) for use and test for the Commonwealth Games 2010 at New Delhi with assistance from HKO. SWIRLS-2 ingests a range of observation data including SIGMET/IRIS DWR radar product, raingauge data, radiosonde data, lightning data to analyze and predict reflectivity, radar-echo motion, QPE, QPF, as well as track of thunderstorm and its associated severe weather, including cloud-to-ground lightning, severe squalls and hail, and probability of precipitation. SWIRLS-2 uses a number of algorithms to derive the storm motion vectors. These include TREC (“Tracking of Radar Echoes by Correlation”), GTrack (Group tracking of radar echoes, an object-oriented technique for tracking the movement of a storm as a whole entity) and lately MOVA (“Multi-scale Optical flow by Variational Analysis”). This latest algorithm uses optical flow, a technique commonly used in motion detection in image processing, and variational analysis to derive the motion vector field. By cascading through a range of scales, MOVA can better depict the actual storm motion vector field as compared with TREC and GTrack which does well in tracking small scales features and storm entity respectively. In this paper the application of TREC and MOVA to derive the storm motion vector, reflectivity and QPF using Indian DWR data has been demonstrated for the thunderstorm events over Kolkata and New Delhi. The system has been successfully operationalized for Delhi and neighborhood area for commonwealth games 2010. Real time products are available on IMD website.

USBAS 5.02

Paper Title: Analysis of Water Parameters Using Haar Wavelet (Level 3)

Author(s): Parmar, K.S. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab; University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Current Engineering & Technology, Vol.2(1), (2012), pp 166-170

ISSN No. : 2347-51-61

Abstract: Today, we are living in a water starved world. Water is an essential element for life. Most of countries fulfill the requirement of water from river water and ground water. Pollution in river water draws attention of government, public, NGO's and environmentalists in India and world over. Wavelet analysis of water quality parameters COD (Chemical Oxygen Demand), BOD (Biochemical Oxygen Demand), DO (Dissolved Oxygen), WT (Water Temperature), AMM (Free Ammonia), TKN (Total Kjeldahl Nitrogen), TC (Total Coliform), FC (Fecal Coliform) and PH (Potential of Hydrogen) monitored at Nizamuddin bridge-mid stream (Delhi) of Yamuna River in India have been studied for last 10 years. 1-D Discrete and Continuous Wavelet transform using Haar Wavelet at level 3 have been analyzed for each water parameter. Discrete Haar Wavelet (level 3) analysis decomposes each data in 5 parts namely s, a3, d1, d2 and d3. The first part 's' represents signal or raw data, second part 'a3' correspond to amplitude of signal for Haar Wavelet at level 3. d1, d2, d3 represents details of signal or raw data at three different levels. 1D continuous wavelet analysis has four parts; first part on top

represents the analyzed signal or raw data, second part contains the scalograms values. The scale of color changes from minimum (dark color) to maximum (light color). The vertical axis shows the frequency values while the horizontal axis represents the number of days. The third part shows the daily variation of coefficients. The fourth part depicts the local maximums of related parameters.

USBAS 5.03

Paper Title: Wavelet Spectrum of Carbon Mono-oxide at different locations of Delhi

Author(s): Bhardwaj, R.¹, Siddiqi, A.H.², and Mittal, A.¹

Affiliation(s): ¹Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²School of Engineering & Technology, Sharda University, Greater Noida - 201306, Uttar Pradesh

Source: Indian Journal of Industrial and Applied Mathematics, Vol.3(1), (2012), pp 107-115

ISSN No. : 0973-4317

Abstract: This paper deals with the study of variation of wavelet power spectrum and wavelet correlation coefficient with scale for air pollutants carbon monoxide (CO) between a pair of different locations of Delhi : (a) Delhi college of engineering and ITO crossing (b) Delhi college of engineering and mobile van (c) Delhi college of engineering and siri fort; (d) ITO crossing and mobile van; (e) ITO crossing and siri fort (f) mobile van and siri fort. It is observed that wavelet power spectrum for CO has three maxima and two minima at all locations between 0 to 2000. Maxima of both the spectrum corresponds to maximum value of CO and minimum in the spectra is correspond to a value which is the difference between maximum and minimum of CO. Variation in wavelet power spectrum with scale for CO also exhibits same behaviour. Also, it is observed that the value of correlation coefficient increases with scale reached a maximum and then decrease as further increase in scale.

USBAS 5.04

Paper Title: Predictability Index, Fractal Dimension & Hurst Exponent Estimation of Carbon Mono-Oxide at different locations of Delhi.

Author(s): Bhardwaj, R.¹, Siddiqi A.H.² and Mittal, A.¹

Affiliation(s): ¹Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²School of Engineering & Technology, Sharda University, Greater Noida - 201306, Uttar Pradesh,

Source: Indian Journal of Industrial and Applied Mathematics, Vol.3(2), (2012), pp 91-97.

ISSN No. : 0973-4317

Abstract: This paper deals with the estimation of Hurst exponent, fractal dimension and predictability index using wavelet method for air pollutant carbon monoxide (CO) collected from different locations at Delhi i.e. Delhi college of engineering (industrial area); ITO crossing (commercial area); siri fort; (residential area) and mobile van which can be treated as a mixed location of Delhi used for the period of last four years. Hurst exponent and predictability index for CO at all locations lies between 0 to 0.5 confirms the anti persistent behaviour. Fractal dimension for CO at all location lie between 1.5 and 2 which also confirms anti persistent behaviour. Thus the behaviour of CO follows Brownian motion and is unpredictable.

USBAS 5.05

Paper Title: Wavelet and Correlation analysis of weather data

Author(s): Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Current Engineering & Technology., Vol.2(1), (2012), pp 178-183.

Abstract: This paper deals with the wavelet and correlation analysis of meteorological parameters for various meteorological stations of India. Discrete wavelet using Daubechies wavelet at level 5 (Db5) and Continuous wavelet using Mexican Hat wavelet of meteorological parameters have been discussed. Discrete wavelet decomposition of each parameter presented in seven parts namely s, a5, d1, d2, d3, d4 and d5. The first part "s" represents the signal or raw data and the second part "a5" corresponds to the amplitude of the signal. The next five parts d1, d2, d3, d4 and d5 represent details of the signal or raw data at five different levels. 1-D continuous wavelet decomposition of each parameter has four parts; first part on top represents the analyzed signal or raw data, second part contains the scalogram value. The third part shows the daily variation of coefficients. The fourth part depicts the local maximums of related parameters. It has been observed that maximum and minimum temperature have positive correlation for all the years and at all stations except for Shimla. All stations for all years have negative correlation between rainfall and maximum temperature; rainfall and minimum temperature.

USBAS 5.06

Paper Title: Spacecraft tumbling chaotically under Gravity and Aerodynamic Torque

Author(s): Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Current Engineering & Technology, Vol.2(2), (2012), pp 256-259.

ISSN No. : 2277-4114

Abstract: In this paper, the half width of the chaotic separatrix has been estimated by Chirikov's criterion. Through surface of section method, it has been observed that the aerodynamic torque parameter and the mass distribution parameter play an important role in changing the regular motion into chaotic one.

USBAS 5.07

Paper Title: Wavelet & Correlation analysis of air pollution parameters using Haar wavelet (Level 3)

Author(s): Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Thermal Technologies., Vol.2(2), (2012), pp 160-164

ISSN No. : 2277-4114

Abstract: This paper deals with the wavelet and correlation analysis of air pollution parameters in Delhi, India. Hourly average value of air pollution parameters Carbon Monoxide (CO), Nitrogen Oxide (NO), Nitrogen Dioxide (NO₂), Ozone (O₃), Particulate Matters (PM_{2.5}) and Sulphur Dioxide (SO₂) have been studied. Discrete wavelet using Haar wavelet at level 3 and Continuous wavelet of air pollution parameters have been discussed. Discrete wavelet decomposition of each parameter presented in

five parts namely s , a_3 , d_1 , d_2 , d_3 . The first part " s " represents the signal or raw data and the second part " a_3 " corresponds to the amplitude of the signal. The next three parts d_1 , d_2 , d_3 represent details of the signal or raw data at three different levels. 1D continuous wavelet decomposition of each parameter has four parts; first part on top represents the analyzed signal or raw data, second part contains the scalogram value. The third part shows the daily variation of coefficients. The fourth part depicts the local maximums of related parameters. It has been observed that all the pollutants have positive correlation with all the other pollutants except with O_3 . Ozone has negative correlation with all the pollutant parameters.

USBAS 5.08

Paper Title: Analysis of Water parameters using Daubechies Wavelet (Level 5) (Db5)

Author(s): Parmar, K.S. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: American Journal of Mathematics and Statistics, Vol.2(3), (2012), pp 64-75

ISSN No. : 2162-948X

Abstract: Statistical analysis of the water quality parameters COD (Chemical Oxygen Demand), BOD (Biochemical Oxygen Demand), DO (Dissolved Oxygen), WT (Water Temperature), AMM (Free Ammonia), TKN (Total Kjeldahl Ni-trogen), TC (Total Coliform), FC (Fecal Coliform) and pH (Potential of Hydrogen) monitored at Hathni Kund Dam (Haryana) Yamuna River in India have been studied. It has been observed that water quality parameter have positive correlation between COD-BOD; AMM-TKN; WT-pH; TC-FC; and negatively correlation between COD-DO; BOD-DO; TKN-FC; DO-WT. Discrete wavelet analyses of water quality parameter using Daubechies wavelet at level 5 have been calculated. It has been observed that the values of signal data at five different levels for AMM, BOD, COD, DO, FC, pH, TC, TKN, WT varies between -1 to 1, -2 to 2, -20 to 20, -2 to 2, -5 to 5, -1 to 1, -2 to 2, -5 to 5, -10 to 10 respectively.

USBAS 5.09

Paper Title: Analysis of relative energy distribution in Indian air pollutants using continuous wavelet transform

Author(s): Mittal, A. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Emerging Trends in Engineering and Development, Vol.2(1), (2012), pp 164-177

ISSN No. : 2454-6410

Abstract: This Paper deals with the study of percentage of energy distribution in Indian air pollution parameters. Daily averaged values of air pollution parameters CO, NO, NO₂, O₃ and SO₂ used for the period of last four years collected from different monitoring station located in Delhi, India. One dimensional continuous wavelet transform performed for each of the air pollutants using Db4 wavelet. Wavelet Scalogram (represent the relative energy distribution at various scales) plotted for each of the air pollutants and observed that that distribution of energy in air pollutants depends on the scales.

USBAS 5.10

Paper Title: Impact of Doppler Weather Radar data on Numerical simulation of heavy rainfall

Author(s): Bhardwaj, R.¹, Siddiqi A,H, ² and Mittal A.¹

Affiliation(s): ¹Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²School of Engineering & Technology, Sharda University, Greater Noida - 201306, Uttar Pradesh

Source: Indian Journal of Industrial and Applied Mathematics, Vol.4(1), (2013), pp 94-97

ISSN No. : 0973-4317

Abstract: This paper deals with the energy distribution of air pollutant carbon monoxide (CO) collected from different monitoring stations located in Delhi, i.e., the Delhi College of Engineering (DCE, industrial area), ITO-Crossing (ITO, commercial area) and Siri fort (SF, residential area), and by a mobile van (MV), which can be treated as mixed location of Delhi used for the period of last 4 years. Also, the percentage of energy distribution of wavelet coefficient for CO has been discussed using one-dimensional continuous Daubechies wavelet, Db₄. It has been observed that relative energy plot for CO at the DCE, ITO and SF has more random behaviour and thus it has more light coloured strips (maximum energy), but for MV, the maximum energy has been observed between 300-600 and 1200-1400 data points. The distribution of energy in wavelet scalograms for CO depends on the scale.

USBAS 5.11

Paper Title: Chaos in Satellite's motion under Aerodynamic torque

Author(s): Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol.4(1), (2013), pp 68-80

ISSN No. : 0973-4317

Abstract: This paper deals with chaotic oscillation of the satellite under the influence of aerodynamic torque in circular orbit. Non-linear planar equation of motion of the model has been derived. Using the Bogoliubov- Krylov- Mitropolskii (BKM) method, it is observed that resonances exist. The analysis regarding stability of stationary planar oscillation of satellite near resonance frequency shows that discontinuity occurs in the amplitude of oscillation at frequency of external periodic force which is less than frequency of the natural oscillation. The aerodynamic torque plays a very significant role in changing the motion of revolution into libration or infinite period separatrix. The half width of the chaotic separatrices estimated by the Chirikov's criterion is not affected by the aerodynamic torque. It has been concluded that in the spin-orbit phase space, the regular curves start disintegrating due to aerodynamic torque (e) and the irregular mass distribution (n) of the satellite and this disintegration increases with the increase in e and n.

USBAS 5.12

Paper Title: Wavelet and Statistical Analysis of river water quality parameters.

Author(s): Parmar, K.S. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Applied Mathematics and computation, Vol.219(20), (2013), pp 10172-10182

ISSN No. : 0096-3003

Abstract: Statistical and wavelet analysis of water quality parameters COD (chemical oxygen demand), BOD (biochemical oxygen demand), DO (dissolved oxygen), WT (water temperature), AMM (free ammonia), TKN (total kjeldahl nitrogen), TC (total coliform), FC (fecal coliform) and pH (potential of hydrogen) monitored at Nizamuddin bridge-mid stream (Delhi) of Yamuna River in India have been studied. It has been observed that COD is highly correlated with BOD, AMM and TKN. Daubechies wavelet at level 5 (Db₅) have been calculated for each water quality parameters as it gives the finer scale approximation and decomposition of each water parameters. Wavelet decomposition and approximation using Db₅ of each parameters presented in seven parts namely s, a₅, d₁, d₂, d₃, d₄ and d₅ where "s" represents signal or raw data; low frequency part "a₅" gives an approximate of signal at level 5; high frequency parts d₁, d₂, d₃, d₄ and d₅ contains the detail of "s" at different levels respectively.

USBAS 5.13

Paper Title: Analysis of Carbon Mono-oxide Using Haar Wavelet.

Author(s): Bhardwaj, R.¹, Siddiqi, A. H² and Mittal, A.¹

Affiliation(s): ¹Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²School of Engineering & Technology, Sharda University, Greater Noida - 201306, Uttar Pradesh

Source: Indian Journal of Industrial and Applied Mathematics, Vol.4(1), (2013), pp 44-51

ISSN No. : 0973-4317

Abstract: Statistical properties using average value, maximum, minimum, variance, standard deviation, coefficient of variation, coefficient of kurtosis and coefficient of skewness of carbon monoxide (CO), recorded at four different locations, namely, the Delhi College of Engineering (DCE), ITO-crossing (ITO), Siri fort (SF) and by mobile van (MV) in Delhi, India, were analysed for 4 years from 2007 to 2010. The 1-dimensional discrete and continuous wavelets analysis in time and frequency domains has been carried out for CO using Haar wavelet at level 3. It has been observed that at DCE, the average concentration of CO decreased from 1385 µg/m³ in the year 2007 to 1039 µg/m³ in the year 2010. At ITO, CO level crossed maximum limit of 2,000 µg/m³ for all the 4 years. The CO has moderate positive linear relationship between DCE and ITO and between MV and SF and weak positive correlation between DCE and MV, DCE and SF, ITO and MV and ITO and SF.

USBAS 5.14

Paper Title: Water quality Index and Fractal dimension analysis of water parameters

Author(s): Parmar, K.S. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Environmental Science and Technology, Vol.10(1), (2013), pp151-164

ISSN No. : 1735-1472

Abstract: Statistical analysis of water quality parameters were analyzed at Harike Lake on the confluence of Beas and Sutlej rivers of Punjab (India). Mean, median, mode, standard deviation, kurtosis, skewness, coefficient of variation, regression lines, correlation coefficient, Hurst exponent, fractal dimension and predictability index were estimated for each water parameter. Monthly variation of water quality index using month-wise and parameter-wise value of quality rating and actual value present in water sample was calculated and compared with World Health Organization/ Environmental Protection Agency standard value of these parameters. It was observed that Brownian time series behavior exists of potential of hydrogen with total dissolved solids, hardness, alkalinity, sulfate, chloride and conductance parameters; biochemical oxygen demand with total dissolved solids, hardness, alkalinity, sulfate, chloride, conductance and calcium parameters; dissolved oxygen with total dissolved solids, hardness, alkalinity, sulfate, chloride, conductance and calcium parameters; ferrous with total dissolved solids, hardness, alkalinity, sulfate, conductance and calcium parameters; chromium with total dissolved solids, hardness, alkalinity, sulfate, chloride, conductance and zinc parameters; zinc with total dissolved solids, hardness, sulfate, chloride, conductance and calcium parameters; fluoride with total dissolved solids, hardness, alkalinity, sulfate, chloride and conductance parameters; nitrate with total dissolved solids, sulfate and conductance parameters; nitrite with potential of hydrogen, total dissolved solids, hardness, alkalinity, sulfate, chloride, conductance and calcium parameters. Also, using water quality index, it was observed that water of the lake was severely contaminated and became unfit for drinking and industrial use.

USBAS 5.15

Paper Title: Statistical Bias Correction Methods for Numerical Weather Prediction Model (NWP) Forecasts of Maximum and Minimum Temperatures

Author(s): Durai, V.R.¹ and Bhardwaj, R.²

Affiliation(s): ¹India Meteorological Department, New Delhi 110003; ²Non-Linear Dynamics Research Lab; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol.4(2), (2013), pp 142-151

ISSN No. : 0973-4317

Abstract: We have investigated the performance of four bias correction methods for improving both maximum and minimum temperature forecasts produced by the NWP model. The objective of bias correction is to minimize the systematic error of the next forecast using bias from past errors. The need for bias corrections arises from the many sources of systematic errors in NWP modeling systems. NWP models have shortcomings in the physical parameterization of weather events and have the inability to handle sub-grid phenomena successfully. The statistical algorithms used for minimizing the bias of the next forecast are Running-Mean (RM) bias correction, Best Easy Systematic (BES) estimator, simple Linear Regression (LR) and the

Nearest Neighborhood Weighted (NNW) mean, as they are suitable for small samples. Bias correction is done for four global NWP model maximum and minimum temperature forecasts. The magnitude of the bias at a grid point depends upon geographical location and season. Validation of the bias correction methodology is carried out using daily observed and bias corrected model maximum and minimum temperature forecast over India during July-September 2011. The bias corrected NWP model forecast generally outperforms direct model output (DMO). The spatial distribution of Mean Absolute Error (MAE) and Root mean squared Error (RMSE) for bias corrected forecast over India indicate that both the RM and NNW methods produces the best skill among other bias correction methods. The inter-comparison reveals that statistical bias correction methods improves the DMO forecast in terms of accuracy in forecast and has the potential for operational applications.

USBAS 5.16

Paper Title: Study of slip velocity effect on performance of magnetic fluid flow

Author(s): Chawla, M. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol.4(2), (2013), pp 108-117

ISSN No. : 0973-4317

Abstract: The use of magnetic fluids has led to the development of many new energy devices and instruments. Magnetically cooled high fidelity speakers, computer disc drives and semiconductors are already in commercially use. Magnetic fluids are prepared by suspending ferromagnetic grains in nonmagnetic, non-conducting liquids such as diesters, kerosene, hydrocarbons and fluorocarbons. Among various applications in engineering, most important are those of the possibility of collecting and holding firmly small quantities of such fluids in regions with highly focused magnetic fields. A theoretical model of magnetic fluid based porous-pivoted slider bearing with slip velocity is considered to study effect of surface roughness on the performance of fluid. Generalized form for surface roughness characterized by stochastic random variable with non-zero mean, variance and skewness is used to define bearing surface. Load capacity is evaluated in terms of magnetic, permeability, slip and surface roughness parameters. Numerical and graphical behavior of load capacity based on magnetic, permeability, slip and surface roughness parameters is also studied. Minimization of slip parameter and permeability parameter is discussed for the possible increase in the load capacity.

USBAS 5.17

Paper Title: Impact of Doppler Weather Radar data on Numerical simulation of heavy rainfall

Author(s): Srivastava, K¹. and Bhardwaj, R.²

Affiliation(s): ¹Scientist, IMD Unit, Civil Aviation Training College, Bamrauli, Allahabad – 211012 (U.P.) ;²Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol.(1), (2014), pp 64-75

ISSN No. : 0973-4317

Abstract: In this paper, impact of Doppler Weather Radar (DWR) data has been examined for numerical simulation of heavy rainfall events using numerical weather prediction

system Advance Regional Prediction System (ARPS) model at 3 km horizontal resolution. Weather radars transmit electromagnetic waves that receive and process backscattered signals and receive information of size, shape, class and precipitation rate. Fundamental variable measured by weather radars includes reflectivity and radial velocity. The reflectivity and radial velocity observations from DWR station Delhi are assimilated into ARPS model using ARPS Data Assimilation System (ADAS) and cloud analysis scheme. The main objective of this study is to evaluate the impact of Delhi DWR data on hydrometeor initialization (rain, snow and hail) of Numerical Weather Prediction (NWP) model, using hydrometeor analysis procedure within framework of ADAS and thence spin up problem. An initial results show that hydrometeor analysis procedure of ADAS is successfully able to convert observed reflectivity of Delhi radar to the model's precipitating hydrometeors (rain, snow and hail). The use of hydrometeor analysis for DWR data has significantly improved precipitation field in the initial conditions. It also significantly reduces spin up problem when model has been initialized with improved initial conditions.

USBAS 5.18

Paper Title: Rotational Oscillation of satellite in elliptic orbit under magnetic torque

Author(s): Kaur, P.¹ and Bhardwaj, R.²

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Source: Indian Journal of Industrial and Applied Mathematics, Vol.5(1), (2014), pp 17-24.

ISSN No. : 0973-4317

Abstract: Magnetic disturbance torque results from interaction between spacecraft's residual magnetic field and geomagnetic field. The primary sources of magnetic disturbance torques are spacecraft magnetic moments, eddy currents and hysteresis. The instantaneous magnetic disturbance torque due to spacecraft effective magnetic moment is the product of geocentric magnetic flux density and sum of individual magnetic moments caused by permanent and induced magnetism and spacecraft generated current loops. Let us consider a rigid satellite S moving around the central body C and orbital plane of satellite coincides with equatorial plane of C. This paper deals with rotational oscillation of satellite under influence of magnetic torque in elliptic orbit. Non-linear planar equation of motion of model has been derived. Using BKM method, it is observed that resonances exist. The analysis regarding stability of stationary planar oscillation of satellite near resonance frequency shows that discontinuity occurs in amplitude of oscillation at frequency of external periodic force which is less than frequency of the natural oscillation. The half width of chaotic separatrix has been estimated by Chirikov's criterion. Through surface of section method, it has been observed that magnetic torque parameter, eccentricity and mass ratio play an important role in changing regular motion into chaotic one.

USBAS 5.19

Paper Title: Forecasting Quantitative Rainfall over India using Multi-Model Ensemble Technique

Author(s): Durai, V.R.¹ and Bhardwaj, R.²

Affiliation(s): ¹India Meteorological Department, New Delhi 110003; ²Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Meteorology and Atmospheric Physics, Vol.126, (2014), pp 31-48
ISSN No. : 0177-7971
Abstract: A new approach to ensemble forecasting of rainfall over India based on daily outputs of four operational numerical weather prediction (NWP) models in the medium-range timescale (up to 5 days) is proposed in this study. Four global models, namely ECMWF, JMA, GFS and UKMO available on real-time basis at India Meteorological Department, New Delhi, are used simultaneously with adequate weights to obtain a multi-model ensemble (MME) technique. In this technique, weights for each NWP model at each grid point are assigned on the basis of unbiased mean absolute error between the bias corrected forecast and observed rainfall time series of 366 daily data of 3 consecutive southwest monsoon periods (JJAS) of 2008, 2009 and 2010. Apart from MME, a simple ensemble mean (ENSM) forecast is also generated and experimented. The prediction skill of MME is examined against observed and corresponding outputs of each constituent model during monsoon 2011. The inter comparison reveals that MME is able to provide more realistic forecast of rainfall over Indian monsoon region by taking the strength of each constituent model. It has been further found that the weighted MME technique has higher skill in predicting daily rainfall compared to ENSM and individual member models. RMSE is found to be lowest in MME forecasts both in magnitude and area coverage. This indicates that fluctuations of day-to-day errors are relatively less in the MME forecast. The inter comparison of domain-averaged skill scores for different rainfall thresholds further clearly demonstrates that the MME algorithm improves slightly above the ENSM and member models.

USBAS 5.20

Paper Title: Fractal, Predictability Index and Variability in Trends Analysis of River Water Dynamics
Author(s): Parmar, K.S. and Bhardwaj, R.
Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: International Journal of River Basin Management, Vol.12(4), (2014), pp 285-297
ISSN No. : 1814-2060
Abstract: Statistical modelling, analysis of physico-chemical parameters chemical oxygen demand (COD), biochemical oxygen demand (BOD), dissolved oxygen (DO), water temperature (WT), free ammonia (AMM), total Kjeldahl nitrogen (TKN), total coliform (TC), fecal coliform (FC) and potential of hydrogen (pH) monitored at the Hathnikund barrage (Haryana) sample site of river Yamuna in India have been studied. It has been observed that water-quality parameters such as COD-BOD, AMM-TKN, WT-pH and TC-FC are positively correlated whereas COD-DO, BOD-DO, TKN-FC and DO-WT are negatively correlated. For water-quality parameters such as pH, AMM, TC and FC no seasonal pattern is observed. Parameters such as COD, BOD, TKN, DO and WT follow a six-month seasonal pattern. All the parameters except DO and WT follow a positive trend for monthly and annual variations. BOD, AMM and TKN have anti-persistence behaviour for both monthly and yearly variations. For parameters COD (+27.83%), BOD (+42.36%), AMM (+49.63%), TKN (+22.71%), TC (+141.80%) and FC (+42.89%) the future trend remains positive with high variability. WT (27.47%) follows a negative trend with low variation and DO (217.12%) has a negative trend with lofty variation. Using fractal, predictability index and variability in trend analysis, it is concluded that all

parameters, except pH and WT, cross the prescribed limits of WHO/EPA and if the same trend should be followed, then in the future the quality of water shall continuously deteriorate and water may not be fit for drinking, agriculture and industrial use.

USBAS 5.21

Paper Title: Time Series, Trend and Wavelet Analysis of Water Parameters

Author(s): Parmar, K.S. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol.5(1), (2014), pp 1-9

ISSN No. : 2277-4114

Abstract: Time series, trend and wavelet analysis of water quality parameters Chemical Oxygen Demand (COD), Biochemical Oxygen Demand (BOD), Dissolved Oxygen (DO) monitored at Nizamuddin bridge mid-stream of river Yamuna in India have been studied. In Auto Regressive Integrated Moving Average (ARIMA) model (p, d, q) value of 'd' is zero thus process is stationary. It is observed that Root Mean Square Error (RMSE) value are comparatively very low thus dependent series is closed with the model predicted level. The Mean Absolute Percentage Error (MAPE), MaxAPE, MAE, MaxAE, normalized Bayesian Information Criterion (BIC) are calculated and have low value. trend is calculated by using Auto correlation function (ACF), Partial auto correlation function (PACF) and lag. The predictive model is useful at 95% confidence limits. The 1-D discrete and continuous Daubechies wavelet analysis explains that the parameters COD, BOD, DO have the maximum value 120, 50, 8; the value of a_5 varies between 52 to 78, 10 to 30, 0.2 to 1.4 and the scale values of Db_5 , i.e., d_5 ranges between -10 to 10; -5 to 5 and -0.5 to 0.5, respectively. It is concluded that as the value of COD, BOD increases and value of DO decreases, water is not fit for drinking, agriculture and industrial use.

USBAS 5.22

Paper Title: Location Specific Forecasting of Maximum and Minimum Temperature over India by Using the Statistical Bias Corrected Output of Global Forecasting System

Author(s): Durai V.R.¹ and Bhardwaj, R.²

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Source: Journal of Earth system science, Vol.123(5), (2014), pp 1171-1195

ISSN No. : 0973-774X

Abstract: The output from Global Forecasting System (GFS) T574L64 operational at India Meteorological Department (IMD), New Delhi is used for obtaining location specific quantitative forecast of maximum and minimum temperatures over India in the medium range time scale. In this study, a statistical bias correction algorithm has been introduced to reduce the systematic bias in the 24–120 hour GFS model location specific forecast of maximum and minimum temperatures for 98 selected synoptic stations, representing different geographical regions of India. The statistical bias correction algorithm used for minimizing the bias of the next forecast is Decaying Weighted Mean (DWM), as it is suitable for small samples. The main objective of this study is to evaluate the skill of Direct Model Output (DMO) and Bias Corrected (BC) GFS for location specific forecast of maximum and minimum

temperatures over India. The performance skill of 24–120 hour DMO and BC forecast of GFS model is evaluated for all the 98 synoptic stations during summer (May–August 2012) and winter (November 2012–February 2013) seasons using different statistical evaluation skill measures. The magnitude of Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) for BC GFS forecast is lower than DMO during both summer and winter seasons. The BC GFS forecasts have higher skill score as compared to GFS DMO over most of the stations in all day-1 to day-5 forecasts during both summer and winter seasons. It is concluded from the study that the skill of GFS statistical BC forecast improves over the GFS DMO remarkably and hence can be used as an operational weather forecasting system for location specific forecast over India.

USBAS 5.23

Paper Title: Evaluation of Statistical Bias Correction Methods for Numerical Weather Prediction Model (NWP) Forecasts of Maximum and Minimum Temperatures

Author(s): Durai, V.R.¹ and Bhardwaj, R.²

Affiliation(s): ¹India Meteorological Department, New Delhi 110003; ²Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Natural Hazards, Vol.73(3), (2014), pp 1229-1254

ISSN No. : 1573-0840

Abstract: Statistical bias correction methods for numerical weather prediction (NWP) forecasts of maximum and minimum temperatures over India in the medium-range time scale (up to 5 days) are proposed in this study. The objective of bias correction is to minimize the systematic error of the next forecast using bias from past errors. The need for bias corrections arises from the many sources of systematic errors in NWP modelling systems. NWP models have shortcomings in the physical parameterization of weather events and have the inability to handle sub-grid phenomena successfully. The statistical algorithms used for minimizing the bias of the next forecast are running-mean (RM) bias correction, best easy systematic estimator, simple linear regression and the nearest neighborhood (NN) weighted mean, as they are suitable for small samples. Bias correction is done for four global NWP model maximum and minimum temperature forecasts. The magnitude of the bias at a grid point depends upon geographical location and season. Validation of the bias correction methodology is carried out using daily observed and bias corrected model maximum and minimum temperature forecast over India during July–September 2011. The bias-corrected NWP model forecast generally outperforms direct model output (DMO). The spatial distribution of mean absolute error and root-mean squared error for bias-corrected forecast over India indicate that both the RM and NN methods produce the best skill among other bias correction methods. The inter-comparison reveals that statistical bias correction methods improve the DMO forecast in terms of accuracy in forecast and have the potential for operational applications.

USBAS 5.24

Paper Title: Improving precipitation forecasts skill over India using a multi-model ensemble technique

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Source: *Geofizika*, Vol.30(2), (2014), pp 119-141

ISSN No. : 0352-3659

Abstract: In this paper a Multi-Model Ensemble (MM E) technique is experimented for improving day to day rainfall forecast over India in short to medium range time scale during summer monsoon of 2010. Four operational global Numerical Weather Prediction (NWP) models namely, ECMWF, JMA, NCEP GFS and UKMO available on real time basis at India Meteorological Department (IMD), New Delhi are used simultaneously with appropriate weights to obtain the MM E Technique. In this technique, weights for each NWP model at each grid point is assigned on the basis of the correlation coefficient (CC) between model forecasts and observed daily rainfall time series of south west monsoon (JJAS) season. Apart from MM E, a simple ensemble mean (ENSM) forecast are also generated and experimented. The rainfall prediction skill of the weighted MM E is examined against ENSM and member models. The inter-comparison reveals that the weighted MM E is able to provide more accurate forecast of rainfall over Indian monsoon region by taking the strength of each constituent member model. It has been further found that the rainfall prediction skill of MM E is higher as compared to ENSM and member models in the short range time scale. The rainfall prediction skill of weighted MM E technique improved significantly over India.

USBAS 5.25

Paper Title: Analysis and very short-range forecast of Cyclone "AILA" with radar data assimilation with rapid intermittent cycle using ARPS 3DVAR and cloud analysis techniques

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Source: *Meteorology and Atmospheric Mathematics*, Vol.124(1-2), (2014), pp 97-111

ISSN No. : 0177-7971

Abstract: In this study, both reflectivity and radial velocity are assimilated into the Weather Research and Forecasting (WRF) model using ARPS 3DVAR technique and cloud analysis procedure for analysis and very short range forecast of cyclone AILA. Doppler weather radar (DWR) data from Kolkata radar are assimilated for numerical simulation of land falling tropical cyclone. Results show that the structure of cyclone AILA has significantly improved when radar data is assimilated. Radar reflectivity data assimilation has strong influence on hydrometeor structures of the initial vortex and precipitation pattern and relatively less influence is observed on the wind fields. Divergence/convergence conditions over cyclone inner-core area in the low-to-middle troposphere (600–900 hPa) are significantly improved when wind data are assimilated. However, less impact is observed on the moisture field. Analysed minimum sea level pressure (SLP) is improved significantly when both reflectivity and wind data assimilated simultaneously (RAD-ZVr experiment), using ARPS 3DVAR technique. In this experiment, the centre of cyclone is relocated very close

to the observed position and the system maintains its intensity for longer duration. As compared to other experiments track errors are much reduced and predicted track is very much closer to the best track in RAD-ZVr experiment. Rainfall pattern and amount of rainfall are better captured in this experiment. The study also reveals that cyclone structure, intensification, direction of movement, speed and location of cyclone are significantly improved and different stages of system are best captured when both radar reflectivity and wind data are assimilated using ARPS 3DVAR technique and cloud analysis procedure. Thus optimal impact of radar data is realized in RAD-ZVr experiment. The impact of DWR data reduces after 12 h forecast and it is due to the dominance of the flow from large-scale global forecast system model. Successful coupling of data assimilation package ARPS 3DVAR with WRF model for Indian DWR data is also demonstrated.

USBAS 5.26

Paper Title: Assimilation of Doppler weather Radar Data in WRF model for simulation of tropical cyclone Aila

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Source: Pure and Applied Geophysics, Vol.124(1-2), (2014), pp 2043-2072

ISSN No. : 0033-4553

Abstract: For the accurate and effective forecasting of a cyclone, it is critical to have accurate initial structure of the cyclone in numerical models. In this study, Kolkata Doppler weather radar (DWR) data were assimilated for the numerical simulation of a land-falling Tropical Cyclone Aila (2009) in the Bay of Bengal. To study the impact of radar data on very short-range forecasting of a cyclone's path, intensity and precipitation, both reflectivity and radial velocity were assimilated into the weather research and forecasting (WRF) model through the ARPS data assimilation system (ADAS) and cloud analysis procedure. Numerical experiment results indicated that radar data assimilation significantly improved the simulated structure of Cyclone Aila. Strong influences on hydrometeor structures of the initial vortex and precipitation pattern were observed when radar reflectivity data was assimilated, but a relatively small impact was observed on the wind fields at all height levels. The assimilation of radar wind data significantly improved the prediction of divergence/ convergence conditions over the cyclone's inner-core area, as well as its wind field in the low-to-middle troposphere (600–900 hPa), but relatively less impact was observed on analyzed moisture field. Maximum surface wind speed produced from DWR–Vr and DWR–ZVr data assimilation experiments were very close to real-time values. The impact of radar data, after final analysis, on minimum sea level pressure was relatively less because the ADAS system does not adjust for pressure due to the lack of pressure observations, and from not using a 3DVAR balance condition that includes pressure. The greatest impact of radar data on forecasting was realized when both reflectivity and wind data (DWR–ZVr and DWR–ZVr00 experiment) were assimilated. It is concluded that after final analysis, the center of the cyclone was relocated very close to the observed position, and simulated cyclone maintained its intensity for a longer duration. Using this analysis, different stages of the cyclone are better captured, and cyclone structure, intensification, direction of movement, speed

and location are significantly improved when both radar reflectivity and wind data are assimilated. As compared to other experiments, the maximum reduction in track error was noticed in the DWR–ZVr and DWR– ZVr00 experiments, and the predicted track in these experiments was very close to the observed track. In the DWR–ZVr and DWR–ZVr00 experiments, rainfall pattern and amount of rainfall forecasts were remarkably improved and were similar to the observation over West Bengal, Orissa and Jharkhand; however, the rainfall over Meghalaya and Bangladesh was missed in all the experiments. The influence of radar data reduces beyond a 12-h forecast, due to the dominance of the flow from large-scale, global forecast system models. This study also demonstrates successful coupling of the data assimilation package ADAS with the WRF model for Indian DWR data.

USBAS 5.27

Paper Title: Hamiltonian function for Satellite motion in an Elliptic Orbit under the influence of Aerodynamic Torque.

Author(s): Bhardwaj, R. and Kaur, M.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol.5(2), (2014), pp 141-147

ISSN No. : 0973-4317

Abstract: This paper deals with the non-linear oscillation of a satellite in an elliptic orbit around the Earth under the influence of aerodynamic and gravitational torque. It is assumed that the orbital plane coincides with the equatorial plane of the Earth. Using Euler's dynamical equation of motion, the equation of motion and Hamiltonian function for the problem is derived. Taking aerodynamic torque of the order of eccentricity, it is observed that Hamiltonian function is dependent on aerodynamic torque. The equilibrium points and Double Asymptotic solutions related to the problem are calculated. It is concluded that in the phase space $(0, 2)$ and $(\pi, 2)$ are the equilibrium points, out of which $(0, 2)$ is a stable and $(\pi, 2)$ is an unstable equilibrium point.

USBAS 5.28

Paper Title: Water Quality management using Statistical analysis and time series prediction model

Author(s): Singh, K.P and Bhardwaj, R.

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Source: Applied water science, Vol.4, (2014), pp 425-434

ISSN No. : 2190-5495

Abstract: This paper deals with water quality management using statistical analysis and time-series prediction model. The monthly variation of water quality standards has been used to compare statistical mean, median, mode, standard deviation, kurtosis, skewness, coefficient of variation at Yamuna River. Model validated using R-squared, root mean square error, mean absolute percentage error, maximum absolute percentage error, mean absolute error, maximum absolute error, normalized Bayesian information criterion, Ljung–Box analysis, predicted value and confidence limits. Using auto regressive integrated moving average model, future water quality parameters values have been estimated. It is observed that predictive model is useful at 95 % confidence limits and curve is platykurtic for potential of hydrogen (pH), free ammonia, total Kjeldahl nitrogen,

dissolved oxygen, water temperature (WT); leptokurtic for chemical oxygen demand, biochemical oxygen demand. Also, it is observed that predicted series is close to the original series which provides a perfect fit. All parameters except pH and WT cross the prescribed limits of the World Health Organization /United States Environmental Protection Agency, and thus water is not fit for drinking, agriculture and industrial use.

USBAS 5.29

Paper Title: **Real time Nowcast of a Cloudburst and a Thunderstorm event with assimilation of Doppler Weather Radar data**

Author(s): Srivastava, K.¹ and Bhardwaj, R.²

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Source: Natural Hazards, Vol.70(2), (2014), pp 1357-1383

ISSN No. : 1573-0840

Abstract: Extreme weather events such as cloudburst and thunderstorms are great threat to life and property. It is a great challenge for the forecasters to nowcast such hazardous extreme weather events. Mesoscale model (ARPS) with real-time assimilation of DWR data has been operationally implemented in India Meteorological Department (IMD) for real-time nowcast of weather over Indian region. Three-dimensional variational (ARPS3DVAR) technique and cloud analysis procedure are utilized for real-time data assimilation in the model. The assimilation is performed as a sequence of intermittent cycles and complete process (starting from reception, processing and assimilation of DWR data, running of ARPS model and Web site updation) takes less than 20 minutes. Thus, real-time nowcast for next 3 h from ARPS model is available within 20 minutes of corresponding hour. Cloudburst event of September 15, 2011, and thunderstorm event of October 22, 2010, are considered to demonstrate the capability of ARPS model to nowcast the extreme weather events in real time over Indian region. Results show that in both the cases, ARPS3DVAR and cloud analysis technique are able to extract hydrometeors from radar data which are transported to upper levels by the strong upward motion resulting in the distribution of hydrometeors at various isobaric levels. Dynamic and thermodynamic structures of cloudburst and thunderstorm are also well simulated. Thus, significant improvement in the initial condition is noticed. In the case of cloudburst event, the model is able to capture the sudden collisions of two or more clouds during 09–10 UTC. Rainfall predicted by the model during cloudburst event is over 100 mm which is very close to the observed rainfall (117 mm). The model is able to predict the cloudburst with slight errors in time and space. Real-time nowcast of thunderstorm shows that movement, horizontal extension, and north–south orientation of thunderstorm are well captured during first hour and deteriorate thereafter. The amount of rainfall predicted by the model during thunderstorm closely matches with observation with slight errors in the location of rainfall area. The temporal and spatial information predicted by ARPS model about the sudden collision/ merger and broken up of convective cells, intensification, weakening, and maintaining intensity of convective cells has added value to a human forecast.

USBAS 5.30

Paper Title: Surface Roughness and Slip Velocity Effect on Magnetic Lubricated Porous Pivoted Slider Bearings

Author(s): Chawla, M. and Bhardwaj, R.

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Source: Indian Journal of Industrial and Applied Mathematics, Vol.5(2), (2014), pp 87-95

ISSN No. : 0973-4317

Abstract: This paper describes the theoretical analysis of the surface roughness and slip velocity effect on magnetic fluid based porous-pivoted slider bearing. The bearing surface is defined by stochastic random variable with skewness, variance and non-zero mean. The concerned stochastically averaged Reynolds equation is solved numerically to get the pressure distribution. The expression for dimensionless centre of pressure is obtained in form of integrals. The value of centre of pressure is calculated and plotted numerically. It is observed that the value of centre of pressure depends on surface roughness, magnetic, slip and permeability parameters. It is concluded that slip and permeability parameters play a vital role for increasing the life of bearing system roughness.

USBAS 5.31

Paper Title: Bifurcation Analysis in Economic System Dynamics.

Author(s): Ranjan, A. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol. 6(1), (2015), pp 49-56.

ISSN No. : 0973-4317

Abstract: This paper discusses the role of investment on dynamics of micro-economic in nonlinear financial model. The interest rate, investment demand and price index are modeled with the help of saving amount, cost per investment and demand elasticity of commercial markets, all these parameters are considered as positive. Using bifurcation theory, bifurcation point and time period is studied for the financial system. Through numerical methods, it is observed that the value of time bifurcation decreases as investment demand decreases, further the time bifurcation decreases with the investment demand parameter and elasticity of commercial markets. It is concluded that the bifurcation analysis depends on the value of investment demand and also on the elasticity of commercial markets parameter.

USBAS 5.32

Paper Title: Non-integrability for motion of Natural and Artificial Satellite in an Elliptic Orbit under the influence of Aerodynamic Torque.

Author(s): Kaur, M. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol. 6(2), (2015), pp 153-163

ISSN No. : 0973-4317

Abstract: This article deals with the non-linear oscillation of a satellite in an elliptic orbit around the Earth under the influence of aerodynamic and gravitational torque. It is assumed that the orbital plane coincides with the equatorial plane of the Earth. Using Euler's dynamical equation of motion, the equation of motion, Hamiltonian function

and Melnikov's integral for the problem is derived. Taking aerodynamic torque of the order of eccentricity, it is observed that Hamiltonian function is dependent on aerodynamic torque. Using Melnikov's method it is observed that equations of motion are non-integrable. The non-integrability is observed graphically and numerically in Earth–Moon system and Earth–Resourcesat-1 system. It is concluded that for Earth–satellite system (Earth– Moon and Earth–Resourcesat-1) the Melnikov's function has simple zeros with the change in mass parameter and aerodynamic torque parameter, thus the non-linear system for equation of motion is non-integrable.

USBAS 5.33

Paper Title: Bifurcation Analysis of time delay in Economic System Dynamics

Author(s): Ranjan,A and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol. 6(2), (2015), pp 153-163.

ISSN No. : 0973-4317

Abstract: This paper discusses the role of investment on dynamics of micro-economic in nonlinear financial model with distributed time delay feedback and effect of delay on the dynamics of micro-economic in nonlinear financial model with distributed time delay feedback. The interest rate, investment demand and price index are modelled with the help of saving amount, cost per investment, demand elasticity of commercial markets and the strength of feedback. All these parameters are considered as positive. Using bifurcation theory, bifurcation point and time period are studied for the financial system with distributed time delay feedback. Through numerical methods, it is observed that the value of time bifurcation with time delay feedback in investment increases as investment demand increases, further the time bifurcation increases with the investment demand parameter and strength of time delay feedback in investment demand. It is concluded that the bifurcation analysis depends on the value of investment demand and also on the strength of time delay feedback parameter.

USBAS 5.34

Paper Title: Verification of quantitative precipitation forecast from operational ensemble prediction systems over India

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Source: Mausam, Vol. 66(3), (2015), pp 479-496

ISSN No. : 2529416

Abstract: In this paper the performance of four operational Ensemble Prediction System (EPS) of the European Centre for Medium-Range Weather Forecasts (ECMWF), the UK Met Office (UKMO), the US National Centers for Environmental Prediction (NCEP) and the Japan Meteorological Agency (JMA) available from "The Observing System Research and Predictability Experiment" (THORPEX) Interactive Grand Global Ensemble (TIGGE) database are studied over India in short to medium range time scale. The rainfall prediction skill of these EPS is examined in both deterministic and probabilistic senses. Results suggest that the ensemble mean forecast of all four EPS could reproduce the seasonal

mean heavy rainfall belts along the west coast, over north east and central India reasonably well. The active rainfall (positive anomaly) and weak or break condition of rainfall (negative anomaly) activity is well captured by all EPS ensemble mean forecasts. The ensemble mean rainfall forecast from ECMWF EPS generally has the highest skill, followed by UKMO, NCEP and JMA EPS. For the probability forecast, the NCEP and UKMO EPS appeared to have more or less similar skill when measured using BSS, RPSS and ROC over India in the medium range.

USBAS 5.35

Paper Title: Prediction Skill of Global Numerical Weather Prediction Model Deterministic Forecast over India during North East Monsoon

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Source: Vayumandal, Vol. 40(1-2), (2015), pp 182-191.

ISSN No. : 0970-1397

Abstract: This study provides a concise documentation of the current level of skill of the deterministic NWP model during North East monsoon 2010; making detailed inter-comparison with daily rainfall analysis from the use of rain gauge observations and satellite (TRMM) derived quantitative precipitation estimates (QPE) obtained from NASA web site. Model performance is evaluated for day-1 to day-5 forecasts of 24-h accumulated precipitation in terms of several accuracy and skill measures. Forecast quality and potential value are found to depend strongly on the verification dataset, geographic region, and precipitation threshold. Precipitation forecasts of the model, when accumulated over the whole season (October to December), reproduce the observed pattern. However, the model predicted rainfall is comparatively higher than the observed rainfall over most parts of the NE Monsoon regions during the season. The model showed considerable skill in predicting the daily and seasonal mean rainfall over southern peninsular India and also over five broad regions (Tamilnadu, Kerala, South Interior Karnataka, Rayalseema and Coastal Andhra Pradesh) of Indian North East monsoon areas. Various skill score and categorical statistics for the deterministic global model of IMD GFS rainfall forecast for NE Monsoon 2010 are prepared. The model bias for rainfall prediction changes from overestimation to underestimation at the threshold of 20 mm/day except for day-5 forecast. Model skill falls dramatically for occurrence rainfall thresholds greater than 15 mm/day. This implies that the model is much better at predicting the occurrence of rainfall than they are at predicting the magnitude and location of the peak values.

USBAS 5.36

Paper Title: Statistical, Time Series and Fractal Analysis of Full Stretch of River Yamuna (India) for Water Quality Management

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Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Environmental Science and Pollution Research, Vol. 22(1), (2015), pp 397-414.

ISSN No. : 1614-7499

Abstract: River water is a major resource of drinking water on earth. Management of river water is highly needed for surviving. Yamuna is the main river of India, and monthly

variation of water quality of river Yamuna, using statistical methods have been compared at different sites for each water parameters. Regression, correlation coefficient, auto regressive integrated moving average (ARIMA), box-Jenkins, residual autocorrelation function (ACF), residual partial autocorrelation function (PACF), lag, fractal, Hurst exponent, and predictability index have been estimated to analyze trend and prediction of water quality. Predictive model is useful at 95 %confidence limits and all water parameters reveal platykurtic curve. Brownian motion (true random walk) behavior exists at different sites for BOD, AMM, and total Kjeldahlnitrogen(TKN). Quality of Yamuna River water at Hathnikund is good, declines at Nizamuddin, Mazawali, Agra D/S, and regains good quality again at Juhikha. For all sites, almost all parameters except potential of hydrogen (pH), water temperature (WT) crosses the prescribed limits of World Health Organization (WHO)/United States Environmental Protection Agency (EPA)

USBAS 5.37

Paper Title: River Water Prediction Modeling Using Neural Networks, Fuzzy and Wavelet Coupled Model

Author(s): Parmar, K.S. and Bhardwaj, R.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Water Resource Management., Vol. 29(1), (2015), pp 17-33

ISSN No. : 0920-4741

Abstract: In this paper, new prediction model introduced by coupling of neural networks model, fuzzy model and wavelet model for the water resources management. Artificial neural network (ANN), fuzzy, wavelet and adaptive neuro-fuzzy inference system (ANFIS) are found to be a sturdy tool to model many non-linear hydrological processes. Wavelet transformation will improve the ability of a prediction model by capturing valuable information on different resolution levels. The target of this research is to compare our model with other famous data-driven models for monthly forecasting of water quality parameter chemical oxygen demand(COD) level monitored at Nizamuddin station, New Delhi, India of river Yamuna based on the past history. The data has been decomposed into wavelet domain constitutive sub series using Daubechies wavelet at level 8 (Db8). Statistical behavior of wavelet domain constitutive series has been studied. The foretelling performance of the wavelet coupled model has been compared with classical neuro fuzzy, artificial neural network and regression models. The result shows that the wavelet coupled model produces considerably higher leads to comparison to neuro fuzzy, neural network, regression models.

USBAS 5.38

Paper Title: On Nonlinear Dynamics, Chaos and Complexities

Author(s): Saha, L.M.¹; Das, M.K.² and Bhardwaj, R.³

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Source: Indian Journal of Industrial and Applied Mathematics, Vol. 7(2), (2016), pp 270-284.

ISSN No. : 0973-4317

Abstract: Almost all evolving real systems emerging around us are nonlinear in nature and their dynamics are not as simple as in cases of linear systems. Principle of superposition is no more applicable to real system and, to study them, one must apply the recent rules and methodology suggested in nonlinear dynamics. Because of nonlinearity in nature, real systems show complexities in behavior while evolving and chaos is one such complexity. Principles of nonlinear dynamics can only help to understand complex and chaotic behaviors observed in any nonlinear system. Various tools, which have been discovered due to growing researches in this area, are helpful to understand phenomena of evolutions in real systems. In addition to the basic tools, (e.g., time series and phase plane graphs), some tools such as Lyapunov exponents (LCEs), topological entropies, correlation dimension, etc., have been suggested recently which help us to understand better the complexities and chaotic motion in a dynamical system. To distinguish regular and chaotic motion, some recent tools have also been discussed with their working limitations. The present paper aims to explain evolutionary dynamics of nonlinear systems and to explain about complexities observed during the processes. Some specific models proposed for real systems would be discussed and calculations of LCEs, topological entropies, correlation dimensions have been obtained as a part of complexity measure. Numerically calculated results are displayed graphically with complete interpretation.

USBAS 5.39

Paper Title: Nonlinear Modelling of Competitive Ecosystem

Author(s): Das, S. and Bhardwaj, R.

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Source: Indian Journal of Industrial and Applied Mathematics, Vol. 7(1), (2016), pp 11-25.

ISSN No. : 0973-4317

Abstract: This paper deals with the mathematical modelling of an ecosystem where two or more species are competing for natural resources. Using fixed point and phase portrait analysis, the linear and non-linear models of the system are studied. Fixed-point analysis is used to find the stability conditions and phase portrait analysis is used to study the direction of flow in which system evolves. The phase portraits are plotted using MATLAB programmes. For a linear model, there exists a coexistence and catastrophe phase. In the coexistence phase for linear model, it is observed that the one species is dominant on the other species and vice versa in terms of population by shifting of dominance. The limit cycle in the phase portrait concludes that conservation of total population of the ecosystem exists. Also, in some cases, the catastrophe is observed which concludes that the total population of ecosystem gets extinct despite of transfer of dominance amongst the species. For nonlinear model, the intra- and inter-species interactions between the species based on Lotka Volterra model is considered. If an intermediate is introduced in the system then the whole dynamics of the system changes with the arising of chaotic state in which sustenance and extinction of the species is uncertain. It is observed that stability transfers from one equilibrium point to another with the change of parameter values. It is concluded that if the parameters are maintained effectively then for any kind of interactions between the photosynthetic algal species, the species will exhibit coexistence behaviour within a limited range and effectively utilise the natural resources from the environment which may be useful in conserving the biological diversity and the ecological cycles in environment.

USBAS 5.40

Paper Title: Surface roughness effect on couple stress fluid lubricated Porous pivoted slider bearings

Author(s): Chawla, M. and Bhardwaj, R.

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Source: Journal of Information and Optimization Sciences, Vol. 37(1), (2016), pp 13-22.

ISSN No. : 2169-0103

Abstract: A theoretical model is developed to study the surface roughness effect on couple stress fluid lubricated Porous pivoted slider bearings. Mathematical model of Reynolds equation is obtained for rough porous pivoted slider bearing. Capacity for load bearing and point where pressure is centered are evaluated in form of various parameters that are couple stress, permeability and surface roughness. It is concluded that capacity for load bearing increases with roughness and decreases with increases in permeability parameters. Normal behaviour exists for surface roughness parameters with pressure and pressure with permeability parameters.

USBAS 5.41

Paper Title: Complex Dynamics of Meditating Body

Author(s): Bhardwaj, R. and Bangia, A.

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Source: Indian Journal of Industrial and Applied Mathematics, Vol. 7(2), (2016), pp 106-116.

ISSN No. : 0973-4371

Abstract: Physical exercise is any bodily activity that enhances or maintains physical fitness, overall health, and wellness. Fitness means being able to perform physical activity. It also means having the energy and strength to feel as good as possible. Getting more fit, even a little bit, can improve your health. Exercise is a way of life. It has an important role in the prevention and treatment of lifestyle-related diseases. Physiologically, the benefits of exercises can be explained as more availability of oxygen to all tissues of body as it increases the alveolar ventilation and improves the strength of respiratory muscle and lung volumes by regular practice. In this paper, a mathematical model is developed to study the effects of exercise on the human body and on its two major components lungs and heart. The model uses non-linear differential equations which are time dependent under constant metabolic rate. A compartment model of breath function from lungs to tissues or body cells is discussed. The stability analysis by finding the equilibrium points, eigen system and phase space was discussed. Further, for improving accuracy and efficiency of the model, time series analysis is also discussed. Lastly, statistical analysis comprising regression line, correlation, fractal dimension, Hurst exponent are also studied for the time series data generated from the non-linear differential equations of the proposed model. It is observed that lungs variable has exponential growth. The body cell and heart variable have chaotic behavior. It is concluded that excessive exercise or increase in time of exercising can be harmful as it leads to more intake of oxygen and then a sudden drop which may be life threatening.

USBAS 5.42

Paper Title: Predictability and wavelet analysis of air pollutants for commercial and industrial regions.

Author(s): Bhardwaj, R. and Pruthi, D.

Affiliation(s): Non-Linear Dynamics Research Lab University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Industrial and Applied Mathematics, Vol. 7(2), (2016), pp 165-174.

ISSN No. : 0973-4371

Abstract: Globalization is fueling global warming, a major problem around the world. The cause of global warming is air pollution which indeed is mankind's attitude towards the environment. The past studies reveal that Afghanistan to China belt including India is severely affected by it. Regional climate effects air pollution and impact the whole globe. In reference to regional climate change, pollutants variability and transient trends have been analyzed in this study. According to WHO estimates, 15 to 20 million people have asthma in India, with children of age group 5-11 years being worst affected. In the last four years, there is an increase of 43% in sales of medicines to treat respiratory disorders in India. This study reveals significant variation in daily and 8 hourly trend for fine particulate matter. The observed difference contributes to error in air quality prediction. Further primary reason for increase of pollution were meteorological factors such as breeze and mixing height values cause relatively lower scattering of pollutants, leading to higher concentrations.

USBAS 5.43

Paper Title: Aerodynamic Torque exhibits non-resonance oscillation in satellite motion.

Author(s): Bhardwaj, R. and Kaur, M.

Affiliation(s): Non-Linear Dynamics Research Lab, University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Mathematica Applicanda, Vol. 44(1), (2016), pp 247-261.

ISSN No. : 2299-4009

Abstract: This paper deals with the non-linear oscillation of a satellite in an elliptic orbit around the Earth under the influence of aerodynamic and gravitational torque. It is assumed that the orbital plane coincides with the equatorial plane of the Earth. Using Bogoliubov–Krylov–Mitropolsky (BKM) methods of nonlinear oscillations, it is observed that the amplitude of the oscillation remains constant up to the second order of approximation. Numerically time series, 2D and 3D phase spaces are plotted for Earth Moon system using Matlab. The existence of main and parametric resonance concludes the different frequency states which transit the motion from regular to an attractor that leads to chaotic state.

USBAS-6.01

Paper Title: Reduced graphene oxide synthesis by high energy ball milling

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Source: Materials Chemistry and Physics ,Vol. 161 (2015), pp 123-129

ISSN No. : 0254-0584

Abstract: Graphene oxide is transformed to reduced graphene oxide by high energy ball milling in inert atmosphere. The process of ball milling introduces defects and removes oxygen functional groups, thereby creating the possibility of fine tuning the band gap of all intermediate stages of the structural evolution. A limit of the backbone sp^2 network structure has been found which should be able to accommodate defects, before amorphization sets in. The amorphization of graphene oxide is achieved rather quickly in comparison to that of graphite. From thermogravimetric and differential scanning calorimetric analysis along with Fourier transform infrared (FTIR) and Raman spectroscopic studies, it is found that the number of oxygen-containing groups decreases at a faster rate than that of aromatic double bonds with increasing ball milling time with a maximum limit of 3 h. Several characterization techniques (FTIR, Raman, UV–Visible and X-ray photoelectron spectroscopy) have confirmed that the material synthesized is, indeed, reduced graphene oxide.

USBAS-6.02

Paper Title: Multifunctionality in graphene decorated with cobalt nanorods

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Source: Materials and Design Vol. 101 (2016) pp 204–209

ISSN No. : 0284-1275

Abstract: Creating multifunctionality is always fascinating and required for various advance applications. We have prepared cobalt-graphene nanocomposite by co-reduction of graphite oxide and a divalent cobalt salt in water, at room temperature, by sodium borohydride. Microstructural study by high resolution transmission electron microscope (HRTEM) delineates that the nanocomposites consists of few layer of graphene sheets decorated by cobalt nanorods. The composite shows unusual photoluminescence in visible range due to defect decoration by cobalt nanorods, in spite of showing expected absorbance and magnetic properties. Functional nanomaterials with both magnetic and luminescence properties are important for application in biological systems.

USBAS-6.03

Paper Title: A brief review on graphene/inorganic nanostructure composites: materials for the future

Author(s): Mitra, S^{1,2}, Banerjee, S³, Datta, A⁴ and Chakravorty, D¹

Affiliation(s): ¹MLS Professor of Physics 'Unit, Indian Association for the Cultivation of Science, Jadavpur, Kolkata 700032; ²Department of Condensed Matter Physics, The Weizmann Institute of Science, Rehovot, Israel; ³Department of Physics, University of Calcutta, 92, A.P.C. Road, Kolkata 700009; ⁴University School of Basic and Applied Science, Guru Govind Singh Indraprastha University, New Delhi 110078

Source: Indian J Physics, Vol. 90(9) (2016), pp 1019–1032

ISSN No. : 0973-1458

Abstract: The exotic physical properties of graphene have led to intense research activities on the synthesis and characterization of graphene composites during the last decade. The methods developed for preparation of such materials and the different application areas are reviewed. Mainly the inorganic nanostructure/graphene composites have been discussed. The techniques of ex-situ and in-situ hybridization respectively, have been pointed out. Some of the application areas such as batteries, ultracapacitors for energy storage, fuel cells and solar cells for energy generation are discussed. The possible future directions of research are highlighted.

USBAS-6.04

Paper Title: Gamma radiation induced resistivity changes in Iron

Author(s): Tundwal, A., Kumar, V., and Datta, A.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian J Physics, Vol. 91(3), pp 293–29(2016)

ISSN No. : 0973-1958

Abstract: Monte Carlo Code JAIPU is used for estimation of Frenkelpairs and their effect on change of resistivity of Iron on irradiation by gamma spectrum of CO60. The Code includes three cascade processes of incident gamma, produced electrons and recoiled atoms and simulation of the lattice structure of the target material. Change in experimentally measured resistivity of Iron is found to vary with number of Frenkel pairs as $(x-1)\ln Nd$.

USBAS-6.05

Paper Title: Monte Carlo simulation of radiation damage produced in iron and vanadium by primary knock on atom 'PKA '

Author(s): Tundwal, A¹., Kumar, V¹., Raghaw, N. S². and Datta, A¹.

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²HENPL(ADS Program), University of Rajasthan, Jaipur

Source: Radiation Effects and Defects in Solids, Vol. 171(7-8), (2016), 658-667,

ISSN No. : 1042050

Abstract: Atomic scale simulation of radiation damage of pure iron and vanadium has been studied using the JA-IPU code based on Monte Carlo simulation. In response to gamma, neutron and any charged particle irradiation, energetic atoms knocked off their lattice position also generate atomic cascades inside the material besides the projectiles. The atomic cascade initiated by the primary knock on atoms (PKAs) of energy in the range 0–50 keV have been simulated in case of iron and vanadium metals. More realistic energy segregation has been achieved by incorporating

electronic energy loss (EEL) along with nuclear stopping in the code. It is revealed that the effect of EEL is definite and different at low PKA energy as compared with high energy. The flipover energy is $\sim 8\text{keV}$ in iron and $\sim 20\text{keV}$ in the case of vanadium. This difference is found to be more in the case of the displacements than in the case of the defects. Cascade efficiency of vanadium calculated from the JA-IPU code has also been compared with the molecular dynamic simulation and found to be nearly the same

USBAS-7.01

Paper Title: Generalised Cauchy-Riemann Lightlike Submanifolds of Indefinite Cosymplectic manifolds

Author(s): Gupta, R. S., Upadhyay, A. and Sharfuddin, A.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; Department of Mathematics, Faculty of Natural Sciences, Jamia Millia Islamia (Central University), New Delhi 110025

Source: An. St. Univ. Al. I. Cuza, Romania, LVIII f(2), (2012), pp 381-394

ISSN No.: 1221-8421

Abstract: Duggal and Sahin have studied generalised Cauchy-Riemann (GCR) lightlike submanifolds of indefinite Sasakian manifolds. In this paper, we study generalised Cauchy-Riemann (GCR) lightlike submanifold of an indefinite cosymplectic manifold and give a few examples also.

USBAS7.02

Paper Title: Lightlike Submanifolds of Indefinite Cosymplectic manifolds

Author(s): Gupta, R. S., Upadhyay, A. and Sharfuddin, A.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Mathematics, Faculty of Natural Sciences, Jamia Millia Islamia (Central University), New Delhi 110025

Source: An. St. Univ. Al. I. Cuza” Romania, LVIII f (1), (2012), pp 157-180

ISSN No.: 1221-8421

Abstract: In this paper we introduce the notion of lightlike submanifolds of an indefinite cosymplectic manifold. We have studied the invariant, contact CR, contact screen Cauchy-Riemann (contact SCR) lightlike submanifolds of an indefinite cosymplectic manifold. We give the condition under which lightlike submanifold of an indefinite cosymplectic manifold is minimal. We have also studied totally contact umbilical lightlike submanifold. Examples of lightlike submanifold of an indefinite cosymplectic manifold have also been given.

USBAS-7.03

Paper Title: Semi-symmetric and Ricci Semi-symmetric Lightlike Hyper- surface of an Indefinite Generalised Sasakian Space Form

Author(s): Upadhyay, A., Gupta, R. S. and Sharfuddin, A.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; Department of Mathematics, Faculty of Natural Sciences, Jamia MilliaIslamia(Central University), New Delhi 110025

Source: Int. Electronic Journal of Geometry, Vol. 5(1), (2012), pp140-150

ISSN No.: 1307-5624

Abstract: In this paper, we study semi-symmetric, Ricci semi-symmetric lightlike hypersurfaces of a indefinite generalized Sasakian space form with structure vector field tangent to hypersurface. We obtain the condition for Ricci tensor of lightlike hypersurface of indefinite generalized Sasakian space form to be symmetric and parallel.

USBAS-7.04

Paper Title: Ricci-semi-symmetric light like hypersurfaces of indefinite cosymplectic manifolds

Author(s): Gupta, R. S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Kyungpook Mathematical Journal, Korea, Vol. 53(4), (2013), 593-602

ISSN No.: 1225-6951

Abstract: This paper is devoted to study Ricci semi-symmetric lightlike hypersurfaces of an indefinite cosymplectic space form with structure vector field tangent to hypersurface. The condition for Ricci tensor of lightlike hypersurface of indefinite cosymplectic space form to be semi-symmetric and parallel have been obtained. An example of non-totally geodesic Ricci semi-symmetric lightlike hypersurface in R^7 have been given.

USBAS-7.05

Paper Title: B. Y. Chen's inequalities for bi-slant submanifolds in cosymplectic space forms

Author(s): Gupta, R. S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Sarjevo J. Math., Bosnia & Herzegovina., Vol.9 (21), (2013), 117-128

ISSN No.: 1840-0655

Abstract: In this paper we obtain B. Y. Chen's inequalities for a bi-slant submanifold M of a cosymplectic space form $\bar{M}(c)$, when the structure vector field ξ of the ambient space is tangent to M .

USBAS-7.06

Paper Title: On Biharmonic Hypersurfaces in Euclidean Space of Arbitrary Dimension

Author(s): Gupta, R. S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Glasgow Math. J., Vol.57, (2015), pp633-642.

ISSN No.: 0017-0895

Abstract: The following Chen's bi-harmonic conjecture made in 1991 is well known and stays open: The only bi-harmonic submanifolds of Euclidean spaces are the minimal ones. In this paper, we prove that the bi-harmonic conjecture is true for biharmonic hypersurfaces with three distinct principal curvatures of a Euclidean space of arbitrary dimension.

USBAS-7.07

Paper Title: Biharmonic Hypersurfaces in E^5 with Zero Scalar Curvature

Author(s): Deepika and Gupta, R.S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Afr. Diaspora J. Math., Vol.18(1), (2015), pp12-26

ISSN No.: 1539-854X

Abstract: We prove non-existence of proper biharmonic hypersurfaces of zero scalar curvature in Euclidean space E^5 .

USBAS-7.08

Paper Title: Null 2-type hypersurfaces in Euclidean 6-space

Author(s): Gupta, R. S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Boll. Unione Mat. Ital., Vol.9(3), (2016), pp363-373

ISSN No.: 1972-6724

Abstract: In this paper, we study null 2-type hypersurfaces in the Euclidean space E^6 whose second fundamental form has constant norm. We prove that every such null 2-type hypersurface in E^6 with at most four distinct principal curvatures must be of constant mean curvature. Moreover, it has constant scalar curvature.

USBAS-7.09

Paper Title: Biharmonic Hypersurfaces in E^6 with constant scalar curvature

Author(s): Gupta, R. S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International J. Geom., Vol.5(2), (2016), pp39-50.

ISSN No.: 2247-9880

Abstract: In this paper, we study biharmonic hypersurfaces in E^6 with constant scalar curvature. We prove that every such biharmonic hypersurface in Euclidean space E^6 with at most four distinct principal curvatures must be minimal.

USBAS-7.10

Paper Title: Biharmonic hypersurfaces in Euclidean space E^5

Author(s): Gupta, R.S.¹ and Sharfuddin, A.²

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Mathematics, Faculty of Natural Sciences, Jamia Millia Islamia (Central University), New Delhi 110025

Source: J. Geom., Vol.107, (2016), pp 685-705

ISSN No.: 0047-2468

Abstract: In this paper, we study biharmonic hypersurfaces in E^5 . We prove that every biharmonic hypersurface in Euclidean space E^5 must be minimal.

USBAS-7.11

Paper Title: Lorentz Hyper surfaces satisfying ΔH^\rightarrow eigen values $= \alpha H$ with complex

Author(s): Deepika and Gupta, R.S

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Novi Sad J. Math., Vol. 46(1),(2016),pp 171-180

ISSN No.: 1450-5444

Abstract: In this paper, we study Lorentz hypersurface M^n in E^{n+1} satisfying $\Delta H^\rightarrow = \alpha H^\rightarrow$ with minimal polynomial $[(y-\lambda)^2 + \mu^2](y-\lambda_1)(y-\lambda_n)$ having shape operator. We prove that every such Lorentz hypersurface in E^{n+1} having at most four distinct principal curvatures has a constant mean curvature.

USBAS-7.12

Paper Title: Biharmonic Hypersurfaces with Constant Scalar Curvature in E^5

Author(s): Deepika, Gupta, R.S.¹ and Sharfuddin, A.²

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Mathematics, Faculty of Natural Sciences, Jamia Millia Islamia (Central University), New Delhi 110025

Source: Kyungpook Math. J., Vol.56,(2016), pp 273-293

ISSN No.: 1225-6951

Abstract: In this paper, we obtain that every biharmonic non-degenerate hypersurfaces in semi-Euclidean space E^5 with constant scalar curvature of diagonal shape operator has zero mean curvature.

USBAS-7.13

Paper Title: Biharmonic Hypersurfaces in E^5

Author(s): Gupta, R. S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: An. St. Univ. Al. I. Cuza, Romania, Tomul LXII, f. 2, Vol. 2(2016), pp585-593.

ISSN No. : 1221-8421

Abstract: In this paper, we prove that every biharmonic non-degenerate hypersurface with three distinct principal curvatures in 5-dimensional semi-Euclidean space with diagonal shape operator must be minimal.

USBAS-8.01

PaperTitle: An overview of commonly used semiconductor nanoparticles in photocatalysis
Author(s): Gupta, S. M. and Tripathi, M.
Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: ХИМИЯ ВЫСОКИХ ЭНЕРГИЙ (High Energy Chemistry), Vol. 46(1), 1-9 (2012)
ISSN No.: 0018-1439
Abstract: The depletion of non-renewable resources and rise in global warming has caused great concern to humankind. With a view to use renewable source of energy and to eliminate hazardous chemical compounds from air, soil, and water, photocatalysis utilizing solar energy is becoming a rapidly expanding technology. Semiconductor nanoparticles have the ability to undergo photoinduced electron transfer to an adsorbed particle governed by the band energy positions of the semiconductor and the redox potential of the adsorbate. A brief overview of metal oxides and sulphides that can act as sensitizers for light induced redox processes due to their electronic structure is presented here.

USBAS-8.02

Paper Title: A review on the synthesis of TiO₂ nanoparticles by solution route
Author(s): Gupta, S. M. and Tripathi, M.
Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: Central European Journal of Chemistry, Vol. 10(2), 279-294 (2012)
ISSN No.: 1895-1066
Abstract: TiO₂ can be prepared in the form of powder, crystals, or thin films. Liquid-phase processing is one of the most convenient and utilized methods of synthesis. It has the advantage of allowing control over the stoichiometry, production of homogeneous materials, formation of complex shapes, and preparation of composite materials. However, there may be some disadvantages such as expensive precursors, long processing times, and the presence of carbon as an impurity. In comparison, the physical production techniques, although environment friendly, are limited by the size of the produced samples which is not sufficient for a large-scale production. The most commonly used solution routes in the synthesis of TiO₂ are reviewed.

USBAS-8.03

Paper Title: Synthesis and Photophysics of LeadsulphideNanocrystallites
Author(s): Gupta, S. M.
Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: ХИМИЯ ВЫСОКИХ ЭНЕРГИЙ (High Energy Chemistry), Vol. 47(3), pp 130-134 (2013)
ISSN No.: 0018-1439
Abstract: Nanoparticles of lead sulphide have been stabilized in the presence of excess Pb²⁺ in aqueous basic medium by a simple chemical route of synthesis. These PbS nanoparticles were synthesized very conveniently at room temperature using

hexametaphosphate as stabilizer. These nanoparticles have an absorption extending into the NIR region. A significant quantum confinement effect made the bandgap of lead sulphide nanoparticles produce a blue shift from 0.41 eV to about 1.5 eV. The size and morphology of the particles were studied by TEM. Particles were relatively small sized (about 6 nm) having narrow size distribution. XRD data analysis indicate that the product is a mixture of PbS, PbO and Pb(OH)₂. Both XRD pattern and HRTEM images confirm the crystalline structure of lead sulphide crystals. IR spectroscopy indicates the formation of PbS. PbS nanoparticles were fairly stable and could be stored for about three weeks at room temperature and for about two months at 5°C without agglomeration. These particles were photoactive and sensitized the reaction of aniline by light leading to the formation of azobenzene.

USBAS-8.04

PaperTitle: Preparation and evaluation of stable nanofluids for heat transfer application: A review

Author(s): Babita, , Sharma, S.K. and **Gupta, S. M.**

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Experimental Thermal and Fluid Science, Vol. 79, (2016), pp 202–212

ISSN No.: 0894-1777

Abstract: High heat load is becoming a barrier in industrial development. This high heat load can be overcome by increasing the rate of heat transfer. Heat transfer rate can be increased by increasing temperature gradient, area of heat transfer or by improving thermo physical properties of heat transfer fluids. Emergence of modern technology provides a great opportunity to process and produce particles in the size range of 1–100 nm called nanoparticles having high specific surface area. Colloidal suspension of nanoparticles into the conventional fluid called nanofluid has higher thermal conductivity compared to conventional fluids. Long term stability of nanofluid is one of the basic requirements for its better utilization in heat transfer applications. Preparation of a long term stable nanofluid is one of the main technical challenge. The main focus of this study is to review the work carried out by various researchers in the last two decades and to summarize the preparation and analytical techniques used for preparation of stable nanofluids. The paper also discusses some new challenging issues that need to be solved for better industrial application of nanofluids.

USBAS-8.05

Paper Title: Preparation and evaluation of stable nanofluids for heat transfer application: A review

Author(s): Babita, Sharma, S.K. and **Gupta, S.M.**

Affiliation(s): University School of Chemical Technology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi- 110078; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Experimental Thermal and Fluid Science, Vol. 79, (2016), pp 202–212

ISSN No.: 0894-1777

Abstract: High heat load is becoming a barrier in industrial development. This high heat load can be overcome by increasing the rate of heat transfer. Heat transfer rate can be increased by increasing temperature gradient, area of heat transfer or by improving thermo physical properties of heat transfer fluids. Emergence of modern technology

provides a great opportunity to process and produce particles in the size range of 1–100 nm called nanoparticles having high specific surface area. Colloidal suspension of nanoparticles into the conventional fluid called nanofluid has higher thermal conductivity compared to conventional fluids. Long term stability of nanofluid is one of the basic requirements for its better utilization in heat transfer applications. Preparation of a long term stable nanofluid is one of the main technical challenge. The main focus of this study is to review the work carried out by various researchers in the last two decades and to summarize the preparation and analytical techniques used for preparation of stable nanofluids. The paper also discusses some new challenging issues that need to be solved for better industrial application of nanofluids.

USBAS-9.01

Paper Title: Synthesis and characterization of thiolated pectin stabilized gold coated magnetic nanoparticles.

Author(s): Arora V.¹, Sood, A.¹, Shah, J.², Kotnala, R.K.² and Jain T.K.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²National Physical Laboratory, Dr K.S. Krishnan Road, New Delhi 110012

Source: Mater. Chem. Phys., Vol. 173, (2016), pp 161–167

ISSN No.: 0254-0584

Abstract: Core-shell nanoparticles, magnetic core and gold shell, were synthesized by reduction of gold chloride on the surface of magnetic nanoparticles; using tyrosine as a reducing agent. The formation of gold shell on magnetic nanoparticles was confirmed by X-ray diffraction (XRD) and UV-Visible spectroscopy. The core-shell nanoparticles (CSn) were conjugated with thiolated pectin to form a stable aqueous dispersion. The hydrodynamic size of thiolated pectin stabilized core-shell nanoparticles (TP-CSn) measured by Dynamic light scattering (DLS) was 160.5 nm with a poly dispersity index (PDI) of 0.302, whereas the mean particle size of TP-CSn calculated by high resolution transmission electron microscopy (HRTEM) was 10.8 ±2.7 nm. The value of zeta potential for TP-CSn was - 13.6 mV. There was a decrease in the value of saturation magnetization upon formation of the gold shell on magnetic nanoparticles. The amount of thiolated pectin bound to the surface of core-shell nanoparticles, calculated using Thermogravimetric analysis (TGA), was 6% of sample weight.

USBAS-9.02

Paper Title: Ascorbic acid-mediated synthesis and characterisation of iron oxide/gold core-shell nanoparticles.

Author(s): Arora V.¹, Sood, A.¹, Shah, J.², Kotnala, R.K.² and Jain T.K.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²National Physical Laboratory, Dr K.S. Krishnan Road, New Delhi 110012

Source: J. Exp. Nanosci., Vol. 11, (2016), pp 370–382

ISSN No.: 17458080

Abstract: The current article reports on providing surface modification of magnetic nanoparticles with gold to provide stability against aggregation. Gold-coated magnetite nanoparticles were synthesised to combine both magnetic as well as surface plasma resonance (SPR) properties in a single moiety. The nanocomposites were produced by reduction (using ascorbic acid) of gold chloride

on to the surface of iron oxide nanoparticles. Ascorbic acid not only acts as a reducing agent, but also the oxidised form of ascorbic acid i.e. Dehydro-ascorbic acid acts as a capping agent to impart stability to as synthesised gold-coated iron oxide nanocomposites. The synthesised nanocomposite was monodispersed with a mean particle size of around 16 nm and polydispersity index of 0.190. X-ray diffraction analysis confirms presence of gold on the surface of magnetite nanoparticles. The synthesised nanocomposites had a total organic content of around 3.2% w/w and also showed a shifted SPR peak at 546 nm as compared to gold nanoparticles (528 nm). Both uncoated and gold-coated magnetite exhibited superparamagnetic behaviour at room temperature. Upon coating with gold shell, saturation magnetisation of iron oxide nanoparticles decreases from 42.806 to 3.54 emu/gram.

USBAS-10.01

Paper Title: A Heterogeneous Catalyst for Transesterification of Argemone mexicana Oil

Author(s): Sharma, M¹; Khan, A. A², Dohhen, K. C.¹; Christopher, J¹; Puri, S. K.¹, Tuli, D. K.¹; Sarin, R¹

Affiliation(s): ¹Indian Oil Corporation Ltd., Research and Development Centre, Faridabad; ²University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Journal of the American Oil Chemists' Society, Vol. 89, (2012), pp 1545-1555

ISSN No.: 15589381

Abstract: A novel CaO based catalyst, CaO-Ca₁₂Al₁₄O₃₃ binary complex has been synthesized for the prodn. of biodiesel from vegetable oils. The catalyst has been prepd. on the basis of integration of CaO, as solid reactant, with a composite metal oxide, Ca₁₂Al₁₄O₃₃. A non-traditional oilseed, Argemone mexicana was examd. in detail as a reliable and economical bioresource for biodiesel prodn. The oil was extd. from the seeds and was transesterified with methanol, using a CaO-Ca₁₂Al₁₄O₃₃ catalyst vis-a-vis with a conventional homogeneous sodium methoxide catalyst.

USBAS-10.02

Abstract: Wood ash as a potential heterogeneous catalyst for biodiesel synthesis

Author(s): Sharma, M¹; Khan, A. A², Puri, S. K¹, Tuli and D. K¹.

Affiliation(s): ¹Indian Oil Corporation Ltd., Research & Development Centre, Faridabad; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Biomass and Bioenergy, Vol. 41, (2012), pp 94-106

ISSN No.: 0961-9534

Abstract: Wood ash is a highly alk. material comprises of inorg. constituents. A limited information on use of wood ash as catalyst is available in literature. The present study was undertaken to investigate the catalytic activity of wood ash for transesterification of Jatropha oil. The thermal treatment (calcination) of wood ash was carried out at temp. in the range of 500-1200 °C to produce calcined wood ash catalysts (CWC). The wood ash was also chem. activated with K₂CO₃ and CaCO₃ by double carbonate solid state reaction to yield activated wood ash catalysts (AWC).

USBAS-10.03

Paper Title: Synthesis of 3-(4-methyl-phenyl)-2-phenyl-3,4-dihydro-2H-benzo[e][1,3,2]oxazaphosphinine and its chalcogenides

Author(s): Rani, M., Shukla, D.K. and Khan, A. A.

Affiliation(s): University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Asian Journal of Chemistry, Vol.25, (2013), pp 3449-3451

ISSN No.: 1042-6507

Abstract: A simple method for the synthesis of 3-(4-methyl-phenyl)-2-phenyl-3,4-dihydro-2H-benzo[e][1,3,2]oxazaphosphinine(2) is described. P-Chalcogenides of (2) can be prepd. by reacting with S, Se powder in toluene at 110°C. Whereas the tungsten pentacarbonyl complex can be prepd. by reacting (2) with W(CO)₅CH₃CN in THF at 20-25°C.

USBAS-10.04

Paper Title: An Efficient Route for the Synthesis of 3-(4-Bromophenyl)-2-Phenyl-3,4-Dihydro-2H-Benzo[e][1,3,2]Oxazaphosphinine, its P-Chalcogenides and Metal Complexes

Author(s): Shukla, D. K.; Rani, M. and Khan, A. A.

Affiliation(s): University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Phosphorus, Sulfur and Silicon and the Related Elements, Vol. 188, (2013), pp 1088-1094

ISSN No.: 1042-6507

Abstract: 2-[(4-Bromophenylamino)-methyl]-phenol gave substantially pure 3-(4-bromophenyl)-2-phenyl-3,4-dihydro-2H-benzo[e][1,3,2]-oxazaphosphinine (2) on cyclization with phenyldichlorophosphine in toluene at 0 °C. Reaction of 2 with H₂O₂ in dichloromethane gave selectively the oxide. P-chalcogenide derivs. and were prepd. by reacting with elemental S and Se powder in toluene, whereas a tungsten pentacarbonyl complex was prepd. by reacting with [W(CO)₅(CH₃CN)] in THF at 25 °C.

USBAS-10.05

Paper Title: Synthesis and biological activity of some 3-aryl-3,4-dihydro-2H-benz[e]1,3-oxazines/6-bromo-3-aryl-3,4-dihydro-2H-benz[e]-1,3-oxazines

Author(s): Shukla, D.K.¹, Rani, M.¹; Khan, A.A.¹; Tiwari, K.² and Gupta, R. K.²

Affiliation(s): ¹University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078; ²University School of Biotechnology, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Asian Journal of Chemistry, Vol. 25, (2013), pp 5921-5924

ISSN No.: 9707077

Abstract: N-(2-Hydroxy)-benzyl-arylamine gives substantially pure 3-aryl-3,4-dihydro-2H-benz[e]-1,3-oxazines/6-bromo-3-aryl-3,4-dihydro-2H-benz[e]-1,3-oxazines on cyclization with formaldehyde in methanol within 0.5-1.0 h at 65-68° in excellent yields. The compds. thus prepd. were screened for their antimicrobial studies against Gram-pos. bacteria (Staphylococcus aureus, MTCC 96) and Gram-neg. bacteria (E. coli, MTCC 739). For estg. antifungal activity the organism used is Candida albicans. Min. inhibitory concn. of all the compds. was detd. using the micro-broth diln. method.

USBAS-10.06

Paper Title: One pot synthesis of 3,9-bis-(2,4-di-tert-butyl phenoxy)-2,4,8,10-tetraoxa-3,9-diphospha-spiro[5.5]undecane, their chalcogenides and metal complexes

Author(s): Manju, R.¹; Shukla, D. K and Khan, A. A.

Affiliation(s): ¹University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Asian Journal of Chemistry, Vol. 25, (2013), pp 4556-4558

ISSN No.: 9707077

Abstract: A simple method for the synthesis of 3,9-di[2,4-di-tert-Bu phenoxy]-2,4,8,10-tetraoxa-3,9-diphospha-spiro[5.5]undecane and its chalcogenides and metal complex (I) are reported.

USBAS-10.07

Paper Title: A quick route for the synthesis of 3-aryl-3,4-dihydro-2H-benz[e]-1,3-oxazin-2-ones

Author(s): Shukla, D.K; Manju, R. and Khan, A.A

Affiliation(s): University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Asian Journal of Chemistry, Vol.25, (2013), pp4537-4540

ISSN No.: 9707077

Abstract: N-(5-H/bromo-2-hydroxybenzyl)-arylamines gave substantially pure 3-aryl-3,4-dihydro-2H-benz[e]-1,3-oxazin-2-ones on cyclization with carbonyldiimidazole in DMSO in 20-30 min at 20-25 °C in excellent yields.

USBAS-10.08

Paper Title: Synthesis of chalcogenides and metal complex of 2-phenyl-benzo[1,3,2]dioxophosphinin-4-one

Author(s): Rani, M., Shukla, D.K. and Khan, A.A

Affiliation(s): University School of Basic & Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110 078

Source: Asian Journal of Chemistry, (2014), Vol. 26, pp 1998-2000

ISSN No.: 9707077

Abstract: The chalcogenides and the metal complexes of 2-phenyl-benzo[1,3,2]dioxophosphinin-4-one are prepd. by single step reaction of 2-phenyl-benzo[1,3,2]dioxophosphinin-4-one (1) with DMSO, elemental S, Se and W(CO)₅CH₃CN.

USBAS-11.01

Paper Title: Biginelli Reaction: A Green Perspective

Author(s): Panda, S.S.¹, Khanna, P.² and Khanna, L.³

Affiliation(s): ¹Department of Chemistry, University of Florida, Gainesville, Florida 32611, USA.²Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, Dwarka, New Delhi-110019; ³Guru Gobind Singh Indraprastha University, New Delhi-110078

Source: Curr. Org. Chem., Vol. 16, (2012), pp 507-520

ISSN No.: 1385-2728

Abstract: The Biginelli Reaction is a one-pot acid catalysed cyclocondensation of α -keto ester, urea and aromatic aldehyde which leads to the synthesis of functionalised 3,4-

dihydro-2(*H*)-pyrimidinones (DHPMs). This three-component reaction for the synthesis of dihydropyrimidinone and corresponding dihydropyrimidinethiones has now been known for more than a century since first reported in 1893. Owing to the increasing use of Green technology approach, due to its various merits over Classical methodology and as a need for sustainable Chemistry, this reaction has received renewed interest for preparing DHPMs in an environmentally thoughtful manner with improved yields. The classical reaction has been modified in the recent past by using various catalysts and several structural variants in different solvents to synthesize large number of Biginelli type compounds. Also, these DHPMs (synthetic and natural) possess a wide range of pharmacological activities. We hereby wish to compile, in this present review, the literature available methods related to large number of Biginelli type compounds synthesized using eco-friendly technologies. This protocol couples the benefits of Biginelli reaction with that of greener approach for organic transformations, thus facilitating efficient synthesis of bioactive compounds in environmentally benign way.

USBAS-11.02

Paper Title: Synthetic routes to symmetric bisbenzimidazoles: a review

Author(s): Panda, S.S.¹, Khanna, P.² and Khanna, L.³

Affiliation(s): ³University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Acharya Narendra Dev College, University of Delhi, Govindpuri, Kalkaji, Dwarka, New Delhi-110019; ¹Department of Chemistry, University of Florida, Gainesville, Florida 32611, USA

Source: Mini-Reviews in Organic Chemistry, Vol. 9,(2012), pp 381-396

ISSN No.: 1570-193

Abstract: Bisbenzimidazoles, have shown various biological activities *viz.* antineoplastic, anti-tumor, anti-fungal, anti-inflammatory, hypoglycemia treatment and physiological disorders, besides other pharmacological effects. Structural modifications of the benzimidazole nucleus are being carried out in several ways in order to anticipate enhanced biological activities. The synthesis of bis-benzimidazoles is one such attempt, where the two benzimidazole nuclei are united together using a variety of linkers and points of linkages. These structural permutations and combinations have given a large number of available bisbenzimidazole compounds for pharmacological and biological research. A number of reviews have been published over the past decade on the compilation of the biological activities of bisbenzimidazoles. However, we could not locate any report covering the general strategies followed for the synthesis of these compounds. The present review provides an in depth view of synthetic routes for preparation of symmetric bisbenzimidazoles.

USABAS-11.03

Paper Title: Synthesis of Various S-S Linked Symmetric Bisazaheterocycles: A Review

Author(s): Khanna, L.¹, Khanna, P.², Panda, C.S.³ and Panda, S.S.³

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Source: Mini-Reviews in Organic Chemistry, Vol. 10, (2013), pp268-280

Abstract: There has been an increasing interest in discovering and developing small molecules that are of pharmaceutical importance. Heterocyclic compounds are known to be the most versatile class of these types of molecules, either prepared synthetically or

occurring in nature. However, in some cases, it has been reported that the activity is enhanced to a larger extent when these heterocycles are repeated in the molecule separated by a suitable spacer, i.e., a bis-heterocycle. Thus, the synthesis of new bis heterocyclic compounds has become an eye-catching field to explore in the recent past owing to their pharmacological, biological and industrial importance. The synthesis of bis-heterocycles is mainly achieved by joining heterocyclic nuclei together using a variety of linkers and points of linkages. These structural permutations and combinations have given an unlimited number of available bis-heterocycles. Use of S-S linkage is one such facile method of getting bis-heterocycles as they are easily obtained from the oxidation of thiols and protected thiols by using broad range of reagents and reaction conditions. Disulphide linkage being an integral part of the biological system, as disulphide bonds are found in peptides and proteins, also adds to the efficacy of these bis-heterocycles.

USBAS-11.04

Paper Title: Aqua Mediated Synthesis of Spirocyclic Compounds

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Source: Mini-Reviews in Organic Chemistry, Vol. 11, (2014), pp 73-86

Abstract: Spirocyclic scaffolds are embedded in many biologically active natural and synthetic compounds. Efforts have been made time to time to develop new and better methodologies for the preparation of spirocyclic compounds. Noteworthy advantages were observed during the course of our study on “in water” synthesis of spirocyclic compounds. The established advantages of using water as a solvent in reactions are: water is the most abundant and available resource on the planet and that many biochemical processes occur in aqueous medium. This review is focused on the use of water in the synthesis of spirocyclic compounds.

USBAS-12.01

Paper Title: Effect of Euphorbia Coagulum on Flexural Property of Polyester Banana Fiber Composite.

Author(s): Rai, B.¹, Kumar G.² and Diwan R.K.³

Affiliation(s): ¹Shriram Institute for Industrial Research, 19 University Road, Delhi; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Sources: Advanced Materials Research, Vol. 664, (2013), pp 764-767

ISSN No.: 1662-8985

Abstract: Presently composites made up of either both the binder and the reinforcing fibers are synthetic or either one of the material is natural or synthetic. In the present study coagulum (dried latex) of Euphorbia royleana has been used for replacing polyester resin as a natural binder in polyester banana fiber composite. The influence of different volume fraction of the coagulum in the composite is studied. It is observed that with the increase in the coagulum fraction, the flexural property of the polyester banana fiber composite increases. The flexural strength increase by 25% and flexural modulus by 15% at 40% of coagulum weight fraction. This study presents the

possibility of preparation of composites using coagulum of *Euphorbia* latex. The developed composite may be used in partition walls, roof tiles, interior linings of automobiles, etc. as wood substitute.

USBAS-12.02

Paper Title: Collection and Characterization of Latex from *Euphorbia Royleana*.

Author(s): Rai, B.¹, Kumar G.² and Diwan R.K.³

Affiliation(s): ¹Shriram Institute for Industrial Research, 19 University Road, Delhi ;²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Int. J. Appl. Res. Eng. Sci., Vol. 3(4), (2014), pp 16-24

ISSN No.: 2348-2443

Abstract: The plants from Euphorbiaceae family have received worldwide attention as research subject for several years due to the use of their latex in medical application. However, some of the plants of Euphorbiaceae family have been employed for different applications including bio energy source. In the present study, latex has been collected from *Euphorbia royleana* plant of Euphorbiaceae family to study the rate of flow and the collected latex was characterized to explore its use as polymer substitute. To collect the latex a cut has been made on the stems without destroying the plant and it has been observed that rate of flow of latex at initial stage is fast and decreases with time. It was also observed that more quantity of latex was collected from branches than that of main stem after having equal area of cut. The latex was characterized for solid content whereas coagulated latex was characterized for acid value and iodine value. The result shows that its solid content is 32% and the acid value and iodine value of the coagulum is 150 and 60 respectively which shows that it can be an alternative source for natural rubber.

USBAS-12.03

Paper Title: Development and Characterization of Green Composite from *Euphorbia* Coagulum and Banana Fiber.

Author(s): Rai, B.¹, Kumar, G.², Tyagi, V.K.¹, Diwan, R.K.³ and Niyogi, U.K.¹

Affiliation(s): ¹Shriram Institute for Industrial Research, 19 University Road, Delhi; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Amity University, Sector – 125, Noida (U. P.)

Source: Journal of Polymer Materials, Vol. 32(3), (2015), pp 305-316

ISSN No.: 0973-8622

Abstract: In the present study *Euphorbia* coagulum - Banana fiber composites were prepared with varying weight % of untreated and alkali treated banana fibers. The mechanical properties, morphology and bio-degradability of the developed composites were studied. Results show that the water absorption of the composite increased with increasing fiber content and was less for the composites prepared with the treated fiber. The void content of the composite decreases from the fiber content 40% to 50% but increased at 55% fiber loading. The mechanical properties of the composites enhanced with the increase in the fiber content from 40% to 50% but deteriorated at 55% fiber loading. Improvement in the mechanical properties of the composites was observed when alkali treated banana fiber was used. Morphology of the surface of the composites with different fiber ratio shows poor dispersion of fibers at 55% fiber loading and morphology of the longitudinal section of the composite prepared with untreated and treated fiber shows improvement in the dispersion of fiber in the *Euphorbia* coagulum matrix when alkali treated banana

fiber used at fiber content 50%. The biodegradability study shows that it possesses high degree of biodegradation properties. Thus Euphorbia latex can be used for the development of bio-degradable composites from nonwood renewable resources which can be used as eco-friendly wood substitute.

USBAS-12.04

Paper Title: Morphological and Biodegradability Studies of Euphorbia Latex Modified Polyester – Banana Fiber Composites.

Author(s): Rai, B.¹, Kumar, G² and Diwan, R.K.³

Affiliation(s): ¹Shriram Institute for Industrial Research, 19 University Road, Delhi; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³Amity University, Sector – 125, Noida (U. P.)

Source: AIP Conference Proceeding,(2016)

ISSN No: 0094-243X

Abstract: The composites of Banana fiber were prepared using polyester resin blended Euphorbia coagulum, morphology and the degree of rate of aerobic biodegradation of the prepared composites were studied. Polyester resin blended Euphorbia coagulum containing Banana fiber, Euphorbia coagulum and polyester resin taken in the ratio 40: 24: 36 was used for the study, which was the optimum composition of the composite reported in a previous study by the authors. In the biodegradability study cellulose has been used as positive reference material. Result shows that Euphorbia coagulum modified polyester – Banana fiber composites exhibited biodegradation to the extent of around 40%. The use of developed green composites may help in reducing the generation of non-biodegradable polymeric wastes.

USBAS-13.01

Paper Title: Physical and chemical response of polypropylene irradiated with 70 MeV carbon and 150 MeV nickel-ions

Author(s): Dhillon, R.K.¹, Singh, S.¹ and Kumar, R.^{2,3}

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Source: Radiation Measurements, Vol. 47, (2012), pp 1018-1022

ISSN No.: 1350-4487

Abstract: Polypropylene films were irradiated with C⁵⁺ (70 MeV) and Ni¹¹⁺ (150 MeV) ions of varying fluence. The ion induced optical, chemical and structural changes were investigated using UV-Vis and Fourier Transform Infrared (FTIR) spectroscopy and X-ray diffractometry (XRD). UV-Vis data showed an increase of optical absorbance and a shift of the absorption edge towards the red end of the spectrum when the ion fluence was increased. This shift may be attributed to the greater degree of conjugation. FTIR analysis revealed the formation of alcoholic and ketonic groups. Significant loss of crystallinity occurred with increasing ion fluence.

USBAS-13.02

Paper Title: Free volume evolution in 50 MeV Li³⁺ ion-irradiated polymers studied by positron annihilation lifetime spectroscopy

Author(s): Singh, P.¹, Kumar, R.¹ and Prasad, R.²

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ² Vivekananda College of Technology & Management, Aligarh-202002

Source: Radiation Effects & Defects in Solids, Vol. 168, (2013), pp 97–105

ISSN No.: 1029-4953

Abstract: This article is aimed at studying the effect of ion irradiation on free volume of polyethersulphone (PES) and polyamide nylon-6 (PN-6) polymers by positron annihilation lifetime spectroscopy (PALS). Free volume properties of polymeric materials change with swift heavy ion irradiation. Free volume is found to have a strong correlation with the macroscopic properties of the polymer. PALS has recently emerged as a unique non-destructive and non-interfering nano-probe, capable of measuring the free volume hole size in polymers with high detection efficiency. PES and PN-6 polymer films of thickness of 250µm were irradiated with Li³⁺ ions of energy 50 MeV from the 15 UD Pelletron accelerator at the Inter University Accelerator Centre, New Delhi, India. PES films were irradiated to the fluences of 10¹¹, 10¹², 10¹³ and 10¹⁴ ions/cm², whereas PN-6 films were irradiated to the fluences of 10¹¹, 10¹² and 10¹³ ions/cm². The average free volume and fractional free volume obtained from the long-lived component, attributed to ortho-positronium lifetime, are found to vary with the variation of fluence in both the cases.

USBAS-13.03

Paper Title: Study of structural and free volume properties of swift heavy ion irradiated Polyallyldiglycol carbonate polymer films

Author(s): Singh, P. and Kumar, R.

Affiliation: University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Vacuum, Vol. 96, (2013), pp 46-51

Abstract: Structural and free volume properties of polyallyldiglycol carbonate (PADC) commercially known as CR-39 polymer films of thickness 250 mm were irradiated with 50 MeV Li³⁺ ions at the fluences ranging from 1× 10¹¹ to 1× 10¹⁴ ions/cm². The structural studies were investigated by X-ray diffraction measurement. The crystallite size as well as percentage crystallinity was calculated from the X-ray diffraction data. The change in the crystallite size, peak broadening and variation in the intensity of X-ray peak shows significant increase in amorphous phases of the polymer samples at higher fluences. Free volume properties were studied by Positron Annihilation Lifetime Spectroscopy (PALS). Hole radius (R), free volume (V_f) and fractional free volume (Fv) were calculated by using the Tao-Eldrup Model. There is a gradual decrease in the hole radius and free volume up to the fluence of 1 10¹² ions/cm². It could be attributed to the cross linking of polymer chains whereas subsequent irradiation resulted in an additional defect generation that aided to the free volume growth by their condensation on to the existing free volume defects. The free volume increases at higher fluences whereas degree of crystallinity shows opposite behavior at higher fluences.

USBAS-13.04

Paper Title: Study of high energy (MeV) N^{6+} ion and gamma radiation induced modifications in low density polyethylene (LDPE) polymer

Author(s): Dhillon, R.K.¹, Singh, P.², Gupta, S. K.^{2,3}, Singh, S.² and Kumar, R.¹

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Source: Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Vol. 301, (2013), pp 12-16.

ISSN No.: 0168-583X

Abstract: The optical and structural response of low density polyethylene (LDPE) under the influence of 80 MeV N^{6+} ion at various fluences (5×10^{11} to 1×10^{13} ions/cm²) and gamma rays at doses 100 and 1000 kGy were studied using UV-Vis spectroscopy and X-ray diffraction (XRD). The optical absorption spectra of N^{6+} ion irradiated LDPE showed a shift in the absorption edge towards higher wavelength side, which indicated a significant decrease in the direct and indirect band gaps of the films. The optical data showed decrease in the calculated band gap with increasing gamma dose. The diffraction pattern of pristine sample showed the semi crystalline nature of the polymer. The decrease in peak intensity and hence increase in amorphous nature was observed in N^{6+} ion irradiated samples. The opposite behavior is seen in case of gamma ray exposed samples at 100 kGy dose. The crystallite size (L) decreased but the other factors like interchain separation (R), interplanar distance (d), micro strain (ϵ), dislocation density (δ) and distortion parameters (g) increased for N^{6+} ion irradiated samples.

USBAS-13.05

Paper Title: Preparation and characterization of Ag_2Se nanowalled tubules by electrochemical method

Author(s): Rani, M.¹, Kumar, R.¹, Kumar, R.², Singh, R.³ and Chakarvarti, S. K.⁴

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Source: Chalcogenide Letters, Vol. 10, (2013), pp 99 - 104

Abstract: In this paper, we report the preparation of nanowalled hollow tubules of Ag_2Se in to the pores of track-etch membrane (TEMs). Using the electrolyte solution (0.01 M $AgNO_3$ and 0.3 M SeO_2 + 0.03 M H_2SO_4 + 50% DMSO), a current density 0.06 A cm⁻² was applied for 20 minutes. The tubules were characterized by scanning electron microscopy (SEM), X-ray diffraction (XRD) and energy dispersive X-ray (EDX) techniques. The SEM photographs show the high aspect ratio of the tubules and EDX analysis shows good stoichiometric composition of the Ag_2Se product.

USBAS-13.06

Paper Title: Swift heavy ion induced modification in morphological and physico-chemical properties of tin oxide nanocomposites

Author(s): Jaiswal, M. K.¹, Kanjilal, D.² and Kumar, R.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi 110067

Source: Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Vol. 315, (2013), pp 179-183

ISSN No.: 0168-583X

Abstract: Nanocomposite thin films of tin oxide (SnO₂)/titanium oxide (TiO₂) were grown on silicon (1 0 0) substrates by electron beam evaporation deposition technique using sintered nanocomposite pellet of SnO₂/TiO₂ in the percentage ratio of 95:5. Sintering of the nanocomposite pellet was done at 1300 °C for 24 h. The thicknesses of these films were measured to be 100 nm during deposition using piezo-sensor attached to the deposition chamber. TiO₂ doped SnO₂ nanocomposite films were irradiated by 100 MeV Au⁸⁺ ion beam at fluence range varying from 1×10^{11} ions/cm² to 5×10^{13} ions/cm² at Inter University Accelerator Center (IUAC), New Delhi, India. Chemical properties of pristine and ion irradiation modified thin films were characterized by Fourier Transform Infrared (FTIR) spectroscopy. FTIR peak at 610 cm⁻¹ confirms the presence of O–Sn–O bridge of tin (IV) oxide signifying the composite nature of pristine and irradiated thin films. Atomic Force Microscope (AFM) in tapping mode was used to study the surface morphology and grain growth due to swift heavy ion irradiation at different fluencies. Grain size calculations obtained from sectional analysis of AFM images were compared with results obtained from Glancing Angle X-ray Diffraction (GAXRD) measurements using Scherrer's formulae. Phase transformation due to irradiation was observed from Glancing Angle X-ray Diffraction (GAXRD) results. The prominent 2θ peaks observed in GAXRD spectrum are at 30.67°, 32.08°, 43.91°, 44.91° and 52.35° in the irradiated films.

USBAS-13.07

Paper Title: Structural and optical studies of 100 MeV Au irradiated thin films of tin oxide

Author(s): Jaiswal, M.K.¹, Kanjilal, D.² and Kumar, R.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi 110067

Source: Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Vol. 314, (2013), pp 170-175

ISSN No.: 0168-583X

Abstract: Thin films of tin(IV) oxide (SnO₂) of 100 nm thickness were grown on silicon (1 0 0) matrices by electron beam evaporation deposition technique under high vacuum. The thicknesses of these films were monitored by piezo-sensor attached to the deposition chamber. Nanocrystallinity is achieved in these thin films by 100 MeV Au⁸⁺ using 1 pA current at normal incidence with ion fluences varying from 1×10^{11} ions/cm² to 5×10^{13} ions/cm². Swift Heavy Ion beam irradiation was carried out by using 15 UD Pelletron Accelerator at IUAC, New Delhi, India. Optical studies of pristine and ion irradiated thin films were characterized by UV–Visible spectroscopy and Fourier Transform Infrared (FTIR) spectroscopy. Prominent peak at 610 cm⁻¹ in FTIR spectrum confirmed the O–Sn–O bonding of tin(IV) oxide. For

Surface topographical studies and grain size calculations, these films were characterized by Atomic Force Microscope (AFM) using Nanoscope III-A. Crystallinity and phase transformation due to irradiation of pristine and irradiated films were characterized by Glancing Angle X-ray Diffraction (GAXRD) using Brucker-D8 advance model. GAXRD results show improvement in crystallinity and phase transformation due to swift heavy ion irradiation. Grain size distribution was verified by AFM and GAXRD results. Swift heavy ion induced modifications in thin films of SnO₂ were confirmed by the presence of prominent peaks at 2θ values of 30.65°, 32.045°, 43.94°, 44.96° and 52.36° in GAXRD spectrum.

USBAS-13.08

Paper Title: UV–visible and infrared spectroscopic studies of Li³⁺ and C⁵⁺ irradiated PADC polymer

Author(s): Kumar, R. and Singh, P.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Results in Physics, Vol. 3, (2013), pp 122-128

ISSN No.: 2211-3797

Abstract: 125 µm Thick PADC polymer samples were irradiated by 50 MeV Li³⁺ ions and 250 µm thick PADC polymer samples were irradiated by 70 MeV C⁵⁺ ions. The optical absorption edge shifted towards the visible region of the spectrum with the increase of ion fluence signifying the decrease in the band gap energy in both cases. There was larger decrease in the band gap energy value in carbon ions irradiated samples as compared to lithium ions irradiated samples. Increase in number of carbon hexagon rings per cluster was verified by modified Robertson equation. The Urbach's energy calculations showed the thermal fluctuations in the band gap energy values. The FTIR spectrum showed the reduction in absorbance (higher percentage transmittance) of typical bands at higher fluences in case of lithium ion irradiation. The carbon ion irradiation showed little modification in chemical studies.

USBAS-13.09

Paper Title: High energy (MeV) ion fluence dependent nano scale free volume defects studies of PMMA films

Author(s): Singh, P.¹, Kumar, R.¹, Cyriac, J.², Rahul, M.T.², Nambissan, P.M.G.³ and Prasad, R.⁴

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²School of Pure and Applied Physics, Mahatma Gandhi University, Kottayam, Kerala 686560; ³Applied Nuclear Physics Division, Saha Institute of Nuclear Physics, Kolkata 700064; ⁴Vivekananda College of Technology & Management, Aligarh 202002

Source: Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Vol. 320, (2014), pp 64-69

ISSN No.: 0168-583X

Abstract: A systematic study on the dependence of the free volume at nanoscale in carbon ions irradiated polymethylmethacrylate polymer samples was carried out by means of positron annihilation lifetime spectroscopy and Doppler broadening spectroscopy (DBS). An investigation about the evolution of cross-linking in the polymeric chains after ion irradiation was carried out from the calculated values of hole radius, free volume and fractional free volume using Tao-Eldrup Model. The role of rise in

temperature on the growth of free volume was observed at higher fluences. The results were supported by variations in the S parameter of DBS study. The structural analyses were carried out using XRD to investigate for the modification in the structural nature, degree of crystallinity and average crystallite size of the polymer after ion irradiation. Additional information on the modifications of optical and chemical properties was extracted by means of UV-visible and FTIR spectroscopy respectively.

USBAS-13.10

Paper Title: Study of physical and chemical modifications induced by 50 MeV Li³⁺ ion beam in polymers

Author(s): Singh, P.¹, Kumar, S.², Prasad, R.³ and Kumar, R.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Baba Saheb Bhimrao Amedkar University, Lucknow 226025; ³Vivekananda College of Technology & Management, Aligarh 202002

Source: Radiation Physics and Chemistry, Vol. 94, (2014), pp 54-57

ISSN No.: 0969-806X

Abstract: Polyether-sulphone and polyamide-nylon-6 polymers were irradiated by 50 MeV Li³⁺ ions for modifications in structural, optical and chemical properties. The decrease in peak width and increase in peak intensity of XRD spectra indicated alignment of polymeric chains in a regular pattern and hence there was decrease in the amorphous character of the irradiated polymers. The gradual increase in the optical absorption and shift towards visible region was observed in optical absorption spectra of irradiated polymers. The increase in absorption was attributed to the generation of a conjugated system of bonds which lowered the band gap of irradiated polymers to significant values. The thermal fluctuations in the band gap energy due to temperature dependent self energies of the electrons were observed from the calculated values of the Urbach's energy. The FTIR spectra obtained after irradiation exhibited decrease in absorbance for various bands in case of PN-6 whereas opposite behavior was observed in case of PES polymer.

USBAS-13.11

Paper Title: Modifications of structural, optical and chemical properties of Li³⁺ irradiated polyurethane and polyetheretherketone

Author(s): Singh, P.¹, Ali, S.A.² and Kumar, R.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Department of Applied Physics, Aligarh Muslim University, Aligarh-202002

Source: Radiation Physics and Chemistry, Vol. 96, (2014), pp 181-185

ISSN No.: 0969-806X

Abstract: Thin membranes of PU and PEEK polymers were irradiated with 50 MeV lithium ions for modifications in structural, optical and chemical properties. The XRD spectra indicated the alignment of polymeric chains in a regular pattern and hence there was decrease in the amorphous character of the irradiated polymers. The optical absorption of all irradiated samples shifted towards the visible region of the spectrum. It was attributed to the generation of a conjugated system of bonds which lowered the band gap energy of irradiated samples. The FTIR spectra obtained after irradiation exhibited decrease in absorbance for various bands in case of PU whereas PEEK showed minor changes in its chemical properties. The other results were discussed from the calculated parameters such as crystallite size, Urbach's energy

and number of carbon hexagon rings per conjugation length from the analyses of the XRD and UV–visible data.

USBAS-13.12

Paper Title: Radiation dose due to radon, thoron and their decay products in indoor environment of Khurja City, U.P., India

Author(s): Kumar, M.¹, Agrawal, A.² and Kumar, R.³

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Source: J Radioanal Nucl Chem, Vol. 300, (2014), pp 39–44

ISSN No.: 0236-5731

Abstract: Inhalation of radon, thoron and their decay products can cause a significant health hazard when present in enhanced levels in the indoor environment like a human dwelling. In the present work a set of indoor radon and thoron measurements was carried out using time-integrated passive twin cup dosimeters containing LR-115 Type II solid state nuclear track detectors in different houses of Khurja City in Bulandshahar district of U.P. in India, built of the same type of building materials. The radon gas concentration was found to vary from 9.18 to 23.19 Bq m⁻³ with an average value of 16.02 Bq m⁻³ (SD = 3.68) and the thoron gas concentration varied from 2.78 to 9.03 Bq m⁻³ with an average value of 5.36 Bq m⁻³ (SD = 1.58). The radon progeny concentration ranged from 0.99 to 2.51 mWL with an average value of 1.77 mWL (SD = 0.40) and the concentration of thoron progeny was found to vary from 0.30 to 0.98 mWL with an average value of 0.58 mWL (SD = 0.17). The annual effective dose varied from 0.27 to 0.67 mSv year⁻¹ with an average value of 0.47 mSv year⁻¹ (SD = 0.10).

USBAS-13.13

Paper Title: Influence of High-Energy Ion Irradiation on the Structural, Optical, and Chemical Properties of Polytetrafluoroethylene

Author(s): Singh, P. and Kumar, R.

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Source: Advances in Polymer Technology, Vol. 33, (2014), pp21410

ISSN No.: 0730-6679

Abstract: Polytetrafluoroethylene (PTFE) polymer samples were irradiated by 50 MeV Li³⁺ ion beams to the fluences of 1×10^{10} , 1×10^{11} , and 1×10^{12} ions/cm². The structural, optical, and chemical properties were studied by X-ray diffraction (XRD), UV–visible (UV–vis) spectroscopy, and Fourier transform infrared (FTIR) spectroscopy, respectively. The XRD analyses showed amorphization of the polymer sample at fluences of 1×10^{10} and 1×10^{11} ions/cm². Crystallite size (calculated by applying the Scherrer formula) decreased for irradiated samples at fluences of 1×10^{10} and 1×10^{11} ions/cm². The other factors like microstrain (ϵ), dislocation density (δ), and distortion parameters (g) showed variations at these fluences. However, there was no change in the interchain separation (R) and interplanar distance (d) for all irradiated samples. UV–vis showed a shift of the absorption edge of irradiated samples towards the visible region. The band gap energy (E_g) was calculated using Tauc's relation, and its value decreased with an increase of ion fluence for all irradiated samples. The number of carbon atoms per conjugation length (N) increased for the irradiated

samples. The FTIR results revealed the liberation of CF₂ groups and the appearance of some new bands after irradiation.

USBAS-13.14

Paper Title: Study of radon, thoron and their progeny levels in indoor environment of Firozabad city in U.P., India

Author(s): Kumar, M.¹, Agrawal, A.² and Kumar, R.³.

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Source: J Radioanal Nucl Chem, (2014), Vol. 302, pp 1475–1479

Abstract: Twin cup pin-hole dosimeters having LR-115 as the detector were used to measure the concentration of radon and thoron in the dwellings of Firozabad city of Uttar Pradesh State in India. The mean values of radon, thoron, radon progeny and thoron progeny concentrations were found to be 37.4 Bqm⁻³, 13.7 Bqm⁻³, 4.0 and 1.5 mWL respectively. The average value of annual effective dose equivalent to the inhabitants of Firozabad city was found to be 1.1 mSv and is below the action level as recommended by the ICRP.

USBAS-13.15

Paper Title: Dense electronic excitation induced modification in TiO₂ doped SnO₂ nanocomposite films

Author(s): Jaiswal, M.K.¹, Kumar, R.¹ and Kanjilal, D.²

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Inter University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi 110067

Source: J. Alloys compd, (2014), Vol. (10) PP 651-658

ISSN No.: 1873-4669

Abstract: Nanocomposite thin films of TiO₂ doped SnO₂ were grown on silicon and quartz matrices by electron beam evaporation deposition technique using sintered nanocomposite pellet of SnO₂/TiO₂ taken in the mass percentage ratio of 90:10. The deposition was done in high vacuum (~10⁻⁶ mbar) condition. 100 MeV Au⁸⁺ Swift Heavy Ion (SHI) beam were used at Inter University Accelerator Center, New Delhi, India for dense electronic excitation in these nanocomposite thin films. The SHI irradiation fluencies were varied from 1 × 10¹¹ ions/cm² to 5 × 10¹³ ions/cm². Surface morphology studies and grain growth due to swift heavy ion irradiation induced dense electronic excitation at different ion fluencies characterized by Atomic Force Microscopy–Magnetic Force Microscopy (AFM–MFM) technique using Nanoscope – IIIA shows magnetic nature of grains. Sectional analysis of AFM images shows dependence of grain size on irradiation fluence. Grain size varies between 15 nm and 100 nm at different irradiation ion fluencies. The variation in roughness exponent as calculated from power spectral density data and RMS roughness with respect to irradiation fluence are similar in nature. Amorphous to crystalline phase transformation occurs due to SHI irradiation. The SnO₂ dominated crystalline planes observed at irradiation fluence of 1 × 10¹³ ions/cm² and 5 × 10¹³ ions/cm² were (0 2 0), (0 2 1), (1 2 4) and (2 0 4). Literature survey suggests these planes were not achieved by thermal annealing as observed from GAXRD data. At low irradiation fluencies up to 5 × 10¹² ions/cm² the variation in optical band gap (~3.7 eV) was negligible as studied by UV–Visible Spectroscopy. Rutherford Backscattering (RBS) results supports transformation from lower crystalline to higher crystalline state due

to absence of any impurities in the samples by 100 MeV Au⁸⁺ SHI irradiation and reduction in RBS yield for Sn and O at highest fluence of 5×10^{13} ions/cm².

USBAS-13.16

Paper Title: Modifications induced by gamma irradiation upon structural, optical and chemical properties of polyamide nylon-6,6 polymer

Author(s): Gupta, S.K.^{1,2}, Singh, P.¹, and Kumar, R.¹

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Source: Radiation Effects & Defects in Solids, Vol. 169, (2014), pp 679–685

ISSN No.: 1042-0150

Abstract: The effects of gamma rays were studied on the optical, structural and chemical properties of the PA-66 polymer samples. The polymer samples obtained from Goodfellow (Cambridge, UK) were irradiated with gamma rays at various doses ranging from 100 to 1250 kGy. The pristine and gamma rays irradiated samples were characterized by UV–visible (UV–VIS) spectroscopy, X-ray diffraction (XRD) and Fourier transform infrared (FTIR) spectroscopy. UV–VIS shows a shift in absorption toward the visible region for irradiated samples and a decrease in band gap energy (E_g). The XRD analyses show an increase in the crystalline nature of the polymer at higher doses as a result of significant decrease in the peak width of XRD patterns. The FTIR spectra show decrease in intensity and shift of various bands with increase in gamma dose.

USBAS-13.17

Paper Title: 60 MeV Ni ion induced modifications in nano-CdS/polystyrene composite films

Author(s): Kumar, S.¹, Singh, P.², Sonkawade, R.G.¹, Awasthi, K.³ and Kumar, R.²

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Source : Radiation Physics and chemistry (2014), Vol. (94) PP 49-53

ISSN No.: 0969-9806X

Abstract: The cadmium sulfide (CdS) nanoparticles of size in the range 50–60 nm were synthesized by micro-emulsion method. The polystyrene/CdS (PS/CdS) nanocomposites were doped with Ni and Cu metals. The pristine and doped samples were irradiated with 60 MeV Ni ions. The effect of doping of metals and ion irradiation was studied for modifications in structural, optical and chemical properties of PS/CdS nanocomposites. The decrease in peak width of XRD spectra of irradiated PS indicated the decrease in the amorphous nature at higher fluences. The optical absorption peaks of the irradiated and doped samples shifted towards visible region. The shift in case of metal doped samples was more pronounced than those of pure polystyrene and PS/CdS matrix samples. The increase in absorption was attributed to the generation of a conjugated system of bonds. The decrease in band gap energy value in case of Ni doped PS/CdS was greater than that of Cu doped PS/CdS and the ion irradiation further decreased the band gap energy value. The vibrational absorption peak of the Cd–S bond was observed at 405 cm^{–1} in FTIR spectra of metal doped PS/CdS composites. The intensity of styrene absorption lines decreased in all irradiated samples.

USBAS-13.18

Paper Title: The influence of cross-linking and clustering upon the nanohole free volume of the SHI and γ -radiation induced polymeric material

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Source: J. Applied Surface Science, Vol. 328, (2015), pp 482-490

ISSN No.: 0169-4332

Abstract: The effects of swift heavy ions and gamma radiations upon the nano-scale free volume of the polymethylmethacrylate (PMMA) polymer were investigated using positron annihilation lifetime spectroscopy. The polymer samples were (a) irradiated by 50 MeV Li³⁺ ion beam to the fluences ranging from 1×10^{11} to 5×10^{12} ions/cm² and (b) exposed to gamma radiation at various doses ranging from 250 to 1000 kGy. The amorphization was observed in XRD study after ion irradiation and gamma exposure. The absorption edge in the UV-visible study shifted towards the higher wavelength regime leading to decrease of the band gap energy in both cases of irradiations. The formation of new bands at positions 1570, 1560 and 1542 cm⁻¹ were observed in FTIR study of gamma radiation exposed sample at 750 kGy. The cluster formation was seen in the SEM images. The nano-scale free volume (V_f) of the Li³⁺ ions irradiated PMMA samples was observed to be decreased at fluences of 1.0×10^{11} , 5.0×10^{11} and 2.5×10^{12} ions/cm² due to ion induced cross-linking of the polymeric chains. The values of hole radius (R) and V_f were increased at fluence of 5.0×10^{12} ions/cm², it could be due to the clustering induced at higher fluences. The gamma exposures of the samples lead to decrease of the values of R and V_f .

USBAS-13.19

Paper Title: Studies of Dense Electronic Excitation Induced Modification in Crystalline Fe doped SnO₂ Thin Films

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Source: J. Applied Surface Science, Vol. 332, (2015), pp 726-735

ISSN No.: 0169-4332

Abstract: Dense electronic excitation-induced modification in thin films of Fe-doped tin oxide (SnO₂) grown by RF sputtering technique was done by irradiating swift heavy ion (SHI) beams of 100 MeV Au⁸⁺ with varying ion fluencies from 5×10^{11} to 1×10^{13} ions/cm². While the AFM results exhibit grain size dependence on irradiation fluence, MFM images show uniformly distributed magnetized nanoparticles over the entire surface after irradiation. GAXRD pattern indicates particle size variation (from 5 to 26 nm) due to irradiation and higher stability of (1 0 1) other planes against irradiation. Our reported results show that the surface energies of $E_{\text{Surf}}(1\ 0\ 1) > E_{\text{Surf}}(1\ 1\ 0)$ in rutile structure of SnO₂. Change in optical band gap between 3.78 and 5.08 eV due to variation fluence was observed. This is attributed to variation in particle size, scattering due to surface roughness and modification in local electronic structure. RT magnetic studies done by SQUID

shows that coercivity increases up to the fluence of 5×10^{12} ions/cm² (157.71 Oe). The increase in coercivity is due to oxygen vacancies created and change in local electronic structure of Sn due to recoil implantation. Resonance RBS results confirm the presence of Fe in the samples with a new observation where increase in peak intensity of Sn after irradiation occurred. The presence of X-ray absorption near-edge structure spectra at O K-edge around 532.63 eV in pristine and irradiated samples confirms the doping of Fe at the lattice site of Sn in SnO₂. Evolution of new spectral features at 486.09, 486.75, 491.40, 492.85 and 499.14 eV for XANES at Sn M-edge was obtained after irradiation.

USBAS-13.20

Paper Title: A Comparative Study of the Effects of Oxygen Ions Upon the Free Volume and Physico-Chemical Properties of Makrofol (KG & N) Polycarbonate

Author(s): Gupta, S.K.^{1,2}, Singh, P.¹, Awasthi, K.³, Roychowdhury A.⁴ and Kumar, R.¹

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Source: Macromol. Symp, Vol. 357, (2015), pp 86–98

ISSN No.: 1022-1360

Abstract: Makrofol (KG & N) polymers are the important class of polycarbonates which are used as solid state nuclear track detectors. The effect of 100 MeV oxygen ions (O⁷⁺) on the free volume and physico-chemical properties of Makrofol (KG & N) polymers were studied. The pristine and irradiated samples were characterized by positron annihilation lifetime spectroscopy, X-ray diffraction, UV-visible and FTIR. A comparative study of free volume was carried out from the obtained values of the pristine and irradiated samples of both the polymers. The absorption edges of UV-visible were found to be shifted towards longer wavelength region. The intensities of the various absorption bands of the infrared spectra were found to be modified; which indicated the changes in the chemical properties of the exposed samples.

USBAS-13.21

Paper Title: Impact of Swift Heavy Ions and Gamma Radiation upon Optical, Structural, and Chemical Properties of Polypropylene Polymer Films

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Source: Advances in Polymer Technology, Vol. 34, (2015), pp 4

ISSN No.: 07306679

Abstract: The present work focuses on the effects of two different ions (70 MeV carbon and 50 MeV lithium) and gamma radiation upon the structural, optical, and chemical properties of 125-μm thick polypropylene (PP) polymer films. The different samples of PP were irradiated with ions to the fluences in the range 10^{11} – 10^{13} ions/cm² and exposed to gamma radiation of doses in the range 100–1250 kGy. A comparative study is carried out upon different parameters of irradiated polymer samples such as crystallite size and band gap energy. The structural properties are effectively modified by the ions irradiation, whereas gamma exposure shows insignificant

changes in this regard; however, gamma exposure is observed to be effective in gradually decreasing the band gap energy of the PP samples with an increase in the gamma dose. The formation of new chemical bands is observed in the ion-irradiated and gamma-exposed PP polymer samples.

USBAS-13.22

Paper Title: PALS and physico-chemical study of swift heavy ions and gamma radiation irradiated polyamide nylon 66 polymer

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Source: Vacuum, Vol. 121, (2015), pp 177-186

ISSN No.: 0042-207X

Abstract: Polyamide nylon 66 (PA-66) polymer samples after being irradiated with 100 MeV O⁷⁺ ions and gamma radiation were studied for modifications in free volume properties by using positron annihilation lifetime spectroscopy (PALS) technique. The results obtained from PALS experiment were analysed in terms of hole radius, available free volume and fractional free volume. Both, ion irradiation as well as gamma exposure showed modifications in the size of available free volume and fractional free volume but the effectiveness of gamma radiation exposure was more pronounced than that of ion irradiation. The modifications produced in optical, structural and chemical properties of the PA-66 samples were studied by UV-visible (UV-vis) spectroscopy, X-ray diffraction (XRD) and Fourier transform infrared (FTIR) spectroscopy respectively. UV-vis studies showed a shift in absorption edge towards the visible region and a decrease in band gap energy (Eg). An increase in the crystalline nature of the polymer at higher fluence as a result of decrease in the peak width of XRD patterns was observed. The FTIR studies showed insignificant modifications in the chemical structure of irradiated polymer samples. Increase in surface roughness and cracks were observed in SEM results of ion and gamma exposed samples respectively.

USBAS-13.23

Paper Title: Annual Effective Dose due to radon, thoron and their progeny in dwellings in Aligarh City and around a thermal power station in Aligarh District, U.P, India.

Author(s): Kumar, M.¹, Agrawal, A.², and Kumar, R.³.

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Source: Physics Procedia, Vol. 80, (2015), pp 117 – 119

ISSN No.: 1875-3892

Abstract: The present study was conducted to measure integrated radon and thoron concentration levels in dwellings of Aligarh city and around the thermal power station situated in Aligarh District. Solid State Nuclear Track Detectors (LR-115, TYPE-II) based twin cup dosimeters were used for this purpose. Radon and thoron progeny concentration levels in terms of Potential Alpha Energy Concentrations (PAECs) and annual effective dose received by the inhabitants in studied dwellings were estimated from observed values of radon and thoron as concentrations. The evaluated mean values of radon and thoron gas concentration in Aligarh city were 30.3 Bqm⁻³ (SD =10.6) and 10.2 Bqm⁻³(SD =6.1) respectively and around thermal

power station 23.6 Bqm⁻³(SD = 5.2) and 7.7 Bqm⁻³(SD= 1.9) respectively. The evaluated mean value of radon and thoron progeny concentration were 3.3 mWL (SD=1.1) and 1.1 mWL (SD= 0.7) respectively, in Aligarh city and 2.6 mWL (SD=0.6) and 0.8 mWL (SD= 0.2) around thermal power station. The estimated average value of annual effective dose in studied dwellings was 0.9 mSv (SD= 0.3) in Aligarh city and 0.7 mSv (SD= 0.2) around thermal power station.

USBAS-13.24

Paper Title: Studies of dense electronic excitation induced modification in cobalt doped SnO₂ thin films prepared by RF sputtering technique

Author(s): Jaiswal M.K. and Kumar, R.

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Source: Journal of Alloys and Compounds, Vol. 648, (2015), pp 550-558

ISSN No.: 0925-8388

Abstract: Crystalline thin films of cobalt doped SnO₂ undergoes modification by dense electronic excitation induced by Swift Heavy Ion (SHI) irradiation using 100 MeV Au⁸⁺ ion beam. Atomic Force Microscopy (AFM) and Power Spectral Density (PSD) analysis shows that the surface modification is dominated by diffusion of surface adatoms. Modification in surface features viz. grain size, rms roughness and roughness exponent can be controlled with homogeneity in surface features due to dense electronic excitation as observed from AFM-PSD and MFM analysis. X-ray diffraction results shows formation of new crystalline phase due to dense electronic excitation. The variation in strain along (101) and (110) crystal plane are nearly equal at irradiation fluence of 5×10¹² ions/cm² as calculated using X-ray diffraction results. UV-Visible studies shows formation of local energy states within the optical band gap region due to modification in electronic state of the system. The significant variation in Urbach's energy at irradiation fluence of 5×10¹² ions/cm² was observed. Transition in magnetic property after critical irradiation fluence of 5×10¹² ions/cm² with high coercivity and lowest saturated magnetization is observed. Resonance RBS studies shows Impurity free phase formation and amorphization causes reduction in density of the target due to amorphization. Very small modification in room temperature electrical conductivity was observed. Overall results shows that the modification in impurity free phase occurred by 100 MeV Au⁸⁺ ion irradiation in cobalt doped SnO₂ thin films is tough to achieve by other techniques.

USBAS-13.25

Paper Title: Study of natural radioactivity, radon exhalation rate and radiation doses in coal and flyash samples from Thermal Power Plants, India

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Source: Physics Procedia, Vol. 80, (2015), pp 120–124

ISSN No.: 1875-3892

Abstract: Coal is one of the most important source used for electrical power generation. Its combustion part known as fly ash is used in the manufacturing of bricks, sheets, cement, land filling etc. Coal and its by-products have significant amounts of radionuclide's including uranium, thorium which is the ultimate source of the

radioactive gas radon and thoron respectively. Radiation hazard from airborne emissions of coal-fired power plants have been cited as possible causes of health in environmental. Assessment of the radiation exposure from coal burning is critically dependent on the concentration of radioactive elements in coal and in the fly ash. In the present study, samples of coal and flyash were collected from Rajghat Power Plant and Badarpur Thermal Power Plant, New Delhi, India. Radon exhalation is important parameter for the estimation of radiation risk from various materials. Solis State Nuclear Track Detector based sealed Can Technique (using LR-115 type II) has been used for measurement radon exhalation rate. Also accumulation chamber based Continuous Radon Monitor and Continuous Thoron Monitor have been used for radon masss exhalation and thoron surface exhalation rate respectively. Natural radioactivity has been measured using a low level NaI (Tl) detector based on gamma ray spectrometry.

USBAS-13.26

Paper Title: Preparation and field emission study of low-dimensional ZnS arrays and tubules

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Source: Journal of Experimental Nanoscience, Vol.10 (2015), pp 126-134.

ISSN No.: 1745-8099

Abstract: In the present work, freestanding ZnS nanotipped arrays and hollow tubules have been generated using an electrodeposition technique via template synthesis. The structures and morphologies of the arrays and tubules were investigated using X-ray diffraction and scanning electron microscopy, respectively. Electron field emission properties of the ZnS nanotipped arrays and tubules have been studied in a good vacuum condition at room temperature and current–voltage characteristics were found to follow the Fowler–Nordheim theory. It is found that ZnS tubules show good electron field emission properties at low voltage with large field enhancement factor compared to ZnS solid arrays. Optical properties of such synthesised structures were also studied using ultraviolet– visible spectrophotometry.

USBAS-13.27

Paper Title: Investigation of in-depth and surface properties of polyethyleneterephthalate thin films after SHI and gamma radiation treatment by means of PALS and AFM studies

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Source: Vacuum, Vol. 115, (2015), pp 31-38

ISSN No.: 0042-207X

Abstract: Positron annihilation lifetime spectroscopy (PALS) and atomic force microscopy (AFM) analyses were adopted for in-depth (at the nanoscale level) and surface (at the microscale level) understanding of the swift heavy ions (SHI) irradiated and radiation exposed polymer films. Polyethyleneterephthalate (PET) polymer films

were irradiated by 70 MeV C^{5+} ions to the fluences ranging from 1×10^{11} to 5×10^{12} ions/cm². The other set of PET films were exposed to gamma radiation emitted by ^{60}Co source at various doses ranging from 250 to 1250 kGy. The Tao-Eldrup model was used to calculate the value of hole radius (R), free volume (FV) and fractional free volume (FFV) from the lifetime and intensity values of ortho-positronium (o-Ps) as obtained from the PALS spectra. These parameters (R, FV and FFV) were analyzed to study the in-depth modification of the polymer after ion beam and gamma radiation treatment. The AFM studies reveal the surface modifications in the ions irradiated and gamma radiation exposed polymer films. In addition to these studies; the structural, optical and chemical properties were studied by X-ray diffraction (XRD), UV-visible (UV-vis) and Fourier transform infrared (FTIR) spectroscopy respectively. The XRD spectra showed improved crystalline nature of the polymer after ion beam irradiation as well as gamma radiation exposure. The optical absorption spectra showed a shift in the absorption edge towards higher wavelength side. The band gap energy was calculated using Tauc's relation, which indicated a significant decrease in the value of band gap of the polymer films in both the cases (C^{5+} ions and gamma radiation). The FTIR spectra obtained after irradiation exhibits increment of the intensities of the typical vibrational bands.

USBAS-13.28

Paper Title: Influence of SHI upon nanohole free volume and micro scale level surface modifications of polyethyleneterephthalate polymer films

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Source: Applied Surface Science, Vol. 337, (2015), pp 19-26

ISSN No.: 0169-4332

Abstract: Topographic micro scale and in-depth nano scale level modifications of polymeric materials play an important role in engineering their physical and chemical properties. Polyethylene terephthalate (PET) is an important class of semi-crystalline polymers used for gas separation properties. The gas diffusion and permeability parameters are directly related to the free volume fractions and the hole distributions. The controlled and precise ion beam irradiation can be used to induce surface and in-depth modifications in the properties of the polymers which help in modifying free volume holes and their distributions. In the present study, the investigation of free volume (nano scale level) and surface (micro scale level) properties of PET polymeric thin films after SHI treatment were employed by means of positron annihilation lifetime spectroscopy (PALS) and atomic force microscopy (AFM) respectively. The PET thin films were irradiated by 50 MeV lithium ions as a function of ion fluence. The value of hole radius (R) and intensity (I₃) of o-Ps were observed to be increased after ion beam treatment. The further analyses were employed to calculate the free volume and fractional free volume of holes from the obtained values of R and I₃. The AFM studies reveal the surface modifications in the irradiated polymer films. The structural, optical and chemical properties were investigated by X-ray diffraction (XRD), UV-visible (UV-vis) and Fourier transform infrared (FTIR) spectrophotometry. Different parameters such as crystallite size and band gap energy were calculated from the obtained data of XRD and UV-vis respectively.

USBAS-13.29

Paper Title: SHI irradiation of metal doped zinc sulfide polymer nanocomposites synthesized using micro emulsion method

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Source: Nuclear Instruments and Methods in Physics Research B, Vol. 358, (2015), pp258–262

ISSN No.: 0168-583X

Abstract: The metal doped ZnS nanoparticles dispersed in polystyrene were synthesized using micro emulsion method. The synthesized free standing nanocomposites films of 18mm thickness were irradiated with 60 MeV nickel ions at two different fluences for the modification of structural, optical and chemical properties. The pristine and irradiated samples were characterized by X-ray diffraction, UV–visible and FTIR spectrophotometer. The SEM and XRD results confirmed the synthesis of nanoparticles. The ion irradiation shifted the optical absorption towards higher wavelength and decreased the band gap energy to significant levels. The infrared band at 465 cm⁻¹ confirmed the Zn–S bonding. The intensity of other absorption bands was modified after ion irradiation.

USBAS-13.30

Paper Title: Gamma Radiation Induced Modifications on Physicochemical Properties of Makrofol (KG and N) Polycarbonate

Author(s): Gupta, S.K.¹, Singh, P.¹, Kumar, R.¹ and Kumar, S.²

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Source: Advances in Polymer Technology, Vol. 4, (2015), pp 21510

ISSN No.: 07306679

Abstract: Makrofol (KG and N) polycarbonates (PCs) are the most versatile solid-state nuclear track detectors. These polymers were exposed to gamma radiation of doses ranging from 250 to 1000 kGy. The pristine and exposed samples were characterized by X-ray diffraction (XRD), UV–vis spectrophotometry, and Fourier transform infrared spectrophotometry for the structural, optical, and chemical studies, respectively. The XRD studies showed that crystallite size for exposed samples of makrofol-KG PC decreased from 64.7 to 57.9 Å and for makrofol-N PC it increased from 19.1 to 21.1 Å. The band gap energy decreased from 4.40 to 4.07 eV for makrofol-KG and from 4.26 to 3.83 eV for makrofol-N after the gamma exposure. The number of carbon atoms per conjugation length as obtained from UV–vis studies was increased in both cases. The activation energy showed fluctuations for exposed samples of both polymers. The intensity of various absorption bands of the infrared spectra decreased at some doses for both the PCs, indicating the change in the chemical properties of the exposed samples.

USBAS-13.31

Paper Title: Study of radon, thoron exhalation and natural radioactivity in coal and fly ash samples of kota super thermal power plant, Rajasthan, India

Author(s): Singh, L.M.¹, Kumar, M.², Sahoo, B.K.³, Sapra, B.K.³ and Kumar, R.¹

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Source: Radiation Protection Dosimetry, Vol. 171, (2016), pp 1–4

ISSN No.: 0144-8420

Abstract: Electricity generation in India is largely dependent on coal-based thermal power plants, and increasing demand of energy raised the coal consumption in the power plants. In recent years, study of natural radioactivity content and radon/thoron exhalation from combustion of coal and its by-products has given considerable attention as they have been recognised as one of the important technically enhanced naturally occurring radioactive materials. In the present study, radon, thoron exhalation rate and the radioactivity concentration of radionuclides in coal and fly ash samples collected from Kota Super Thermal Power Plant, Rajasthan, India have been measured and compared with data of natural soil samples. The results have been analysed and discussed.

USBAS-14.01

Paper Title: Plasmonic, low frequency Raman and non-linear optical limiting studies in copper-silica nanocomposites

Author(s): Mohapatra, S.¹, Mishra, Y.K.², Warriar, A.M.³, Philip, R.³, Sahoo, S.⁴, Arora, A.K.⁴ and Avasthi, D.K.⁵

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Source: Plasmonics, Vol. 7, (2012), pp 25-31

ISSN No. : 1557-1955

Abstract: Nanocomposite thin films consisting of Cu nanoparticles embedded in silica matrix were synthesized by atom beam co-sputtering technique. Plasmonic, optical, and structural properties of the nanocomposite films were investigated by using ultraviolet (UV)–visible absorption spectroscopy, nonlinear optical transmission, X-ray diffraction (XRD), and low-frequency Raman scattering. UV–visible absorption studies revealed the surface plasmon resonance absorption at 564 nm which showed a red shift with increase in Cu fraction. XRD results together with surface plasmon resonance absorption confirmed the presence of Cu nanoparticles of different size. Low-frequency Raman studies of nanocomposite films revealed breathing modes in Cu nanoparticles. Nanocomposites with lower metal fractions were found to behave like optical limiters. The possibility of controllably tuning the optical nonlinearity of these nanocomposites could enable them to be the potential candidates for applications in nanophotonics.

USBAS-14.02

Paper Title: Crystal growth behaviours in Au-ZnO nanocomposite under different annealing environments and photoswitchability

Author(s): Mishra, Y.K.¹, Chakravadhanula, V.S.K.², Hrkac, V.², Jebril, S.³, Agarwal, D.C.⁴, Mohapatra, S.⁵, Avasthi, D.K.⁴, Kienle, L.² and Adelung, R.¹

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Source: Journal of Applied Physics, Vol. 112, (2012), pp 064308

ISSN No. : 0021-8979

Abstract: The growth of gold nanoparticles and ZnO nanorods in atom beam co-sputtered Au-ZnO nanocomposite (NC) system by annealing at two different ambient conditions is demonstrated in this work. Annealing in a furnace at 600°C (air environment) confirmed the formation of ZnO nanorods surrounded with Au nanoparticles. In-situ annealing inside a transmission electron microscope (TEM) led to the formation of gold nanocrystals with different polygonal shapes. TEM micrographs were obtained in real time at intermediate temperatures of 300°C, 420°C, and 600°C under vacuum. The growth mechanisms of Au nanocrystals and ZnO nanorods are discussed in the framework of Au-Zn eutectic and Zn-melting temperatures in vacuum and air, respectively. Current-voltage responses of Au-ZnO NC nanorods in dark as well as under light illumination have been investigated and photoswitching in Au-ZnO NC system is reported. The photoswitching has been discussed in terms of Au-ZnO band-diagram.

USBAS-14.03

Paper Title: A study on formation of nanostructure on surface and catcher by dense electronic excitation of Ag thin film

Author(s): Singh, U.B.¹, Agarwal, D.C.¹, Khan, S.A.¹, Mohapatra, S.², Tripathi, A.¹ and Avasthi, D. K.¹

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Source: Journal of Physics D: Applied Physics, Vol. 45, (2012), pp 445304

ISSN No. : 0022-3727

Abstract: Irradiation of Ag thin films with 100 MeV Ag ions leads to the formation of Ag nanoparticles on the surface as well as on the catcher, due to electronic energy loss mediated sputtering of Ag. The experimentally determined sputter yield of Ag is found to be three orders of magnitude higher than the values expected for bulk Ag, which is explained on the basis of the inelastic thermal spike model. The confinement of energy in the nanoparticles having size smaller than the electron mean free path (λ) and higher surface coverage area results in a higher sputtering yield. Transmission electron microscopy was performed to study the size distribution of nanoparticles on the catcher. The variation of sputtered particle yield with the number of constituent atoms follows an inverse power law with the value of exponent (δ) ~ 0.33 , at fluence of 1×10^{13} ions cm^{-2} . With increase in fluence up to 1×10^{14} ions cm^{-2} , an additional value of exponent of $\delta \approx 1$ arises. The size of Ag

nanoparticles is decreased with increased fluence due to ion-induced sputtering. The irradiated sample is found to have partially embedded nanoparticles showing localized surface plasmon resonance.

USBAS-14.04

Paper Title: Synthesis and characterizations of Au–alumina nanocomposites prepared by atom beam co-sputtering

Author(s): Tiwary, M.¹, Agarwal, D.C.², Mohapatra, S.³, Pivin, J.C.⁴, Avasthi, D.K.² and Annapoorni S.¹

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Source: Physica Status Solidi A, Vol. 209, (2012), pp 2499-2504

ISSN No. : 1862-6300

Abstract: Nanocomposite thin films of Au–alumina with varying Au contents were synthesized by atom beam co-sputtering. The Au content and the thickness of nanocomposite films were determined by Rutherford backscattering spectrometry. Transmission electron microscopy studies reveal the presence of Au nanoparticles with bimodal size distribution in nanocomposites for lower Au content. Overlapping Au nanoparticles were observed for higher Au content. The increase in size of Au nanocrystals is observed with increase in Au concentration as also evident by glancing angle X-ray diffraction studies. Ultraviolet (UV)-visible absorption studies revealed surface plasmon resonance (SPR) peak which showed a red shift from 519 to 602 nm with increasing Au content of the nanocomposites. Preliminary study exploring the interaction between Au nanoparticles in the nanocomposites and bovine serum albumin (BSA) showed the Au nanoparticles to be BSA sensitive, indicating their possible applications in biosensors.

USBAS-14.05

Paper Title: Swift heavy ion irradiation of ZnO nanoparticles embedded in silica: radiation-induced deoxidation and shape elongation

Author(s): Amekura, H.¹, Okubo, N.², Ishikawa, N.², Tsuya, D.¹, Mitsuishi, K.¹, Nakayama, Y.¹, Singh, U.B.³, Khan, S.A.³, Mohapatra, S.⁴, and Avasthi, D.K.³

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Source: Applied Physics Letters, Vol. 103, (2013), pp 203106

ISSN No. : 1077-3118

Abstract: ZnO nanoparticles (NPs) embedded in amorphous SiO₂ were irradiated with 200 MeV Xe¹⁴⁺ swift heavy ions (SHIs) to a fluence of 5.0x10¹³ ions/cm². Optical linear dichroism was induced in the samples by the irradiation, indicating shape transformation of the NPs from spheres to anisotropic ones. Transmission electron microscopy observations revealed that some NPs were elongated to prolate shapes; the elongated NPs consisted not of ZnO but of Zn metal. The SHI irradiation induced deoxidation of small ZnO NPs and successive shape elongation of the deoxidized metal NPs.

USBAS-14.06

Paper Title: Ejection of Au and Si nanocrystals from Au implanted Si(100) by MeV heavy ion irradiation

Author(s): Mohapatra, S.

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Source: Applied Surface Science, Vol. 283, (2013), pp 128-133

ISSN No. : 0169-4332

Abstract: Si(1 0 0) substrates implanted with 32 keV Au⁻ ions, were irradiated with 3 MeV Au³⁺ ions at an angle of 60°. Transmission electron microscopy (TEM) studies on sputtered particles collected on catcher grids revealed the presence of Au and Si nanocrystals. The size distribution of collected Au nanocrystals exhibited inverse power law dependence with a decay exponent of 2. Atomic force microscopy (AFM) analysis of irradiated sample showed the presence of surface craters along with hillocks. The formation of Au and Si nanocrystals in MeV ion irradiated Au doped amorphous Si layer can be attributed to the localized melting due to thermal spike phase of atomic displacement cascades produced by MeV Au ion impacts.

USBAS-14.07

Paper Title: Structural, optical and photocatalytic properties of flower-like ZnO nanostructures prepared by a facile wet chemical method

Author(s): Kuriakose, S.¹, Bhardwaj, N.¹, Singh, J.¹, Satpati, B.², and Mohapatra, S.¹

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Source: Beilstein Journal of Nanotechnology, Vol. 4, (2013), pp 763-770

ISSN No. : 2190-4286

Abstract: Flower-like ZnO nanostructures were synthesized by a facile wet chemical method. Structural, optical and photocatalytic properties of these nanostructures have been studied by X-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), photoluminescence (PL) and UV-vis absorption spectroscopy. SEM and TEM studies revealed flower-like structures consisting of nanosheets, formed due to oriented attachment of ZnO nanoparticles. Flower-like ZnO structures showed enhanced photocatalytic activity towards sunlight driven photodegradation of methylene blue dye (MB) as compared to ZnO nanoparticles. XRD, UV-vis absorption, PL, FTIR and TEM studies revealed the formation of Zn(OH)₂ surface layer on ZnO nanostructures upon ageing. We demonstrate that the formation of a passivating Zn(OH)₂ surface layer on the ZnO nanostructures upon ageing deteriorates their efficiency to photocatalytically degrade of MB.

USBAS-14.08

Paper Title: Formation of self-organized silver nanocup-type structures and their plasmonic absorption

Author(s): Mishra, Y.K.¹, Adelung, R.¹, Kumar, G.², Elbahri, M.^{3,4}, Mohapatra, S.⁵, Singhal, R.⁶, Tripathi, A.⁷ and Avasthi, D.K.⁷

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Source: Plasmonics, Vol. 8, (2013), pp 811-815

ISSN No. : 1557-1955

Abstract: The present work reports on the formation of extremely low volume, silver nanocup-type structures on the surface by annealing of ultra-thin silver film on quartz in inert environment. Atomic force microscopy studies together with scanning electron microscopy confirmed the formation of Ag nanocup-type structures at the surface. A basic physical model for the formation of nanocups in terms of buckling and Oswald ripening due to surface-induced morphological instability and diffusional mass transport under thermal treatment is demonstrated. Surface plasmon resonance absorptions of nanocup structures are studied and preliminary experiment for observing the surface enhanced Raman scattering of fullerene C₇₀ molecules has been shown.

USBAS-14.09

Paper Title: *In-situ* TEM observation of electron irradiation induced shape transition of elongated gold nanoparticles embedded in silica

Author(s): Mohapatra, S.¹, Mishra, Y. K.², Ghatak, J.³ and Avasthi, D.K.⁴

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Source: Advanced Materials Letters, Vol. 4, (2013), pp 444-448

ISSN No. : 0976-3961

Abstract: Elongated Au nanoparticles (NPs) embedded in silica matrix were fabricated by 100 MeV Ag ion irradiation of 3 MeV Au ion implanted SiO₂/Si(100) substrates, annealed at 1050°C. Electron-beam-induced shape evolution of elongated Au NPs embedded in SiO₂ has been studied by high resolution transmission electron microscopy. Electron beam irradiation resulted in a decrease in the aspect ratio of Au NPs from ~ 1.4 to 1 with increase in irradiation time. The observed ellipsoidal-to-spherical shape transition of Au NPs has been ascribed mainly to the cumulative effects of electron beam induced heating, softening of silica matrix and radiation enhanced diffusion of knock-on displaced O and Si atoms, resulting in local stress relaxation.

USBAS-14.10

Paper Title: Shape elongation of Zn nanoparticles in silica irradiated with swift heavy ions of different species and energies: scaling law and some insights on the elongation mechanism

Author(s): Amekura, H.¹, Mohapatra, S.², Singh, U. B.³, Khan, S. A.³, Kulriya, P.³, Ishikawa, N.⁴, Okubo, N.⁴, and Avasthi, D. K.³

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Source: Nanotechnology, Vol. 25, (2014), pp 435301

ISSN No. : 0957-4484

Abstract: Zinc nanoparticles (NPs) embedded in silica were irradiated with swift heavy ions (SHIs) of seven different combinations of species and energies. The shape elongation induced by the irradiations was evaluated by optical linear dichroism (OLD) spectroscopy, which is a sensitive tool for determining the change in the mean aspect ratio (AR) of NPs. Although the mean AR change indicated a linear fluence dependence in the low- and medium-fluence regions, it indicated a nonlinear dependence in the high-fluence region. The data reveal that the elongation efficiency of Zn is correlated with the electronic stopping power 'Se in silica' and is not correlated with either the 'Se in Zn' or the nuclear stopping power. The elongation efficiency plotted as a function of the 'Se in silica' revealed a linear relationship, with a threshold value of $\sim 2 \text{ keV nm}^{-1}$, which is the same dependence exhibited by the ion-track formation in silica. The log-log plot showed that the elongation efficiency increased linearly with Se above a critical value of $\sim 3 \text{ keV nm}^{-1}$ and steeply decreased with Se to the power of 5 below the critical Se. The steep decrease can be ascribed to the discontinuous nature of the ion tracks, which is expected at $\text{Se} \sim 2\text{--}4 \text{ keV nm}^{-1}$ in silica. The fluence Φ dependences of $AR - 1$ under various irradiations are well-normalized with the electronic energy deposition of SHIs, i.e., the product of Se and Φ , with a Se greater than the same critical value of $\sim 3 \text{ keV nm}^{-1}$. The normalized data above the critical value fell on a linear relation, $AR(\Phi) - 1 \propto \text{Se}\Phi$, for $\text{Se}\Phi < 2 \text{ keV nm}^{-3}$ and a sublinear relation, $AR(\Phi) - 1 \propto (\text{Se}\Phi)^{1/2}$ for $\text{Se}\Phi > 2 \text{ keV nm}^{-3}$. On the basis of these experimental results, we discuss some insights into the elongation mechanism.

USBAS-14.11

Paper Title: Effects of MeV ion irradiation on structural and optical properties of SnO₂-ZnO nanocomposites prepared by carbothermal evaporation

Author(s): Bhardwaj, N.¹, Kuriakose, S.¹, Pandey, A.², Sharma, R. C.³ and Avasthi, D. K.⁴ and Mohapatra, S.¹

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Source: Journal of Alloys and Compounds, Vol. 617, (2014), pp 734-739

ISSN No. : 0925-8388

Abstract: Nanocomposite thin films of SnO₂-ZnO were prepared by carbothermal evaporation of mixture of Sn and ZnO without using any catalyst. The nanocomposite thin films

were irradiated with 8 MeV Si³⁺ ions at room temperature to fluence varying from 1 x 10¹⁴ to 1 x 10¹⁵ ions/cm². Effects of MeV ion irradiation on the structural and optical properties of SnO₂-ZnO nanocomposites were studied using X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM) with energy dispersive X-ray spectroscopy, Photoluminescence spectroscopy (PL) and Raman spectroscopy. XRD studies revealed the presence of Sn, SnO₂ and ZnO nanostructures in the as-deposited films. FESEM studies on the irradiated samples revealed the formation of ZnO nanosheets. A tentative growth mechanism underlying the formation of ZnO nanosheets is proposed. Ion irradiation resulted in a significant enhancement in the UV and defect emissions from ZnO and SnO₂ nanostructures in the nanocomposite.

USBAS-14.12

Paper Title: Facile synthesis of Ag-ZnO hybrid nanospindles for highly efficient photocatalytic degradation of methyl orange

Author(s): Kuriakose, S.¹, Choudhary, V.¹, Satpati, B.², and Mohapatra, S.¹

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Source: Physical Chemistry Chemical Physics, Vol. 16 (2014), pp 17560-17568

ISSN No. : 1463-9076

Abstract: Highly photocatalytically active Ag nanoparticle decorated ZnO nanospindles were synthesized by a facile wet chemical method. The structural and optical properties of the as-synthesized materials were characterized by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), transmission electron microscopy (TEM) and high resolution TEM (HRTEM) with energy dispersive X-ray spectroscopy, UV-visible absorption spectroscopy and Raman spectroscopy. The photocatalytic activity of these nanostructures was evaluated by analyzing sunlight driven degradation of methyl orange (MO) dye and it was observed that Ag nanoparticle modified ZnO nanospindles show significantly enhanced photocatalytic activity for degradation of MO, as compared to ZnO nanospindles. We attribute the observed enhanced photocatalytic activity of Ag nanoparticle decorated ZnO nanospindles to their improved sunlight utilization efficiency and the efficient suppression of recombination of photogenerated charge carriers due to the electron scavenging action of Ag nanoparticles and the interfacial electron transfers due to the Schottky junction between Ag nanoparticles and ZnO nanospindles.

USBAS-14.13

Paper Title: Enhanced photocatalytic activity of Co doped ZnO nanodisks and nanorods prepared by a facile wet chemical method

Author(s): Kuriakose, S.¹, Satpati, B.² and Mohapatra, S.¹

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Source: Physical Chemistry Chemical Physics, Vol. 16, (2014), pp 12741-12749

ISSN No. : 1463-9076

Abstract: Cobalt doped ZnO nanodisks and nanorods were synthesized by a facile wet chemical method and well characterized by X-ray diffraction, field emission scanning electron microscopy (FESEM), high resolution transmission electron microscopy (HRTEM) with energy dispersive X-ray spectroscopy, photoluminescence spectroscopy, Raman

spectroscopy and UV-visible absorption spectroscopy. The photocatalytic activities were evaluated for sunlight driven degradation of an aqueous methylene blue (MB) solution. The results showed that Co doped ZnO nanodisks and nanorods exhibit highly enhanced photocatalytic activity, as compared to pure ZnO nanodisks and nanorods. The enhanced photocatalytic activities of Co doped ZnO nanostructures were attributed to the combined effects of enhanced surface area of ZnO nanodisks and improved charge separation efficiency due to optimal Co doping which inhibit recombination of photogenerated charge carriers. The possible mechanism for the enhanced photocatalytic activity of Co doped ZnO nanostructures is tentatively proposed.

USBAS-14.14

Paper Title: Tunable surface plasmon resonance of silver nanoclusters in ion exchanged soda lime glass

Author(s): Mohapatra, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Alloys and Compounds, Vol. 598 (2014), pp 11-15

ISSN No. : 0925-8388

Abstract: Silver (Ag) nanoclusters embedded in soda lime glass were synthesized by Ag ion exchange followed by thermal annealing. The effects of annealing temperature, time and atmosphere on the plasmonic response, structural and optical properties of silver-glass nanocomposites have been investigated using UV-visible absorption spectroscopy and X-ray photoelectron spectroscopy (XPS). As exchanged sample exhibits surface plasmon resonance (SPR) band around 420 nm which showed regular red shift with increase in annealing temperature. A significant red shift of 176 nm (from 420 to 596 nm) and broadening of the SPR peak was observed for annealing in air at 450 °C. XPS studies on air annealed samples confirmed the presence of Ag₂O in addition to Ag. Subsequent annealing at 250 °C in reducing atmosphere resulted in increase in intensity, narrowing and blue shift of the SPR peak to 398 nm. Our observations suggest that SPR tunability is mainly due to the formation and dissolution of Ag₂O nanoshells around Ag nanoclusters in the near-surface region of glass during annealing in oxidizing and reducing atmosphere, respectively.

USBAS-14.15

Paper Title: Enhanced photocatalytic activity of Ag-ZnO hybrid plasmonic nanostructures prepared by a facile wet chemical method

Author(s): Kuriakose, S.¹, Vandana¹, Satpati, B.² and Mohapatra, S.¹

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Source: Beilstein Journal of Nanotechnology, Vol. 5, (2014), pp 639-650

ISSN No. : 2190-4286

Abstract: We report the synthesis of Ag-ZnO hybrid plasmonic nanostructures with enhanced photocatalytic activity by a facile wet-chemical method. The structural, optical, plasmonic and photocatalytic properties of the Ag-ZnO hybrid nanostructures were studied by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), transmission electron microscopy (TEM), photoluminescence (PL) and UV-visible absorption spectroscopy. The effects of citrate concentration and Ag

nanoparticle loading on the photocatalytic activity of Ag–ZnO hybrid nanostructures towards sun-light driven degradation of methylene blue (MB) have been investigated. Increase in citrate concentration has been found to result in the formation of nanodisk-like structures, due to citrate assisted oriented attachment of ZnO nanoparticles. The decoration of ZnO nanostructures with Ag nanoparticles resulted in a significant enhancement of the photocatalytic degradation efficiency, which has been found to increase with the extent of Ag nanoparticle loading.

USBAS-14.16

Paper Title: Structural and optical properties of SnO₂ nanotowers and interconnected nanowires prepared by carbothermal reduction method

Author(s): Bhardwaj, N., Kuriakose, S. and Mohapatra, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Alloys and Compounds, Vol. 592, (2014), pp 238-243

ISSN No. : 0925-8388

Abstract: Nanotowers and interconnected nanowires of SnO₂ have been successfully synthesized using a simple carbothermal reduction method by heating mixtures of SnO₂, graphite and Ag powders at 1050 °C. Field emission scanning electron microscopy (FESEM) studies revealed that the synthesized nanotowers consist of layer-by-layer stacked SnO₂ nanosheets of average thickness 100 nm. At higher Ag concentration, interconnected nanowires of SnO₂ have been obtained. The formation of SnO₂ nanotowers involves vapor–solid growth, while the interconnected SnO₂ nanowires were formed by vapor–liquid–solid growth mediated by Ag₃Sn liquid nanodroplets. Photoluminescence studies on SnO₂ nanotowers revealed intense peaks at 365 and 396 nm and a very weak broad band around 545 nm. The synthesized SnO₂ nanotowers and interconnected SnO₂ nanowires have potential applications as functional blocks in future nanodevices.

USBAS-14.17

Paper Title: Synthesis of embedded Au nanostructures by ion irradiation: influence of ion induced viscous flow and sputtering

Author(s): Singh, U.B.¹, Agarwal, D.C.¹, Khan, S.A.¹, Mohapatra, S.², Amekura, H.³, Datta, D.P.⁴, Kumar, A.⁵, Choudhury, R.K.⁵, Chan, T.K.⁶, Osipowicz, T.⁶ and Avasthi, D.K.¹

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Source: Beilstein Journal of Nanotechnology, Vol. 5, (2014), pp 105-110

ISSN No. : 2190-4286

Abstract: The ion-irradiation induced synthesis of embedded Au nanoparticles (NPs) into glass from islands of Au on a glass substrate is studied in the context of recoiling atoms, sputtering and viscous flow. Cross sectional transmission electron microscopy studies revealed the formation of Au NPs embedded in the glass substrates by the 50 keV Si[−] ion irradiation of irregularly shaped Au nanostructures on the glass surfaces at a fluence of 3×10^{16} ions/cm². The depth profiles of Au in the samples were obtained from high resolution Rutherford backscattering spectrometry studies. The

results from TRIDYN simulation reveal the role of various ion induced processes during the synthesis of the embedded Au NPs, viz. sputtering and recoiling atoms. Simulation and experimental results suggest that the viscous flow is one of the major factors that are responsible for the embedding of Au nanoparticles into the glass substrate.

USBAS-14.18

Paper Title: **Highly efficient photocatalytic degradation of organic dyes by Cu doped ZnO nanostructures**

Author(s): Kuriakose, S.¹, Satpati, B.², and Mohapatra, S.¹

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Source: Physical Chemistry Chemical Physics, Vol. 17, (2015), pp 25172-25181

ISSN No. : 1463-9076

Abstract: Copper doped ZnO nanostructures have been synthesized by a facile wet chemical method. Structural properties of as-synthesized nanomaterials have been studied by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM) and transmission electron microscopy (TEM) with energy dispersive X-ray spectroscopy, while UV-visible absorption spectroscopy and Raman spectroscopy have been used to study their optical properties. Sunlight driven photocatalytic degradation of methylene blue (MB) and methyl orange (MO) dyes in water was used to evaluate the photocatalytic activities of Cu doped ZnO nanostructures using UV-visible absorption spectroscopy. The results showed that there is an optimum Cu doping level which leads to the highly enhanced photocatalytic activity of Cu doped ZnO nanostructures, as compared to pure ZnO nanostructures. A mechanism for the enhanced photocatalytic activity of Cu-ZnO nanostructures is tentatively proposed. The enhanced photocatalytic activity of Cu-ZnO nanostructures is attributed to the combined effects of improved separation of photogenerated charge carriers due to optimal Cu doping in ZnO nanostructures and the formation of ZnO-CuO nanoheterojunctions.

USBAS-14.19

Paper Title: **Effects of solvent on structural, optical and photocatalytic properties of ZnO nanostructures**

Author(s): Kuriakose, S.¹, Satpati, B.², and Mohapatra, S.¹

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Source: Advanced Materials Letters, Vol. 6, (2015), pp 1104-1110

ISSN No. : 0976-3961

Abstract: ZnO nanostructures were synthesized by a facile wet chemical method using water, ethanol and propanol as solvents. X-ray diffraction, field emission scanning electron microscopy (FESEM) and transmission electron microscopy (TEM) have been used to study the structural properties of the synthesized ZnO nanostructures, while their optical properties have been studied using UV-visible absorption spectroscopy and Raman spectroscopy. The photocatalytic activities of the as-synthesized ZnO nanostructures were evaluated by monitoring sunlight driven photocatalytic degradation of methylene blue (MB) and methyl orange (MO) dyes in water and it was observed that ZnO nanostructures prepared using propanol as a solvent exhibit

highly enhanced photocatalytic activity as compared to those prepared using other solvents. The mechanism underlying the photocatalytic activity of ZnO nanostructures towards photocatalytic degradation of dyes is proposed. We attribute the highly enhanced photocatalytic activity of ZnO nanostructures prepared in propanol to the high surface area of nanosheets-like structures formed, which lead to enhanced adsorption of dye molecules resulting in efficient photocatalytic degradation of dyes upon sunlight irradiation.

USBAS-14.20

PaperTitle: Fabrication of SnO₂ three dimensional complex microcrystal chains by carbothermal reduction method

Author(s): Bhardwaj, N. and Mohapatra, S.

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Source: Advanced Materials Letters, Vol. 6, (2015), pp 148-152

ISSN No. : 0976-3961

Abstract: Three dimensional (3D) complex microcrystal chains of SnO₂ have been fabricated by simple carbothermal reduction based vapour deposition method. The structural and optical properties of the as-synthesized materials were well characterized by field emission scanning electron microscopy (FESEM) with energy dispersive X-ray spectroscopy, X-ray diffraction (XRD), Raman spectroscopy and photoluminescence spectroscopy. FESEM studies revealed the formation of 3D complex chains of microcrystals of SnO₂ of varying shape and size. The SnO₂ microcrystals have been found to be inter-connected through oriented attachment, leading to the formation of 3D complex chains of microcrystals. XRD studies showed the presence of SnO₂ and Sn in the synthesized material. Photoluminescence studies on SnO₂ microcrystal chains revealed peaks at 361, 407, 438 and 465 nm. A tentative mechanism of formation of the 3D complex chains of SnO₂ microcrystals is proposed. These SnO₂ microcrystal chains have potential applications as building blocks in novel functional devices.

USBAS-14.21

PaperTitle: Facile synthesis of Co doped ZnO nanodisks for highly efficient photocatalytic degradation of methyl orange

Author (s): Kuriakose, S.¹, Satpati, B.², and Mohapatra, S.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Saha Institute of Nuclear Physics, 1/AF Bidhannagar, Kolkata 700064

Source: Advanced Materials Letters, Vol. 6, (2015), pp 217-223

ISSN No. : 0976-3961

Abstract: Highly photocatalytically active nanodisks of ZnO and Co doped ZnO were synthesized by a facile wet chemical method. The structural, optical and photocatalytic properties of ZnO and Co doped ZnO nanodisks were studied by X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), atomic force microscopy (AFM), transmission electron microscopy (TEM), Raman spectroscopy and UV-visible absorption spectroscopy. FESEM, AFM and TEM studies revealed the presence of ZnO nanodisks. Sun light driven degradation of aqueous methyl orange (MO) dye was used for evaluating the photocatalytic activity of as-synthesized ZnO and Co doped ZnO nanodisks. Co doped ZnO nanodisks showed very high photocatalytic efficiency and lead to almost complete degradation

of MO dye in just 8 minutes. A tentative mechanism of the photocatalytic degradation of MO by Co doped ZnO nanodisks is proposed. We attribute the enhanced photocatalytic activity of Co doped ZnO nanodisks to their high specific surface area and efficient charge carrier separation due to Co doping, which improves suppression of recombination of photogenerated electrons and holes. Development of sun light active highly efficient and stable photocatalysts is very promising for environmental remediation leading to safe and clean water.

USBAS-14.22

Paper Title: Biosynthesis of high concentration, stable aqueous dispersions of silver nanoparticles using *Citrus limon* extract

Author(s): Mohapatra, B.¹, Kaintura, R.¹, Singh, J.^{1,2}, Kuriakose, S.^{1,2}, and Mohapatra, S.^{1,2}

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Source: Advanced Materials Letters, Vol. 6, (2015), pp 228-234

ISSN No. : 0976-3961

Abstract: Stable aqueous dispersions with high concentration of silver nanoparticles were synthesized by a facile and green synthetic route by treating silver ions with aqueous *Citrus limon* extract, used as a reducing and capping agent. The formation and growth of silver nanoparticles, prepared by this simple and convenient method, was monitored using UV-visible absorption spectroscopy. The effects of Ag concentration, *Citrus limon* extract concentration, in-situ and ex-situ pH variations upon NaOH addition on the structural, optical and plasmonic properties of the synthesized Ag nanoparticles were investigated. X-ray diffraction studies revealed the formation of Ag nanoparticles, whose morphology was studied using atomic force microscopy. UV-visible absorption studies revealed surface plasmon resonance (SPR) peak around 465 nm, confirming the presence of Ag nanoparticles. The SPR peak blue shifted along with significant enhancement in intensity with increase in Ag concentration and pH, due to the growth and increased aggregation of Ag nanoparticles. We have shown that addition of NaOH is a key to rapid biosynthesis of stable aqueous dispersions of high concentration of silver nanoparticles. This green synthetic route provides faster synthesis of silver nanoparticles with improved colloidal stability, which can be used in foods, cosmetics and biomedical applications.

USBAS-14.23

Paper Title: Thermal evolution of structural, optical and photocatalytic properties of TiO₂ nanostructures

Author (s): Singh, J. and Mohapatra, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Advanced Materials Letters, Vol. 6, (2015), pp 924-929

ISSN No. : 0976-3961

Abstract: Nanostructures of TiO₂ were synthesized by a facile sol-gel method using pentanol as solvent. The effects of thermal annealing on the structural, optical and photocatalytic properties of as-synthesized TiO₂ nanostructures have been studied using X-ray diffraction (XRD), atomic force microscopy (AFM), Raman spectroscopy and UV-visible absorption spectroscopy. XRD and Raman spectroscopy results revealed that

the synthesized TiO₂ nanostructures exist in anatase phase for annealing at temperatures up to 300°C, while annealing at 600°C led to the formation of TiO₂ nanostructures in anatase/rutile mixed-phase. AFM studies revealed the presence of TiO₂ nanorods, which showed a small decrease in aspect ratio upon annealing. The photocatalytic activity of nanostructured TiO₂ samples was evaluated through sun light driven degradation of methylene blue (MB) dye in water. TiO₂ nanorods in anatase/rutile mixed-phase in the sample annealed at 600°C were found to exhibit the highest photocatalytic activity towards degradation of MB dye. The mechanism underlying the enhanced photocatalytic activity of TiO₂ nanostructures in anatase/rutile mixed-phase is tentatively proposed.

USBAS-14.24

Paper Title: MeV ion irradiation induced evolution of morphological, structural and optical properties of nanostructured SnO₂ thin films

Author(s): Mohapatra, S.¹, Bhardwaj, N.² and Pandey, A.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Solid State Physics Laboratory, Defence Research and Development Organization, Timarpur, Delhi 110054

Source: Materials Research Express, Vol. 2, (2015), pp 045013

ISSN No. : 2053-1591

Abstract: Nanostructured SnO₂ thin films were prepared by carbothermal evaporation method. Morphological, structural and optical properties of the SnO₂ thin films, before and after 8 MeV Si ion irradiation to fluences varying from 1×10^{13} to 1×10^{15} ions cm⁻², were well characterized using atomic force microscopy (AFM), field emission scanning electron microscopy (FESEM), x-ray diffraction (XRD), Raman spectroscopy and photoluminescence spectroscopy (PL). XRD studies revealed the presence of SnO₂ and Sn nanoparticles in the as-deposited samples. AFM and FESEM studies on the irradiated samples revealed formation of nanoring-like structures, at a fluence of 1×10^{15} ions cm⁻², with a central hole and circular rim consisting of nearly monodisperse SnO₂ nanoparticles. PL studies revealed strong enhancement in UV emissions upon 8 MeV Si ion irradiation. A growth mechanism underlying the formation of SnO₂ nanorings involving self-assembly of SnO₂ nanoparticles around nanoholes is tentatively proposed.

USBAS-14.25

Paper Title: Effects of swift heavy ion irradiation on the structural, optical and photocatalytic properties of ZnO-CuO nanocomposites prepared by carbothermal evaporation method

Author(s): Kuriakose, S.¹, Avasthi, D.K.² and Mohapatra, S.¹

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Source: Beilstein Journal of Nanotechnology, Vol. 6, (2015), pp 928-937

ISSN No. : 2190-4286

Abstract: ZnO-CuO nanocomposite thin films were prepared by carbothermal evaporation of ZnO and Cu, combined with annealing. The effects of 90 MeV Ni⁷⁺ ion irradiation on the structural and optical properties of ZnO-CuO nanocomposites were studied by using X-ray diffraction (XRD), field emission scanning electron microscopy (FESEM), UV-visible absorption spectroscopy and Raman spectroscopy. XRD studies showed the presence of ZnO and CuO nanostructures in the nanocomposites.

FESEM images revealed the presence of nanosheets and nanorods in the nanocomposites. The photocatalytic activity of ZnO–CuO nanocomposites was evaluated on the basis of degradation of methylene blue (MB) and methyl orange (MO) dyes under sun light irradiation and it was observed that swift heavy ion irradiation results in significant enhancement in the photocatalytic efficiency of ZnO–CuO nanocomposites towards degradation of MB and MO dyes. The possible mechanism for the enhanced photocatalytic activity of ZnO–CuO nanocomposites is proposed. We attribute the observed enhanced photocatalytic activity of ZnO–CuO nanocomposites to the combined effects of improved sun light utilization and suppression of the recombination of photogenerated charge carriers in ZnO–CuO nanocomposites.

USBAS-14.26

Paper Title: Ion beam induced evolution of surface morphology and optical properties of SnO₂-ZnO nanocomposite thin films

Author(s): Bhardwaj, N. and Mohapatra, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Ceramics International, Vol. 41, (2015), pp 8614-8622

ISSN No. : 0272-8842

Abstract: SnO₂-ZnO nanocomposite thin films, prepared by a simple carbothermal reduction based vapor deposition method, were irradiated with 8 MeV Si³⁺ ions for engineering the morphological and optical properties. The surface morphology of the nanocomposites was studied by atomic force microscopy (AFM), while the optical properties were investigated by photoluminescence spectroscopy (PL) and Raman spectroscopy. AFM studies on the irradiated samples revealed growth of nanoparticles at lower fluence and a significant change in surface morphology leading to the formation of nanosheets and their aggregates at higher fluences. A tentative mechanism underlying the observed ion induced evolution of surface morphology of SnO₂-ZnO nanocomposite is proposed. PL studies revealed strong enhancement in the UV emissions from the nanocomposite thin film at lower fluence, while a drastic decrease in the UV emissions along with a significant enhancement in the defect emissions has been observed at higher fluences..

USBAS-14.27

Paper Title: Rapid green synthesis of silver nanoparticles and nanorods using *Piper nigrum* extract

Author(s): Mohapatra, B.¹, Kuriakose, S.^{1,2} and Mohapatra, S.^{1,2}

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Source: Journal of Alloys and Compounds, Vol. 637, (2015), pp 119-126

ISSN No. : 0925-8388

Abstract: We report sun light driven rapid green synthesis of stable aqueous dispersions of silver nanoparticles and nanorods at room temperature using photoreduction of silver ions with *Piper nigrum* extract. Silver nanoparticles were formed within 3 min of sun light irradiation following addition of *Piper nigrum* extract to the AgNO₃ solution. The effects of AgNO₃ concentration and irradiation time on the formation and plasmonic properties of biosynthesized silver nanoparticles were studied using

UV–visible absorptionspectroscopy. The morphology and structure of silver nanoparticles were well characterized by atomicforce microscopy (AFM) and X-ray diffraction (XRD). The size of Ag nanoparticles increased with increase in irradiation time, leading to the formation of anisotropic nanostructures. Increasing the AgNO₃concentrationresulted in the formation of Ag nanorods. UV–visible absorption studies revealed the presence ofsurface plasmon resonance (SPR) peaks which red shift and broaden with increasing AgNO₃concentration.We have demonstrated a facile, energy efficient and rapid green synthetic route to synthesize stableaqueous dispersions of silver nanoparticles and nanorods.

USBAS-14.28

Paper Title: Plasmonic properties of Ag nanoparticles embedded in GeO₂-SiO₂ matrix by atom beam sputtering

Author(s): Mohapatra, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Physical Chemistry Chemical Physics, Vol. 18, (2016), pp 3878-3883

ISSN No. : 1463-9076

Abstract: Nanocomposite thin films containing Ag nanoparticles embedded in the GeO₂-SiO₂ matrix were synthesizedby the atom beam co-sputtering technique. The structural, optical and plasmonic properties andthe chemical composition of the nanocomposite thin films were studied by transmission electron microscopy(TEM) with energy dispersive X-ray spectroscopy (EDX), UV-visible absorption spectroscopy andX-ray photoelectron spectroscopy (XPS). UV-visible absorption studies on Ag–SiO₂nanocompositesrevealed the presence of a strong localized surface plasmon resonance (LSPR) peak characteristic of Agnanoparticles at 413 nm, which showed a blue shift of 26 nm (413 to 387 nm) along with a significantbroadening and drastic decrease in intensity with the incorporation of 16 at% of Ge into the SiO₂matrix. TEM studies on Ag-GeO₂-SiO₂ nanocomposite thin films confirmed the presence of Ag nanoparticleswith an average size of 3.8 nm in addition to their aggregates with an average size of 16.2 nm. Thermalannealing in air resulted in strong enhancement in the intensity of the LSPR peak, which showed a regularred shift of 51 nm (from 387 to 438 nm) with the increase in annealing temperature up to 500 °C.XPSstudies showed that annealing in air resulted in oxidation of excess Ge atoms in the nanocomposite intoGeO₂. Our work demonstrates the possibility of controllably tuning the LSPR of Ag nanoparticlesemerged in the GeO₂-SiO₂ matrix by single-step thermal annealing, which is interesting for opticalapplications.

USBAS-14.29

Paper Title: Enhanced CO gas sensing properties of Cu doped SnO₂ nanostructures prepared by a facile wet chemical method

Author(s): Bhardwaj, N.¹, Pandey, A.², Satpati, B.³, Tomar, M.⁴, Gupta, V.⁴, and Mohapatra, S.¹

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Source : Physical Chemistry Chemical Physics, Vol. 18, (2016), pp 18846-18854

ISSN No. : 1463-9076

Abstract: We report the synthesis of Cu doped SnO₂ nanostructures with enhanced CO gas sensing properties by a facile wet chemical method. The effects of Cu doping on the structural and optical properties of SnO₂ nanostructures were investigated using X-ray diffraction, field emission scanning electron microscopy (FESEM), transmission electron microscopy (TEM) and high resolution TEM (HRTEM) with energy dispersive X-ray spectroscopy, Raman spectroscopy and photoluminescence spectroscopy. FESEM studies revealed the presence of nanosheets and nanodisc-like structures in Cu doped SnO₂ samples. Gas sensing studies showed that the sensor prepared using 1% Cu doped SnO₂ nanostructures exhibits highly enhanced CO gas sensing properties as compared to pure SnO₂ nanostructures and shows excellent selectivity for CO with negligible interference from CH₄, CO₂ and NO₂. The possible mechanism for the enhanced CO gas sensing properties of Cu doped SnO₂ nanostructures is proposed.

USBAS-14.30

Paper Title: Ion beam engineering of morphological, structural and optical properties of Au/SnO₂ hybrid nanostructured thin films

Author(s): Bhardwaj, N.¹, Pandey, A.², Avasthi, D.K.³, and Mohapatra, S.¹

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Source: Journal of Alloys and Compounds, Vol. 680, (2016), pp 155-162

ISSN No. : 0925-8388

Abstract: Hybrid nanostructured thin films of Au/SnO₂ consisting of SnO₂ nanostructures decorated with Au nanoparticles were synthesized by thermal evaporation of nanostructured SnO₂ thin films combined with deposition of ultrathin Au films by sputtering. The synthesized Au/SnO₂ hybrid nanostructured thin films were irradiated with 8 MeV Si³⁺ ions at room temperature to fluences varying from 2×10^{14} to 5×10^{15} ions/cm². Effects of MeV ion irradiation on the morphological, structural and optical properties of Au/SnO₂ hybrid nanostructured thin films were studied using atomic force microscopy (AFM), field emission scanning electron microscopy (FESEM), X-ray diffraction (XRD), Raman spectroscopy, UV-Visible absorption spectroscopy and photoluminescence spectroscopy (PL). XRD studies revealed the presence of nanostructures of SnO₂, Au, Sn and Au-Sn alloy in the as-deposited thin films. XRD and AFM studies showed growth in size of nanostructures in the Au/SnO₂ hybrid nanostructured thin films upon ion irradiation. PL studies on as-deposited Au/SnO₂ hybrid nanostructured thin film revealed intense peaks at 382, 399, 419, 455 and 542 nm. MeV ion irradiation resulted in strong enhancement in UV emission and visible emissions from SnO₂ nanostructures in the Au/SnO₂ hybrid nanostructured thin films. Gas sensing studies showed that the sensor prepared using Au/SnO₂ hybrid nanostructured thin film exhibits highly enhanced CO gas sensing properties as compared to pure SnO₂ nanostructured thin film sensor and shows excellent selectivity for CO gas with negligible interference from CH₄, NH₃, CO₂ and SO₂. The mechanism underlying the enhanced gas sensing properties of Au/SnO₂ nanostructured thin film is tentatively proposed.

USBAS-14.31

Paper Title: Effects of MeV heavy ion irradiation on structural, morphological and optical properties of nanostructured SnO₂ thin films prepared by thermal evaporation

Author(s): Bhardwaj, N.¹, Pandey, A.², and Mohapatra, S.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Solid State Physics Laboratory, Defence Research and Development Organization, Timarpur, Delhi, 110054

Source : Journal of Alloys and Compounds, Vol. 656, (2016), pp 647-653

ISSN No. : 0925-8388

Abstract: We report on the effects of 8 MeV Si³⁺ ion irradiation on the structural, morphological and optical properties of nanostructured SnO₂ thin films, prepared by a simple thermal evaporation method. The structural and morphological evolution of nanostructured SnO₂ thin films upon MeV ion irradiation was studied by X-ray diffraction (XRD) and atomic force microscopy (AFM), while the optical properties of the thin films were characterized by Raman spectroscopy and photoluminescence spectroscopy (PL). XRD studies revealed the presence of nanocrystals of orthorhombic SnO₂ and cubic Sn in the as-deposited thin films. AFM studies revealed growth of SnO₂ nanoparticles in the films upon MeV ion irradiation. PL studies on the 8 MeV Si ion irradiated nanostructured SnO₂ thin films revealed strong enhancement in the intensity of UV and visible emissions from SnO₂ nanostructures.

USBAS-14.32

Paper Title: Radiation stability of Gd₂Zr₂O₇: effect of stoichiometry and structure

Author (s): Kumari, R.¹, Kulriya, P.K.¹, Grover, V.², Shukla, R.², Saravanan, K.², Mohapatra, S.³, Tyagi, A.K.² and Avasthi, D.K.¹

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Source: Ceramics International, Vol. 42, (2016), pp 103-109

ISSN No. : 0272-8842

Abstract: The dependence of radiation stability of Gd₂Zr₂O₇ on stoichiometry and structure under swift heavy ion irradiation was investigated. Gd₂Zr₂O₇, lies on the borderline of pyrochlore to fluorite phase transition, hence, it is highly sensitive to variations in the composition and/or synthesis conditions. The Gd₂Zr₂O₇ was synthesized in two sets (Set-A and -B) by solid state synthesis and gel combustion yielding different phases and stoichiometry as confirmed by Resonant Rutherford backscattering spectrometry (RRBS) and field emission scanning electron microscopy (FESEM). Both sets of Gd₂Zr₂O₇ were irradiated with 120 MeV Au ions with fluences varying from 3×10¹¹ to 1×10¹⁴ ions/cm². The pristine and irradiated samples were studied by X-ray diffraction (XRD) and Raman spectroscopy. The Set-A sample with pyrochlore structure remained crystalline upto the highest fluence 10¹⁴ ions/cm² employed, whereas Set-B sample having anion-deficient fluorite structure lost crystallinity at the fluence of 5×10¹³ ions/cm², as revealed by in-situ XRD experiment. The in-situ XRD along with Raman studies elucidated that sample synthesized using solid state reaction process exhibits better stability under swift heavy ion irradiation, implying that the sample with perfect stoichiometric pyrochlore structure possess better radiation stability.

USBAS-14.33

Paper Title: **Structural, optical and gas sensing properties of Ag-SnO₂ plasmonic nanocomposite thin films**

Author (s): Bhardwaj, N., and Mohapatra, S.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Ceramics International, Vol. 42, (2016), pp 17237-17242

ISSN No. : 0272-8842

Abstract: Nanocomposite thin films of Ag-SnO₂ were synthesized by simple thermal evaporation based vapor deposition method combined with thermal annealing. The morphological, structural, optical and plasmonic properties of the nanocomposite thin films were studied by field emission scanning electron microscopy (FESEM), X-ray diffraction (XRD) and UV–visible absorption spectroscopy. UV–visible absorption studies revealed surface plasmon resonance (SPR) peak at 421 nm confirming the presence of Ag nanoparticles in the nanocomposites. The annealed Ag-SnO₂ nanocomposites exhibited enhanced CO gas sensing properties including high sensitivity, fast response-recovery and good selectivity towards CO gas. A tentative mechanism for the enhanced CO gas sensing properties of Ag-SnO₂ nanocomposites is proposed.

USBAS-14.34

Paper Title: **Swift heavy ion irradiation of metal containing tetrahedral amorphous carbon films**

Author (s): Karaseov, P. A.¹, Protopopova, V. S.², Karabeshkin, K. V.¹, Shubina, E. N.¹, Mishin, M. V.¹, Koskinen, J.², Mohapatra, S.³, Tripathi, A.⁴, Avasthi, D. K.⁵ and Titov, A. I.¹

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Source: Nucl. Instr. and Meth. B379, (2016), pp 162-166

ISSN No. : 0168-583X

Abstract: Thin carbon films were grown at room temperature on (001) n-Si substrate using dual cathode filtered vacuum arc deposition system. Graphite was used as a source of carbon atoms and separate metallic electrode was simultaneously utilized to introduce Ni or Cu atoms. Films were irradiated by 100 MeV Ag⁷⁺ ions to fluences in the range 1×10^{10} – 3×10^{11} cm⁻². Rutherford backscattering spectroscopy, Raman scattering, scanning electron microscopy and atomic force microscopy in conductive mode were used to investigate film properties and structure change under irradiation. Some conductive channels having metallic conductivity type were found in the films. Number of such channels is less than number of impinging ions. Presence of Ni and Cu atoms increases conductivity of those conductive channels. Fluence dependence of all properties studied suggests different mechanisms of swift heavy ion irradiation-induced transformation of carbon matrix due to different chemical effect of nickel and copper atoms.

USBAS-15.01

- PaperTitle:** Ligand-dependent Transient Absorption Studies of Hybrid Polymer:CdSe Quantum Dot Composites.
- Author(s):** Sharma, S. N.; Vats, T.; Dhenadhayan, N.; Ramamurthy, P. and **Narula, A. K.**
- Affiliation(s):** University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
- Source:** Sol. Energy Mater. Sol. Cells, Vol. 100, (2012),pp 6.
- ISSN No.:** 0927-0248
- Abstract:** Elucidate the possibility to modulate charge/energy transfer rate between polymer and semiconductor quantum dots using a suitable ligand-exchange process. The various characterization techniques used in this work provide an insight into the charge separation, charge accumulation and/or trapping of charge carriers for the better understanding of hybrid organic-inorganic photovoltaics. (C) 2011 Elsevier B.V. All rights reserved.

USBAS-15.02

- PaperTitle:** Synthesis and Characterization of Diamide-Diimide-Diamines Based on P-Amino Benzoic Acid and their Curing and Thermal Behavior with Epoxy Blends Containing Phosphorus/Silicon in the Main Chain.
- Author:** Durga, G. and **Narula, A. K.**
- Affiliation:** University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
- Source:** Journal Appl. Polym. Sci., Vol. 124,(2012),pp 3685.
- ISSN No.:** 1097-4628
- Abstract:** Diimide-diacid (I) having an imide group in its rigid structure was synthesized by the refluxing of 3,3',4,4'-benzophenonetetracarboxylic dianhydride [4,4'-carbonyldipthalic anhydride (BTDA)] and p-amino benzoic acid in a mixture of acetic acid and pyridine (3 : 2 v/v). The chloroderivative of the diacid (I) was synthesized by its reaction with thionyl chloride, this was followed by condensation with different diamines with phenyl, naphthyl, ether, sulfide, and cardo groups to generate a series of diamide-diimide-diamines (DADIDAs). The resultant DADIDAs were characterized by elemental analysis and spectroscopic techniques, namely, Fourier transform infrared spectroscopy and NMR spectroscopy, and were used as epoxy curing agents to impart flame retardancy to the epoxy system. Two epoxy blends (designated as ES and EP) were prepared by the homogeneous mixing of diglycidyl ether of bisphenol A (DGEBA) with 1,3-bis(3-glycidyloxypropyl)tetramethyldisiloxane and DGEBA with tris(glycidyloxy)phosphine oxide: each in a ratio of 3 : 2 respectively. The synergistic effect of phosphorus/silicon with nitrogen on the thermal properties of the modified epoxy system was studied. The curing behavior of the epoxy resins formulated by the reaction of stoichiometric amounts of ES/EP with the synthesized DADIDAs were determined by differential scanning calorimetry, and the thermal stabilities of the cured epoxies were evaluated by thermogravimetric analyses (TGAs) under nitrogen and air. TGA indicated that the residual weight percentage of polymers at 800°C was in the range 36.4–60.0 in nitrogen, and in air, it was up to 6.5. However, the major loss in weight in air occurred at elevated temperature; this demonstrated their potential use as flame-retardant epoxy systems for electronic/electrical encapsulants.

USBAS-15.03

PaperTitle: Effect of Mercaptopropionic Acid as Linker on Structural, Thermal, and Optical Properties of TiO₂-CdSe Nanocomposites.

Author(s): Arya, S. K.; Vats, T.; Sharma, S. N.; Singh, K. and Narula, A. K.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: J. Therm. Anal. Calorim., Vol. 107, (2012), pp 555

ISSN No.: 1388-6150

Abstract: In this study, we have studied the stability of TiO₂-CdSe nanocomposites in which the individual moieties are linked using a bifunctional linker (mercaptopropionic acid). Nanoparticles of TiO₂ and CdSe are synthesized by sol-gel and one pot methods. The equimolar amount of the above particles is utilized to prepare nanocomposites with and without linker. These samples are characterized for their structural, thermal, and optical properties using X-ray diffraction (XRD), differential thermal analysis (DTA), thermogravimetric analysis (TG), Fourier transform infra-red spectroscopy (FTIR), and UV-Vis spectroscopy. The average particle size of TiO₂ and CdSe are 16 and 23 nm, respectively. The addition of a bifunctional linker shows remarkable effect on the properties of TiO₂-CdSe nanocomposites.

USBAS-15.04

PaperTitle: Curing Kinetics and Thermal Stability of Epoxy Blends containing Phosphorous- Oxirane with Aromatic Amide-Amine as Curing Agents.

Author: Durga, G. and Narula, A. K.

Affiliation: University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Chin. J. Polym. Sci., Vol. 30, (2012), pp 694

ISSN No.: 1793-7043

Abstract: This article describes the synthesis of a series of aromatic amide-amines and their potential use as epoxy hardeners. These amines were synthesized by the reaction of L-phenylalanine (PA) with diamines of different structures i.e. 1,4-phenylene diamine (PD), 1,5-diamino naphthalene (N), 4,4'-(9-fluorenylidene)-dianiline (F), 4,4'-diaminodiphenyl sulphide (DS) and 3,4'-oxydianiline (O) in stoichiometric ratio (1:1). Structural characterization of synthesized amide-amines was done with the help of elemental analysis and spectroscopic techniques viz. FT-IR, ¹H-NMR and ¹³C-NMR. An epoxy blend was prepared by mixing tris(glycidyl)oxy

USBAS-15.05

PaperTitle: Diorganotin Complexes of Carboxylates: Synthesis and Characterization.

Author(s): Chilwal, A.; Malhotra, P. and Narula, A. K.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: J. Coord. Chem., Vol. 66, (2013), pp 1046

ISSN No.: 0095-8972

Abstract: Diorganotin complexes of monoisopropyl and monomethyl nadate, succinate, and phthalate were synthesized and characterized by elemental analysis, FT-IR, ¹H NMR, ¹³C NMR, and ¹¹⁹Sn NMR spectroscopic techniques. The spectroscopic

investigation demonstrated that carboxylate is bidentate in the diorganotin complexes. On the basis of $1J(119\text{Sn}-^{13}\text{C})$ and $2J(119\text{Sn}-^1\text{H})$ values, C–Sn–C bond angles were also calculated. The newly synthesized complexes were also screened for their antibacterial activities against Gram-positive and Gram-negative pathogenic strains of bacteria.

USBAS-15.06

PaperTitle: Thermal Analysis of New Dimethyl/Dibutyl Tin (IV) Compounds with Amino Acid.

Author(s): Chilwal, A.; Malhotra, P. and Narula, A. K.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: J. Therm. Anal. Calorim., Vol. 114, (2013), pp 345

ISSN No.: 1388-6150

Abstract: or L-tryptophan (T) using acetonitrile as solvent and designated as MM1, MC, MT, BM1, BC, and BT. The structural characterization of dimethyltin(IV) and dibutyltin(IV) compounds were done using elemental analysis, FT-IR, ^1H -NMR, ^{13}C -NMR, and ^{119}Sn -NMR spectroscopy. The thermal properties of the synthesized compounds were studied by thermogravimetric analysis and differential scanning calorimetry techniques in a dynamic atmosphere of nitrogen. The thermal decomposition mechanisms were similar for compounds MM1, BM1, MC, BC, and occurred in one step, while in compounds MT and BT it occurred in two consecutive steps. The TG curves of the MT and BT compounds suggest the loss of the ligand (AA) in the first step, with probable formation of a tin oxide R_2SnO intermediate. At the end of the second step free tin is obtained similar to the MM1, BM1, MC, BC in accordance with the stoichiometry of the related compounds.

USBAS-15.07

PaperTitle: Synthesis, Characterization, and Thermal and Antibacterial Studies of Diorganotin(IV) Derivatives of Amino Acids.

Author(s): Chilwal, A. and Narula, A. K.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Phosphorus Sulfur Silicon Relat. Elem., Vol. 188, (2013), pp 1369

ISSN No.: 1563-5325

Abstract: Six diorganotin(IV) derivatives of α -amino acids with general formulae $[(\text{CH}_3)_2\text{SnAACl}]_2$ and $[(\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_2)_2\text{SnAACl}]_2$, where AA = L-alaninate, L-phenylalaninate, and L-isoleucinate, have been synthesized by reacting dimethyltin(IV) dichloride (M) and dibutyltin(IV) dichloride (B) with L-alanine (A) or L-phenylalanine (PA) or L-isoleucine (I) using acetonitrile as the solvent and designated as MA, MPA, MI, BA, BPA, and BI. These complexes have been characterized by elemental analysis, infrared (IR), ^1H NMR, ^{13}C NMR, and ^{119}Sn NMR spectroscopy. Thermal studies of all of the synthesized complexes were also carried out using thermogravimetric (TG) and differential scanning calorimetry (DSC) techniques. The thermal decomposition mechanisms were similar for MA, BA, MI, and BI and occurred in one step, while in compounds MPA and BPA, it occurred in two consecutive steps. The TG curves of MPA and BPA suggest the loss of the ligand (AA) in the first step, with probable formation of a tin oxide R_2SnO as an intermediate, and in the second step, free tin is obtained, similar to MA, BA, MI, and BI, in accordance with the stoichiometry of the related

derivatives. The diorganotin(IV) complexes have also been screened for their antibacterial activity against *Escherichia coli*, *Staphylococcus aureus*, *Staphylococcus epidermidis*, and *Pseudomonas aeruginosa*. The minimum inhibitory concentration values of these complexes show enhanced activity.

USBAS-15.08

Paper Title: Facile Synthesis of New Thermally stable and Organo-soluble Polyamide-imides from Phosphorus- Containing Aromatic Amines and Various Dianhydrides.

Author(s): Agrawal, S.; Narula, A. K.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh, Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Polymer Engineering, Vol. 33,(2013), pp509.

ISSN No.: 334-6447

Abstract: Imide ring containing novel polyamide-imides (PAIs) were prepared by triphenyl phosphite-activated polycondensation of phosphorus-containing aromatic amines, bis(3-aminophenyl)isopropyl phosphine (BAP) and bis(3-aminophenyl) aminotolyl phosphine (TAP), with various diimide-diacids (DIDAS). All polymers were fully characterized by FTIR, H-1-NMR, C-13-NMR, P-31-NMR spectroscopy and elemental analysis. These polymers showed no significant weight loss below 419 degrees C and glass transition temperatures (T-g) in the region of 231 degrees C-290 degrees C. The resulting polymeric films exhibited high optical transparency. The inherent viscosity of the synthesized polymers was in the range 0.55-0.85 dl/g and wide angle X-ray diffraction measurements revealed that these polymers were predominantly amorphous.

USBAS-16.01

Paper Title: Synthesis of PbTe thermoelectric film by high energy heavy ion beam mixing

Author(s): Gupta, S¹, D.C. Agarwal², Jai Prakash³, S.K. Tripathi⁴, Neeleshwar S.¹, B.K. Panigrahi⁵ and D.K. Avasthi²

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²Inter University Accelerator Centre, New Delhi-110067; ³Department of Chemistry, M.M.H (P.G) College, Ghaziabad-201001; ⁴Department of Physics, Panjab University, Chandigarh-160 014; ⁵Materials Science Division, Indira Gandhi Centre for Atomic Research, Kalpakkam-603102

Source: AIP Conference Proceedings, American Institute of Physics, Vol. 1393(1), (2011)

ISSN No.: 1551-7616

Abstract: The Te/Pb bilayer samples were prepared by sequential thermal evaporation of Pb and Te on glass substrate. These bilayer samples were irradiated by 100 MeV Ag⁹⁺ at different fluences (3×10^{12} , 1×10^{13} , and 3×10^{13} ions/cm²) to synthesis PbTe by ion beam mixing. The samples were characterized by RBS to study composition and X-ray diffraction (XRD) for phase identification before and after irradiation. Thickness of Pb and Te were 75 nm and 105 nm respectively in pristine film as deduced from RBS analysis. The RBS of irradiated sample indicates the mixing between Pb and Te layers. XRD revealed phases of PbTe in sample irradiated at 3×10^{13} ions/cm². This phase formation may be due to inter diffusion across the interface induced by swift heavy ion irradiation.

USBAS-16.02

Paper Title: Surface Roughness Effects on Seebeck Coefficient in Silicon ultra thin Films

Author(s): Manoj Kumar¹, Bagga A.² and Neeleshwar S.²

Affiliation(s): ¹Department of Physics Indian Institute of Technology Delhi, Hauz Khas New Delhi-110016; ²University School of Basic and Applied Sciences GGS Indraprastha University, Dwarka, New Delhi-110078

Source: The 4th IEEE International NanoElectronics Conference, IEEE, 2011

Abstract: Surface roughness effects play a crucial role in determining the performance of a device with dimensionality in the sub-50nm scale. In this work we theoretically investigate surface roughness effects on Seebeck coefficient of ultrathin silicon film using non equilibrium Green's function technique. To systematically study surface roughness effects, thickness of the film is varied periodically with square wave profile characterized by two parameters: amplitude(A0) and wavelength(λ). The results show that Seebeck coefficient increases with increasing roughness amplitude and frequency($1/\lambda$). It is found that current which flows through the device, due to temperature gradient, is reduced due to surface roughness. It is interesting to note that, though the current decreases, the voltage required to nullify this current increases. Due to this increase in voltage Seebeck coefficient increases.

USBAS-16.03

Paper Title: Effect of annealing temperature on the electrical characteristics of Platinum/4H-SiC Schottky barrier diodes

Author(s): S. Khannaaba^{1,2}, A. Noora¹, Neeleshwar, S.² and M.S. Tyagic³

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Source: International journal of electronics, Vol. 98(12), (2011), pp 1733-1741

ISSN No.: 1362-3060

Abstract: Pt/4H-SiC Schottky barrier diodes have been fabricated to investigate the effect of annealing on the electrical characteristics of the fabricated devices. The parameters such as barrier height, ideality factor and donor concentration were deduced from the current-voltage (I-V) and the capacitance-voltage (C-V) measurements at room temperature. Diodes showed non-ideal behaviour like high value of ideality factor and lower value of barrier height. A barrier height of 1.82 eV was obtained from C-V measurements and it was 1.07 eV when obtained from the I-V measurements with ideality factor 1.71 for as-deposited diodes at room temperature. The diodes, therefore, were annealed in the temperature range from 25°C to 400°C to observe the effect of annealing temperature on these parameters. Schottky barrier height and ideality factors were found to be temperature-dependent. After rapid thermal annealing upto 400C, a barrier height of 1.59 eV from C-V measurements and the value of 1.40 eV from I-V measurements with ideality factor 1.12 were obtained. Barrier heights deduced from C-V measurements were consistently larger than those obtained from I-V measurements. To come to terms with this discrepancy, we re-examined our results by including the effect of ideality factor in the expression of the barrier height. This inclusion of ideality factor results in reasonably good agreement between the values of barrier height deduced by the above two methods. We believe that these improvements in the electrical parameters result from the improvement in the quality of interfacial layer

USBAS-16.04

Paper Title: Tailoring of Seebeck coefficient with surface roughness effects in silicon sub-50-nm films

Author(s): Manoj Kumar¹, Bagga A.² and Neeleshwar S.²

Affiliation(s): ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Nanoscale research letters, Vol. 7(1), (2012), pp 1-8

ISSN No.: 1556-276X

Abstract: The effect of surface roughness on the Seebeck coefficient in the sub-50-nm scale silicon ultra thin films is investigated theoretically using nonequilibrium Green's function formalism. For systematic studies, the surface roughness is modelled by varying thickness periodically with square wave profile characterized by two parameters: amplitude (A_0) and wavelength (λ). Since high Seebeck coefficient is obtained if the temperature difference between the ends of device produces higher currents and higher induced voltages, we investigate how the generated current and induced voltage is affected with increasing A_0 and λ . The theoretical investigations show that pseudoperiodicity of the device structure gives rise to two effects: firstly the threshold energy at which the transmission of current starts is shifted towards higher energy sides and secondly transmission spectra of current possess pseudobands and pseudogaps. The width of the pseudobands and their occupancies determine the total generated current. It is found that current decreases with increasing A_0 but shows a complicated trend with λ . The trends of threshold energy determine the trends of Seebeck voltage with roughness parameters. The increase in threshold energy makes the current flow in higher energy levels. Thus, the Seebeck voltage, i.e. voltage required to nullify this current, increases. Increase in Seebeck voltage results in increase in Seebeck coefficient. We find that threshold energy increases with increasing A_0 and frequency ($1/\lambda$). Hence, Seebeck voltage and Seebeck coefficient increase vice versa. It is observed that Seebeck coefficient is tuneable with surface roughness parameters.

USBAS-16.05

Paper Title: Synthesis of bismuth telluride nanostructures by refluxing method.

Author(s): Gupta, S.¹, Neeleshwar, S.¹, Vinod Kumar¹, Y.Y. Chen²

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ² Institute of Physics, Academia Sinica, ROC, Taiwan,

Source: Adv. Mater. Lett, Vol. 3(1), (2012), pp 50-54

ISSN No.: 0976-397X

Abstract: Bismuth telluride (Bi₂Te₃) nano particles were prepared by refluxing method in different conditions such as varying concentration of KOH and reaction timings. X-ray diffraction (XRD) and transmission electron microscopy (TEM) measurements have been performed for structural and phase formation studies. The nanoparticles are showing the same structure of bulk except broadening of peak confirmed by XRD. The reaction time and KOH concentration are the key parameters to control the morphology and size of the particles. As the concentration of KOH increases, the particle size decreases from 23 to 15 nm and with increasing reaction time, nanorod like structures (~100 nm length and ~ 20 nm diameter) are formed.

USBAS-16.06

Paper Title: PbTe formation by swift heavy ion beam induced interface mixing of Te/PbO bilayer

Author(s): Gupta, S.¹, D.C. Agarwal², Jai Prakash³, S.A. Khan⁴, S.K. Tripathi⁴, A. Tripathi², Neeleshwar, S.¹, S.K. Srivastava^e, B.K. Panigrahi⁶, R.Chandra⁷, D.K. Avasthi²

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Source: Nuclear Instruments and Methods in Physics Research Section B: Beam Interactions with Materials and Atoms, Vol. 289, (2012), pp 22-27

ISSN No.: 0168-583X

Abstract: The present work reports on the PbTe formation by swift heavy ion beam induced mixing of the bilayer of PbO and Te. Rutherford backscattering spectra (RBS) of pristine and irradiated samples reveal strong mixing with mixing rate at least an order of magnitude higher than that reported in other systems. X-ray diffraction (XRD) study reveals the formation of PbTe phase in irradiated samples, which is further confirmed by transmission electron microscopy (TEM). The observed ion beam mixing is attributed to the inter-diffusion of atomic species across the interface during transient melt phase, in the framework of thermal spike model.

USBAS-16.07

Paper Title: Electrical Characterization Of Nichrome/4h-Sic Schottky Diodes

Author(s): Khanna, S.¹, Arti Noor², Neeleshwar, S.³,

Affiliation(s): ¹JSS Academy of Technical Education, Noida, Uttar Pradesh; ² School of Electronics, Centre for Development of Advanced Computing Noida, Uttar Pradesh; ³University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Electron Devices, Vol. 18, (2013), pp 1514-1520

ISSN No.: 1682 -3427

Abstract: Schottky barriers have been made by evaporation of Nichrome at a pressure of 1×10^{-6} Torr onto n-type 4H-SiC. Electrical characteristics of the fabricated diodes were analyzed by current-voltage (I-V) and capacitance-voltage (C-V) techniques initially at the room temperature. Electronic parameters such as barrier height, ideality factor, donor concentration were determined. The barrier height of 0.88eV obtained from C-V measurements and 0.83eV obtained from the I-V measurements with ideality factor of 1.98 for as-deposited diodes at room temperature. Diodes showed non-ideal behavior like high ideality factor and lower barrier height at room temperature. These diodes therefore were annealed for the improvement of the Schottky parameters in the temperature range from 250C4000C. The consequently calculated Schottky barrier height (SBH) and ideality factors are found to be temperature dependent. After rapid thermal annealing (RTA) up to 4000C barrier height of 1.38 eV from C-V measurements and the value of 1.34 eV were obtained from I-V measurements with ideality factor of 1.11. We believe that improvement in electrical parameters result from the improvement in the quality of interfacial layer.

USBAS-16.08

Paper Title: Study of ion beam synthesized nanostructured PbTe surface

Author(s): Gupta, S.¹, D.C.Agarwal², S.K.Tripathi³, A.Tripathi², Neeleshwar, S.¹, D.K.Avasthi²

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Source: Applied surface science, Vol. 265, (2013), pp 124-129

ISSN No.: 0169-4332

Abstract: Vertically protruding out nano structures of PbTe are synthesized by ion beam mixing of Te/PbO bilayer using 100 MeV Ag ions. Scanning electron microscopy (SEM) and atomic force microscopy (AFM) of pristine and irradiated samples are performed to study surface structures. Power spectral density (PSD) spectra of the structures at different fluences have been determined from AFM micrograph. The values of roughness and growth exponent, deduced from PSD, are far from any universality classes. Results distinctly indicate the unstable growth and rapid roughening of surface under swift heavy ion (SHI) bombardment.

USBAS-16.09

Paper Title: Superiority of ion irradiation over annealing for enhancing the thermopower of PbTe thin films

Author(s): Gupta, S.¹, D.C.Agarwal², S.K.Tripathi³, Neeleshwar, S.¹, B.K.Panigrahi⁴, A.Jacquot⁵, B.Lenoir⁶, D.K.Avasthi²

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Source: Radiation Physics and Chemistry, Vol. 86, (2013), pp 6-9

ISSN No.: 0969-806X

Abstract: Present study reveals that swift heavy ion (SHI) irradiation enhances thermoelectric properties and the annealing deteriorates thermoelectric performance of PbTe thin film. X-ray diffraction (XRD), Atomic force microscopy (AFM) and Rutherford backscattering spectrometry (RBS) measurements are performed for phase formation, surface morphology and elemental composition of all the samples, respectively. Electrical conductivity (σ) and thermo power (S) measurement of all the samples have also been measured using four probe method. The increase in thermo power (S) is ~40% upto high temperature (~520 K) after irradiation whereas it decreases on annealing treatment. These findings are discussed on the basis of density of states enhancement or carrier scattering due to the point defects after SHI irradiation.

USBAS-16.10

Paper Title: PbTe nanocrystal formation by interface mixing of Te/Pb bilayer using low energy ions

Author(s): Gupta, S.¹, D.C.Agarwal², S.A.Khan², Neeleshwar, S.¹, SunilOjha², Sanjeev Srivastava³, A.Tripathi², S.Amirthapandian⁴, B.K.Panigrahi⁴, D.K.Avasthi²

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Source: Materials Science and Engineering: B, Vol. 184, (2014), pp 58-66

ISSN No.: 0921-5107

Abstract: PbTe nanocrystals are synthesised using low energy ion beam mixing of a Te/Pb bilayer on a Si substrate. The bilayer films are irradiated using 90 keV Ar⁺ ions and 140 keV Kr⁺ ions at different fluences ranging from 3×10^{15} ions/cm² to 3×10^{16} ions/cm². The samples are characterised by resonant Rutherford backscattering spectrometry (RRBS) for determination of presence of oxygen and for ion beam mixing analysis. The simulation of RRBS spectra reveals the mixing of Te and Pb layers with ion irradiation and sputtering of Te and Pb. High-resolution transmission electron microscopy (HRTEM) and atomic force microscopy (AFM) are used to study the phase formation and change in surface morphology of the pristine and irradiated films. HRTEM confirms the formation of PbTe nanocrystals of ~3–5 nm. The present work reveals that local spherical thermal spike contributes significantly to the mixing process whereas the possibilities of mixing at interface by ballistic process and radiation enhanced diffusion are rather low.

USBAS-16.11

Paper Title: Two Dimensional-Lead Selenide (PbSe) Nanosheets for Renewable Energy Applications

Author(s): Khasimsaheb¹, B.,Neeleshwar¹, S., Amirthapandiyan², S., Panigrahi², B. K.

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078, ²Materials Physics Division, Materials Science Group, Indira Gandhi Center for Atomic Research (IGCAR), Kalpakam, Tamilnadu

Source: Advanced Science Letters, Vol. 20(7-8), (2014), pp 1383-1386

ISSN No.: 1936-6612

Abstract: In the present work nanosheets of PbSe were fabricated by refluxing method. These synthesized nanosheets were characterized using X-ray Diffraction (XRD), Energy Dispersion Spectrum (EDS), High Resolution-Transmission Electron Microscope (HR-TEM) and Selective Area Electron Diffraction (SAED). Simple cubic structure of as prepared sample was confirmed using XRD which was in coordination to bulk except the line broadening of the peaks which is due to quantum size effect. The data obtained from XRD was reconfirmed using SAED which gave similar results. Atomic ratio of Pb and Se was confirmed as 1:1 using EDS. Particle size distribution, crystalline nature of the prepared sample as well as the structural phase was further confirmed by HRTEM, which certifies nanosheets with an average length and width of approximately 9 nm and 6 nm respectively.

USBAS-16.12

Paper Title: Thermoelectric properties of spark plasma sintered lead telluride nanocubes.

Author(s): BayikadiKhasimsaheb (a¹),Neeleshwar S. (a¹), Mandava Srikanth (a¹), SivaiahBathula (a²), Bhasker Gahtori (a²), Avanish Kumar Srivsatava (a²), Ajay Dhar (a²), AmirthapandianSankarakumar (a³), Binaya Kumar Panigrahi (a³), Sriparna Bhattacharya (a⁴), Ramakrishna Podila (a⁴) and Apparao M. Rao (a⁴)

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Source: Journal of Materials Research, Vol. 30(17), (2015), pp 2638-2648

ISSN No.: 0884-2914

Abstract: We report a cost-effective, surfactant-free, and scalable synthesis technique for lead telluride (PbTe) nanocubes by a chemical precipitation method. The high-resolution transmission electron microscopy studies indicated the evolution of nucleation centers (spherical) into nanocubes with the addition of the Pb and Te atoms. The spark plasma sintered PbTe nanocubes exhibited an enhanced Seebeck coefficient, $S > +400 \mu\text{V}$, higher than the reported values of the bulk PbTe over an extended temperature range of 300–425 K, and a moderate electrical conductivity, $\sigma \sim 8000 \text{ S/m}$ at 300 K. A significant reduction in the lattice thermal conductivity was observed due to effective phonon scattering from the presence of numerous interfaces introduced by nanostructuring. The resulting figure-of-merit (ZT) ~ 0.45 at 300 K is higher than the reported values at this temperature in other PbTe nanostructures. Moreover, a moderate thermoelectric compatibility factor makes the PbTe nanocubes a potential candidate for green energy generation.

USBAS-16.13

Paper Title: The intrinsic thermal conductivity of SnSe.

Author(s): Pai-Chun, Wei¹,Bhattacharya S.², He J.², Neeleshwar, S.³,Podila, R.², Chen Y.Y.¹, Rao, A.M.²

Affiliation(s):¹Institute of Physics, Academia Sinica, Taipei 11529, Taiwan. email: chenyl2@phys.sinica.edu.tw;²Clemson Nanomaterials Institute and Department of Physics and Astronomy, Clemson University, Clemson, South Carolina 29634, USA. email: arao@clemson.edu email: bbhatta@g.clemson.edu;³University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078.

Source: Nature, (2016), E1-E2

ISSN No.: 539-7627

Abstract: Several groups have been unable to reproduce the record high thermoelectric figure of merit ZT of SnSe reported in ref. 1. Zhao *et al.* measured an ultralow thermal conductivity ($<0.4 \text{ W m}^{-1} \text{ K}^{-1}$ at 923 K) and consequently record high values of $ZT \approx 2.6 \pm 0.3$ and $ZT \approx 2.3 \pm 0.3$ at 923 K along the b and c directions, respectively, in their single-crystalline SnSe. However, after careful analysis of the data of ref. 1, we deduce that their samples are not fully dense and thus not truly single crystalline, implying that their reported thermal conductivities are not intrinsic to SnSe. This warrants further investigation into intrinsic thermal transport in SnSe single crystals and its use as a thermoelectric material.

USBAS-17.01

Paper Title: Effects of Flavor dependence on Weak decays of J/psi and Upsilon

Author(s): Dhir, R., Verma R.C. and Sharma, A.C.,

Affiliation(s): Department of Physics and IPAP, Yonsei University, Seoul 120-749, Korea. Department of Physics, Punjabi University, Patiala – 147002. University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Advances of High Energy Physics, Vol. 2013, (2014)

ISSN No.: 1687-7357

Abstract: We carry out a detailed analysis of effects of flavor dependence of average transverse quark momentum inside a meson on and transition form factors and two-body weak hadronic decays of J/ψ and Υ employing the factorization scheme. We predict the branching ratios of semileptonic and nonleptonic weak decays of J/ψ and Υ mesons in Cabibbo-angle-enhanced and Cabibbo-angle-suppressed modes.

USBAS-17.02

Paper Title: Measurement of natural radioactivity, radon exhalation rate and radiation hazard assessment in Indian cement samples

Author(s): Sharma, A.¹, Mahur, A.K.³, Yadav, M.⁴, Sonkawade R.G.⁵, Sharma, A. C.¹, Ramola, R.C.⁴ and Prasad R.³

Affiliation(s): School of Physical Science, B.B.A. University Lucknow-226 025; University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078. Department of Applied Science, Vivekananda College of Technology and Management Aligarh-202001 ; Department of Physics, H. N. B. Garhwal University, Badshahi Thaul Campus, Tehri Garhwal 249 199, Uttarakhand, Inter- University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067

Source: Physics Procedia, Vol. 80, (2015), pp 135-139

ISSN No.: 1875-3892

Abstract: Building materials are assumed to be the second source of Radon inside buildings. Due to low level of radon emanation from these materials, long term measurements are needed. Radiation doses from the building materials vary depending upon the natural radionuclides ^{226}Ra , ^{232}Th and their daughter products and ^{40}K present in them. Cement is the main and important component used in the construction of buildings in many countries. These radio nuclides pose exposure risk due to their gamma ray emission and internally due to radon and its progeny that emit alpha particles. In the present study radon exhalation rate and the activity concentration of ^{226}Ra , ^{232}Th and ^{40}K radionuclides in cement samples used in Aligarh region (U.P.), India have been measured by “Sealed Can technique...”

USBAS-17.03

Paper Title: Measurement of indoor Radon, Thoron in dwelling of Delhi, India using double dosimeter cups with SSNTDS.

Author(s): Sharma, A.¹, Mahur, A.K.², Sonkawade, R.G.³, Sharma, A. C.¹,

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078. Department of Applied Science, Vivekananda College of Technology and Management Aligarh-202001; Inter- University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067

Source: Physics Procedia, Vol. 80, (2015), pp 125-127

ISSN No.: 1875-3892

Abstract: In present study, Solid State Nuclear Track Detectors (SSNTDS) based twin chamber dosimeter cups were used for estimating Radon (²²²Rn) and Thoron (²²⁰Rn) gas concentration levels in the environmental air of normal background radiation area in thirty one dwellings of Dwarka city of New Delhi, India which were constructed by bricks, cement and concrete. LR-115 type-II, films were used as detector. In the studied dwellings Radon concentration levels were found to vary from 4.4 ± 1.6 to 29.82 ± 3.8 Bqm-3 whereas thoron concentrations is found to vary from 2.77 ± 0.5 to 13.63 ± 1.7 Bqm-3 The annual effective dose from radon were found to vary from 0.12 to 0.86 mSv whereas from thoron found to vary from 0.01 to 0.07 mSv.

USBAS-17.04

Paper Title: Measurement of Radon exhalation Rate in Sand samples from Gopalpur and Rushikulya beach Orissa, Eastern India

Author(s): Mahur A.K.¹, Sharma A.², Sonkawade, R.G.³, Sengupta, D.⁴, Sharma, A. C.², and Prasad R.¹

Affiliation(s): Department of Applied Science, Vivekananda College of Technology and Management Aligarh-20200; ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; Inter-University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067; Department of Geology and Geophysics, IIT Kharagapur, 721302

Source: Physics Procedia, Vol. 80, (2015), pp 140-143

ISSN No.: 1875-3896

Abstract: Natural radioactivity is wide spread in the earth's environment and exists in various geological formations like soils, rocks, water and sand etc. The measurement of activities of naturally occurring radionuclides ²²⁶Ra, ²³²Th and ⁴⁰K is important for the estimation of radiation risk and has been the subject of interest of research scientists all over the world. Building construction materials and soil beneath the house are the main sources of radon inside the dwellings. Radon exhalation rate from building materials like, cement, sand and concrete etc. is a major source of radiation to the habitants. In the present studies radon exhalation rates in sand samples collected from Gopalpur and Rushikulya beach placer deposit in Orissa are measured by using "Sealed Can technique" with LR-115 type II nuclear track detectors. In Samples from Rushikulya beach show radon activities varying from 389 ± 24 to 997 ± 38 Bq m-3 with an average value of 549 ± 28 Bq m-3. Surface exhalation rates in these samples are found to vary from 140 ± 9 to 359 ± 14 mBq m-2 h-1 with an average value of 197 ± 10 mBq m-2 h-1, whereas, mass exhalation rates vary from 5 ± 0.3 to 14 ± 0.5 mBq kg-1 h-1 with an average value of 8 ± 0.4 mBq kg-1 h-1. Samples from Gopalpur radon activities are found to vary from 371 ± 23 to 800 ± 34

Bq m⁻³ with an average value of 549 ± 28 Bq m⁻³. Surface exhalation rates in these samples are found to vary from 133 ± 8 to 288 ± 12 mBq m⁻²h⁻¹ with an average value of 197 ± 10 mBq m⁻² h⁻¹, whereas, mass exhalation rates vary from 5 ± 0.3 to 11 ± 1 mBq kg⁻¹ h⁻¹ with an average value of 8 ± 0.4 mBq kg⁻¹ h⁻¹.

USBAS-17.05

Paper Title: Topological Analysis of Bottom meson decays emitting two Pseudoscalar Mesons

Author(s): Kaur M., Dhir, R., Sharma, A.C., Verma, R.C.

Affiliation(s): University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: 'Physics of Particles and Nuclei Letters', Vol. 12(2), (2015), pp 230-237

ISSN No.: 1819-5957

Abstract: We investigate weak nonleptonic decays of *B* mesons emitting two pseudoscalar (*P*) mesons for Cabibbo-Kobayshi-Maskawa enhanced as well as suppressed modes. We employ the Quark Diagram Scheme at SU(3) level for various weak quark-level processes responsible for these decays. Several relations are obtained among their decays amplitudes and the corresponding branching fractions for which some experimental data exist.

USBAS-17.06

Paper Title: Natural radioactivity and radiological hazard assessment of coal samples collected from Kasimpur Thermal Power plant, Kasimpur (U.P.), India

Author(s): Sharma, A.¹, Sonkawade, R.G.², and Sharma, A. C.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; Inter- University Accelerator Centre, Aruna Asaf Ali Marg, New Delhi-110067

Source: International Journal of Low Radiation, Vol. 10(2), (2015)

ISSN No.: 17419190

Abstract: Low-level gamma ray spectroscopy with a NaI (TI) gamma radiation detector was used for the measurement of activity concentrations of radionuclides ²²⁶Ra, ²³²Th and ⁴⁰K. Activity concentrations of radium were found to vary from 12 to 39 Bq kg⁻¹, thorium ranged from 15 to 49 Bq kg⁻¹ whereas ⁴⁰K ranged from 157 to 460 Bq kg⁻¹. Radium equivalent activity has been found to vary from 50.8 to 118 Bq kg⁻¹ and absorbed gamma dose rates varied from 24 to 53.2 nGy h⁻¹ whereas corresponding outdoor annual effective dose found to vary from 0.029 to 0.065 mSv y⁻¹. The calculated values of Hex and Hin range from 0.13 to 0.31 and 0.16 to 0.41 respectively whereas values of gamma and alpha index vary from 0.19 to 0.42 and 0.06 to 0.19 respectively. The values of hazard index are under the action limit.

USBAS-18.01

Paper Title: Monodisperse Co, Zn-Ferrite nanocrystals: Controlled synthesis, characterization and magnetic properties

Author(s): Kumar, S.¹, Singh, V.², Aggarwal, S.², Mandal, U.K.³, Kotnala, R.K.⁴

Affiliation(s): ¹University of Petroleum & Energy Studies, Dehradun 248007; ²School of Basic and Applied Sciences; ³University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ⁴National Physical Laboratory, New Delhi 110012

Source: J. Magn. Magn. Mater., Vol. 324, (2012), pp 3683–3689

ISSN No.: 0304-8853

Abstract: Co_xZn_yFe_{3-x-y}O₄ ferrite (x=1 to 0; y=0 to 1) nanocrystals have been synthesized by reverse microemulsion method. The nanocrystals are then comprehensively characterized by X-ray diffraction, Fourier transform infrared spectroscopy, Field emission transmission electron microscopy (FETEM), and magnetic properties were measured by using Vibrating sample magnetometer. X-ray analysis showed that all the crystals were cubic spinel. The lattice constant increased with the increase in Zn substitution. FETEM reveals that particle size varies in the range from 3 to 6 nm. As the concentration of Zn increases the magnetic behavior varies from ferromagnetic at y=0 and 0.2 to superparamagnetic to paramagnetic at y=1. The Curie temperature decreases with increasing concentration of Zn.

USBAS-18.02

Paper Title: Nanocrystalline Co_{0.5}Zn_{0.5}Fe₂O₄ ferrite: Synthesis, characterization and study of their magnetic behavior at different temperatures

Author(s): Kumar, S.¹, Singh, V.², Mandal U.K.², Kotnala R.K.³,

Affiliation(s): ¹University of Petroleum & Energy Studies, Dehradun 248007; ²University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ³National Physical Laboratory

Source: InorganicaChim. Acta., Vol. 428, (2015), pp 21–26

ISSN No.: 1873-3255

Abstract: Co_{0.5}Zn_{0.5}Fe₂O₄ ferrite nanocrystals with average diameter in the range of 5–6 nm have been synthesized by reverse microemulsion technique. X-ray diffraction (XRD), transmission electron microscopy (TEM) and vibrating sample magnetometer (VSM) are used to characterize the structural, morphological, and magnetic properties. X-ray analysis showed that the nanocrystals possess cubic spinel structure. The absence of hysteresis, negligible remanence, and coercivity at 300 K indicate the superparamagnetic character and single domain in the nanocrystalline Co_{0.5}Zn_{0.5}Fe₂O₄ ferrite materials. The nanocrystalline Co_{0.5}Zn_{0.5}Fe₂O₄ ferrite was annealed at 600 °C. As a result of heat treatment, the average particle size increases from 5 nm to 7 nm and the corresponding magnetization value increases to 15.94 emu/g at 300 K. However, at a low temperature of 100 K, the annealed samples show hysteresis loop which is the characteristic of a superparamagnetic to ferromagnetic transition. A comparative study of the magnetic properties of Co_{0.5}Zn_{0.5}Fe₂O₄ ferrite nanocrystals obtained from (1) reverse microemulsion and (2) chemical co-precipitation route has also been carried out.

USBAS-19.01

Paper Title: Removal of organophosphorus (OP) pesticide residues from vegetables using various washing solutions and boiling

Author(s): Satpathy, G.¹, Tyagi, Y.K.¹, and Gupta, R.K.²

Affiliation: ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Biotechnology, Dwarka, Delhi-110078

Source: Journal of Agricultural Science, Vol.4 (2),(2015), pp 69-78

ISSN No.: 1916-9752

Abstract: In a monitoring study, the effects of household processing on removal of organophosphate residues (malathion, fenitrothion, formothion, parathion, methyl parathion and chlorpyrifos) in tomato, bean, okra, eggplant, cauliflower and capsicum were studied. The processes included washing separately with (water, 0.9 % NaCl, 0.1 % NaHCO₃, and 0.1 % acetic acid, 0.001 % KMnO₄, 0.1 % ascorbic acid, 0.1 % malic acid and 0.1 % oxalic acid and 2 % aqueous solution of raw *Spondias pinnata* (SP)) and boiling. Organophosphorous (OP) residues were estimated (for real market samples and spiked samples) using multi residue analytical technique employing with capillary gas chromatograph with mass spectrometry detector (GCMSD). In all of the vegetables, washing with different household chemicals reduced the residues by 20-89 % and boiling reduced the residues by 52-100 %. Boiling of vegetables was found to be more effective than washing in dislodging the residues.

USBAS-19.02

Paper Title: Development and Validation of Multi-Residue Analysis of 82 Pesticides in Grapes and Pomegranate as per the Requirements of the European Union (EU) and Codex Alimentarius Using GC-MS/MS with Compound Based Screening

Authors: Satpathy, G.¹, Tyagi, Y.K.¹, and Gupta, R.K.²

Affiliation: ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Biotechnology, Dwarka, Delhi-110078

Source: American Journal of Food Science and Technology, Vol. 2(2),(2014), pp 53-61

ISSN No.: 2333-4827

Abstract: The Quick Easy Cheap Effective Rugged and Safe (QuEChERS) multiresidue method has been validated for the extraction of 82 pesticides belonging to various chemical classes from grapes and pomegranate (commodities with high sugar and low lipid contents). A mixture of 82 pesticides amenable to gas chromatography (GC) was quantitatively recovered from spiked grapes and pomegranate and determined using gas chromatography tandem mass spectrometry (GC-MS/MS). The method employed involved initial extraction in a water/ethyl acetate system, an extraction/partitioning step after the addition of salt, and a cleanup step utilizing dispersive solid-phase extraction (d-SPE); this combination ensured that it was a rapid, simple and cost-effective procedure. The method setup is streamlined with the new software approach of Compound Based Scanning (CBS). The matrix-matched calibration results have demonstrated good reproducibility, robustness and linearity. The spiking levels for the recovery experiments were 0.005, 0.01 and 0.1 mg kg⁻¹ for GC-MS/MS analyses. Adequate pesticide quantification and identity confirmation were attained, even at the lowest concentration levels, considering the high signal-to-noise ratios, the very good accuracies and precisions, as well as the good matches between the observed ion ratios. Mean recoveries mostly ranged

between 70 and 110 % (91% on average), and RSD were generally below 12% (7.3% on average). The use of analyte protectants during GC analysis was demonstrated to provide a good alternative to the use of matrix-matched standards to minimize matrix-effect-related errors. For all compounds LODs were 0.001 to 0.005 mgkg⁻¹ and LOQs were 0.005 to 0.020 mgkg⁻¹. Correlation coefficients of the calibration curves were >0.991. Based on these results, the methodology has been proven to be highly efficient and robust and thus suitable for monitoring the Maximum Residual Limit (MRL) compliance of a wide range of commodity/pesticide combinations.

USBAS-19.03

Paper Title: Effects of edible coatings on the shelf life and quality of potato (*Solanum tuberosum L.*) tubers during storage

Author(s): Anuradha,Saha¹, Rajinder, K. Gupta² and Tyagi, Y.K.¹

Affiliation: ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078;²University School of Biotechnology, Dwarka, Delhi-110078

Source: Journal of Chemical and Pharmaceutical Research, Vol.6(12), (2014), pp802-809

ISSN No.: 0975 – 7384

Abstract: The effects of different edible coating on the quality and shelf life of potatoes during 60 days of storage at 20 ±1°C were investigated. Four different combinations of chitosan with whey protein and coconut oil (lipid) have been used. The potato tubers were coated and stored along with uncoated (control) potato tubers. They were periodically tested for different quality attributes like visual appearance, weight loss, respiration rate, soluble solids, pH, ascorbic acid, firmness and decay percentage. The results indicated that coated potatoes showed reduced rate of weight loss, respiration, decay percentage, soluble solids, shrinking and wrinkle development compared with uncoated. The shelf life of coated potatoes increased to 60 days compared to control (uncoated) ones which lasted up to 45 days, thereby offering a large advantage.

USBAS-19.04

Paper Title: Development of chitosan based edible coatings to study sapota (Manilkara zapota) fruit shelf life

Author(s): Anu, Ahlawat², Anuradha, Saha¹, Tyagi, Y.K.¹ and Rajinder, K. Gupta².

Affiliation: ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078;²University School of Biotechnology, Dwarka, Delhi-110078

Source: Journal of Chemical and Pharmaceutical Research, Vol.7(1),(2015), pp 879-885

ISSN No.: 0975-7384

Abstract: Edible coatings with different proportion of chitosan have been chosen and their effectiveness in sapota quality was investigated. The effects of these coatings on the weight loss, respiration rate, total soluble solids, pH, titratable acidity, ascorbic acid, firmness and decay incidence of coated fruit were studied at 21±1 °C and 75-80% Relative humidity for 14 days. The results revealed a lesser weight loss and respiration rate for the 1.5% chitosan coated fruits followed by 1%, 0.5% chitosan and uncoated fruits, respectively. After two weeks, a lower concentration of total soluble solids (19.57 °Brix) was observed in 1.5% chitosan treated fruit followed by 1% and 0.5% coating in comparison to uncoated (21.09 °Brix). No deterioration was observed in 1.5% chitosan coated sapota, shriveling was observed in 0.5% treatment (50 %). The results suggested that using 1.5% chitosan as an edible coating was more

effective than 1% and 0.5% in maintaining the quality attributes and visual appearances after 14 days of storage and can extend the post harvest life.

USBAS-19.05

Paper Title: Edible coating and its effect on shelf life and quality of Hachiya“, an astringent variety of persimmon fruit

Author(s): Anuradha, Saha¹, Rajinder, K. Gupta², Ram, Roshan, Sharma³, Kuldeep, Kumar³ and Tyagi, Y.K.¹.

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Biotechnology, Dwarka, Delhi-110078; ³Division of Food Sciences & Post harvest Technology, Indian Agricultural Research Institute, New Delhi 110012.

Source: Asian Journal of Biochemical and Pharmaceutical Research, Vol. 3(5),(2015), pp 182-192

ISSN No.: 2231-2560

Abstract: Persimmon (*Diospyros kaki* L.) is a subtropical fruit due to which it has short postharvest life. We have investigated the effect of gum arabic, guar gum and chitosan based edible coatings blended with suitable plasticizer on the postharvest quality and shelf life of persimmon fruits. Fruits were dipped in different edible coating solution for 1 minute, followed by air drying at room temperature and stored at 25±2°C and 50±5% RH for 15 days. Changes in shelf life, weight loss, firmness, total antioxidant activity, total phenol contents, color and sensory evaluation were evaluated. The results showed that fruit shelf life was significantly increased by edible coating treatment. Application of 1.0 % guar gum, 1 and 1.5 % chitosan delayed weight loss (5.4% and 4.5% lower than non-coated fruits respectively), colour development and retained greater total antioxidant activity, total phenolic compounds and firmness compared to the control (non-coated) treatments. No significant differences were observed in fruit shelf life between the two concentrations of gum arabic coating. These results demonstrated that postharvest chitosan and guar gum application has potential to extend shelf life and maintain quality of harvested 'Hachiya' persimmon fruit. The coating of guar gum and chitosan displayed increased shelf life by 20 days. The sensory evaluation of coated persimmon fruit for taste, colour, texture and overall acceptability further confirmed the findings.

USBAS-19.06

Paper Title: Nutraceutical potential and phytochemical screening of *Buchanania lanzan*, an underutilized exotic Indian nut and its use as a source of functional food

Author(s): Nazia, Khatoon¹, Rajinder, K. Gupta², Tyagi, Y.K.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Biotechnology, Dwarka, Delhi-110078

Source: Journal of Pharmacognosy and Phytochemistry, Vol. 4(1),(2015), pp 87-94

ISSN No.: 2278-4136

Abstract: The seeds of an underutilized exotic fruit Chironji, *Buchanania lanzan* (Anacardiaceae) were investigated for their nutritional, phytochemical and antioxidant properties to understand its nutraceutical potential. The nutritional analysis showed good protein content (43.24 %), moderate carbohydrate content (12.96 %), and high amount of crude fiber (18.50 %), fat (38 %) and also high calorie value (229.99kCal). ICP-OES analysis has shown these edible seeds contain

Iron (4.8mg/100g), Phosphorous (593mg/100g), Magnesium (275mg/100g) and Calcium (70mg/100g) in considerable amount and Manganese, Copper, Barium, Aluminium and Boron in trace amounts. A thorough physiochemical characterization of the seeds demonstrates that it as an active source of phenolics, natural antioxidants and minerals. Total phenolics and flavanoid content in petroleum ether extract (PEE), dichloromethane extract (DCME), methanolic extract (ME) and ethanol and water extract (EWE) were 5.78, 6.73, 10.05 and 13.42 $\mu\text{g GAE mg}^{-1}$ and 13.74, 7.08, 5.21 and 11.41 $\mu\text{g CE mg}^{-1}$ respectively. Antioxidant activities were carried out using FRAP assay and the results reveal that EWE and ME showed the highest antioxidant activity 13.42 and 10.05 $\mu\text{g BHTg}^{-1}$ respectively. Moreover EWE and ME showed antibacterial activity against *S. flexneri* and *B. cereus* strain. Antifungal assay was also carried against three test organisms. GC/MS Screening confirms the presence of considerable amounts of fatty acids, plant sterols and phenolic compounds. The oil of seeds was extracted by cold pressing and analyzed for the fatty acid profile which revealed the presence of polyunsaturated fatty acid such as Linolenic Acid (ω -3) and Linoleic Acid (ω -6) monounsaturated fatty acid such as Oleic Acid (ω -9). The seeds provide opportunities to develop value added products, dietary supplements and phytotherapeutic compounds.

USBAS-19.07

Paper Title: Guar gum based edible coating on cucumber (*Cucumis Sativus* L.)

Author(s): Anuradha, Saha¹, Shvetambri, Tyagi³, Rajinder, K. Gupta² and Tyagi, Y.K.¹

Affiliation(s): ¹University School of Basic and Applied Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Biotechnology, Dwarka, Delhi-110078; ³Bhaskarcharya College of Applied Sciences, University of Delhi, Sector 2, Phase 1, Delhi-110078

Source: EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH, Vol. 3(9),(2016), pp 558-570

ISSN No.: 3294-3211

Abstract: In this study, the application of guar gum based edible coating on quality and shelf life of cucumber (*Cucumis sativus* L.) vegetables during storage at ambient conditions ($25\pm 2^\circ\text{C}$ and $70\pm 5\%$) was investigated. The formulations consist of guar gum, carboxymethyl guar gum, potassium sorbate, cinnamon oil, glycerol, water and an emulsifying agent. Different quality parameters were monitored to evaluate the coating effects. The parameters included weight loss, decay loss, soluble solids, ascorbic acid content, pH, titratable acidity, juicability, total phenolics, antioxidant activity and microbial activity evaluation. The coating reduced the weight loss, decay loss, acidity, total phenolics, relatively maintained the antioxidant activity, decreases the microbial infection and thereby increased the post harvest storage life of cucumbers at ambient conditions ($25\pm 2^\circ\text{C}$ and $70\pm 5\%$).

USBAS-20.01

Paper Title: Preferred states of the apparatus

Author (s): Venugopalan A.

Affiliation(s): University School of Basic and Applied Sciences, Guru GoindSingh Indraprastha University, Dwarka, New Delhi-110078

Source: Pramana-Journal of Physics, Vol. 78(2), (2012), pp 175-186

ISSN No.: 0304-4289

Abstract: A simple one-dimensional model for the system–apparatus interaction is analysed. The system is a spin-1/2 particle, and its position and momentum degrees constitute the apparatus. An analysis involving only unitary Schrödinger dynamics illustrates the nature of the correlations established in the system–apparatus entangled state. It is shown that even in the absence of any environment-induced decoherence, or any other measurement model, certain initial states of the apparatus – like localized Gaussian wavepackets – are preferred over others, in terms of measurementlike one-to-one correlations in the pure system–apparatus entangled state.

USBAS-20.02

Paper Title: An Integrated Hierarchical Dynamic Quantum Secret Sharing Protocol

Author (s): Sandeep Mishra, Chitra Shukla, Anirban Pathak, R. Srikanth and Venugopalan A

Affiliation(s): University School of Basic and Applied Sciences, Guru GoindSingh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Theoretical Physics, (2015), pp 1-12

ISSN No.: 0020-7748

Abstract: Generalizing the notion of dynamic quantum secret sharing (DQSS), a simplified protocol for hierarchical dynamic quantum secret sharing (HDQSS) is proposed and it is shown that the protocol can be implemented using any existing protocol of quantum key distribution, quantum key agreement or secure direct quantum communication. The security of this proposed protocol against eavesdropping and collusion attacks is discussed with specific attention towards the issues related to the composability of the subprotocols that constitute the proposed protocol. The security and qubit efficiency of the proposed protocol is also compared with that of other existing protocols of DQSS. Further, it is shown that it is possible to design a semi-quantum protocol of HDQSS and in principle, the protocols of HDQSS can be implemented using any quantum state. It is also noted that the completely orthogonal-state-based realization of HDQSS protocol is possible and that HDQSS can be experimentally realized using a large number of alternative approaches.

**UNIVERSITY SCHOOL OF HUMANITIES
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| 7 | Vats, N. | USHSS. 7.01-7.02 |

USHSS-1.01

Paper Title: The Text and Metatext of *Ragini*: A Study

Author(s): Beniwal, A. S. and Saroha S.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Maharshi Dayanand University Research Journal (Arts), Vol 14(1),(2015), pp 81-91

ISSN No.: 0972-706X

Abstract: The meta-narratives constitute and are constitutive of the cultural archetypes. When a folk bard picks up any event, incident or character from his memory-pool and, through the mediation of his folk interpolation, renders it into a folk narrative, the resultant performative/folk rendition assumes multiple forms and interpretive and narrative possibilities. *Ragini*, a popular folk of north India, is marked by a creative propensity for a dialectal-dialogical interaction with its source narratives; the bard draws upon the epic or mythological fragments and through their public performances reinvest these adoptions and adaptations with re-configured normative and narrative potentials. The present paper puts this interaction under analytic focus to understand the textual and meta-textual potentials of *Ragini* and its 'mutant possibilities' from the vantage point of contemporary cultural context.

USHSS-2.01

Paper Title: The Politics of Culture and Violence in Agha Shahid Ali's Poems.

Author(s): Kang, M.K., and Bhat T.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: South Asian Ensemble: A Canadian Quarterly of Literature, Arts and Culture Vol. 6 (3 & 4), Summer & Fall, (2014), pp 197-208

ISSN No. 1920-6763

Abstract: Experiencing violence and writing about violence are two disparate domains of human activities; the former is an ineffable feeling of the pain and horrors caused by violence and the latter an attempt to problematize violence with a view to stimulate discourse in cultural politics. Since the poetry of collective violence is realised in a linguistic medium, it becomes a part of the politics of culture. It cannot be divorced from concerns with the historical, social and political conditions that actuate and determine it. Like writing poetry of political violence, reading, analysing and teaching it are also inextricably linked with the politics of culture. This paper studies select poems of Agha Shahid Ali in light of these concerns. His poetry appeared during the most turbulent years of violence in the state of Jammu and Kashmir. His poetry provides us with an interesting field of study in terms of the interdependence of cultural consciousness, subversion and style.

USHSS 2.02

Paper Title: Oprah's Book Club: The Phenomenal Role of Oprah Winfrey in the Promotion of Literature.

Author(s): Kang, M.K

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: MELUS-MELOW Journal, Vol. 4, (2014), pp 45-51

ISSN No. 2581-5768

Abstract: Oprah Gail Winfrey began her career as a radio news co-anchor in 1973 and is today known as the 'The Queen of all Media'. In the course of her journey, she has impacted the lives of millions of viewers through her talk shows. She broke many cultural barriers and her shows changed attitudes towards sexuality, ethnicity, communication in the media and much else. By the mid-1990s, her shows focused on literature, self-improvement, and spirituality. Winfrey is an amazing example of how television, one of the more popular forms of contemporary communication, has impacted the promotion and popularity of literary works. This paper explores the extent of the global impact Oprah Winfrey has made on the promotion of literature. It also looks into how her show has helped in the dissemination of information about books and has been instrumental in generating and sustaining an interest in the study of literature in a way not imaginable before the advent of fast-paced technological advances that have re-shaped the cultural order of the world.

USHSS 2.03

Paper Title: Anne Sexton's Transformations: A 'Re-Vision' of Grimm's Fairy Tales

Author(s): Kang, M.K

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: IJOSR (Indian Journal of Scholarly Research), Vol.3(5), (2014), pp 34-37

ISSN No.: 2278-8271

Abstract: Sexton's fifth volume of poetry, Transformations (1971) is a collection of seventeen poems, which is very different from her earlier, usually melancholic work. The poems in this volume are Grimm's fairy tales retold and reshaped in a way which Adrienne Rich, a feminist poet, would call a "re-visioning". Even though they are versions of fairy tales, Sexton's presence and voice are persistent throughout the narration. The transformations, through the re plotting of the original stories, draw the readers' attention to the myriad thematic preoccupations of the poet, but in this paper, the portrayal of relationships and the position of women in these relationships is focused on. The paper takes a close look at the Transformations to understand the social view of women they reflect and their relevance in the contemporary world.

USHSS 2.04

Paper Title: In Remembrance of Jasbir Kaur: Some Poems

Author(s): Kang, M.K and Chandrashekhar, V.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh
Indraprastha University, Dwarka, New Delhi-110078

Source: Indraprastha: An International Journal of Culture and Communication Studies Vol.
II,(2013), pp 164-170

ISSN No.: 2278-7208

Abstract: Jasbir Kaur was a human being not only with a fine sensibility but also a heart filled with pain and empathy for the victims of fate and hate. Her poetry exposes the double standards and pseudo cultural values of our society, particularly towards women. Her poems reflect her anguish for the hapless victims of society. With an intent to share her poetry with a larger audience, we have translated some of her selected poems from Punjabi to English.

USHSS 2.05

Paper Title: Focalisation of Violence: A Study of Hari Krishan Kaul's Short Stories

Author(s): Bhat, T., and Kang, M.K

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh
Indraprastha University, Dwarka, New Delhi-110078

Source: Miraas Vol. VI (II),(2013), pp 13-21

ISSN No. 2278-2125

Abstract: Violence has always been one of the central themes of literature since its inception. All movements in art and literature have been a reflection of violence and the corresponding disillusionment with the time-honoured themes and forms. Because of political upheavals Kashmiri society has undergone a sudden and catastrophic transformation. Propagation of violent exclusionist politics and the resulting bloodshed, massacres, mayhem, intimidation, coercion and excommunication have caused many schisms and ruptures in Kashmiri society. The present paper takes for its premise four short stories of Hari Krishan Kaul and analyses them in terms of the impact of violence on contemporary Kashmiri literature.

USHSS 2.06

Paper Title: Poetic Configuration of Communalism: A Study of Selected Poems of Imtiaz Dharker, Seema Qasim and Rukmini Bhaya Nair

Author(s): Vij, B., and Kang, M.K

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh
Indraprastha University, Dwarka, New Delhi-110078

Source: Dialog: A Bi-Annual Interdisciplinary Journal, Vol. 22, (2012), pp 73-89

ISSN No. 0975-4881

Abstract: Indian women's poetry in English has undergone a paradigmatic shift since the pre-colonial times to the present. From struggling against the colonial power, launching movements for the liberation of women, swinging between the home and the world, to the articulation of uninhibited desires, combating violence in the outer sphere etc.; the journey of women's poetry in English has been phenomenal. If in the contemporary women's poetry, women attempt to re-portray themselves on the canvass of literature, by creating an alternative voice, they are able to do so only because of poets like Toru Dutt, Sarojini Naidu, Mahadevi Verma, Subhadra K.

Chauhan and others who laid strong foundations for an emancipated, modern poetic discourse. These poets had not simply expressed their discontent of the inner self, but had delved deep into the socio-cultural matrix of society and used poetry to question and subvert those systematic structures of oppression that undermine them. This paper attempts to exhibit the face of contemporary women's poetry in English, which has widened its scope and has ventured beyond the conventional issues of female identity, asserting one's sexuality, railing against male domination, couching "personal in public" and the depiction of the treatment of communalism, which follows three distinct creative trajectories at the hands of three different modern women poets: Imtiaz Dharker, SeemeeQasim and Rukmini Bhaya Nair.

USHSS 3.01

Paper Title: Assertion of Self: A Reading of Selected Marathi Dalit Poets

Author(s): Singh, S.B. and Kochar, S.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Language in India, Vol. 15, (2015), pp 1-14

ISSN No.: 1930-2940

Abstract: This paper is devoted to analyse the selected poems by Marathi Dalit poets who incorporate frustration, depression, irritation, etc., in their poems as the emerging themes. The paper identifies how in post-Ambedkarian era, Dalits have tried to assert their identity in various quarters of life: politics, religion, education and economics.

USHSS 4.01

Paper Title: Identity Politics and the Muslim Other

Author(s): Sachdeva, V.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Brukenthalia – Romanian Cultural History, Vol.5, (2015), pp 965-973

ISSN No.: 2285-9497.

Abstract: Cinema as a cultural practice cuts across the barriers and strongly influences the popular consciousness of a society. The collective cinematic experience in India, while being a formative influence on the popular consciousness, is also a signifier of the society. Cinema has been instrumental in constructing and propagating identities embedded in the psyche of Indian society. While popular cinema has been facilitating the audience imagine India as a Hindu nation, the filmmakers of Indian New Wave have questioned and subverted the categories that govern popular Hindi cinema and popular consciousness. This paper makes an attempt to understand the identity politics in Indian cinema, with special reference to the portrayal of Muslims. It shall allow me to critique the identity politics in India since the British rule; to question the division of Punjabi community on the basis of religious identity during the colonial period and consequently problematize the two-nation theory, which led to the creation of India and Pakistan and also to question appropriateness of the western model of nation in Indian context.

USHSS 4.02

Paper Title: Cinema: An Instrument of Governmentality

Author(s): Sachdeva, V.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: MELUS-MELOW Journal, (2015), pp 36-47

ISSN: 2249-4839

Abstract: To see censorship in the light of affective potentials of cinematic images or merely curbing freedom of speech on moralistic grounds can be seen as platitude. In the present paper, there is an attempt to see censorship as 'political censorship' executed by the "political and cultural authority in a mass mediated society" (Mazarella 2) in which the institution of censorship functions more like a state agency which functions towards normalizing subjectivity and citizenry. In the paper, I shall go into the history of political censorship in colonial and postcolonial India and explore ideological tenacity of 'political censorship' in the history of Indian cinema when censorship has been most controversial what is called the period of 'cultural emergency'. Placing the argument in the larger frame of politics behind the institution of cinema, the Censor Board is perceived as an agency to propagate the ideology of the state. The paper also makes an attempt to understand the role of censor board from the point of view of Foucault's 'governmentality' and its relation with citizens in the present Indian context.

USHSS 4.03

Paper Title: Liminal Cultural and Cinematic Spaces in ShyamBenegal's *Welcome to Sajjanpur* and *Well Done Abba*

Author(s): Sachdeva, V.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: The Journal of Popular Culture, Vol. 49(5), pp 1146-1162

ISSN: 0022-3840

Abstract: ShyamBenegal's cinema underwent a major aesthetic and ideological shift in the age of liberalization. Going beyond the binaries of the rural and the urban; parallel cinema and commercial cinema, the filmmaker has set his two latest films in moffusil spaces. Aesthetically, his cinema shifts from hardcore political cinema of 1970s and 1980s to comic satire in *Welcome to Sajjanpur* and *Well Done Abba*. Placing the films in the economic context of liberalization, the paper explores liminality in the representation of spaces and cinema as a space of representation.

USHSS 5.01

Paper Title: Theatre in Education: A Study of the use of Children's Theatre in Education in India
Author(s): Sharma, S.
Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078
Source: Edulight: Multidisciplinary & Peer Reviewed Journal, Vol. 4 (7), (2015), pp 257-263
ISSN No: 2278-9545
Abstract: Right stimulus for the appropriate growth of child into a well balanced human being is a must. Both educationists and policy makers in India have come to realize the worth of experiential learning. Children's theatre is an excellent tool for experiential learning as per theory professed by famous education scholar David A Kolb. It gives the child or student an opportunity to improve speech, language and expression and thereby learning to communicate well and express his ideas with clarity and cohesion. Above all, drama provides the child a platform where he can release his emotions and socialize well with others in the groups. The paper discusses the worth and relevance of the use of theatre as pedagogical tool in school teaching in India. It documents the evidence of presence of children's theatre in various parts of India since ancient times and its present status. It further highlights the need for more serious and concerted effort to promote use of children's theatre as pedagogical tool by both government agencies and NGOs.

USHSS 5.02

Paper Title: Title: Interrogating Phallogentrism: A Study of Select Plays by Indian English Women Playwrights
Author(s): Sharma, S.
Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078
Source: Research Journal of English Language and Literature, Vol. 3(2), (2015), pp 83-87
ISSN No: 2395-2636
Abstract: Indian English Women's Theatre is a genre that came to be widely recognized, practiced and debated in the literary circle in the wake of Women 'Liberation Movement of the seventies and the experimental theatre which used to encapsulate issues related to feminine subjugation and inferiorization. Women playwrights like Deena Mehta, Manju Padmanabhan, Poile Sengupta and Mallika Sarabhai used theatre as means to subvert the dominant patriarchal ideology working behind conventional representation of women which further establishes, consolidate and strengthen the patriarchal hegemony. The current paper attempts to explore the use of theatre by Indian English Women Playwrights Deena Mehta, Manju Padmanabhan and Poile Sengupta, to augment their own creative idiom which at once critiques the socially accepted norms and presents an alternate spectacle to view the situation.

USHSS 5.03

Paper Title: Title: Subverting Hegemonic Patriarchal Discourses: A Study of Mahasweta Devi's *Draupadi*

Author(s): Sharma, S.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: International Journal of English Language, Literature and Translation, Vol. 2 (3), (2015), pp 158-162

ISSN No: 2395-2628

Abstract: Mahasweta Devi, the activist-writer, challenges the grand narratives of the nation and presents counter-narratives that challenges the official/state position of silence and engineered exclusion. Her short story, *Draupadi*, is a document of violence on and resistance by gendered subaltern, *Dopdi*, who challenges the might of callous post-colonial state (embodied in the figure of Senanayak) through her indomitable courage and will power. She uses her vulnerability as a counter-offensive against both the state and the hegemonic social structures and derides at their incapacity to face the 'unarmed target'. Conquering her pain and humiliation she emerges as the most powerful 'subject'. The present paper attempts to analyze Devi's *Draupadi* as a metanarrative that subverts hegemonic patriarchal discourses.

USHSS-5.04

Paper Title: Addressing Gender Concerns through Theatre: A Study of Women Empowerment Programme by WASPJ

Author(s): Sharma, S.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: International Journal of English Language, Literature and Humanities, Vol III (II), (2015), pp 215-224

ISSN No: 2321-7065

Abstract: Abstract In recent years there has been growing realization that women empowerment is a pre-requisite for their social, economic and political upliftment. Both national and international agencies have been launching plethora of empowerment programmes and campaigns for women. But while the discourse on gender parity seems to be increasingly gaining currency around the globe, local realities of India still remain grim and disturbing. Despite the concept of Gender Budgeting and providing special provisions for women in programmes such as National Literacy Mission, Rashtriya Mahila Kosh, Indira Mahila Yojana, Swawlamban Project and Swashakti Yojana, and the latest PM Narendra Modi's Beti Bachao Beti Padhao Abhiyaan, a large population of women in India still face violence at the time of birth and later, confront barriers in accessing education, restricting social norms and threats to their chastity. The paper attempts to explore the use of theatre as a tool for personal and collective empowerment. It begins with an exploration and explanation of the concept of 'Community Theatre' as is evidenced around the world, and its practices in other parts of the globe, based on the principles of empowerment with specific reference to its use in women empowerment. It is followed by a case-study of a Community Theatre group called SAKHHI, by NGO Titled Women's Association for Social Protection and Justice (WASPJ) acting in select villages of Delhi NCR, along with the group's relationship with the audience and other members of the community. In this way, the proposed

paper shall attempt to propose guidelines towards the use of Community Theatre as powerful means of women empowerment.

USHSS 6.01

Paper Title: True Love-A Mirage: A Comparative Study of Sylvia Plath and Kamala Das.

Author(s): Tiwari, C

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Journal of Literature Culture and Media Studies, Vol.9 & 10, (2014), pp 116-123

ISSN No.: 0974-79192.

Abstract: Love, after the fulfillment of the basic necessities i.e. food, cloth and shelter, is undoubtedly the very next requirement of all human beings. Moreover, it is the only feeling that is present in each and every creature of the Universe from the biggest to the tiniest. Love, like a charming rainbow, allures one and all. All the shades are equally enchanting. No one can get away from its magic. Then, how the poets, one of the most sensitive of all the creatures of the creation could escape its fascination? Love, as a theme of poetry, has never escaped poets. All the shades of love-be it the idyllic love of Shakespearean plays, or the classical platonic love, or even the down-to-earth erotic love-have been employed by the poets to convey their feeling. The paper is about the exploration of true love as a mirage in the poetry of Sylvia Plath and Kamala Das..

USHSS 6.02

Paper Title: Hinduism: A Way to Ecological Humanism.

Author(s): Tiwari, C.

Affiliation: University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Ecology, Environment and Conservation, Vol. 19(4), (2013), pp 1097-1101

ISSN No.: 0971-765X

Abstract: In recent days, Environmental Science and Ecology are disciplines of modern science under which study of environment and its constituents is done with minute details. Environment includes its surroundings and atmosphere. Ecology is the science that deals with the interrelations of plants and animals together with the environment. But this modern discovery has been a part of the knowledge of our seers since the Vedic times that establishes that the nature and human being (Prakriti and Purush) form an inseparable part of life support system. The paper explores the awareness of ancient Indian people of the existence of environment and ecology, the inter dependence of all the elements of nature and the relevance of their knowledge at present time when environmental changes are sending warning signals to humanity for changing its attitudes towards nature.

USHSS 7.01

Paper Title: Literature as an Art Form: An Aesthetic Perspective.

Author(s): Dwivedi, R R and Vats, N.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Approaches: A Bi-annual International Refereed Research Journal of English Language and Literature, Vol. III, (2015), pp 88-96

ISSN No.: 2349-5960.

Abstract: There has been a perpetual debate amongst the academicians and intelligentsia regarding the actual nature of literature. Even the notion that literature is an art form, though commonly agreeable, has been approached with its own share of rational problematic. Any approximation with the true character of literature necessitates the analysis of the variables that form the Title of this paper, i.e. **Literature as an Art Form: An Aesthetic Perspective**. As such, it would be pertinent to raise certain questions, which would only lead to the specified extension of each variable. *What is literature, how does it communicate, how is its communication different from other forms of writing such as journalistic, legal or political* are some prominent questions that surface for their reasonable answers. Keeping this in view, suggestible terms like *Art form* and *Aesthetic* have been incorporated into the Title to lend an initial impression of the comprehensive domain and character of literature. The mutually inclusive pattern of art, beauty, and pleasure is best conserved by literature that serves to quicken the innermost urges of mankind. Consequently, art and aesthetics of literature also becomes redemptive for people in overcoming their pallid thinking of self, society and life at large as the immediate pleasure oozing out of beautiful art exudes positive, vibrant vibes that harmonise all oddities and worries.

USHSS 7.02

Paper Title: Depiction of Beauty in Pandit Lakhmi Chand's Poetry.

Author(s): Vats, N.

Affiliation(s): University School of Humanities & Social Sciences, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Journal for Rajasthan Association for Studies in English: A Peer Reviewed Journal of Studies in English, Vol. II, (2015), pp 21-28

ISSN No.: 2349-5960

Abstract: Beauty is a feeling that soothes our senses; its source can be living or non-living. Anything that fills us with joy, that force-attracts our gaze, that fills our taste buds with richness, that excites us to the core when touched, that makes us forget everything else when heard, and makes us experience that AHA moment which psychologists recognize as feeling of fulfillment, is beautiful. Beauty is simple as well as comprehensive to define in words for the lack of a generally accepted trait or a set of properties physical properties may not agree with the inner traits or vice versa. However, artists and philosophers have been making efforts to express the idea of beauty in language- Verbal as well as Non-verbal. In all literary traditions of the world, poets have tried to express the idea of beauty according to their cognitive. When we think of the folk literature of Northern India, the list is very long. Hence, mentioning some of them means leaving the others out as all have made a remarkable contribution to the folk literary tradition. The paper focuses on Pt Lakhmi Chand, who sang his heart out for about twenty years and established himself as the literary giant in Haryanvi folk tradition.

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USLLS-1.01

Paper Title: Freedom and social responsibility of Social media: Emerging issues in Indian Legal System

Author(s): Gautam, U¹ and Tewari, D B²

Affiliation(s): ¹University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078; ²Dyal Singh College, University of Delhi, New Delhi-110003

Source: Kathmandu School of law Review, Vol.IV (1),(2014), pp 68-81

ISSN No.: 2091-2119

Abstract: The paper seeks to highlight the performance of social responsibility as regards the online social sites. The role of social networking sites as the replacement to the erstwhile 'open access' platforms of deliberations will also be addressed. This paper also analyses various laws regulating the freedom of speech and expression in this open wide cyberspace. It advocates the need for redefining the basic concepts of ethics, morality, freedom, liberty and responsibility which form the basis of legal framework regulating this large contiguous cyberspace.

USLLS-2.01

Paper Title: A Big No To Spousal Rape- Its Enough Women Had It

Author(s): Goswami, S.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Asian Academic Research Journal of Social Sciences & Humanities, (2014), pp 308-316

ISSN No.: 2278-859X

Abstract: Companionship is the basic requirement of all human beings that is why the institution of marriage came into existence. At the time of marriage people vow to be partners for life, in joys and sorrows, in success or despair but are it? The reality is somewhat else. The most shameful and disgraceful wrong which has not been recognized as a crime or rather society is not taking seriously is the offence of marital rape. Marital rape is not the norm of the present day society. Only thing is that women have now started speaking about it. There is a myth that when women is raped by her husband, it does not have a lasting effect but the reality is somewhat else. She suffers from physical and psychological effects. This is a somber issue which needs to be addressed. It is not understandable when women constitute nearly half of our human population then isn't it a human rights issue which really needs to be pondered and deliberated. The author would be basically dealing with various issues relating to marital rape, types, effects etc. additionally the scenario in different countries would also be discussed. Apart from this, why people are hesitant in bringing into the statute book, various arguments of the people in favour and disfavor of criminalization of marital rape would also be dealt with

USLLS-3.01

Paper Title: Legal Challenges Surrogacy for Fertility Tourism in India

Author(s): Khan, Z. A

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Amity law Review, Vol.11(1), (2015), pp 90-104

ISSN No.: 2249-2232

Abstract: With the rise of surrogacy as societal practice, proper regulation of surrogacy is the need of hour. Though many medical bodies discouraged the practice of commercial surrogacy but, need for a concrete legal framework was felt which can monitor the existing state of surrogacy. All kind of precaution and check & balances should be made transparent and unambiguous regarding security of surrogate mother and child. Various mechanisms should be deployed to prevent financial exploitation of surrogate mother whenever there is apprehension of undue advantage of surrogate agencies and middlemen. Remuneration for surrogacy service should be decided on the basis of many considerations like health of surrogate mother (before and after birth of the child), occupation of surrogate mother (especially related to financial security). Justice won't be meted out if health insurance for surrogate mother is not covered under surrogacy contract for unanticipated medical risks and complications.

USLLS-3.02

Paper Title: Need for Witness protection in India: A legal Analysis

Author(s): Khan, Z. A

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Dehradun Law Review, Vol. VII (1), (2015), pp 37-47

ISSN No.: 2231-1157

Abstract: Witness is an indispensable aid in the justice dispensation system in any civilized society. The greatest weakness of our criminal justice system is that it has become stagnant and does not function in a expedite manner resulting in deciding the conviction or innocence of those charged with crime. The most unfortunate thing is that the parties often threaten the witnesses, turning them hostile and interfering with the fair administration of justice. These cases came as a bombshell showing inefficiency & insecurity in the judicial system. Providing witness protection may be difficult in a country with a limited police force, but it is a key aspect of justice. Whether innovative techniques adopted by Court can secure safeguarding the interest of witness? What can be the criteria for the Court to decide on providing the security of witness? When should witness protection be provided? This paper discusses how the law relating to the protection of witnesses is insufficient and also emphasize on the need for a witness protection programme.

USLLS-3.03

Paper Title: Judicial Activism & Growth of Environmental Jurisprudence

Author(s): Khan, Z. A

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Indian Bar Review, Vol. XL (4), (2013), pp 97-107

ISSN No.: 9788193198100

Abstract: Judiciary in India particularly, Supreme Court and high courts have played an important role in preserving the environment without halting the development of the country which means preservation of doctrine of sustainable development. India being a developing country with vast geographical area and large population, the main task of the government becomes to look after present and future needs of people. The bane of Indian legislation has always been its implementation and as far as the environmental damages are concerned if the decision in order to save the ecology or the environment are left at the mercy of enforcement agencies nothing can be achieved except to increase the thickness of various law reports and journals.

USLLS-3.04

Paper Title: Protection of Biodiversity in India & Bangladesh: A legal Perspective

Author(s): Khan, Z. A

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: ILI Law Review, (2016), pp 223-235

ISSN No.: 0010-4019

Abstract: Biological diversity means heterogeneity in many ways of life. It includes the overall aggregation of ecosystem where genetic diversity and species diversity play a crucial aspect in nourishing ecological balance. The scope and extent of biodiversity is wide enough and its quantification is difficult to realize. Protection of biodiversity in India and Bangladesh is quite challenging with the passage of time as both countries have highly enriched with traditional and indigenous resources. The most challenging situation is of rights indigenous people living in a particular area, their respective right of benefit sharing, specific prior-informed consent. It is important to understand to introspect the obligation of local administration in protecting biodiversity and how so far they are successful in managing the proper commercial utilization of indigenous resources by providing proportionate monetary right to indigenous people.

USLLS-3.05

Paper Title: Uniform civil code: Prospect for Gender Equality

Author(s): Khan, Z. A

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Bharati Law Review, Vol. V (1), (2016), pp 46-53

ISSN No.: 2278-6996

Abstract: The term uniform civil code is used to cover the entire set of laws governing rights relating to personal matters like marriage, divorce, maintenance, adoption and inheritance. The idea of a Uniform Civil Code flows out of Article 44 of the Indian Constitution that is a directive principle of state policy. Personal laws should be regulated & changed drastically with a purpose to bring social transformation. Fatwas

given by qazis& verdicts given by khap panchayat has to be properly scrutinized and regulated. Unambiguity and confusion with respect to uniform civil code without any political advantage has to be removed. It has to be ensured that Uniform Civil code will definitely increase social mobility in a way all multi-cultural practices and contemporary life practices will find a balance through Constitutional protection.

USLLS-4.01

Paper Title: Non -Traditional Trademarks: A Critique

Author(s): Lukose, L.P

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Journal of the Indian Law Institute, Vol. 57(2), (2015), pp 187-215

ISSN No.: 0019-5731

Abstract: In the globalized era where cross border trade takes place in international market, trademark has become a key tool to denote a company's identity. A good trademark carries its own image, attaches distinct personality to the goods and becomes the essence of competition. The modern trademark law reflects some novel developments as to the make and appearance of 'mark' itself. The 'modern market' is in the busy process of inventing new products with 'typical odour' 'special touch' and 'unique sound' in order to present more 'sensory' consumer goods to the 'modern customers'. Although these novel trademarks have not yet reached a high acceptance in all jurisdictions, use of such marks is common in contemporary market. In modern times, new forms of sensory trademarks have come to be globally accepted as intellectual property as the result of certain legislative amendments or judicial interpretations. In the modern market, non-traditional trademarks still remain a developing practice and the case-law on this subject matter is evolving. However, studies show that there is an increasing demand from the proprietors for the registration of non-traditional marks in the international trade. On the contrary, there is no uniform standard across the globe in examination, registration and enforcement of these marks. Against this backdrop, this paper captures the brief history of non-traditional trademarks, the rationale of its protection under the legal regimes, through various case studies, prevalent in United States (US), European Union (EU) and India for its registration and enforcement. It also examines how these modern marks discharge their functions as a trademark. The paper also analyses the issues arising from the lack of uniform practice in the examination and registration of non-traditional trademarks worldwide. It concludes with suggestions for harmonization of examination and registration process across various registries.

USLLS-4.02

Paper Title: The Applicability of Administrative Law Principles To Issues Of Privatisation In India

Author(s): Lukose, L.P

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: International Islamic University Malaysia Law Journal (IIUM Law Journal), Vol. 23(3), (2015), pp 267-288

ISSN No: 1975-5945

Abstract: Privatisation is an exclusive subject of governmental policy in several countries. The reasons for privatisations may mainly be political and economic; nevertheless, it raises many legal questions. Apart from the constitutionality and legality of the decision on privatisation there are public law issues in administrative law that usually crop up with privatisation decisions. The principle aim of this article is to examine the applicability of administrative law principles in privatisation. In the initial part, the article examines the phenomenon, various approaches towards privatisation, its rationale and limitations. Subsequently, the article analyses different types of privatisation. It also portrays various interfaces between privatisation and administrative law with special reference to India. In the last part, the article is summed up with an appropriate conclusion and suggestions.

USLLS-4.03

Paper Title: Women and the Law

Author(s): Lukose, L.P

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Annual Survey of Indian Law 2014, (ASIL), Vol. XLIX, (2015), pp 1073-1116

ISSN No: 0570- 2666

Abstract: Civilization of a country is known how it respects its women. Each society is obliged to treat the women with respect and dignity so that humanism in its conceptual essentiality remains alive. Though woman is said to be 'the best of all God 'and the *Mahabharat* treats her as the source of salvation; crime against women continues to rise and today it has risen to alarming proportions. This is what the survey of 2013 cases reveals.

USLLS-4.04

Paper Title: Legislative Response in India to the Protection of Traditional Knowledge: A Critique

Author(s): Lukose, L. P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: The Bangalore Law Journal, Vol. 5(2), (2014), pp 189-200

ISSN No.: 2349-624X

Abstract: India being one among the major countries abounding in biodiversity possesses a distinct identity in the global map due to its great diversity of natural ecosystems and bio genetic resources. India is rich in almost all categories of biodiversity and contributes significantly to the total species richness of the world. Of the 196 countries in the world, 17 megadiverse countries house 70 percent of the global

biodiversity and India is one among them with her unparalleled richness in crop and medicinal plant diversity. With 7-8% of the earth's total bio-diversity, India contains a great wealth of biological diversity and associated traditional knowledge (TK). In spite of this, India does not have a specific or sui generis legislation to protect her immense TK. A few legislations such as Biological Diversity Act, 2002; Protection of Plant Varieties and Farmers' Rights Act, 2001; Patents Act, 1970 (with its various Amendments) have some bearing on the protection of TK. On this background, this article is an attempt to examine the importance of TK to India and to analyze our national legislative endeavours in legally protecting TK.

USLLS-4.05

Paper Title: Copyright Amendment Act, 2012: A Revisit

Author(s): Sivakumar, S.² and Lukose, L.P.¹

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Source: Journal of the Indian Law Institute, Vol. 55(2), (2013), pp 149-174

ISSN No.: 0019-5731

Abstract: The modern copyright law is a creation of statute. The history of Indian copyright jurisprudence reflects constant legislative revisions of statutory law to address technological developments. The Indian Copyright Act, 1957 has been amended six times, since its inception, in the years 1983, 1984, 1992, 1994, 1999 and 2012. Subsequent to 2012 amendment which came into effect on June 21, 2012 the Copyright Rules have been notified on March 14, 2013. The 2012 amendments have received overwhelming appreciation with many progressive changes. To name a few, introduction of provisions for digital rights management, strengthening of border measures, special provisions for persons with disabilities, conferment of affirmative rights for performers, extension of fair dealing to all categories of works covered under section 13, compulsory licensing in respect of foreign works, recognition of moral rights of performers, provisions to streamline the functioning of the copyright societies are examples of welcome amendments. There are certain unwelcome amendments including the removal of parallel importation. Non-inclusion of provisions for multimedia works, non-specification of status of remixes and parodies, non-inclusion of the concepts 'unicast' and 'narrowcast', lack of guidelines for fair dealings etc. are some instances of missed opportunities. This article, thus aims at (i) analyzing the welcome changes brought about by the 2012 amendment, (ii) commenting on the regressive changes and (iii) highlighting the missed opportunities.

USLLS-4.06

Paper Title: Biodiversity and Traditional Knowledge Issues in Bio-Prospecting: An Analysis through the Prism of Patents '

Author(s): Lukose, L.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Army Institute of Law Journal, (2013), pp 54-70

ISSN No.: 0975-8208

Abstract: This article aims at critically analysing the modern trends in bio-prospecting at the cost of biological diversity of green rich countries. The bio-prospecting usually results in bio-piracy and misappropriation of traditional knowledge (TK). TK is often associated with the biological and genetic resources of a given locality. The biological diversity and associated TK have assumed importance in the contemporary world since they provide necessary leads in the R&D for inventions, innovations and patents. Advances in biotechnology reveal that though traditional agricultural products such as neem, basmati rice or turmeric cannot be patented per se, their genetically modified versions (for example, new strain of neem with higher pest resistance, wound healing properties of turmeric etc.) can be patented. Despite the fact that the misappropriation of TK takes place mainly in relation to acquiring new patents, the international treaties including TRIPS Agreement are silent on the protection of TK. Though there is an interrelation between intellectual property rights (IPRs) and TK, the existing intellectual property regime is unable to accommodate and resolve issues pertaining to protection of TK. Rather the IPRs system as it stands today directly or indirectly facilitates misappropriation of TK. On this background, this article (i) critically examines bio-piracy and bio-prospecting, (ii) explores the various cases of misappropriation of Indian TK for obtaining foreign patents and (ii) analysis how the current IPRs system fosters patenting of TK based products by third parties with no reward to the custodians of TK.

USLLS-4.07

Paper Title: Minors 'Rights Under Intellectual Property Laws: A Myth or Reality

Author(s): Lukose, L.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Journals of Intellectual Property Rights, Vol. 18, (2013), pp 174-180

ISSN No.: 0019-5731

Abstract: In principle and practice there exist a clear divide between legal competence of minors and majors. A minor's agreement being void is wholly devoid of all effects: creating no contractual obligation and right. The argument of this paper is that the contractual incapacity attached to the minor is detrimental to him as far as his innovative, creative and intellectual talents are concerned. The contractual incapacity averts him from commercially exploiting the fruits of his intellectual labour.

USLLS-4.08

Paper Title: Neighbouring Rights in the International Sphere: An Analysis.

Author(s): Lukose, L.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: CNLU Law Journal, (2012), pp 30-43

ISSN No.: 0976-805X

Abstract: Neighbouring rights are recent introduction to copyright family. Indian Copyright Act 1957 was amended in 1994 to incorporate neighbouring rights protection. This article examined the legal justifications for protection of the rights of performers, broadcasting organisations and phonogram producers. It also examines the international and national legal developments on this topic.

USLLS-4.09

Paper Title: Copyright issues in Legal Research and writing

Author(s): Lukose, L.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Journals of Intellectual Property Rights, (2016), pp 275-282

Abstract: As members of legal fraternity judges, lawyers, academicians, researchers and students continuously engage in legal research and writing. The legal researchers and writers play a double role in their academic exercise as both creators and users of copyrighted materials. It means, they have rights and duties with regard to copyright law. The present article analyses the copyright issues involved in research and examines the ways by which the academic authors should protect themselves from the charges of copyright infringement and plagiarism.

USLLS-4.10

Paper Title: Women and the Law

Author(s): Lukose, L.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Annual Survey of Indian Law, (ASIL), Vol. L, (2016), pp 1125-1147

ISSN No: 0570- 2666

Abstract: Women rights as a topic assume centre stage in contemporary global debates. There is no dearth of law in India to protect the rights of women. However, women in India continue to face manifold problems including violent victimization through rape, acid throwing, matrimonial cruelty, child marriage, dowry death *etc.* The present survey unfolds several issues with reference to women which have reached the higher judiciary in the year 2014: Domestic violence, dowry death, rape and gang rape, compensation and rehabilitation of rape victims, gender inequality in workplace, insensitivity of the society, irresponsibility of police/ prosecution and so on. The present survey of important cases in the relevant field shows that the court is alive, conscious, sensitive and active in protecting the rights of women.

USLLS-4.11

Paper Title: Trademark Infringement Through Cybersquatting: Law And Policy: A Study Of UDRP And Indian System

Author(s): Lukose, L.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: CNLU Law Journal, (2016), pp 33-48

Abstract: Internet is a medium of unfathomable potential. Its multimedia potential makes it unique information exchange and information dissemination medium, it makes vital temporal, special barriers irrelevant and moreover it changes rapidly the paradigms of business. In the contemporary e-world, e-commerce is more significant than the traditional real space commerce. The market economy requires an identifier to distinguish the products. Trademarks and the domain names perform this function of identification in the cyberspace and in the real space respectively. To protect the consumers 'interests and the trademark owners 'rights, there are settled and effective legal mechanisms in the real space. However, where Internet meets the law, and specially, where domain names and the trademarks collide, the answer is totally different, uncertain and controversial. The inter-relationship between Intellectual Property (IP) and the Internet is evident at all levels and in all spheres. Ranging from the threat of copyright violation to trademark infringements, the Internet is viewed as a phenomenon requiring a rethinking of the entire system of Intellectual Property Rights (IPRs) and their protection. This article analyses the issue of trademark infringement through cybersquatting and examines the efficacy of relevant laws and policies. It also scrutinizes the legal standards evolved by WIPO'S ICANN to combat cybersquatting.

USLLS-5.01

Paper Title: Development versus Picturesque: Conflicting Developmental Trajectories in Simla and Darjeeling (1820-1920)

Author: Pradhan, Q.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Critical Imprints, Loreto Journal, Vol.3, (2015), pp 116-136

ISSN No: 2319-4774

Abstract: Hill stations of the Himalayas, such as Simla and Darjeeling, were the resting places for the contemporary weather-weary rulers of the Indian subcontinent. From the middle of the nineteenth century, a regular feature was the 'exodus 'of the European ruling classes to the hills. The urban developments in Simla and Darjeeling in the nineteenth and twentieth centuries raise interesting questions if we compare them with the urban trends emerging in Europe or even in the Indian plains. Can these so-called 'summer resorts 'be considered specialised urban resorts as they emerged in the wake of the nineteenth-century urban and industrial developments in Europe? Can they be termed 'leisure towns', or is it more appropriate to term them 'camp towns 'or 'stations'? Towards the end of the nineteenth century, the colonial state facing a troubling dilemma of retaining the 'picturesque 'panorama with the urban developments.

USLLS-5.02

Paper Title: Oral Tradition, Colonial Encounter and Popular Culture: A Critical Reading of Alice E. Dracott's Simla Village Tales

Author: Pradhan, Q.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Indraprastha, Vol. III, (2014), pp 49-64

ISSN No.: 2278-7208

Abstract: The attempt in the article is to question the dominant hegemonic discourse of orientalism from within the orientalist preoccupation with collecting the oral folk tales of the hills. From a unilinear Eurocentric perspective, the world of the hill people came to be represented as static, timeless and backward. It is argued that these accounts written by the literate imperial class can be read to understand the popular culture that existed autonomously. The paper explores such complexities in understanding the dialectics of popular culture.

USLLS-5.03

Paper Title: Understanding Law, Religion and Sovereignty in Qanun-i-Humayuni

Author: Pradhan, Q.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Religion and Law Review, Vol. XXIII (2), (2014), pp 15-36

ISSN No.: 0971-3212

Abstract: The paper contended that the Mughal State should not be seen in sharp categories of secular and religious: tolerant and intolerant. In the medieval period, from the reading of the text by Khwandmir, religion, law, and society cannot be separated from one another. In pre-modern times, the government was not confined to political or state and the administration. It covered different aspects of life, from guidance for the family to the management of the household to self-control and even directing the soul.

USLLS-5.04

Paper Title: Dehumanising People, Erasing Histories: Colonialism, Marginalisation and the Law

Author: Pradhan, Q.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Indraprastha, Vol. II, (2013), pp 44-58

ISSN No.: 2278-7208

Abstract: The paper focuses on the travails of the indigenous people by the onslaught of western encounters. In the colonization process, the Colonial state used various strategies to marginalize the local people, reducing them to a subordinate position as slaves or labourers. A brief analysis of the colonization in America with the Lepchas of Darjeeling helps understand the phenomenon of colonization and the forces of dehumanization unleashed by them. The remnants of colonial policy about the indigenous population have their traces in the modern nation-state.

USLLS-5.05

Paper Title: Representation and Contestation: Hills in Colonial Imagination (Simla, Darjeeling, Ootacamund and Mount Abu, 1820-1920)

Author(s): Pradhan, Q.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Studia Universitatis Cibiniensis, Series Historica, Vol X, (2013), pp 121-136

ISSN No.: 1584-3165

Abstract: The article explores the themes of 'hills in colonial imagination', 'images of mini-England in the hills', 'community identity' and the 'hill space as a liminal zone'. The central argument is that there was a conscious effort on the part of the colonizers, during their stay in India, to create another home away from the real actual one (England), which led to the marginalization of local people and the erasure of their past history, snapping their association with the land. Instead, there was reproduction of Imperial spaces, which is closely aligned with expanding forces of capitalism and modernity in the 19th and 20th century. It also questions the popular colonial construct that hills in India were 'discovered' by the British travelers and army officers. My argument is supported by the corpus of Indian folk narratives and mythologies existing prior to the British colonization, which challenges hills as 'terra incognita', as asserted by the British. The article ends by exploring traces of resistance by the hill people, reconstructed through oral narratives of the local people in contemporary times, which have not been represented in the 'official history' of the hills.

USLLS-6.01

Paper Title: Religious Conversion under International Law

Author(s): Kumar, R.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Religion and Law review, Vol. XXIII (1), (2014), pp 37-53

ISSN No: 0971-3212

Abstract: Religion has been a powerful social sector in all phases of human history and in all parts of the human world. The experience of mankind over the centuries attests to the fact that religion in some form or other is a primary need for most people to help them forward in their journey through life. Freedom of religion thus for anyone involves the freedom for him to maintain, change and even not to believe in any religion whatsoever. In this regard, it needs to be realised that an incessant process of transformation and change is naturally going on across the world.

USLLS-6.02

Paper Title: Right to Education Act: A critical Analysis

Author(s): Kumar, R.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh Indraprastha University, Dwarka, Delhi – 110078

Source: Ideal Journal of Legal Studies, Vol. 4 (3), (2013), pp 81-87

ISSN No: 2231-0983

Abstract: Education is the most powerful tool which can shape the destiny of an individual as well as the nation. Therefore ensuring equal access to education is increasingly viewed as basic duty of a civil society. However, the universal agreement about the

importance of education, public discourse often seems to be divorced from the realities of the ground. Although the 86th Constitutional amendment added Right to Education a fundamental right, the implementation of RTE is indeed a big challenge.

USLLS-6.03

Paper Title: Subsidy for Religious Pilgrimage-A critical appraisal

Author(s): Kumar, R.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Ideal Journal of Legal Studies, Vol. III (3), (2012), pp 40-47

ISSN No: 2231-0983

Abstract: The principle of equality of religion being an essential facet of egalitarianism has found a place in the Constitution of India. Religious tolerance and equal treatment of all religious groups are essential parts of secularism. Though the term secularism has not found expression in the original Constitution, the principles of secularism were embedded in various parts of our Constitution. Article 25, 26, 27 and 28 provide guarantee to various facets of right to freedom of religion with inbuilt restrictions.

USLLS-6.04

Paper Title: A Critical Appraisal of Indian Secularism and Religious Subsidies

Author(s): Kumar, R.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Delhi Law Review, Vol. 31, (2012), pp 164-175

ISSN No: 0973-001X

Abstract: The principle of equality of religion being an essential facet of egalitarianism has found a place in the Constitution of India. Religious tolerance and equal treatment of all religious groups are essential parts of secularism. Though the term secularism has not found expression in the original Constitution, the principles of secularism were embedded in various parts of our Constitution. Article 25, 26, 27 and 28 provide guarantee to various facets of right to freedom of religion with inbuilt restrictions. The scope of this article is to analyse the unique concept of Indian secularism and legality of religious subsidies.

USLLS-7.01

Paper Title: Role of Media in Promoting Good Governance

Author(s): Singh, A. P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: International Journal of Transparency and Accountability in Governance, Vol. 3, (2015), pp 169-184

ISSN No.: 2395-4337

Abstract: In a democracy like India, media is a link between government and common citizen. The freedom of press is fundamental to the life of an individual in the democratic polity. Like every Pillar, Media is also facing continuous demand to create some regulatory mechanism which makes TV and Print media accountable and responsible. Freedom of press is the Ark of the covenant of Democracy because public criticism is essential to working of its institutions. The role played by media in

last few years has been phenomenal. The media acts as watchdog of the three pillars of democracy that is legislative, executive and Judiciary.

USLLS-7.02

Paper Title: Confidential Information and Trade Secrets: An Indian context

Author(s): Singh, A. P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Army Institute of Law Journal, Vol. VIII, (2014), pp 1-19

ISSN No.: 0975-8208

Abstract: The rapid pace of globalization and technological advancements have created an environment which offers a plethora of products and services. While this has resulted in the growth of economy along with acting as a driving force for competition and innovation in the market, it has also given impetus to a very significant branch of law known as the Intellectual Property Rights. Industries and organizations enormously rely on enforcement of patents, trademarks and copyrights to protect their business interests and services while it is equally important for the customers as it helps to identify original and quality products/services. Trade secrets are relatively a new branch of intellectual property which is gaining a lot of traction, because in the era of globalization, the failure or success of any company depends on its trade secrets. Hence it is of paramount importance that India strives towards implementing the highest standards for protection of trade secrets which shall also ensure a fair and competitive market economy.

USLLS-7.03

Paper Title: Protecting Women-hood: Not by Law Alone

Author(s): Singh, A. P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Banaras Law Journal Vol. 42, (2014), pp 93-104

ISSN No.: 0522-0815

Abstract: Woman is subjected to a variety of discriminations and actions derogatory to her status and has not obtained adequate and proportionate representation in the services, legislature and other decision-making bodies. It raises questions such as: What has gone wrong? Why the constitutional guarantees and voluminous laws passed for her protection and ensuring her proper growth and representation in all walks of life have not been able to secure a proper face for womanhood under Indian Sun? This paper seeks to discuss an alternative strategy to ensure better implementation of existing laws and ensuring better representation of women in all walks of life, securing to her a better place in the socio economic and politico- cultural life of country. Law has two aspects of its application process. There can be what we call hard law approaches and there also can be what we call soft law approaches. What we have done so far is exclusively to come up with hard law approaches in terms of providing reservations or providing solutions in the form of do's and don'ts etc. What is sought to be argued here is that a mixed approach is needed.

USLLS-7.04

Paper Title: Challenges of Democracy

Author(s): Singh, A.P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: The Banaras Law Journal Vol. 41(2), (2013), pp 149-156

ISSN No.: 0522-0815

Abstract: The word “democracy” comes from the Greek word *demos*, which means “common people” and *Kratos*, which means strength. The term “democracy” first appeared in ancient Greek political and philosophical thought in the city-state of Athens during the classical antiquity. It was found in 508–507 BC by the Athenians and it was led by Cleisthenes. Cleisthenes is also known as the “the father of Athenian democracy”. The governance of the economic system is clearly not adequately inclusive and majority of the population of the country is out of the mainstream of developmental process. Equality and justice have been the most cherished goals and organizing principles of Indian constitutional system.

USLLS-7.05

Paper Title: Cross Border Terrorism and Contradictions of Governance

Author(s): Singh, A. P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Amity Law Review, Vol. 9, (2013), pp 1-9

ISSN No.: 2249-2232

Abstract: As had been explored in previous chapters, globalisation has brought with it not only unprecedented opportunities and progress in human development but also greater risks. Events in one economy can quickly spiral to others and the same can be said of social, cultural and political events. One theme that we have not explored in detail is how terrorism has evolved in the era of globalisation. Rather like the way in which the dark web piggybacks on the internet, a shadow side of globalisation gives criminal and violent groups the ability to spread their message and widen their operations. The impact of this shadow form of globalisation alters not only the organisation, resources and methods of such groups but also their reasoning and motivations. Under these conditions we have seen the proliferation of transnational terrorist groups with globalised agendas whose operations involve many countries or have ramifications that transcend national borders.

USLLS-7.06

Paper Title: Ethical Paradigm for Regulation of Cyber-Space

Author(s): Singh, A. P.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Delhi Law Review Vol. 32, (2012), pp 127-133

ISSN No.: 0971-4936

Abstract: This essay steps back from the more detailed regulatory discussions in other contributions to this roundtable on “Competing Visions for Cyberspace” and highlights three broad issues that raise ethical concerns about our activity online. First, the commodification of people—their identities, their data, their privacy—that lies at the heart of business models of many of the largest information and

communication technologies companies risks instrumentalizing human beings. Second, concentrations of wealth and market power online may be contributing to economic inequalities and other forms of domination. Third, long-standing tensions between the security of states and the human security of people in those states have not been at all resolved online and deserve attention.

USLLS-7.07

Paper Title: **Judicial Standards & Accountability: The Roadmap**

Author(s): **Singh, A. P.**

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: International Journal of Transparency and Accountability in Governance, National Law University Delhi, (2012), pp 238-249

ISSN No.: 2395-4337

Abstract: The Judicial organ of our country is the guardian of our Constitution. The judiciary is looked upon when other government machineries fail to do their jobs. The trust and faith of the people of India is a sine quo non for the judiciary to be running successfully. However, in the last few years we have seen that the integrity and dignity of judges has started to deter. Over the years Favouritism, Nepotism, Corruption and bribery have crept their way into the judicial system and have slowly made a permanent home, which is protected by the weapon of Contempt of Court and Unaccountability. The framers of our constitution have laid down the constitutional jurisprudence for our judicial power but the enactment of accountability has not been designed with a sense of principle pragmatism. As a result most of the wrongs done by judges go undetected and moreover unpunished.

USLLS-7.08

Paper Title: **Role of Law in Social Transformation**

Author(s): **Singh, A. P.**

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Delhi Law Review Vol. 31, (2012), pp 58-71

ISSN No.: 0971-4936

Abstract: The political, social and economic conditions change continuously. Social mores and ideals change from time to time creating new problems and altering the complexion of the old ones. This change is not essentially always in positive directions, there could always be changes which are not desirable and are essentially negative in character. The vicissitude of life process moves in strangest of ways. But does that mean that human agency just does not have a part to play in this process of change? Does the change process happen independent of the will of human agent? The way law and state have been organized during last two hundred odd years does not give that indication. The law in the broad sense and the whole legal system with its institutions, rules, procedures, remedies, is society's attempt through state to control this change process and give it a desired direction. Indeed in a highly centralized political system, with advanced technology and communication apparatus, it is taken for granted that legal innovation can effect social change.[i] Roscoe Pound perceived the law as a tool for social engineering. Underlying this view is the assumption that social processes are susceptible to conscious human control and the instrument by means of which this controls is to be achieved is law.

USLLS-8.01

Paper Title: Correctional remission under criminal justice system – Parole and Furlough

Author(s): Singh, K.D.P

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Vivekananda Journal of Research, (2015), pp 98-106

ISSN No.: 2582-0303

Abstract: Reformation and social rehabilitation of criminals are the two important aspects concerning the objectives of punishment in criminal justice administration, the paper deals with historical evolution of parole and furlough and their usage in the current trend of penology. It shall look into the objective of the system of social integration. Radical reforms in the correctional system shall be discussed so that the law makers and the society will help in reformation of offenders, finally leading to peaceful and harmonious society.

USLLS-8-02

Paper Title: Negotiation of Tax Treaties in compliance of International Conventions and Domestic Law

Author(s): Singh, K.D.P

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Amity Law review, Vol. 11, (2015), pp 1-17

Abstract: The Paper aims to reconcile the principles of interpretation of tax treaties. The Tax Treaties lays down a basis for understanding and applying International Tax Concepts. If the two contracting countries do not arrive at the same conclusion with regard to the tax rights under the treaty essence of treaty may be lost. The tax authorities of the world are collectively represented by the Organization for Economic Cooperation and Development ("OECD") and the United Nations ("UN"). The conventions announced by these organisations generally address such discrepancies. The efficiency the treaty approach, however, depends on common and workable interpretations of the treaty terms. Tax treaties are treaties between states governed by public international law. Tax treaties also affect the domestic rights of taxpayers and states. Conflicting, principles of interpretation may apply in public international, and in domestic contexts. The article seeks to reconcile these different principles. The tax treaties need to be interpreted uniformly to achieve reciprocity. The paper distinguishes interpretations with the help of domestic law and international models namely OECD Model and UN model. It shall illustrate the problem of interpreting and its consequences. The problems which arises when a treaty term is not defined or is inadequately defined in the treaty and the parties attach different interpretations to the term under their domestic laws shall be discussed in length. In addition, the paper shall discuss the problem of international tax avoidance and solutions which generally involve restricting the interpretation of a treaty term.

USLLS-8.03

Paper Title: Reforms in tax Laws: Key to Transparent Governance

Author(s): Singh, K.D.P

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: International Journal of Transparency and Accountability in Governance, (2015), pp 159-177

Abstract: This study has highlighted the role of taxation laws in good governance. It looks into contributing factors towards a robust tax system. The study looks into the development of Tax system in India and the policy adopted by the government from time-to- time. It analyses the retrograde steps and suggests steps to be taken for efficient administration of tax laws so that corruption could be weeded out and transparency may be promoted.

USLLS-8.04

Paper Title: Implication of Supreme Court Judgment on Presidential Reference in 2G Spectrum Allocation Case

Author(s): Singh, K.D.P¹ and Chauhan, V.²

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078, Advocate, Dhir and Dhir Associates, Delhi

Source: Amity Law Review, Vol. 9, (2013), pp 42-58

ISSN No.: 2249-2232

Abstract: The central idea of this research was to clearly study the judgment of the Supreme Court on 2G spectrum allocation and to discover the power of the Court to review a policy decision of the Executive in larger public interest. Research methodology was purely doctrinal in its approach and it has used and assessed many academic works of various jurists and eminent writers and publications of numerous newspapers and magazines to reach conclusion.

USLLS-9.01

Paper Title: “Real Estate Legislation in India: An Analysis”

Author(s): Singh, V.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Nagarlok, Vol. XXIV, (2015), pp 28-41

ISSN No.: 0027-7584

Abstract: The present paper deals with the recent legislation in the area of real estate. The author attempts to analyse the different provisions of the proposed Act and its expected impact in the field of real estate.

USLLS-9.02

Paper Title: Commutation of Death Sentence and Changing Collective Conscience of the Nation: Time to revisit the Afzal Guru's case

Author: Singh, V.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Religion and Law Review, Vol. 32, (2013), pp 79-96

ISSN No.: 097-4936

Abstract: The judgements on commutation of death sentence reminds us about the contrary view taken by Supreme Court in Afzal Guru's case and it is required that we should analyse Afzal's case again aftermath of recent Supreme Court judgement on mercy petition decided on 21st Jan. 2014, also the commutation of death sentence in Rajiv Gandhi's assassination case on 18th Feb. 2014. It is necessary for both Indian government and the Indian judiciary to introspect themselves with regard to Parliament attack case

USLLS-9.03

Paper Title: Pashmina Advertisement by Idea Cellular: A case of Misrepresentation of Geographical Indication

Author(s): Singh, V.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Delhi Law Review, Vol. 32, (2013), 181-189

ISSN No.: 0971-4936

Abstract: Some products are unique because they can be produced only in a certain geographical region and they become reputed because they have certain quality traits. The uniqueness about these products is the link between their quality characteristics and the geographical attributes of the region where they are being produced. Economically, these words are valuable assets as they are able to acquire a high reputation and higher premium. The name of Intellectual Property which indicates that a particular product is coming from a particular geographical area is termed as "Geographical Indication".

USLLS-9.04

Paper Title: Trademark Law and Comparative Advertisement in India

Author(s): Singh, V.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, Delhi – 110078

Source: International Journal of Information and Communication Technology, Vol. 9, (2016), pp 145-160

ISSN No.: 1466-6642

Abstract: The research paper 'Trademark law and comparative advertisement' deals with the concept of comparative advertising and how it is covered under different legal systems in India. Starting from the concept of freedom of 'speech and expression' enshrined under the Constitution of India, the paper analysed the other statutes which regulate the comparative advertising in India. The approach of Indian Court on the issues of comparative advertising is discussed in detail by citing important judicial pronouncements. The brief discussion also made about the comparative advertisement in other economy like the USA, Australia, UK and Hong Kong. The

paper concludes by giving recommendations on the issues of legal aspects of comparative advertisement in India. The methodology adopted is mainly doctrinal in nature and includes textbooks, reference books, internet books, articles, journals and newspapers.

USLLS- 9.05

Paper Title: **Functioning of Lok Adalat in India: An analysis**

Author(s): **Singh, V.**

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Religion and Law Review, Vol. 35, (2016), pp 34-42

Abstract: The present paper intends to analyse the concept of Lok Adalats, the need for such mechanism in India and how should we look at the very concept of it. Should it be viewed merely as a by-product of the failure of our judicial system, or as a simple device to dispose of the heaps of cases pending for years in our courts, or as an alternative justice-delivery system to be imposed? The paper would also highlight the challenges and perspectives of Lok Adalat and Permanent Lok Adalats. Finally, the paper intends to frame valuable suggestions to strengthen the law relating to Lok Adalats in India, which can be very useful in fulfilling the aim of Article 39 A of the Constitution of India

USLLS-10.01

Paper Title: **Swachh Bharat Mission: Gandhian Perspective and the Constitutional Context**

Author(s): **Vaksha, A. K and Singh, V.**

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Journal of Constitutional and Parliamentary Studies, Vol.49(1-4), (2015), pp 50-69

ISSN No.: 0022-0043

Abstract: The insignia of Swachh Bharat Mission is the frame of the spectacles that the father of the Nation Bapu wore, which in its true sense is befitting tribute to the commitment of Gandhiji to the cause of cleanliness, hygiene and sanitation in the run up to commemoration of 150th year of his birth anniversary in 2019.

USLLS-11.01

Paper Title: **An Analysis of Conceptual Foundations of International Instruments for Global Peace and Development**

Author(s): **Wani, A. M.**

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Journal of the Indian Law Institute, Vol.55, (2013)

Abstract: All efforts going on in the world for promotion of global economic order through liberalization and privatization can flourish only with nation states on the globe converging to an agenda for establishing peace between them and within each of them. For this reason, all events of universal importance from the second World War show that, along with trade and development, management of conflicts and establishment of peace have been a priority with the world bodies. There is an urge of understanding the process of creating peace and a congenial atmosphere to make it sustainable. On an examination of the international convention and declarations a full-fledged jurisprudence has evolved at the international level which underlines the

philosophical foundations for eliminating war and establishing harmony between nation states and internally within various countries mainly by fine adjustment of interests of parties or groups in conflict by giving boost to the economy, advancement of use of technology, and, if necessary by deploying peace keeping forces.

USLLS-11.02

Paper Title: Contemporary Challenges to Art and Artisanhip in India: State Responsibility for Protection and Promotion of Artisans

Author(s): Wani, M. A

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Punjabi University Law Journal, Vol. VII, (2013)

ISSN No.: 2229-3906

Abstract: India is a combination of multiple worlds. At a time, it lives in many centuries and cultures. The world of India " s crafts persons spans millennia and spreads across the length and breadth of our rich land, which is apparently observed in cities, towns and in beautiful villages. India opened her market to the multinationals during the era of economic reforms, bringing an end to the license raj. Now world boundaries are eroding paving way to economic investment across the world, in which developed nation are penetrating and leading in underdeveloped market of third world. If we talk about Indian Artisans and their products handicrafts which are integral part of our society are in demand in Western consumers. The cultural borders are eroding out and becoming irrelevant. The major concern in the Indian Handicrafts industry is that whether they can stand in front giant industrial products. Opening of Indian market had paved the way to foreign firms to produce daily needs and products for festivals, which are earlier produced by village artisans. This poses a big question for the survival of village artisans who are technically and financially poor. This paper observes the impact of liberalisation on community of weavers in district Mau and the opportunity they may have. Further, this paper will also discuss the governmental policy and programme for the promotion of traditional crafts.

USLLS-11.03

Paper Title: Realities about Process of Marriage Dissolution in Islam

Author(s): Wani, A. M.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: Religion and Law Review, Vol. XXV, (2016)

Abstract: Marriage formed by religious ceremonies which are not legally recognized are often cited as synonymous with unregistered Muslim marriages. The conceived illegitimacy of such unions and the need for legal interventions has been raised in political discourse, such marriages are deemed to counter women's right and wider legal and cultural norms. Focus group discussions and discourse analysis methodology are utilized to explore marriage practices in order to ascertain emerging norms and the perceived need or otherwise to register marriages with the state.

USLLS-12.01

Paper Title: Women: The Primary Victim of Human Trafficking

Author(s): Mehra, N.

Affiliation(s): University School of Law and Legal Studies, Guru Gobind Singh University, Dwarka, New Delhi – 110078

Source: International Journal of Human Rights, (2015), pp 136-140

Abstract: Human trafficking is the trade in humans, most commonly for the purpose of economic gain, sexual slavery, forced labor, or for the extraction of organs and tissues, including surrogacy and ova removal. India is a source country of men, women, and children trafficked for the purposes of forced labor and commercial sexual exploitation not only within the country but also cross borders. Women are at greater risk for being abused, trafficked, and coerced into sex slavery. They are not only forced to work in industries, as a domestic labour in metropolitan cities by illegal placement agencies, to the act of surrogate for the other couples but also pressurized to indulge in flesh trade. India is included amongst the Tier-2 countries, as per the US government's 2014 TIP Report. This is the real and widespread problem which is the major cause of concern. The paper will highlight the main cause of the human trafficking in Indian tribal community. It also explores the link between the human rights and the trafficking. After analysis in detail the problem of trafficking face by the tribal women of India, the paper will move on to make the suggestions for the prevention and the protection of this community from the human trafficking.

**UNIVERSITY SCHOOL OF
EDUCATION
(USE)**

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USE-1.01

Paper Title: Innovative classroom teaching practices: Humanities, Sciences & Mathematics

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Techno LEARN, Vol.2(2), (2012), pp 135-139

ISSN No: 2231-4105

Abstract: Curriculum development stresses upon the softening of subject boundaries i.e. subject boundaries should be porous so that it goes beyond textbooks and learners can get a taste of knowledge and the joy of learning in the disciplines-Humanities, Sciences & Mathematics. All this requires the school pedagogy to be an innovative one in the sense it organizes the classroom experiences in consonance with learners ' nature and environment and thus provides opportunities for all the learners so that they may express themselves, explore their natural and social milieu etc. Innovative pedagogy aims at enhancing learners 'natural desire(s) and strategies to learn and also distinguishes knowledge from information as the former is to be constructed and the latter is to be processed by the learner and of course views teaching as a professional activity not as a coaching for memorization or transmission of information etc. Innovative school pedagogy, irrespective of the discipline, avoids ritualization and in turn facilitates bilateral interaction and participation incorporating the experiences of both learner and teacher as the latter on the track of innovative pedagogy provides a safe space for the learners to share experiences, acknowledge and constructively question the conflicts so that they can make sense of the world around themselves.

USE-1.02

PaperTitle: Concept mapping as an effective teaching practice in science education

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Techno LEARN, Vol.3(1), (2013), pp 27-32

ISSN No.: 2231-4105

Abstract: To impart instructions in science keeping in view the dynamic nature of learner, subject and environment there is imperative need to work out some constructivist approach which must focus on meaningful learning, Concept Mapping is such response in this regard which, being a two dimensional technique for hierarchical arrangement of concepts, sub concepts and their relationship(s), represents the cognitive structure of learner with respect to the concerned concept(s) in context. Over the years, the effectiveness of concept mapping as instructional -, diagnosing-, evaluative -and nurturing tool has been positively proved.

USE-1.03

Paper Title: Professional development of teachers

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Educational Quest, Vol.1(6), (2015), pp 11-15

ISSN No.: 0976-7258

Abstract: Teaching requires expertness which proliferates over the time. Professional development refers to skills and knowledge attained for personal as well as career development. Continuous professional development of teachers is the need of the hour because the students have to face the ever changing world. The knowledge domain, lifelong learning, pedagogy, information and communication technology, communication are the core areas which should be addressed through professional development programmes of teachers. For transacting the professional development programmes agencies like NCERT, State Education Departments, Centre of Advanced Studies in Education etc. undertake the responsibilities.

USE-1.04

Paper Title: Computer & communication technology in education

Author(s): Ahuja, A.

Affiliation: University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Teacher Education, Vol.49(1&2), (2015), pp 25-35

ISSN No.: 0379-3400

Abstract: Information and Communication Technology (ICT), as a technological foundation, enriches the pedagogical methods, raises learners' participation, improves class-room dynamism and enhances the resourcefulness of teachers. ICT comprises of resources and technological tools which facilitate communication and creation, dissemination, storage, sharing, transmission, exchange and management of information which may be as audio, video, image or text etc. ICT as a catalytic agent promotes social development and paves the ways for social changes also. Computer and Communication Technology (CCT) has emerged as an extension of ICT. CCT stands upon an internet supported computer system where the internet, through computer, offers a wide variety of learning experiences, consisting of communication also, in such a manner that the user shares the information, asserts himself, and visualizes the world through some portal. The world has come closer so in practice, rather than face-to-face communication, the tele communication is gaining momentum among users and hence due to CCT the users are in touch with each other by an electronic channel. Professionally there is demand of more refined and precise outputs with lesser conflicts among the users. Educational institutions use computers in administrative tasks, academics, professional development programmes and research etc. The CCT, as a subtype of ICT, can be dynamically harnessed to develop human resources.

USE-1.05

Paper Title: Need of value education for a global society

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Amity International Journal of Teacher Education, Vol.2(1), (2016), pp 1-6

ISSN No.: 2395-616X

Abstract: Value stands for ideas men live for. Values help to reflect upon awareness, communication, commitment and ultimately deeds as actions. Value education, as a joint venture requires collaborative efforts of parents, teachers, teacher educators, administrators, curriculum planners etc. as it develops social cohesion and unity. In today's technology based competitive world, for sustainable development it has become imperative for a nation to emerge as knowledge power otherwise there may be brain drain. Sharing of information, through some reliable means of communication, upon practice leads to knowledge construction and it may ensure brain gain. Such tendencies, if practiced effectively by the people may lay foundations for a global society where people from diverse cultural, social and religious background co-exist by sharing, working and learning in togetherness as spirit. But there may be individual difference also so, there is a need to develop and promote a powerful value system as it helps in sustaining the culture and society. For a global society, aesthetic, spiritual, moral and social values are imperative. Values may be classified into biological, intrinsic and instrumental values. As a school of thought, naturalism is an off shoot of biological values while idealism and pragmatism have their roots in intrinsic and instrumental values respectively.

USE-1.05

Paper Title: A Study of Mental Health among Secondary School Students in relation to Academic Achievement Motivation and Academic Achievement

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: GCTE Journal of Research and Extension in Education, Vol.11(1), (2016), pp 10-18

ISSN No.: 0975-5144

Abstract: An individual with sound mental health accepts himself with his advantages and shortcomings and makes the best use of what he has. Academic Achievement motivation stimulates the students to execute their higher abilities to attain a goal and in school scenario it is reflected as academic achievement. A descriptive survey was conducted on 206 students of class IX in Delhi state. The data analysis indicated that boys and girls did not differ significantly on mental health but girls outperformed than boys on academic achievement motivation and academic achievement. For boys and girls, a significant positive correlation was found between mental health and academic achievement motivation; mental health and academic achievement & academic achievement motivation and academic achievement.

USE-1.06

- Paper Title:** Integration of information & communication technology in school curriculum
Author(s): Ahuja, A.
Affiliation: University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
- Source:** Learning Community, Vol.7(1), (2016), pp 1-8
ISSN No.: 0976-3201
Abstract: The diffusion of technology resources in education may widen the horizon of the learning domains. Information and Communication Technology (ICT) has been credited as a kind of building block which appears to be basic in laying foundations for a modern society in which the criteria of lifelong learning and adjustment are fulfilled. For developing nations, ICT has proved dynamic enough in increasing the access of education and also in improving the quality and relevance of education for the common mass. ICT resources help students in undergoing reasoning, creativity & problem solving and there exists a positive correlation between the ICT supported academics learning and critical thinking skills. ICT oriented curricula must be augmented by appropriate cognizance at ethical, legal and social level of technology use also as there may be unwanted attempts of plagiarism and software piracy. The formal education system is undergoing a radical change from lecture oriented & teacher centred trend to interactive learning and student centred pattern. ICT inclusion in school system boosts the effectiveness of teachers and improves learning on the part of students and the student achievement is also enhanced when ICT is used in some structured and planned way in formal teaching-learning. On ground level there are some obstacles, from both the teachers and learners perspectives, which stand as barriers in ICT inclusion in the school system.

USE-1.07

- Paper Title:** A study of mental health of secondary school students in relation to scientific attitude and adjustment
Author(s): Ahuja, A.
Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: MERI Journal of Education, Vol. 11(2), (2016), pp 1-13
ISSN No.: 0974-2085
Abstract: The present study aims to probe mental health, scientific attitude and adjustment of students at secondary school level. Random sampling was exercised, throughout, in the selection of sample for the study which comprised 103 boys and 105 girls studying in IX standard of two Government schools in Delhi. Mental Health Battery (Singh & Gupta, 2005), Scientific Attitude Scale (Bajwa & Mahajan, 2009) and Adjustment Inventory for School Students (Sinha & Singh, 2013) were used as tools for data collection. The collected data was statistically analysed by applying t-test to find out the significance of difference with respect to the variables under study and computing Karl Pearson's Coefficient of co relation (r) to check the significance of the correlation between any two dependent variables undertaken. It Was found out that boys had significantly higher mental health, scientific attitude and adjustment scores than girls. Mental health & scientific attitude, mental health & adjustment and scientific attitude and adjustment were significantly related to each other as a corresponding significant positive correlation was found between them.

USE-1.08

Paper Title: A study of science process skills among secondary school students in relation to science achievement and emotional intelligence

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Advanced Study in Education, Vol.6(1), (2016), pp 34-42

ISSN No.: 2348-9162

Abstract: The aim of the present study is to probe science process skills, science achievement, and emotional intelligence among students at secondary school level. Random sampling was exercised in the selection of sample which comprised 103 girls and 102 boys of IX class of two Government schools in Delhi. Test of Science Processes (K.S. Misra, 2012) and Emotional Intelligence Scale (Singh & Narain, 2014) were used as standardized tools for data collection. Summative Assessment-II scores were used as science achievement scores. The collected data was analyzed by t-test and Karl Pearson's Coefficient of correlation (r). It was found out that girls had statistically significant higher scores in science process skills, science achievement, and emotional intelligence than boys. A statistically significant positive correlation was found between science process skills & science achievement, science process skills & emotional intelligence and science achievement & emotional intelligence of secondary school students.

USE-1.09

Paper Title: A Study of Emotional Intelligence among Secondary School Students in relation to Academic Anxiety and Adjustment

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Indian Education, Vol. 42(3), (2016), pp 56-70.

ISSN No.: 0377-0435

Abstract: The aim of the present study is to probe emotional intelligence, academic anxiety and adjustment among students at secondary school level. Random sampling was exercised in the selection of sample which comprised 100 boys and 100 girls of IX class of two Government schools in Delhi state. Emotional Intelligence scale (Singh & Narain, 2014), Academic Anxiety Scale (Singh & Sen Gupta, 2013) and Adjustment Inventory for School Students (Sinha & Singh, 2013) were used as tools for data collection. The collected data was analysed by t-test and Karl Pearson's Coefficient of correlation (r). It was found out that girls had higher emotional intelligence scores than boys but in adjustment, boys significantly outperformed better than girls. There was no statistically significant difference between both genders with respect to academic anxiety. Further, emotional intelligence and academic anxiety were not significantly related however a statistically significant positive correlation was found between emotional intelligence and adjustment of students. Also, academic anxiety was negatively co related to adjustment of secondary school students.

USE-1.10

Paper Title: A study of self- efficacy among secondary school students in relation to educational aspiration and academic achievement

Author(s): Ahuja, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Educational Quest, Vol.7(3), (2016), pp 275-283

ISSN No: 0976-7258

Abstract: The aim of the present study is to probe self-efficacy, educational aspiration and academic achievement among secondary school students. In sample selection, random sampling was exercised and final sample comprised 106 boys and 104 girls of IX class of two Government senior secondary schools of Directorate of Education, Delhi. Self-Efficacy Scale (Singh & Narain, 2014) and Educational Aspiration Scale (Sharma & Gupta, 2015) were administered as standardized tools for data collection. Summative Assessment-I scores were used as academic achievement scores. The collected data was analysed by employing t-test and Karl Pearson's Product Moment Coefficient of Correlation (r). It was found out that girls had statistically significant higher scores in self-efficacy, educational aspiration and academic achievement than boys. A statistically significant positive correlation was found between self-efficacy & educational aspiration, self-efficacy & academic achievement and educational aspiration & academic achievement of secondary school students.

USE- 2.01

Paper Title: Addressing the Health and Education Divide-Female Literacy

Author(s): Chauhan, S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal for Research Analysis Vol.3(9), (2014), pp-37-38

Abstract: Education plays a significant role in the holistic development of one's personality. But in the Indian context, importance in other spheres of life and specially education, weightage and preference is shown towards the male gender resulting in discrimination. Gender inequality is now a very prominent feature of the Indian society. A huge disparity between male and female literacy rate is quite alarming and calls for special effort to bridge this gap. In addition to it, the issue of health awareness for females also needs immediate attention which has been a neglected field since time immemorial. The paper has tried to address and touch upon the issues of female literacy, gender disparity, health, women empowerment and expressed the need for social change through supporting and encouraging women to embark upon a journey which will not be at crossroads but meeting at a point where education and health will be at utmost priority leading to live a life full of contentment and quality.

USE- 2.02

Paper Title: Child Labour and Education

Author: Chauhan. S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Humanities and Social Science Vol.1(1), (2014), pp 88-91

ISSN No.: 2348-7429

Abstract: We are moving very fast towards achieving the goal of free and compulsory education for all children in the age group of 6 to 14 years of age, we are faced with several challenges in bring groups of children who remain outside the ambit of education. It is very painful to see several children of this age group living on road sides throughout the day in very unhygienic conditions and not attending schools in spite of several useful provisions made under Sarva Shiksha Abhiyan, Centre and State supported schemes as well as voluntary effort. Why do we have to witness such situation is a serious issue. What are the barriers which come in the way of eliminating the problem of child labour which is one of the hurdles in the way of Education For All?

USE-2.03

Paper Title: Quality in Higher Education-Issues and Challenges

Author(s): Chauhan, S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: AITEA International Journal of Education & Humanities Vol.5(9), (2015), pp 8-18

ISSN No.: 2231-380X

Abstract: The issue of quality in higher education is increasingly becoming crucial day by day. This is emerging as a global phenomenon. Every country both developed and developing is trying to improve "quality" through their individual means. However, the issue, which this paper is trying to ponder on, is whether this "quality" is individualistic to a Country in an increasingly global world. Is this quality governed by economic and financial needs of the world? Are we supposed to produce quality individuals who can contribute profitably to only the economy and market driven policies of the governments, or do we need human beings who are compassionate, humane, decision makers, leaders, friends, philosophers, and guides to themselves and their fellow beings? This paper tries to answer these questions and will try to find the real meaning of quality in Higher Education in global village increasingly affected by over-specialization in everything but lacking basics in everything.

USE- 2.04

Paper Title: Academic Audit- A Step Towards Quality Improvement in Higher Education

Author(s): Bhatnagar, A., Chauhan, S

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Humanities and Social Science, Vol.1(2), (2015), pp 155-165

ISSN No.: 2348-7429

Abstract: With increasing numbers and demand for higher education, the quality and the relevance of education is increasingly becoming a Key Concern in many countries. The stakeholders of Higher Education are demanding more accountability and quality in Higher Education. At the same time, key stake holders such as businesses, professional bodies and employer organizations are losing confidence in the ability of Higher Education Institutions to meet the needs of modern workplaces and labour markets in an increasingly competitive and changing economy. In addition, new modes of delivery of Higher Education have emerged with the advancement in ICT. This paper therefore tries to understand the process of academic audit and the role it can play to foster quality in Higher Education in India, where the limited resources and understanding of continual quality improvement is the need of the hour.

USE-2.05

Paper Title: Demand of Gurjars for Scheduled Tribe Reservation

Author(s): Chauhan, S

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Multidisciplinary Studies; Vol. 4(8), (2015), pp 222-227

ISSN No.: 2348-0459

Abstract: Demand of Gurjars for inclusion in the list of scheduled tribes was the most powerful one to disrupt government functioning mainly for their unity and determined faith to avail similar benefits like Meenas availing for many decades. The state government bowed down their demand and negotiated for agreement to appoint commission under the Chairmanship of Justice Jasraj Chopra in 2007. The commission heard claims and counter claims for and against their inclusion in the list of scheduled tribes and keeping in view various past decisions of judiciary, the state government accepted demand to provide reservation to gurjars under special category other than scheduled tribes. The reservation was agreed in the constitution for the duration of one decade but still continues for political reasons. Various rulings of judiciary for exclusion of already availed benefits in the form of creamy layer have not been enforced by government mainly for political reasons.

USE-2.06

Paper Title: Building a Case for the Use of Blended Learning in Pre Service Teacher Education

Author(s): Chauhan, S., Bhatnagar, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Jamia Journal of Education-An Internal Refereed Peer Reviewed Journal, Vol.3(1), (2016), pp 112-121

ISSN No.: 2348-3490

Abstract: This paper explores the use of blended learning in the pre service teacher education programme. It explains how different types of technologies may be integrated in the traditional classroom discourse effectively. The paper further gives specific examples how technology inputs can be used in different course components of the B.Ed programme such as the School Experience Programme, Foundation Papers, Pedagogical Subjects strengthening the case for Blended learning.

USE-3.01

Paper Title: Human Rights Education: A Call for Inclusion in Teacher Education Programme

Author(s): Joshi. D., Chabra. S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Journal of Interdisciplinary Education, Vol.1, (2013), pp 1-5

ISSN No.: 2321-8118

Abstract: The concept of human rights has evolved over the years and now got hold of a rationality of human kind getting accepted and actualized. They are a kind of grammar which one needs to recognize to invest human kind with dignity, equity, existence and non- exploitative social justice. Thereby human rights education has gained importance in the current context. Sabine Horenberg 2002 argues that human rights education should become an integral part of general education Human rights education is important for everyone and it is the safest, surest and cheapest way to a Knowledgeable and enlightened society through the medium of teachers. This leads to a major task of teacher education. The paper is exploring the inclusion of human rights education in teacher educational programme.

USE-3.02

PaperTitle: Development and Effectiveness of Social Adjustment Scale for Urban Adolescence

Author(s): Joshi. D, Dutta. I

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Innovation and Scientific Research, Vol.1, (2014), pp 26-35

ISSN No.: 2351-8014

Abstract: Adolescence is a phase of the life which is generally can be considered as “re-birth” as many physiological, emotional, cognitive changes takes place. It is the phase of a life where there is a change in the personality of an individual takes place. Erikson and Marcia have considered this phase as identity formation or confusion phase. According to Piaget, there is spurt in the cognitive development of individual at this age. Moreover, it is also the phase wherein individual is under the influence of peer group rather than the parents or elders. Therefore, an individual is always faced with conflict and struggle related to needs and satisfaction especially with his social environment. An individual has to reconcile with his conflict and struggle and thus maintain equilibrium which is generally called adjustment. Though, there are several areas of adjustment like school, home, emotional, educational and personal but, most important is the social adjustment of adolescence especially in light of the present contemporary society. The investigator self-designed and standardized the social adjustment scale on the urban population in the age group of 13-17 years. Thereafter, tool was administered to 246 students taken from heterogeneous schools. The number of male and female participated in the study was 131 and 115. The result

obtained was that majority of the male and female fall in the moderate category of social adjustment. Moreover, there was no significant difference between the female and male students on social adjustment.

USE-3.03

Paper Title: Emotional Intelligence among Secondary Students: Role of Gender and Type of School

Author(s): Joshi, D, Dutta, I.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: MIER Journal of Education Studies Trends and Practices, Vol. 4, (2014)

ISSN No.: 0976-8203

Abstract: In recent years emotional intelligence has gained immense importance especially in predicting the success and failure of an individual in his life. The one who has high level of emotional intelligence is found to be better in handling the situations of life than one who has low level of emotional intelligence. Children in the age group of 14-16 years pass through the phase of life which is considered to be crucial in determining the development of a later phase of life. This phase is considered by many as stress and storm. Therefore, it is imperative that they are able to handle and control their emotions as it has implications for their immediate and future life. The present study was conducted in the urban settings wherein 246 students from public and private- funded institutions participated. The result indicated that female students have higher emotional intelligence in comparison to their male counterparts whereas the type of school does not act as a significant factor in differentiating emotional intelligence.

USE-3.04

Paper Title: A Study of Students Experiences of Mobile Learning

Author(s): Joshi D., Tulika B.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Journal of Human Social Science: H Interdisciplinary, Vol.14(4), (2014)

ISSN No.: 0975-587X

Abstract: These days mobile phones are ubiquitous with everyone and there is lot of craze of messenger applications. Research has often found their students asking them "Do you use WhatsApp?" or "Are you on we chat?" This tickled their mind and made them think how these mobile applications can help in education. This very thought triggered the first step to this research. During session 2013-2014, 37 student of B.Ed. (Bachelors in Education) programme were selected. All the selected students were using smart phones and mobile application named 'WhatsApp'. A WhatsApp group was created and students & teacher interacted with each other through it during 40 days teaching Practice schedule. After the end of teaching practice schedule, students were asked to fill in the questionnaire on the experiences of WhatsApp m learning and for knowing their attitude towards it. For in depth analysis, Interviews of 10 randomly selected students 'was also taken. Findings of the study show that student find learning through WhatsApp very interesting and educationally useful. They found that their social interactivity with their peers and teacher has increased moreover they learned collaboratively. The attitude of the students toward WhatsApp m learning was favorable. They study also revealed that married students found learning through WhatsApp disruptive and that they prefer learning in traditional classroom as it does not collide with their family time.

USE-3.05

Paper Title: OER and Indian Journal Teacher Education of open Learning-Awareness of Barriers

Author(s): Joshi. D, Bansal. T.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian journal of open learning IGNOU: Vol 24 (1&2), 2015, pp 1-12

ISSN No.: 0971-2690

Abstract: The present study aims to find out the awareness of Teacher Educators on Open Educational Resources (OERs) as well as to identify the barriers in the success of Open Educational Resources (OERs). Mixed method employing questionnaire and interview is used for data collection. Data is collected from 40 Teacher Educators of Maharshi Dayanand University and Guru Gobind Singh Indraprastha University. The results of the study reveals high degree of uncertainty about Open Educational Resources (OERs) among Teacher Educators and; identifies lack of knowledge about finding and using OER as the main barrier in the success of Open Educational Resources (OERs). The study highlights the importance of campaigns and workshops on Open Educational Resources (OERs) for taking it to masses.

USE-3.06

Paper Title: A correlative study of Mother Parenting style and emotional intelligence of Adolescent Learner

Author(s): Joshi.D, Dutta.I.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of innovation and scientific Research, Vol.13(1), (2015), pp 145-151

ISSN No.: 2351-8014

Abstract: In the past the success of individual often has been equated with high IQ. But in the last two decades Gardener, Salvoey and Meyer, Goleman and other has researched in the area and found out that it is not IQ but EQ which determines one's success in life. The one who has high on emotional intelligence is found to be better in handling the situations of life than one who has low level of emotional intelligence. The parents who had high influence in the life of children especially at the initial phase of life are responsible to enhance EQ with good social and emotional environment. This will help the child to cope future exigencies. As, the children in the age group of 14-16 years pass through the phase of life which is considered to be crucial therefore, it is imperative that they are able to handle and control their emotions as it has implications for their immediate and future life. Children of this age share a different kind of relationship with their parents. Therefore, it is very pertinent that parents should understand their emotions and try to act according to it. Parents adopt different parenting style to rear their child. Authoritative parenting has been considered as optimum parenting style for the various developmental parameters of a child and it has been true in case of emotional intelligence. But most of the researches are being done in western population. The present study was conducted in the Indian urban setting wherein students and their educated mothers had participated. The result indicated that authoritative parenting style was not all correlated with emotional intelligence of the boys, girls or students. Though, some components were correlated with emotional intelligence.

USE-3.07

Paper Title: Attitude towards e-Learning: A study of in-service Teachers and Teacher Education Students.

Author: Joshi.D. ,Dutta .I.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Jamia Journal of Education (An International Biannual Journal, (2016)

ISSN No.: 23483490

Abstract: E-learning is emerging as an alternative paradigm to education delivery at all levels including school education. Learners from a very young age are exposed to different kinds of information and communication technology tools; thereby have a readiness to use them for education. This necessitates that the teachers are prepared for the same in terms of technological know-how and a favourable attitude towards e-learning. The present study was designed to ascertain the attitude of in-service teachers and teacher education students towards e-learning and significant difference between the two, if any. Analysis on the responses, on a 12 item Likert scale, from a sample of 50 in-service teachers and 50 teacher education students revealed that there is a significant difference between the two groups with teacher education students holding an extremely favorable attitude and in-service teachers having a favorable attitude towards e-learning.

USE-3.08

Paper Title: Annalytical study of Value component of professional courses of University School of GGSIPU.

Author(s): Joshi, D, Prasad. A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Anvesham - The Journal of Education, Vol.4(1), (2016), pp 21-27

ISSN No.: 2279-0004

Abstract: There is a value crisis in our country. This is primarily because of a conflict in our culture. We talk about concern for larger cause, concern for the cosmos and so on. This value orientation can be called selflessness, and has been greatly admired and appreciated. The people, who personalize such values, become the role models for others. But among the present youth, especially the urban youth, such traditional values have lost their hold.

USE- 4.01

Paper Title: Utilization of Educational Technology for Effective Teaching- Learning Process

Author: Shokeen, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Global Education Society Development Journal, Vol. 6(1), (2014), pp 83-88

ISSN No.: 0975-1319

Abstract: The professional growth of teachers both pre-service and in-service training of teachers are inseparable and indispensable. International Commission (1996) here aptly stated that there is a need to update teachers 'knowledge and skills throughout their lifetime. Emphasizing in-service education, the commission has pointed out the importance of the distance mode or appropriate Information Technology (ICT). This paper will discuss the importance of utilizing Educational Technology.

USE-4.02

Paper Title: Problems of Teacher Education in India

Author: Shokeen, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: KIIT Journal of Education, Vol.4(1), (2015), pp 94-96

ISSN No.: 2249-8699

Abstract: Teacher Education Institutions have potential to bring changes in educational system which will help in shaping the knowledge and skills of future teachers. Institutions of teacher education serve as change agents in transforming education and society. Not only they educate teachers, but also update the knowledge and skills and provide professional development for practicing teachers "(UNESCO, 2005). The present paper highlights the problems of Teacher Education in India.

USE-4.03

Paper Title: Excellence in Higher Education: Challenges and Practices

Author: Shokeen, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Innovative Research, Vol. 1, (2016), pp 105-109

ISSN No.: 2454-7085

Abstract: Promotion of Quality in Higher Education has been in issue since independent India. Various commissions had set up aims for developing Higher Education i.e., Greater Access, Equity, Quality, Excellence, value-based education etc. Higher Education is a powerful instrument for the development of any nation. But in the present scenario it is pathetic to know that there is downfall in the education system specifically in Higher Education. We realize that education is an important tool for transforming a developing nation into a developed nation. From the various levels of education, Higher Education is responsible for influential impact on development of a country as it provides an opportunity to reflect upon Moral, Spiritual, Cultural, Social and Economic issues. At present, Higher Education in our country is passing through a crucial junction of diffusion and radical change in terms of privatization, globalization and competition. There is great pressure from the stakeholders for making our Higher Education system a feasible and relevant development tool for betterment of economies and society. The concern of the successive government and policy makers is comprehensive growth, quality and excellence in Higher Education. We enlightened approach to deal with the inadequacies. We have large number of universities but their level of performance is not up to the expected level. The present paper discusses about the challenges in Higher Education and practices in Education for excellence in Higher Education. It is not impossible to bring excellence in Higher Education; it requires that all stakeholders have to realize the need and importance of excellence in Higher Education. Our universities need to create a spirit of excellence in environment, need to attract the brightest minds to propel, teaching and research into innovation, need to have a more enlightened approach to deal with the inadequacies.

USE-4.04

Paper Title: A study on the Attitude of Parents, Teachers and Adolescents towards Social Networking Sites

Author(s): Shokeen, A. and Jain, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Science & Research, Vol. 5(3), (2016), pp 1111-1114

ISSN No.: 2319-7069

Abstract: Social Networking sites have the most popular medium for the exchange of information and knowledge across the globe. There has been a flood of Social Networking Sites in the last five years. The younger generation makes most of the use of social media than any other demographic. Students especially use such medium to stay in touch with old friends and also to meet new ones. Adolescents have been the first ones to embrace social media platforms and have been mainly responsible for the popularity of such platforms. The impact that social media can have on adolescents is very critical and poses important questions for educationists. The exponential increase in mobile ownership in the last few years has further increased the number of social media avenues and the usage of social media by adolescents. With the increasing number of cases of cyber bullying, clique formation etc., the researcher believes this study is relevant to the current times and will attempt to answer questions which are critical to understanding the attitude of adolescents along with their parents and teachers towards Social Networking Sites. The research has been conducted on Adolescents of 16 years of age and their Parents and Teachers respectively with a view to know their Attitude towards Social Networking Sites. The study was conducted on 100 Adolescents, 30 Teachers and Parents through Likert scale and Questionnaire.

USE-4.05

Paper Title: Challenges of Primary Education in India

Author: Shokeen, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of multidisciplinary Research, Vol-5, Issue-2, March, 2016, pp-64-67.

ISSN No.: 2277-9302.

Abstract: The progress of the country depends upon the quantity and quality of education received by the people. Primary Education is the basic need of the life. We cannot ignore Primary Education of the children under any circumstances as Primary Education is the foundation of entire structure of the nation. Quality of Primary Education determines quality of life of the country. Therefore, it becomes an obligatory duty of the government to make education available to each and every child. The present paper highlights the issues and challenges of Primary Education and also evaluates the progress for ensuring the Universalisation of Elementary Education.

USE-4.06

Paper Title: Relationship among Pedagogical Understanding, Teaching Competencies and Attitude towards the Teaching Profession of B.Ed. Student Teachers: An Exploratory Study.

Author: Shokeen, A.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Confab Journal, Vol.5,(4), (2016)

ISSN No.: 2320-009X

Abstract: Education is the only and only means for the desirable social change. Quality of citizens depicts the quality of a nation and the quality of citizens depends upon the quality of education. The quality of education depends upon the teacher's knowledge, their teaching competencies and dedication in the profession. Therefore, we can say that teacher plays a great responsibility in the development of the nation. In the present study, the relationship among Pedagogical Understanding, Teaching Competencies and Attitude towards the Teaching Profession of B.Ed. Student Teachers was spelled out. For this purpose, General Teaching Competency Scale, Attitude Test and Pedagogical Understanding test was administered to a sample of 125 B.Ed. student teachers of four universities of Delhi. Results showed that there is strong relationship among Pedagogical Understanding, Teaching Competencies and Attitude towards the teaching profession of B.Ed. student teachers. The findings have implications for teacher education programs to promote Pedagogical Understanding, Teaching Competencies and develop positive Attitude towards the teaching profession.

USE-4.07

Paper Title: Men's Violence and Women's Silence: Occurrence, Prevalence and Consequence of Domestic Violence against Women in India.

Author(s): Sharma, S.¹ and Shokeen, A.²

Affiliation(s): ¹University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²University School of Humanities and Social Sciences, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Research in Social Sciences, Vol. 6(5), (2016), pp 220-228

ISSN No.: 2249-2496

Abstract: Almost half of the population in India is of women and they have been deprived of their right to life and personal liberty and always been ill-treated. Decades of research, legislation, activism, empowerment programmes and drives have failed to prompt a decline in the cases of violence against women in India. Survey based studies suggest that somewhere from 35 to 75% women in India face some kind of violence at home or outside, be it physical, sexual or verbal from men in their family or otherwise. However, the most prevalent form of violence against women in India is perhaps domestic violence. This subjection to domestic violence is irrespective of their socio-economic background. More so, this violence largely goes unreported in India due to attached social stigma, distrust in legal mechanism, fear of retaliation, so on and so forth. This violence, overt and covert, physical and non-physical has debilitating effect on the feminine identity formation. The paper seeks to foreground the issues of domestic violence against women in India as a case of human rights violation and study the same in the light of Millennium Development Goals setup

worldwide. It attempts to describe various ill effects of domestic violence that are directed towards women. Further, an attempt has been made to propose culture specific ways and means to offset gender bias and curb domestic violence against women in India.

USE-5.01

Paper Title: Facilitator Facebook or Tutorial Twitter-Pedagogy beyond Classrooms.

Author(s): Kaur, M. and Yadava, S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Gyanodaya-The Journal of Progressive Education, Vol. 6(2), (2013), pp 39-45

ISSN No.: 2229-4422

Abstract: The educators and learners of this fast paced learning environment where systems are changing with the need of the day have to adapt to the innovations and need to bring ingenuity in their daily teaching -learning environments. Not only the students but also the teachers have to keep themselves updated with the latest technology that is acting as the tool of knowledge explosion. Social networking is one aspect of social media, where individuals are in communities that share ideas, interests, or are looking to meet people with similar ideology and interests. This paper attempts to showcase the arenas where SNS have begun to impact the virtual teaching- learning environment thereby identifying the potentials of Social Networks and Web 2.0 in education. In annexation, landmark case studies will be identified and analysed for their worthiness in contributing to an effective educational exposure throughout the world. Thus strengthening the pedagogical bond of an educator and a learner by an informal medium of communication i.e. the Social Networking Sites.

USE-5.02

Paper Title: Facilitator Facebook or Tutorial Twitter-Pedagogy beyond Classrooms.

Author(s): Kaur, M. and Yadava, S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Gyanodaya-The Journal of Progressive Education, Vol. 6(2), (2013), pp 39-45

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world. Thus strengthening the pedagogical bond of an educator and a learner by an informal medium of communication i.e. the Social Networking Sites.

USE-5.03

Paper Title: Understanding Life through the Existentialist Lens

Author(s): Yadava,S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source International Journal Educationia Confab, Vol. 10(2), (2013), pp 8-12

ISSN No.: 2320-009X

Abstract: This paper attempts to understand the meaning of Existentialism and of the concept surrounding it. It tries to clarify the meaning of existence for each individual and also how the existence of individuals is defined by the others around them including the omnipresence of God. Our life is but determined by the choices we make and those choices govern our actions which in turn give meaning to our existence in this world. We must have the courage to accept full responsibility for our actions being fully aware of the dynamics which surround them. It also explores how we through our actions at our workplace choose to be either labeled as conformists or eccentrics. The author has tried to build the case in favour of Existentialism as a Philosophy of Life which enables one to transgress boundaries and liberate oneself through the practice of freedom.

USE-5.04

Paper Title: The Practice of ‘Good Teaching’.

Author(s): Yadava, S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal Educationia Confab, Vol. 3(3), (2014), pp14-19

ISSN No.: 2320-009X

Abstract: The paper builds a case for understanding what exactly constitutes the art of teaching-learning such that teaching is effective or in other words facilitates student learning. The author tries to understand the meaning of the term competence in terms of teaching and also explores the kind of classroom environments that teachers need to build in order to create an environment that is conducive to learning. The three important parameters emphasised are engagement in dialogic discourse fearlessly, space for fearless inquiry and empathy and care for each other.

USE-5.05

Paper Title: NGO Participation in SSA with respect to Enrolment, Retention and Achievement at Elementary Stage in the NCT of Delhi: Exploring the Public Private Partnership Model

Author(s): Yadava, S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Himgiri Education Review, Vol. 1(1), (2013), pp 1-15
ISSN No.: 2321-6336
Abstract: NGOs cannot be a panacea for all problems that beset primary education and limitation of their work should be clearly understood. The study focused on studying in depth the participation of NGOs in universalisation of elementary education under Sarva Shiksha Abhiyan (SSA) in the NCT of Delhi. The dynamics of this delivery system were explored with respect to enrollment, retention and achievement. The study was conceived to understand how partnerships with NGOs can provide useful insights in the field of pedagogy of teaching, incentives for enrollment and retention of pupils, community participation etc. This study argued for partnership between the government and non-government sectors to close the gap in access, equity and quality in elementary education. The underlying premise was that the goal of universalizing elementary education cannot be achieved in short term by efforts from the government alone and that sustainable and enduring links with the NGOs shall contribute in achieving these goals.

USE-5.06

Paper Title: Why do we need to talk about ARSH?
Author(s): Yadava, S. and Chopra, D.
Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078
Source: Advanced International Research Journal of Education, Vol. 3(2), (2015), pp 45-49
ISSN No.: 2320-4559
Abstract: Adolescents' reproductive health issues have gained recognition in the International Conference on Population and Development (ICPD), Cairo, in 1994. The adolescents are the most vulnerable group amongst the population. The changes that they undergo during adolescence especially pubertal and sexuality related ones invoke many questions in the minds of the adolescents. But the adolescents in our country are at the crossroads because 'sex' and 'sexuality' is considered a taboo; the parents feel uncomfortable talking to their progeny about it and the teachers ask the students to self study the lesson of reproduction included in the syllabus. Because of these apprehensions about sex, the child, out of natural curiosity explores other means and ways to find an answer to their questions. The access to the internet and exposure to the media provides the adolescents plethora of information on sex but to what extent it is right and scientifically correct, they are not aware. According to the Census 2011, the population of adolescents is 236.5 million which means every fifth person in India is an adolescent (10-19 years) and every third – a young person (10-24 years). The future of our nation lies in the way we groom the adolescents therefore it becomes imperative to critically analyze the way sex and sexuality is being taken up in the school curriculum. The paper discusses the issue of addressing the needs of adolescents with respect to the reproductive and sexual health in context of some of the recently concluded researches.

USE-5.07

PaperTitle: Building a Case for the Use of Blended Learning in Pre Service TeacherEducation

Author(s): Yadava,S.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Jamia Journal of Education-An Internal Refereed Peer Reviewed Journal,Vol. 3(1), (2016), pp 112-121

ISSN No.: 2348 -3490

Abstract: This paper explores the use of blended learning in the pre service teacher education programme. It explains how different types of technologies may be integrated in the traditional classroom discourse effectively. The paper further gives specific examples how technology inputs can be used in different course components of the B.Ed programme such as the School Experience Programme, Foundation Papers, Pedagogical Subjects strengthening the case for Blended learning.

USE-5.08

Paper Title: A Study of the Awareness Level of Metacognition in the B.Ed Student-Teachers of NCR

Author(s): Yadava, S and Chopra, D

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Psycholingua –A Refereed National Peer Reviewed Journal,Vol. 46(2), (2016), pp 188-190

ISSN No.: 0377-3132.

Abstract: Thinking about one's own thinking is the simplest way to define Metacognition. The term not merely refers to the process of thinking but goes beyond to analyse and control one's own thoughts and to develop a better understanding of the conditions under which one can quickly and efficiently grasp the subject/topic under study. The study of metacognition is not only important for the students but as teachers we must also know how to develop and apply the various strategies of metacognition. The present paper is an attempt to gauge the level of awareness about metacognition among the first year student teachers pursuing B.Ed programme in the colleges of education in Delhi,NCR. The data was collected by administration of the standardized tool on a sample of 100 student teachers. The analysis of data revealed that the prospective teachers are quite aware of their metacognition and therefore they must be taught the various strategies to integrate metacognition in teaching learning situations so as to bring about effective learning in classrooms.

USE-5.09

Paper Title: A Study of the Awareness Level of Metacognition in the B.Ed Student-Teachers of NCR

Author(s): Yadava, S. and Chopra, D.

Affiliation(s): University School of Education, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Psycholingua –A Refereed National Peer Reviewed Journal, Vol.46(2), (2016) pp 188-190

ISSN No.: 0377-3132

Abstract: Thinking about one's own thinking is the simplest way to define Metacognition. The term not merely refers to the process of thinking but goes beyond to analyze and control one's own thoughts and to develop a better understanding of the conditions under which one can quickly and efficiently grasp the subject/topic under study. The study of metacognition is not only important for the students but as teachers we must also know how to develop and apply the various strategies of metacognition. The present paper is an attempt to gauge the level of awareness about metacognition among the first year student teachers pursuing B.Ed programme in the colleges of education in Delhi, NCR. The data was collected by administration of the standardized tool on a sample of 100 student teachers. The analysis of data revealed that the prospective teachers are quite aware of their metacognition and therefore they must be taught the various strategies to integrate metacognition in teaching learning situations so as to bring about effective learning in classrooms.

**UNIVERSITY SCHOOL OF MASS
COMMUNICATION
(USMC)**

FACULTY INDEX NUMBER

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| 3. | Tripathi, D. | USMC 3.01 - 3.05 |
| 4. | Tripathi, S. | USMC 4.01 |

USMC-1.01

Paper Title: Changing Bollywood

Author(s): Bharti,S. and Tiwari, R.

Affiliation(s): University School of Mass Communication , Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Glimpses Vol.2(3), (2014), pp 380-394

ISSN No.: 2250-0561

Abstract: Bollywood is the biggest film industry in the world in terms of producing films. On an average, we are producing approximately 800 to 1000 films a year and out of these, around 150 to 250 are in Hindi only. But that is not our USP or strength. Our strength is our audience. We have approximately 14000 film theatres in India and more than 1.5 crore people watch films on these theatres on daily basis. Moreover, every day, films are being shown on television (Doordarshan, Cable TV, Dish TV etc.). From the very beginning in India, working in films or watching films was considered bad. Parents used to discourage their kids for watching films. But, now the scene is changing. Today, even film courses are being offered by reputed institutions and Universities in India. On one hand, our society is changing for films and on the other hand, films are also changing to cater to the evolving needs of the society.

USMC-1.02

Paper Title: Changing Portrayal of Mothers in Bollywood

Author(s): Bharti, S. and Redhu, D.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Contemporary Social Sciences, Vol.2(2), (2014), pp 113-124

ISSN No.: 0302-9298

Abstract: India is a land where it is often said that ‘ –Heaven lies in the feet of Mothers’. Also, films are a reflection of society. It is because of the fact that the love that Bollywood has showered on its screen mothers have made them to be iconic figures. Present paper is an attempt to analyze changing portrayal of mothers in Bollywood. It has been shown that mothers have always been looked up with love and respect in the Indian society. But, the manner in which Bollywood has showered love on its mother characters is what has created an edge for them. For decades, Bollywood has portrayed the never-ending love of its mothers for their kids. Their enduring smile, sacrificing heart, soft voices singing lullabies and the deep eyes that reflected pain of the sacrifices, together has made the perfect ingredients of a Bollywood mother. Mothers have been portrayed no less than the Goddesses. But the scene is not the same now. Over the years, Bollywood has given to its audiences several mother characters that have gone beyond just a particular film. Their images have made a lasting impression on the minds of the audiences.

USMC-1.03

Paper Title: **The Gagmen of Bollywood**

Author (s): **Bharti, S. Bharti. A. and Redhu, D.**

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Glimpses, Vol. 4(4), (2014), pp 194-205

ISSN No.: 2250-0561

Abstract: A Bollywood film entirely depends upon the emotions. Be it sadness, love, care, hatred, jealousy, anger or comedy, a Bollywood film does not leave any stone unturned to grab the eyeballs of its audiences. Our films are undoubtedly an integral part of our lives. They take us to an entirely different world. Our films make us dance, cry, feel happy, laugh and above all, they entertain us as the audiences. We feel liking for any particular film only when it manages to strike a chord with us and make us feel a part of whatever is happening on screen, isn't it? Taking into account the comedy genre, it is certainly the most entertaining of all the other genres as it makes the audiences laugh and takes them away from the monotonous lives. In short, it creates an escape for the audiences and also relaxes them. Humour is a genre which eradicates all sorts of barriers – be it of the age, gender, region, religion or even generation. Who could forget the legendary gagmen like Mehmood, Rajender Nath and Johnny Walker, who were considered no less important than the lead actors like Shammi Kapoor or Rajendra Kumar. Over the decades, films like Chalti Ka Naam Gaadi (1958), Shaukeen (1982), Angoor (1982) etc. have left unforgettable and lasting impressions on the minds of the audiences. Immortal masterpieces like ChupkeChupke (1975), Golmaal (1979), JaaneBhi Do Yaaron (1983) or the more recent ones like Hera Pheri (2000), Hungama (2003), Munnabhai M.B.B.S (2003), Bheja Fry (2007), to name just a few have successfully tickled the funny bones of the audiences. The above mentioned films are just a few of the lot.

USMC-1.04

Paper Title: **Most Potent Tool of New Media: The Smartphones (An Analysis)**

Author(s): **Bharti, S. and Redhu, D.**

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Communication Development, Vol. 4-5(4 &1), (2015), pp 32-42

ISSN No.: 2231-2498

Abstract: Abstract: Man has always been known to be a social animal. To communicate with other beings, to share the views, etc. is equally important for humans as it is to eat or breathe. The difference that has changed the way of living with the advent of time includes all – our biological growth, psychological growth, economical as well as the technological growth. And, talking particularly about the technological growth, it would not be wrong to say that with time, we have witnessed numerous technological inventions, which have made our lives extremely simple and convenient. When it comes to the technological inventions, it becomes essential to talk about telecommunication, which has made us feel closer, regardless of our physical distances. The understanding of the same would be incomplete without taking into account not so old, but, tremendously popular technologies in the field of communication, i.e. mobile technology. We ourselves and our previous generation have been the witness to the time when telephone was not a necessity. Rather, it was a luxury. But times have changed now. Today, mobile phones are present

everywhere. The greatest advantage of the cellular phone is that it can be used anywhere, anytime. Individuals can now be addressed directly. They are permanently within the access by means of the mobile phones. But, just when we would have thought of the mobiles phones as the pinnacle in the field of telecommunication, the communication revolution added another laurel in its path. The palm sized mobile phone device paved way for yet another benchmark in the form of 'smartphones'.

USMC-1.05

Paper Title: **Films on T.V. - Viewing Habits of Youth (A Comparative Study of Delhi and Meerut)**

Author(s): **Bharti, S.**

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Communication Development Vol.7 & 5, (1 & 1), (2016-2017), pp 27-37

ISSN No.: 2231-2498

Abstract: Films have contributed greatly in the way our society has evolved in the last century by influencing the way we live or perceive the world around us. When on one side, film is said to be one of the most potent mass mediums, on the other hand, it is equally true that it is not as immediate as the other mass mediums like newspapers, T.V., or radio. But, it certainly reaches a large mass over a relatively long period of time. Thus, even if it takes time initially to create its place in the minds of the audiences, once the same is done, it manages to create a long lasting impact on the viewers. As soon as the term film is heard, a large 70mm celluloid screen comes to our minds. Presently, the time is that where films have become synonymous to theatres or multiplexes. But, equally rational is the fact that watching films on theatres or multiplexes is an expensive task while on the other hand watching films on T.V. is comparatively cheap. For an average middle class family, going to a theatre four or five times a month is not possible, keeping in mind the expense of the same. Thus, even if one wants, it is not always possible to go a theatre every time a new film is released. But, there is nothing to feel sad about it, as now – a - days, films are easily available on T.V after just a few months of its release in the theaters. Also, we have many T.V. channels showing films, rather new films on T.V.

USMC-2.01

Paper Title: **The Rise of New Media and Product Promotion: Exploring the Potential of Online Media in Advertising the Services Provided by Major Telecommunications Service Providers in India.**

Author(s): **Trehan, K.**

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Indian Journal of Marketing Vol.42(9), (2012), pp 41-51

ISSN No.: 0073-8703

Abstract: The paper attempts to gain insight into the use and nature of online media in telecommunication advertising. The very nature of the medium and the technological services under the study makes it an interesting area to explore. If on one hand, the present study deals with online media - the first segment of new media communication, the industry under exploration is cellular services with an aim to increase the use of applications on mobile phones - the second major component of new media. To study the two in combination provides an opportunity

to find out the extent of the rise of new media as a marketing communication toolkit. Online advertising content is critically examined qualitatively to arrive at applicable constructs.

USMC- 2.02

Paper Title: Deceptive Practices in Indian Advertising: A Content Analysis of Print and Television Advertisements Violating the Guidelines of Advertising Standard Council of India.

Author(s): Trehan, K. and Singh, G.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Business Ethics in Developing Economies Vol.1(2), (2013), pp 30-40

ISSN No.: 0073-8703

Abstract: Whether ethical advertising is an oxymoron remains a subject of debate as it continues to evolve in the Indian media scape. The academia has expressed strong reservations on fundamental motives of advertising while the industry vehemently defends the role and legitimacy of advertising in the integrated brand promotion mix. Amidst it all, it becomes even more significant to decode advertisements visa- vis acceptable norms of conduct. Therefore, this paper attempts to analyze the content of messages in print and television ads that have been registered as violating the code of Advertising Standard Council of India (ASCI). The results show that all deceptive practices exist across product categories. Ethical violations are on the rise because of the powerless nature of ASCI.

USMC- 2.03

Paper Title: Motives and Modes of Social Responsibility in the Mediated Business Environment in India: Perspectives from the Industry.

Author (s): Trehan, K.¹ and Kaur, I.²

Affiliation: ¹University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078; ²SD Government College for Boys, Ludhiana, affiliated to Punjab University Chandigarh.

Source: Asian Journal of Management, Vol. 6(4), (2015), pp 307-313

ISSN No.: 0976-495X

Abstract: The paper attempts to examine the typology of CSR strategies and practices adopted in India. It is an academic critique of the corporate citizenship to enable clear and credible frames and foment for the industry and the media in the neo liberal era. From the study, the practices suggest an acceptance of social responsibility beyond philanthropy where conceptualization, continuity and communication remain the germane areas.

USMC-2.04

Paper Title: Brands Explore Human Relationships for Consumer Engagement: A Critical Analysis of Television Advertising in India.

Author(s): Trehan, K. and Gupta, A.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110078

Source: Indian Journal of Marketing, Vol. 45(12), (2015), pp 35-45

ISSN No.: 0073-8703

Abstract: Within the critical codes of advertising executions, human relations (personal and social) in television ads were examined to know the recurring relationship projections in the present day Indian advertising. It was found that the individuals' relationship with self is emerging as a preferred one, with romantic love and family relations often used either as site or subject to position the brand as integral, at times intimate, and more often, identifiable in the product category. Evidence pointed out at the homogenization of product-consumer relation as well as existing character-character and character - consumer relations across durables, non-durables, or other identified sponsors. From the purposive sample, it was noted that television ads used collectivistic appeals to use or create moments in life driven by the need to love and belong. Products are seldom directly talked at us but are artfully woven in relationship slices in seamless communication and persuasion.

USMC-3.01

Paper Title: New Media: Surfing Habits of Internet Users

Author(s): Tripathi, D. and Kaushik, S.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110078

Source: Pragyaan: Journal of Mass Communication, Vol.9(1), pp 45-49

ISSN No.: 0974-5521

Abstract: In the context of urban India, especially the educated youth of Delhi, the internet is routinely used in both old and familiar ways, and new, innovative ones. They can no longer imagine living their daily lives at leisure or at work, with family or friends without media and communication technologies. To spend a part of day on the Internet is quite normal for many people. In this kind of media mix environment, wherein different individuals are indulging in varied media activities, this project was undertaken to study and analyze relationship between users and internet. Since, internet is directed at common people, especially youth; the study was focused on the usage of internet by youth across age group of 18-25 years. The approach was to appraise the qualitative nature of internet behaviors with aim of discovering the underlying motives and aspirations of various users. The subjective assessment of opinions and approaches were studied

USMC-3.02

Paper Title: Media Habits of Youth (A study of Media habits of Jammu and Kashmir students studying in Delhi)

Author(s): Tripathi, D. and Butt, A.A.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110078

Source: International Journal of Communication Development, Vol.1,(2011) pp 59-66

ISSN No.: 2231-2498

Abstract: This research paper attempts to explore the media habits of Jammu and Kashmir students by using several special tools of media research. A detailed survey of literature was done on this subject to learn how the media behavior of people can be calculated. Although there was not that much of available literature that exclusively dealt with this particular topic on Jammu and Kashmir as not much of the media surveys have happened in the past in this state. This was in itself a new kind of survey. On the account of whatever the limited literature was available, a thorough study of that was conducted and then Hypothesis was made. The research design chosen was that of Exploratory in nature and the survey method was conducted to

know the media habits of Jammu and Kashmir students living outside the state. I have confined my study to the students of the Jammu and Kashmir studying jamia Milia Islamia, Jawahar Lal Nehru Vishvavidyalay, Delhi University, Guru Gobind Indraprastha University and its colleges. I tried to make a balanced research and collected data from the students of all the three provinces of the state and also tried to include the equal proportion of girl students according to the literacy rate of the womens in the state. The sampling method adopted was schedule and the reaction of the respondents was also noted. The thing that I observed in this research is that there is no doubt a drastic change in the media habits of the Jammu and Kashmir students since they have left the state. One Newspaper a day is still the preferred by the students to get detailed news but internet is something that everyone is using hours and hours to fulfill the basic requirement of information, communication and entertainment. This is something very interesting for sure. The state that is so backward that accessing a net is like a miracle for the people of that state, but there is ample scope of that new media to develop since the young generation of the state has accepted and had developed a habit of this new media.

USMC-3.03

Paper Title: Development Coverage by Media (A comparative study between Times of India and Mail Today)

Author(s): Tripathi, D. and Upadhyay, S.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi - 110078

Source: International Journal of Communication Development, Vol.2(1), (2012), pp 29-36

ISSN No.: 2231-2498

Abstract: Development has become a topic of great discussion and debate in recent times. Economically and/or otherwise, India's development scene is an important factor in determining her progress. The International Encyclopaedia defines the term development as 'purposive changes undertaken in a society to achieve what may be regarded generally as a different(improved) state of social and economic affairs. 'In simple words, development is a social change that seeks to improve the quality of life. It is a multi-faceted concept that can be seen and understood through the political, social, economic, physical and intellectual lens. Keeping this in view, development then, befits an important aspect of a nation and therefore, of journalism. Owing to its position as the fourth estate of a country, media carries on its shoulders the great responsibility of actively pursuing this role by unveiling issues that need immediate heed. It is the media's duty, especially the largely used newspapers in India, to create awareness and mobilize people towards national development. While globally this drift can be seen in the dissemination of news, in India, it is still trying to struggle its way out through illiteracy and lack of resources.

USMC-3.04

Paper Title: Viral Marketing and its Impact on Youth: With Special Reference to KolaveriDi Marketing Strategy

Author(s): Tripathi, D. and Kaura, P.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: Pragyaan: Journal of Mass Communication, Vol.10(2), (2012), pp 1-7

ISSN No.: 0974-552

Abstract: This song is stuck into our heads and even if we cannot understand it, we are

enjoying singing it. The 'soup song' and the 'flop song' Kolaveri Di as described by the singer of the song Dhanush in the starting lines of the song is a kind of song that every youth can relate himself to, the one who has been ditched by a girl. Moreover the simplicity of the song- both in terms of lyrics and music makes it a favourite of a large chunk of audience. The video is extremely simple showing the making of the song where Shruti Hassan and Aishwarya are listening to Dhanush in the studio. The song is written and sung by Dhanush and is composed by music director Anirudh Ravi chander. The success of Kolaveri Di has made the marketers to term it as the first super-hit viral campaign of India. Indeed it is especially after looking at the media coverage it got in such a short span of time both on the online media as well as the traditional media after that. Also it became the first Tamil song to be premiered on national wide music channel, MTV and the strategy adopted by Jack in the Box Worldwide has made it an IIM case-study. This research paper has tried to explain the intricacies of viral marketing with respect to social media.

USMC-3.05

Paper Title: Hypertext, Interactivity and AI: Paradigm Shifts in the Mode of eLearning

Author(s): Tripathi, D. and Singh, N. V.

Affiliation(s): University School of Mass Communication, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: International Journal of Communication Development, Vol.6(1), (2016) pp 65-70

ISSN No.: 2231-2498

Abstract: Changing technologies have evolved the mode of interaction of people through a compression of time and space. In this very process of change, the nature of engagement of the people has become more and more personalized, interactive and instantaneous. From the Egyptian times of the use of Papyrus to the modern digital technologies, media tools have provided a far greater scope in the access of information and creation of knowledge. In the case of digital media, the process of learning has become highly dynamic with the rising levels of interactivity and the utilization of hyper text which has led to a process of digital convergence. Now with the integration of AI, e-learning is expected to achieve a different mantle in terms of engagement. The paper primarily focuses on highlighting the transformational trends that have taken place in respect to e-learning platforms from the use of hyper text to increasing the mode of interactivity and finally the integration of AI for a more personalized form of learning. The paper further illuminates upon the future scope of e-learning platforms and how the integration of AI can be seen as a transformational shift in the mode of engagement in various e-learning platforms.

USMC-4.01

Paper Title: Development Support Communication for Rural India

Author(s): Bharti, A. and Tripathi, S. D.

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Source: The Discussant, Vol.3(4), (2015), pp 22-40

ISSN No.: 2250-3412

Abstract: In times when a happy population is participating in various movements related to certain national issues via social media on 3G speeds, there is another part of the population which cannot afford to have a radio or subscribe to the newspapers. There are people in villages which are denied information meant for them, on purpose. These 'ignorant' citizens have gradually lost the hope of any kind of development when they either don't have access to information or are denied information or there

is an absence of proper development support communication. Present paper is an attempt to explore the various communication channels/media that the government uses to make various development related information available in rural areas. The study was conducted to know why the government uses a certain kind of media and whether or not it solves the purpose. It further tries to know the opinion of the rural population on what should be the media to solve the issue of information poverty and what are the reasons that are working as roadblocks. The study was conducted in four villages from two districts, Begusarai and Munger, of Bihar. These two districts were (in fact, Begusarai was a part of Munger till 1972) the first districts to see any kind of industrial developments in the state. These two districts are among the top three in terms of highest per capita income in the state. The selection of villages were on the basis of general demography of the said villages and all vary from each other. Two villages have very limited access to main town area and other two are closer. One of the village is populated by only Scheduled Caste citizens. One of the villages, Babhanagama, is among the most flourishing and aware villages of the district (the cooperative dairy received the prestigious Prime Minister's award of excellence in 2010). The results proved that the approach of government in dissemination of development related information is totally wrong. The sample was decided on the basis of considerations of caste, occupation, literacy and income so that all kinds of citizens are covered. The demography of villages from one small area to another differ drastically and hence the media to address the information dissemination should be selected accordingly. Some villages don't have any access to electricity, some doesn't have schools and a huge population is illiterate, some villages have caste issues which block the flow of information. The study is an eye opener to the local administration, in particular, and state and centre in general where the approach of information dissemination is irrational. In a diverse nation such as ours, where fundamental and infrastructural need of a large rural population is still ignored for various reasons, this paper brings about the fact that unless related authorities get to know the situation first hand and make decisions accordingly, spending billions of rupees won't solve any good purpose. Present paper can be a relevant source for researchers, students, media professionals and policy makers.

**CENTRE FOR DISASTER
MANAGEMENT STUDIES
(CDMS)**

FACULTY INDEX NUMBER

| S. No | Faculty | Abstract No. |
|------------------|-----------------|-----------------------|
| 1 | Kaur, A. | CDMS 1.01-1.02 |

CDMS-1.01

Paper Title: **Integrated Flood Disaster Management and Spatial Information: Case Studies of Netherlands and India**

Author(s): Zlatanovaa, S., Ghawanab, T., **Kaur, A.**, Jeroen, B. and Neuve, M.M.

Affiliation(s): Centre for Disaster Management Studies, Guru Gobind Singh Indraprastha University, Dwarka, New Delhi-110078

Source: The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, (2014), pp 147-154

ISSN No: 2194-9034

Abstract: Spatial Information is an integral part of flood management practices which include risk management and emergency response processes. Although risk and emergency management activities have their own characteristics, for example, related to the time scales, time pressure, activities and actors involved, it is still possible to identify at least one common challenge that constrains the ability of risk and emergency management to plan for and manage emergencies effectively and efficiently i.e. the need for better information. Considering this aspect, this paper explores flood management in Netherlands and India with an emphasis on spatial information requirements of each system. The paper examines the activities, actors information needs related to flood management. Changing perspectives on flood management in Netherlands are studied where additional attention is being paid to the organization and preparation of flood emergency management. Role of different key actors involved in risk management is explored. Indian Flood management guidelines, by National Disaster Management Authority, are analyzed in context of their history, institutional framework, achievements and gaps. Flood Forecasting System of Central Water Commission of India is also analyzed in context of spatial dimensions. Further, information overlap between risk and emergency management from the perspectives of spatial planners and emergency responders and role of GIS based modelling/ simulation is analyzed. Finally, the need for an integrated spatial information structure is explained and discussed in detail. This examination of flood management practices in the Netherlands and India with an emphasis on the required spatial information in these practices has revealed an increased recognition of the strong interdependence between risk management and emergency response processes. Consequently, the importance of an integrated spatial information infrastructure that facilitates the process of both risk and emergency management is addressed.

CDMS -1.02

Paper Title: **Hazard- Risk Assessment and Mitigation Measures for West Delhi District, Delhi, India**

Author(s): **Kaur, A.**, Ghawanab, T., Garg, C.R., Satyab, C., Tarunb, N., Nayak, B.C., Pal, I. and Dharampal

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Source: Disaster Management and Response, (2015)

ISSN No: 2347-2553

Abstract: Disasters have a lasting effect on human survival, lifestyle, economy, infrastructure, environment and finance. Government of India brought the Disaster Management Act, 2005 for prevention and mitigation of any disaster in our country. District Disaster Management Authority (West), (DDMA-W) has formulated the District Disaster Management Plan for West District (DDMP West) which forms the basis of

this Study as well as the primary data & the discussions with District Disaster Management officials. The aim of this paper is to provide an insight into the Hazard and Risk Assessment of West District & suggest Mitigation measures. Area has high population density with dense residential areas and pockets of industrial activity. Fire and Structural Collapse are the main hazards in the area which are caused due to different reasons. Primary data of such incidents for year 2012-2013 and 2014 are analyzed for casualties & injuries and supports this fact. Risk analysis shows population density and associate housing characteristics in 3 sub-divisions of the district as an issue for emergency services timely response. Pre-dominance of small scale industries, existence of industrial areas, quality of construction material, design etc are also the identified risks. A SWOT analysis is performed which highlights the community awareness towards disaster management activities and good communication and rescue equipment with the authorities as strengths of the district disaster management while illegal electricity connections, unauthorized constructions and inadequate safety measures in industrial areas fall under the Threats category for the district. Proposed mitigation measures include microzonation of areas, retrofitting of buildings, capacity-building strategy, provisions of insurance etc. It is recommended that a detailed research study based on advanced GIS and Remote Sensing technologies should be conducted for the district considering subdivision as a unit, which will help district authorities in decision making for the future.



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