

## Experimental Investigation of Abrasive and Diffusive Behavior of Pin Materials with Rotating Disc Material

R. C. Singh<sup>\*</sup>, R. K. Pandey<sup>b</sup>, S. Maji<sup>a</sup>

<sup>a</sup>Department of Mechanical Engineering, Delhi Technological University, Delhi, India

<sup>b</sup>Mechanical Engineering Department, IIT, Delhi, India

**Email:** rcsingh68@hotmail.com

**Abstract:** Various materials have been observed that have continuous relative motion with respect to other material. In modern age, at different situations, the cycle life of the equipments is defined by element that have weakest link in the system. Experimental study has been conducted for investigating the tribological study of mating surfaces on pin on disc test rig. The lubrication at the tribo-pair effects friction and wear significantly. The experimental study has been carried with the ductile pin material having relative motion with respect to mild steel plate at room temperature and atmospheric condition on Pin on Disc test rig. Experimental study reveals some time the weight of the pin decreases and some time increases. The increase in weight is due to diffused particle of disc. The trend of fluctuation of coefficient of friction varies continuously have peaks and valleys about certain mean value. Also the pressures at the contact have significant effect on tribological behavior of continuous rotating tribo pair.

## Combustion Behavior of Bio Fuels In A Single Cylinder Diesel Engine

Haeng Muk Cho<sup>a</sup>, Bhupendra Singh Chauhan<sup>b</sup>

<sup>a</sup>Department of Mechanical and Automotive engineering, Kongju National University, Korea

<sup>b</sup>Department of Mechanical Engineering, Pusan National University. Busan. Korea

**Email:** haengmukcho@hanmail.net

**Abstract:** This study targets at making a comparison of the methyl esters of non edible oils in a diesel engine against diesel fuel. The present work aims at developing a dual fuel engine test rig work on dual fuel mode. The performance parameters of the fuels was evaluated in terms of thermal efficiency, specific fuel consumption, power output and mean effective pressure, cylinder pressure, rate of pressure rise, and heat release rates. The emission parameters of carbon monoxide (CO), carbon dioxide (CO<sub>2</sub>), un-burnt hydrocarbon (HC), oxides of nitrogen (NO<sub>x</sub>), and smoke opacity with the three fuels were also compared. Both varieties of the oil, after transesterification, exhibit the major properties within acceptable limits of biodiesel standards set by many countries. Karanja methyl ester (KME) performed better than Jatropha methyl ester (JME), whereas the shortest ignition delay is observed with JME. Both the esters performed poorer than diesel, but emissions of HC, NO<sub>x</sub>, and smoke were found to be lower with biodiesel.

## Solving the Helmholtz Equation using Direct Boundary Element Method and Dual Reciprocity Boundary Element Method

Hassan Ghassemi<sup>a</sup>, Ahmad Reza Kohansal<sup>b</sup>

<sup>a</sup>Department of Maritime Engineering, Amirkabir University of Technology, Tehran, Iran.

<sup>b</sup>Department of Marine Engineering, Persian Gulf University, Bushehr, Iran.

**Email:** gasemi@aut.ac.ir

**Abstract:** Many boundary value problems like ocean wave propagation, structure vibrations and acoustics are represented by the Helmholtz equation. In this paper, we solve the Helmholtz equation using direct boundary element method (BEM) and the dual reciprocity boundary element method (DRBEM). For BEM formulation, there are two possible choices for fundamental solutions, which can lead to quite different conclusions in terms of their reliability in the frequency domain. For DRBEM formulation, it is shown that although the DBREM can correctly predict eigen frequencies even for higher modes, it fails to yield a reasonably accurate numerical solution for the problem when the frequency is higher than the first eigen frequency.

## Search for Ecofriendly Alternatives Refrigerants in Vapor Compression Refrigeration Systems for Reducing Global Warming and Ozone Depletion

R. S. Mishra

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** professor\_rsmishra@yahoo.co.in

**Abstract:** In the Make India and green India programme, the use of ecofriendly refrigerants is well demonstrated due to global warming and ozone depletion and several training programmes are available for skill development in the various institutions such as SLIT, ITIs, and several polytechnics and various centers in IITs (such as CRT, CES), various technological universities etc.

This paper highlights the use of R-290 refrigerant is the best alternative and second alternative is R600a. and third is R-152a. Due to flammable nature of these ecofriendly refrigerants, these refrigerants can only be used by using safety measures, otherwise R134a and R410a and R404a are easily available in the markets can be used. The performance of R134a gives better than using R410a and R404a, however for larger Industrial applications R 717 and R744 can be used. Even in mixing of nano particles mixed with R718 in the secondary circuit and R1234yf for low temperature applications gives better first law and second law performance as compared to R134a refrigerant To replace, R134a, R1234yf (of zero ODP and 4 GWP) and R1234ze (GWP=6, and Zero ODP) are recommended, although these refrigerants gives 5 to 10% less performance than using R134a. Although the performance of R134a is better than R134a using nano particles mixing in R718 but R1234ze can replace R134a for higher temperature applications. The best first law and second law performances have been found using copper nano materials mixed with R718 in secondary evaporator circuit as compared to TiO<sub>2</sub> nano particles

## Methods for Improving Thermodynamic Energy and Exergy Performance of Vapour Compression Refrigeration Systems using Thirteen Ecofriendly Refrigerants in Primary Circuit and TiO<sub>2</sub> Nano Particles Mixed with R718 used in secondary Evaporator Circuit for Reducing Global Warming and Ozone Depletion

R. S. Mishra

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** professor\_rsmishra@yahoo.co.in

**Abstract:** The methods for improving energy and exergetic efficiency have been considered in this paper by using water as secondary coolant in evaporator with nano particles of Al<sub>2</sub>O<sub>3</sub> and TiO<sub>2</sub> mixed R718 refrigerant is investigated in this paper. Detailed energy and exergy analysis of multi-evaporators at different temperatures in the vapour compression refrigeration systems have been done in terms of performance parameter for R507a, R125, R134a, R290, R600, R600a, R410a, R407c, R404a and R152a refrigerants. The numerical computations have been carried out for both systems. The use of nano particles improves the energy and exergy performance significantly. The best thermodynamic performance is found using R152a and worst performance is observed using R410a.

Due to flammable nature of R290, R600, R600a and R152a, the R134a is recommended for domestic applications. The results were compared by using water in secondary circuit with nano refrigerants and without nano particles used and it was found that use of nano particles improves thermal performances significantly. The energy performance improvement in terms of COP and exergetic performance in terms of exergetic efficiency (rational efficiency) using TiO<sub>2</sub> is better than using Al<sub>2</sub>O<sub>3</sub> with R718 refrigerant in the secondary evaporator circuit.

ICARI-ME-16-02-006

## Characterization of Green Composites from the Starch and Sisal Fiber

V. K. Singh<sup>\*</sup>, Akarsh Verma

Department of Mechanical Engineering, G. B. Pant University of Agriculture and Technology, Pantnagar, India

**Email:** akarshverma007@gmail.com

**Abstract:** In the present a green composite consisting of sisal fiber reinforced in starch-glycerol biodegradable resin was fabricated using hand lay-up technique. Fibers having different weight percentage and 2-3 mm fiber length have been taken for investigation. The surface of the fibers was treated by NaOH to improve bonding. Tests are conducted on 100 kN servo-hydraulic universal testing machine under displacement mode of control, water absorption test, thermal analysis and SEM of various compositions were done. In present investigation it has been concluded that the mechanical property such as ultimate strength found to be maximum for the composition of 15% Sisal fiber by weight green composite as 11.70 MPa without coating and 15.14 MPa with coating. The main drawback of natural composite is that its water absorption property which has been controlled by epoxy coating.

## Effect of number of Passes on mechanical and wear properties of Friction Stir Processed Al 1050 Alloy

N. Yuvaraj<sup>\*</sup>, Vipin, R. S. Mishra

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** yuvraj@dce.ac.in

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**Abstract:** Friction stir processing Technique is used to modify the surface layer and improves the micro-structural modification and enhances the mechanical & wear properties of the material. In this study the effect of number of FSP passes on the Aluminum 1050 alloy was studied. The grain refinement of the matrix was obtained after each FSP pass. With increase in FSP passes decreases the grain size of the matrix alloy and more homogeneous grain refinement occurs on the stir zone. The hardness, tensile strength and wear rate of the processed region was evaluated and found that enhancement of hardness, tensile strength and wear resistance of the samples with increase in passes due to finer refinement of the grain size in the stir zone.

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## Design of Solar Powered UAV

Janardan Prasad Kesari<sup>\*</sup>, Abhishek Shakya

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** drjpkesari@gmail.com

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**Abstract:** This paper summarizes the final project of undergraduate student of the faculty of Mechanical Engineering at the DTU, New Delhi, India. The project's aim is to design, build, test and fly a solar powered Unmanned Aerial Vehicle. Integrating solar energy into modern aircraft technology has been a topic of interest and has received a lot of attention from researchers over the last two decades. A few among the many potential applications of this technology are the possibility of continuous self-sustained flight for purposes such as information relay, surveillance and monitoring. The use of UAS is increasing rapidly due to the reduced production and operating cost compared to the large conventional aircraft.

## Optimization of Surface Roughness in CNC Turning of Aluminium 6061 Using Taguchi Techniques

Nikhil Gaur, Rahul Kumar Choudhary, Ranganath M.S.

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** choudhary.rahul123@gmail.com

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**Abstract:** In the modern machining industries, surface roughness is used to determine and evaluate the quality of the product. In this study, we have investigated the effect of turning parameters i.e. speed, feed and depth of cut on the surface roughness. The objective of the paper is to obtain an optimal setting of turning process parameters to get the minimum surface roughness. Experiments have been conducted using the L27 orthogonal array in a CNC turning machine. Dry turning tests are carried out on Aluminium 6061 with Carbide Insert cutting tool of nose radius 0.4mm. The effects of the selected turning process parameters on surface roughness and the subsequent optimal settings of the parameters have been accomplished using Taguchi's design of experiment (DOE) and then followed by optimization of the results using Analysis of Variance (ANOVA) to find minimum surface roughness. The feed and the depth of cut were identified as the most significant process parameter for surface roughness.

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## Optimization of Different Process Parameters of Aluminium and Brass in Vertical Milling (CNC) Using Taguchi Method

DeshRaj, Roshan Kumar, Ranganath.M. S.

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** roshansinghdtu@gmail.com

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**Abstract:** The present paper outlines an experimental study to optimize the effects of cutting parameters on surface roughness of Aluminium & Brass by employing Taguchi techniques. This paper deals with optimization of the selected milling parameters, i.e. Cutting Speed, Feed rate, Depth of cut. Taguchi orthogonal array is designed with three levels of milling parameters and different experiments are done using L<sub>9</sub> (3<sup>3</sup>) orthogonal array, containing three column which represents three factors, and nine rows which represents nine experiments to be conducted and value of each parameter was obtained. The nine experiments are performed and surface roughness is calculated. The Signal to Noise Ratio (S/N) ratio of predicted value and verification test values are valid when compared with the optimum values. It is found that S/N ratio value of verification test is within the limits of the predicted value and the objective of the work is fulfilled.

## Smart Materials: New Trend in Structural Engineering

Harvinder Singh, Ramandeep Singh

Department of Mechanical Engineering, CGC College of Engineering, Landran, Mohali,  
India **Email:** Cgcoce.me.harvinder@gmail.com

**Abstract:** Smart materials, which have the functions of actuator, sensor, self-healing and so forth, are expected to be used not only as advanced functional materials but also as key materials to provide structures with smart functions. Smart systems sense changes in structure variations in vibration, noise or temperature, for example process the information and then respond appropriately to automatically correct possibly detrimental problems. They tell the structure to alter its properties to prevent damage, optimize performance, correct malfunctions or alert users to a needed repair.

Smart materials technology applies to a huge range of products including buildings, bridges, computers, cameras, aircraft, even skis. Think about the way in which excessive vibration in a machine on the shop floor may result in overheating, or parts that don't meet the manufacturer's specifications. Then, imagine the problems that could occur if a similar situation happened on an aircraft and you begin to understand the scope and value of smart material applications.

The best way to understand the smart material concept is to look at its uses. Smart materials may work completely on their own or as part of a larger smart system. For example, doctors may use shape memory alloy staples used to set broken bones. In this case, the material works as both a sensor and an actuator as the patient's body heat activate the staple to close and thereby clamp the break together. This report deals with the available smart materials, their properties and some of their areas of application and future prospects."

ICARI-ME-16-02-012

## Modeling and Microstructure Study of Thermally Evaporated Nanofilm Thickness of Gold

Shailendra Kumar Gaur<sup>\*</sup>, R. S. Mishra

Department of Mechanical Engineering, Delhi Technological University, New Delhi,  
India **Email:** professor\_rsmishra@yahoo.co.in

**Abstract:** The paper represents the modeling of nano scale gold film thickness deposited by thermal evaporation process. Gold is evaporated from a resistively heated boat at a temperature of 1900 K onto a surface held on a fixed surface. The incident molecular flux onto the silicon surface is  $7.86 \times 10^{19}$  ( $1/m^2 \text{sec}$ ). The thickness varies between 78 nm and 80 nm across the sample after 60 s of deposition, with radial symmetry about the midpoint of the source. The film thickness, mass deposited on the substrate and mass transfer rate on silicon substrates with time dependent model using BDF solver is calculated. The SEM micrographs shows the smooth and uniformly distributed nano scale gold film on silicon and the average grain size of gold is 15-30 nm. The XRD analysis shows the polycrystalline face centered cubic (fcc) structure in preferential (111) plane. Deposited gold film thickness measured from Dektak surface profiler at different points on the substrate surface

ICARI-ME-16-02-013

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## Mechatronics – A Synergistic Integration for Competent Versatility

Sanatan Ratna<sup>a\*</sup>, Swet Nisha<sup>b</sup>

<sup>a</sup> Department of Mechanical Engineering, Amity University, Noida, India

<sup>b</sup> Department of Mechanical Engineering, SOICT, GBU, Greater Noida, India

**Email:** sanatan\_ratna@yahoo.co.in

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**Abstract:** The paper discusses the overall aspect of mechatronics in industry from when it was originated in 1969 to its present applications. This term was coined by Yasakawa Electric company which defined it as the ‘synergistic integration of mechanical engineering, with electronics and intelligent computer control in the design and manufacturing’. It aims to develop a system architecture/framework suitable for embedded distributed computer control systems. There is an urging need of mechatronics in industry to meet the changing demands. Emphasis had been laid on the highly demanding carrier prospects in mechatronics by live surveys. In India like developing country various challenges in adapting the mechatronics widely have also been discussed. Mechatronics is a design philosophy which encourages engineers to concurrently integrate conventional core industries and modern processing-developing industries.

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ICARI-ME-16-02-014

## Mathematical Modeling of Gas Turbine and Solid Oxide Fuel Cell Hybrid System for Enhancing Thermal Performances

Smita Sharma, R.S. Mishra

<sup>a</sup> Department of Mechanical Engineering, Delhi Technological University Delhi, India

<sup>b</sup> Laser Science and Technology Centre, Metcalfe House DRDO New Delhi, India

**Email:** professor\_rsmishra@yahoo.co.in

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**Abstract:** Fuel cell systems are environment friendly. It is a clean energy generator but has a low efficiency when used alone. Gas turbine also has a lower efficiency around 30% when working alone. Hybrid system is the combination of gas turbine and fuel cell to achieve a higher efficiency around 60-70%. The fuel cell generates the major portion of the plant power output and the gas turbine generates a fraction of total output.

The major advantage of fuel cell is that it is not a heat engine so its efficiency can be 100% as it is not limited by the Carnot efficiency. Solid oxide fuel cell combined with gas Turbine hybrid plants produce 50 times less nitrous oxide than current conventional gas turbine and 75% less carbon dioxide than coal-fired power plants.

The present paper includes the development of a mathematical model of SOFC/GT hybrid system using methane as fuel to the hybrid system. This type of hybrid system has a wide application such as distributed generation from centralized power plants heat and cooling energy of building. Numerical computation. is carried out from developed model for Power output, first second law efficiencies and it was observed hybrid systems gives better performances other cogeneration systems

## Mathematical Modeling of Gas Turbine and Solid Oxide Fuel Cell Hybrid System for Enhancing Thermal Performances

Sumeet Rewalia

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** sumeetrewalia@gmail.com

**Abstract:** Waste plastic disposal and excessive use of fossil fuels have caused environment concerns in the world. Both plastics and petroleum derived fuels are hydrocarbons that contain the elements of carbon and hydrogen. The difference between them is that plastic molecules have longer carbon chains than those in LPG, petrol, and diesel fuels. Therefore, it is possible to convert waste plastic into fuels.

The main objectives of this study were to understand and optimize the processes of plastic pyrolysis for maximizing the diesel range products. Pyrolysis of polyethylene (PE), polypropylene (PP), and polystyrene (PS) has been investigated experimentally in a lab-scale pyrolysis reactor. The key factors have been investigated and identified.

From the literature review, the pyrolysis reaction consists of three progressive steps: initiation, propagation, and termination. Initiation reaction cracks the large polymer molecules into free radicals. The free radicals and the molecular species can be further cracked into smaller radicals and molecules during the propagation reactions.  $\beta$ -scission is the dominant reaction in the PE propagation reactions. At last, the radicals will combine together into stable molecules, which are termination reactions. The activation energy and the energy requirement for the pyrolysis are dependent on the reaction process and the distribution of the final products. Following the equations from other literatures, the theoretical energy requirement for pyrolyze 1kg PE is 1.047 MJ. The estimated calorific value of the products is about 43.3 MJ/kg. Therefore, the energy profit is very high for this process.

The PE pyrolysis products are mainly 1-alkenes, n-alkanes, and  $\alpha$ ,  $\omega$ -dialkenes ranging from C1 to C45. This process converts heavy hydrocarbons into gas or light liquid product and significantly reduces 1-alkenes and  $\alpha$ ,  $\omega$ -dialkenes. The product of PE pyrolysis with maximized diesel range output consist of 18.3% non-condensable gases, 81.7% w/w liquid product, and less than 1% pure carbon under high reflux rate process.

## Skill Development in Solid Waste Management

Shubham Gupta<sup>\*</sup>, R. S. Mishra

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** professor\_rsmishra@yahoo.co.in

**Abstract:** To have fast and sustainable growth power demand-supply gap can be linked only by consuming and spreading of renewable energy sources such as Solar, Wind, Biomass, Small Hydro, etc. Fossil fuels are fast depleting and pose an intolerable import bill while adding to the overall pollution. Municipal Solid Waste (MSW) has high potential of generating energy by utilizing various techniques. Training programs are needed across India for development of skill, knowledge for effective and efficient utilization of MSW to meet rising energy demands in India.

## Numerical Study of the Effect Internal Holes Shapes in Blade Turbine Cooling

Hussein Talal Dhaiban

Department of Refrigeration & Air-Conditioning Tech. - Dijlah University College, Iraq

**Email:** husseinayo@gmail.com

**Abstract:** As the temperature of combustion gases is higher than the melting temperature of the turbine materials, cooling of turbine parts in a gas turbine engine is necessary. The gap between rotating turbine blades and the stationary shroud provides an unintended flow path for hot gases. Gases that flow through the tip region cause pressure losses in the turbine section and high heat loads to the blade tip. This paper numerically studies the effect of change shapes of internal cooling holes and shows the effect of cooling at the tip of blade. Also measures the effect of pressure effectiveness and temperature distribution at the tip and alone holes channels.

In this study, results of change shapes of internal holes to circle, rectangle and triangle shows the circle shape is better in cooling by 45 °C and 125°C when compared with rectangle and triangle shapes respectively. Streamlines results explain that they are very crowded at suction side and decreases at pressure sides and many of streamlines that passed through the gap and mixed with cooled flow. Results show also the temperature distribution alone the holes passages are reduced along them from shelf to tip and the maximum values at entrance region. Finally, the results show when the internal velocity of holes increases, the static temperature decreases in the blade.

ICARI-ME-16-02-018

## CFD Analysis of Cooling Tower by Varying Fill Zone Height

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** mzunaid3k@gmail.com

**Abstract:** A Cooling tower cools the working fluid using the principle of vaporization and sensible heat transfer. In this project, the effect of design variables on Natural Draft Wet Cooling Tower has been observed using computational fluid dynamics (CFD) analysis.

The aim of the current work is to analyze the cooling tower and to observe that how the cooling ranges of tower depends on the various design parameters. The dependency of cooling range on fills design, rain zone height, air temperature and flow rate has been observed and conceptualized. This work focus on determining the optimum fills height for design cooling tower used in specific requirement. The problem has been solved in Discrete Phase Model using Lagrangian Particle Tracking and enabling the Stochastic Model with coupled heat and mass transfer and unsteady particle tracking assuming droplet collision and droplet breakup.

The results show that the cooling range increases as the fill height and the rain zone height is increased but there is a more strong dependency on fill height rather than rain zone height. It is also observed that the range of the cooling tower increases as the flow rate of water is decreased. Its variation is observed and recorded in FLUENT. It is observed and it is also clear from FLUENT results that for a lower temperature the saturation pressure of water is also comparatively lower and so the driving force for the evaporation i.e. the difference of the saturation pressure and vapor pressure is also lower and so is the rate of evaporation. Hence, a lower cooling is observed in rain zone for a higher depth of fills.

The most of the factors affecting the cooling range are analyzed, recorded and compared for different sizes of the rain zone, different heights of fill, different mass flow rate, variable air temperature and an effort have been made for the optimization of the cooling tower.

## An Experimental Study on Electro-discharge Machining of Al2014/Al<sub>2</sub>O<sub>3</sub> Composite

Vineet Dubey, Balbir Singh

Department of Mechanical Engineering, Shri Mata Vaishno Devi University, Katra, India

**Email:** dubey.vin1324@gmail.com

**Abstract:** Aluminium metal matrix composites are possessing the properties such a slight weight, good wear resistance, high stiffness etc. Due to unique combination of properties, these composites are replacing conventional materials in industries such as transport, civil aviation, recreation etc. However, wider applications are still marred by poor machinability by conventional machining processes, due to presence of hard reinforcements such Al<sub>2</sub>O<sub>3</sub>, SiC, B<sub>4</sub>C etc in the composite. Electro-discharge machining (EDM) is a potential advanced process for the machining for aluminium metal matrix composites (AIMMC). The present work encompasses an experimental investigation on electro-discharge machining of aluminium alloy 2014 reinforced with 10wt% Al<sub>2</sub>O<sub>3</sub> particles (Al2014/Al<sub>2</sub>O<sub>3</sub>). The central composite rotatable design using response surface methodology (RSM) is used to formulate the design of experiment (DOE) to analyse the effects of EDM process parameters on the machining characteristics viz. Material Removal Rate (MRR) and Surface Roughness (SR). The four process parameters namely current, pulse on time, pulse off time and gap voltage are considered for the experimental study. Regression analysis is performed and the significance of the model developed is checked by analysis of variance (ANOVA). Results obtained are further optimized using desirability functions to maximize MRR and minimize SR. The recommended optimal conditions have been validated by performing the confirmatory experiment.

## CFD Analysis of Cooling Tower by Varying Rain Zone Height

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** mzunaid3k@gmail.com

**Abstract:** A cooling tower used for rejecting the waste heat from hot water to environment. When hot water comes in contact with the air then sensible heat transfer and vaporization of some water droplet takes place due to which temperature of water decreases. The cooling tower is an important element in power plant and Heating ventilation air conditioning.

The present work involves the computational fluid dynamics (CFD) analysis of flow through the cooling tower rain zone by using FLUENT software. The mass flow rate of water, air inlet temperature and water inlet temperature in rain zone is kept constant throughout the study. Three geometries of different rain zone heights are made for analysis. The diameter of the water droplet is varied by using Rosin-Rammler distribution function. Temperature drop for different heights of rain zone is found and rate of drop in temperature by varying diameter for different rain zone heights is also compared.

The problem has been solved in Discrete Phase Model using Lagrangian Particle Tracking and enabling the Stochastic Model with coupled heat and mass transfer and unsteady particle tracking assuming droplet collision and droplet breakup.

Results are analyzed and it reveals that with a decrease in droplet diameter for any height of rain zone, increase drop in water temperature.

## Mechanical Properties of 7075 Aluminium Matrix Composites Reinforced by Nanometric Silicon Carbide Particulates

Samar Sultan<sup>\*a</sup>, Shweta Bisht<sup>b</sup>, Shweta Arya<sup>a</sup>

<sup>a</sup> Department of Mechanical Engineering, Noida Institute of Engineering & Technology, Greater Noida Gautam Buddha Nagar, Uttar Pradesh, India

<sup>b</sup> Department of Mechanical Engineering, Manav Rachna International University, Faridabad, Haryana, India

**Email:** samarfzd@gmail.com

**Abstract:** Aluminum Matrix composites (AMCs) are known as light weight and high-strength materials with their potential application in areas such as aerospace, automobile, defence, engineering and other industries. AMCs have the advantage to significantly reduce the overall weight of the vehicles and aircraft while maintaining their structural strength. Reinforcement of micron or nano-sized range particles with aluminium matrix yields improved mechanical and physical properties in composite materials. The strength of Al matrix composites will be improved about 20% with decreasing reinforcement particle size from micrometric scale to nanometric scale. In this study, Al7075 alloy and nano SiC composites have been fabricated by Electromagnetic stir casting process combined with mechanical stirring. Different weight % of nano SiC particles (0.5, 1, 1.5, and 2 wt %) were used for synthesis of composites. Certain test methods scanning electron microscopy (SEM) and X-Ray diffraction (XRD) are used to examine the microstructure along with the measurement of impact strength of the nano composite. SEM microstructure shows SiC particles are fairly infused into the matrix alloy with agglomeration and porosity at some places. X-Ray Diffraction (XRD) analysis acknowledged that no unknown crystalline elements are present in the composites while mixing reinforcement with Al alloy matrix. The results impact strength shows that impact strength decreases with respect to the base metal because of brittle nature of reinforcement.

ICARI-ME-16-02-022

## Solar Industrial Process Heating system for Indian Automobile Industry

Anubhav Uppal<sup>\*a</sup>, JP Kesari<sup>b</sup>

<sup>a</sup> Department of Renewable Energy Technology, Delhi Technological University, Delhi, India

<sup>b</sup> Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** Anubhav3365@gmail.com

**Abstract:** Demand of heat energy accounts for around 70% of total energy consumption in any industry, therefore solar heat for industry can be perfect application of solar thermal technology as solar collectors can provide most of this heat energy demand. Also the India has a great potential for solar industrial heat because of high solar irradiation for almost 300+ sunny days in year. Apart from these reasons, Shortage of fossil energy sources such as oil, gas or coal with rapidly rising energy consumption in developing countries like India have result in hike in energy prices. From now integration of solar thermal technology with industrial heat sources will increase India's independence from future energy price hikes and help to lessen industrial production costs. Now a day, the automobile industry is under great strain to make their products more environmentally sound in this 21<sup>st</sup> century especially after CO<sub>2</sub> emission laws made in Kyoto protocol. Not only the automobiles themselves, but the whole production has to become more sustainable. Therefore there is urgent need for more sustainable automobile production with lessened demand for energy, materials and as well as emissions.

## Metallurgical Investigation of Synergic MIG Welding Of 304L Stainless Steel

Ravi Butola, Mohit Tyagi<sup>a\*</sup>, Jitendra Kumar<sup>b</sup>

<sup>a</sup>Department of Mechanical and Production & Industrial Engineering, Delhi Technological University, Delhi

<sup>b</sup>Department of Mechanical Engineering G.B Pant Govt. Engineering College, Delhi, India

**Email:** ravibutola33855@gmail.com

**Abstract:** The experimental study is carried out for the analysis of weld bead geometry such as bead reinforcement height, bead width and bead penetration of synergic MIG welding of 304L stainless steel. Microstructures of different zones of interest like weld metal, HAZ and fusion boundary under different welding parameters were viewed and captured with an optical microscope coupled with an image analyzing software. Fractured surface of the weld bead specimens were analyzed using Scanning electron microscopy (SEM) to the nature of the fracture mode. The results of EDS analysis shows that the inclusion particle mainly composed of Fe, Cr, Mn, Si, C elements. X ray diffraction (XRD) study has been done and result shows that phases like Fe, Ni-Cr-Fe, and Fe-Cr-Co-Ni are determined.

ICARI-ME-16-02-024

## Optimization of Process Parameters in Milling Operation by Taguchi's Technique using Regression Analysis

Sunilkumar Panshetty, Jitendra Satpute

Department of Mechanical Engineering, Suman Ramesh Tulsiani Technical Campus- Faculty of Engineering, Khamshet, Pune, India

**Email:** sunilpanshetty@gmail.com

**Abstract:** The present work highlights the optimization of Computerized Numerical Control (CNC) milling Process Parameters to provide a better surface finish and high Material Removal Rate (MRR). As Taguchi's method reduces the number of experiments, it is used for optimization of machining parameters. It is applied to find out the influence of various machining parameters like Speed, Feed rate, Depth of cut on Surface finish and MRR. The material used in this experiment is Al 7075 of size 100mm\*100mm\*10mm and the pocketing operation of size 20mm\*20mm is carried out on vertical CNC milling machine by 12 mm carbide tool. L9 Orthogonal Array (OA) is used to carry out the experimentation. MINITAB-14 Software is used to analyse the result. Surface roughness (Ra) was measured and the MRR values were calculated to determine optimum levels. Results obtained were plotted for Ra, MRR v/s Speed, feed rate, depth of cut. In this Study, it is observed that the order of Significance of the main Variable for Surface Roughness (Ra) is Speed; Feed & Depth of Cut (DOC) whereas for MRR, the Order of Significance is DOC, Feed rate & Speed

## Thermodynamic (Energy-Exergy) Analysis of Solar Assisted Power-Cooling Combined Generation Systems

R.S.Mishra, Kaushalendra Kumar Dubey

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** dubey.kaushalendra@gmail.com

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**Abstract:** Novel concept to produce power and cooling with the energy contained in low-temperature ( $< 200^\circ\text{C}$ ), thermal resources is presented in this paper. These resources can be obtained from concentrating solar thermal energy, and from waste heat sources. The concept uses thermal energy in a low-temperature boiler to partially boil an organic type working fluid mixture. This produces rich vapor that drives an expander. The expander's output is mechanical power; however, under certain operating conditions its exhaust can be cold enough to use for cooling. An analytical study is identified expander efficiency, expander inlet conditions for determining exhaust temperature, consideration of the operating conditions of integrated solar combined power /cooling cycle. The present research provides simulated performance for improving system efficiency.

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## Automobile Exhaust Emissions Varying Characteristics

Kshitij Aggarwal, Mridul Garg

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** kshitijagg@hotmail.com

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**Abstract:** On account of very stringent regulations being imposed on the automotive industry to abate exhaust emissions to curb the issue of various environmental effects like pollution and global warming, extensive research is being conducted to study the effects of various combustion parameters and engine performances on exhaust emission gases. This paper relates to the study of the various factors that affect exhaust emissions. The effect of exhaust gas recirculation (EGR), compression ratio, ignition timing and engine load has been studied on the major exhaust emission gases, namely  $\text{NO}_x$ , CO,  $\text{CO}_2$  and Hydrocarbons (HC). Extensive studies have been carried out by reviewing the work of other scholars and analyzing their study and observations to come up with a generalized trend on how exhaust emissions are affected. Our study shows that advancing ignition timing has no effect on CO and  $\text{CO}_2$  emissions but leads to an increase in  $\text{NO}_x$  levels and installing EGR leads to reduction in  $\text{NO}_x$  and  $\text{CO}_2$  levels but an increase in CO levels on account of lower charge temperature and greater availability of  $\text{O}_2$ . Also increase in compression ratio leads to an increase in amount of  $\text{NO}_x$  and HC emissions whereas the amount of CO and  $\text{CO}_2$  emissions increase till the best compression ratio after which they gradually decrease. Also increasing the load leads to increased levels for most of the exhaust emissions on account of higher combustion rates.

## A Comprehensive Comparisons of Heat Transfer Performance from Circular and Oval Tube

Vipin Dahiya, Roop Lal, R. C. Singh

Department of Mechanical Engineering, Delhi Technological University, New Delhi, India

**Email:** vipin1920@gmail.com

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**Abstract:** In this work, an experimental system has been built to study the overall heat transfer co-efficient of this circular tube and oval tube for the air-cooled condenser used in power plants. The dimension that outer diameter, length and thickness was 10mm, 500mm and 26 gauge respectively used for circular tube against the dimension of oval tube that minor outer diameter, major outer diameter, length and thickness was 10mm, 20mm, 500mm and 26 gauge respectively. Also, a dry heating element of 300w is provided inside both the tubes. The overall heat transfer co-efficient of both the tubes is obtained and a comprehensive comparison of heat transfer performance is carried out. Results reveals, superior airside performance of oval tubes as compared to the circular tubes. Further result suggests that overall heat transfer co-efficient of oval tubes is grater then the circular tubes.

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## Use of Green Technology (F.S.P.) for processing of 99.9% Copper with Carbon Nano Tubes

V. Jegannathan, R. S. Mishra

Department of Mechanical, Production Engineering, Delhi Technological University, Delhi, India

**Email:** rsmishra1651956@yahoo.co.in

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**Abstract:** The states of development of green technology (FSP) for processing of Copper with carbon nanotubes is presented in this paper because Friction stir processing (FSP), is a green technology process in which solid-state microstructural modification technique is viewed in terms of severe plastic deformation technique due to high processing strain involved. It is also unique green technology from the viewpoint of its applicability to a localized region. To investigates the various parameters affecting the friction stir processed copper with carbon nano tubes and enhancement of the microstructure, hardness and tensile properties of the composite material the behaviour of copper with carbon nano tubes has been studied in detail with single pass and multi passes (i.e. double passes and triple passes) and SEM results are presented for each casein the present investigation

## Effect of Fouling on the Performance of Vapour Absorption Refrigeration System

Anuradha Kuttar, Naushad Ahmad Ansari, K. Srinivas, Mohd. Zunaid  
 Department of Mechanical Engineering, Delhi Technological University, New Delhi, India  
**Email:** naushad.nsr@gmail.com

**Abstract:** The incessant increase in the cost and demand for energy has directed to more research and development to consume available energy resources proficiently by minimizing the waste energy. Absorption refrigeration systems gradually attract interest of the researchers. Absorption cooling bids the possibility of using heat to provide cooling. For this persistence heat from conventional boiler can be used or waste heat and solar energy. Absorption system falls into two groupings depending upon the working fluid. These are the NH<sub>3</sub>-H<sub>2</sub>O and LiBr-H<sub>2</sub>O Absorption Refrigeration system. In, NH<sub>3</sub>-H<sub>2</sub>O system ammonia used as a refrigerant and water is used as an absorbent, while in LiBr-H<sub>2</sub>O system water is used as a refrigerant and LiBr is used as an absorbent which served as customary for comparison in studying and emergent new cycles and new absorbent/refrigerant pairs. The objective of this report is to present empirical relations for evaluating the characteristics and performance of a single stage Ammonia water (NH<sub>3</sub>-H<sub>2</sub>O) vapour absorption system under normal as well as fouled conditions. The essential heat and mass transfer equations and appropriate equations recounting the thermodynamic properties of the working fluid at all thermodynamic states are evaluated. An energy scrutiny of each component has been carried out and numerical results for the cycle. Finally the variations of several thermodynamic parameters are replicated and examined. The main effect of the fouling is to decrease the effectiveness of the heat exchanger. Thus, the overall conductance (UA) of the heat exchanger is decreased. In the present work COP of the vapour absorption refrigeration system is decreased under fouling by keeping the constant value of overall conductance. Due to the fouling in the heat exchangers performance of the vapour absorption refrigeration system is degraded by 8.81%.

## Experimental Modal Analysis: A Technique for Structure Modal Analysis

Sushila Rani

Department of Mechanical, Production, Industrial and Automobile Engineering, Delhi Technological University, Delhi, India  
**Email:** sranidtu@gmail.com

**Abstract:** Impact testing has become most popular modal testing method. FFT Analyzer is now available to compute FRF measurements directly. Today, Impact testing is a fast, convenient, and low cost method of finding the modes of machines and structures. In order to conduct impulse response tests an accelerometer, a force hammer and a data acquisition system are all needed. As, for understanding and solving structural dynamics problems, finite element modeling is done to extract modal parameters using finite element model, Experimental modal analysis is also done for same purpose. Experimental modal analysis obtains the modal model from measured FRF data. Thus, it is a path from response data to modal model. Experimental modal analysis relies upon the application of a modal parameter (frequency; mode shapes and damping) estimation technique apply to a set of FRF's measurements.

High cycle fatigue is the root cause of vibration problems which are associated with rotating machinery. A fatigue problem arises due to excessive long term vibrations which are stressed by the steady centrifugal loads resulting from the rotation. Modal analysis can be a powerful tool to assist in the identification and elimination of fatigue problems. The first application of Modal analysis is in determining of dynamic characteristics of structure like natural frequencies, damping and mode shape and Second application of Modal analysis is in the validation of computer generated models of the structures. These models can be very useful to investigate structure properties under running conditions.

## Conceptual Design of A GRC Robot as the New Generation of Guardrail Cleaners

A.R Rajabnejad <sup>a</sup>, H. Shahidian <sup>b</sup>, Sh. Niknejad <sup>c</sup>, S. Rezaeipour <sup>d</sup>

<sup>a</sup> Center of Excellence in Design, Robotics and Automation, School of Mechanical Engineering, Sharif University of Technology, Tehran, Iran.

<sup>b</sup> Mechanical Engineering Department, University of Melbourne, Melbourne, Australia,

<sup>c</sup> School of Mechanical Engineering, Kashan University, Kashan, Iran

<sup>d</sup> Language and Linguistics Department, Sharif University of Technology, Tehran, Iran

**Email:** Rajabnejad@alum.sharif.edu

**Abstract:** Preservation of the beauty of a city has proven to be an effective approach to improving the tourism industry, living safety and economic growth. Since public transportation vehicles such as trams, buses and trains are highly visible to the residents of a city and tourists; their cleanness has a large impact on its visual appeal. Guardrails, being in easy view of passengers, should look tidy and orderly. Although guardrail maintenance is generally performed by laborers, it would be of great benefit to mechanize this task. This study therefore sets out to develop the conceptual design of a novel automatic system called Guardrail Robot Cleaner (GRC) for this task. The system design is presented from mechanical and electrical points of view. Conclusively, the application of robotics to such services could be beneficial to some extent and increase public satisfaction.

## Envisage smart manufacturing through Intellectual Property Rights

Rakesh Kumar, Ajay Solanki

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** contractuafacultydtu@gmail.com

**Abstract:** The main aim of the IPR is to create regime of Intellectual Property in the country. It will also enhance the entrepreneurship capability of the youth so that they will become job givers rather than job seekers. IPR gives an edge to the Indian manufacturer so they can compete in the global market. To become manufacturing hub after china and for sustainable development, India has to use the IPR as a strategic tool. Recently in 2015 the Intellectual Property Index (IPI) India stands at 37<sup>th</sup> position out of 38 countries indexed. The Indian Government is planning to bring out the NIPP (National Intellectual Property Policy) to make the Indian industry competent in the global market. The Indian industry wants itself to be export oriented rather than importer. The success of the smart manufacturing is based on the Innovation and awareness of IPR also among the manufacturers. Most of the technology which the Indian manufacturers are using are not nimble, but the 21<sup>st</sup> century is the century of innovation and it demands state-of-the-art technology, which only can be recognized through the IPR.

## Role of Intellectual Property Rights (IPR) in Indian Manufacturing Organization

Rakesh Kumar, Ajay Solanki

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** contractuafacultydtu@gmail.com

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**Abstract:** Manufacturing is back - as a driving force of economic growth for the development of a country. Its relevance never diminished for developing countries. Industrialized countries, where contributions of manufacturing to the economy have consistently fallen in the last decades, have again come to realize the strategic importance of manufacturing in overall social and economic development as well as in India also. In 2015, the Indian Government announced an 'Make in India' concept which is an most urgent necessity in the present economic scenario. As India is set to be the world's most populous country by 2028, the social stability would depend on the success of MAKE IN INDIA, considering the potential. There are four policy initiatives under the Make In India, First New initiatives, second Foreign Direct Investment, third Intellectual Property Rights and fourth National Manufacturing.

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## Prediction of Surface Roughness using Artificial Neural Network During Drilling- A Review

Ravinder Kundu, Rangathan MS

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** rrkundu2010@gmail.com

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**Abstract:** Article deals with design of appropriate control strategic for prediction of surface roughness as one of important indicators of machine surface quality applying artificial neural network. Many researchers have conducted experiments with different materials and the test data where used as input parameters into neural network to identify the sensitivity among cutting condition, tool wear and monitoring parameters and surface roughness. Selected parameters where used to design a suitable algorithm for control and monitoring of the drilling process. Artificial neural network have proved that a ANN is a powerful tool and used for accurate prediction better than other technique. Many of the researchers have used Matlab software for prediction of ANN.

## Computational Study of Aerodynamic Characteristics of NACA 0012 Airfoil

Ravi Yadav<sup>\*</sup>, Rahul Yadav, Raj Kumar Singh

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** rajkumarsingh@dce.ac.in

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**Abstract:** In this paper, numerical simulation of a 2-D subsonic flow over a NACA 0012 airfoil at various angle of attack which is operating at Reynolds number of 3million, is presented. To study the characteristics of the airfoil, Reynolds averaged Navier-Stocks model is solved numerically using computational fluid dynamic (CFD) code ANSYS FLUENT which is based on finite volume technique. Two dimensional computational domain and mesh is created through ANSYS Design Modular and Meshing tool. For turbulent closure SST k- $\omega$  model is implemented. Angle of attack is varied from  $0^0$  to  $20^0$  for the simulation. The objective of the work is to show the aerodynamics characteristics of the airfoil such as coefficient of lift, coefficient of drag, static pressure coefficient at these conditions.

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## Prediction of Surface Roughness using Taguchi during CNC Turning- A Review

Viplav Setia, Ranganath MS

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** viplav.setia@gmail.com

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**Abstract:** This review paper presents the various studies performed to investigate the parameters affecting roughness of surfaces produced during CNC turning. Many researchers have conducted experiments to study the effect of cutting parameters like speed, feed and depth of cut on the surface roughness. The results of the machining experiment were used as inputs to analyse with the help of Taguchi's method. The Taguchi's approach used to analyse the effect of the cutting parameters on surface roughness in various cases has been discussed in detail.

## Surface Texture Analysis in Milling of Mild Steel using HSS Face and Milling Cutter

Vipin, Rajesh Kumar

Department of Production and Industrial Engineering, Delhi Technological University, Delhi, India

**Email:** rajesh2008dce@gmail.com

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**Abstract:** Surface finish influenced by the machining parameters on milling machine. The MOTIF-method is used for the evaluation of the primary profile. It is based on the envelope system and is suitable for alternative method to the mean line system. It determines the upper point of the surface profile and important for the functional behavior. The roughness and waviness can be evaluated directly from the surface profile curve. Cutting speed, feed rate and depth of cut effect was analyzed on the surface profile analysis. The experiments were conducted to study the machining parameter effects on milling of mild steel. The specimen was milled under different levels and analyzed R, Rx and Ar values.

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## Minimisation of Waste Due To BBD in FMCG Industry

Aditya Goyal, Amit Shokeen, Saurabh Agrawal

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** adityagoyal412@gmail.com

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**Abstract:** Best before date (BBD) is the period of time that a commodity may be stored without becoming unfit for use, consumption, or sale. In other words, it means that a commodity should no longer be on a pantry shelf (unfit for use), or no longer on a megastore shelf (unfit for sale, but not yet unfit for use). Consumers misunderstand what the best before date actually means which lead to wastage of products by them. We model and study the reasons of BBD through Fishbone approach and Pareto analysis. With specific focus on best before date and remaining shelf-life, we develop methods of reduction of waste in FMCGs. RFID (Radio-Frequency Identification) has been proposed as an emerging technology that could help reduce wastage in perishable food supply chains.

## Thermal Performance Analysis through Irreversibility Reduction of Vapour Compression Refrigeration System using Eco Friendly Based Nanorefrigerants

Rahul Jaiswal, R.S. Mishra

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** professor\_rsmishra@yahoo.co.in

**Abstract:** Now a days nano fluid are being considered as a most efficient heat transfer fluid having superior heat transfer property in various thermal application. Refrigerant based nano fluid termed as “Nano refrigerant” have the great potential to improve the performance of refrigeration and air conditioning system. This research analyzed thermo physical property and their effect on the coefficient of performance (C.O.P.) resulted by addition of different nanoparticle mixed with ecofriendly refrigerant. The analysis have been done for the same cooling load and same geometry parameter for all nanoparticle and refrigerant combination mixture .the analysis has been done considering a vapour compression refrigeration based chiller system having two concentric tube type heat exchanger as evaporator and condenser .The result indicate that thermal conductivity, dynamic viscosity and density of nano-refrigerant (different nanoparticle i.e.  $Al_2O_3$ , CuO and  $TiO_2$  with ecofriendly refrigerant R134a, R407c and R404A) increased about 15 to 94 %, 20% and 12 to 34 % respectively compared to base refrigerant on the other hand specific heat of nano-refrigerant is slightly lower the base refrigerant. Moreover  $Al_2O_3$ /R134a nano-refrigerant shows highest C.O.P. of 35%. R404A and R407 with different nano-particle shows enhancement in C.O.P. about 3 to 14 % and 3 to 12 % respectively. Therefore application of nano-refrigerant in refrigeration and air conditioning system is most required to improve the performance of the system.

ICARI-ME-16-02-040

## Adopting Multiple Intelligence Theory for all round Development of the Students

Reema Chaudhary <sup>a \*</sup>, Rajiv Chaudhary <sup>b</sup>, Ramesh Chandra Singh <sup>b</sup>

<sup>a</sup> Department of Mechanical Engineering, Bhagwan Parashuram Institute of Technology, Delhi, India

<sup>b</sup> Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** reemabpit@gmail.com

**Abstract:** Talking of the composition of any classroom today, belonging to almost any place or situations, it looks to be an obvious mix of non-homogeneous class of students. It actually implies the need of different type of planning of all the academic activities altogether, in order to address the needs of this type of class, which is not less than a challenge. There would be several issues associated with dealing with such situations which needs due consideration for making the things more purposeful. In this context, a relevant theory was proposed by Howard Gardner, which was called as “Multiple Intelligence Theory”. According to this theory, all people are born with different sets of intelligences, due to which there happens people wise difference, with respect to mental as well as cognitive abilities. Accordingly, owing to the students having different types and levels of intelligences, they tend to excel in one area over another. As capability of processing various information in different ways, varies person to person, it also varies in the degree of skill possessed by different people, in each of these intelligences, which exhibit distinct characteristics. In this paper an study has been done to examine the theory of multiple intelligences in order to find out the elements, applying and incorporating which various methodologies can be developed with certain objective, in such a way, that the adoption of the Multiple Intelligence theory prove to be very purposeful for any class. Although, some elements would be common to any such situation, as the matter of heterogeneity is a fact for any classroom.

Adopting this comprehensive model, several skills will be developed in the students like effective writing, word identification, comprehension, spelling, vocabulary, reading as well as oral reading etc, which proves the significance of this theory towards all round development of the students.

## Enhancing Mechanical Properties of the Bones of the Human Body through various Physical Activities

Rajiv Chaudhary<sup>\*</sup>, Ramesh Chandra Singh

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** rajivchaudharydce@gmail.com

**Abstract:** It has become a very common and adopted perception that for enjoying a healthy life, one has to be regular in various physical activities, which improve the state of our health. People following this habit are comparatively healthier and they do not fall sick very frequently. In turn apart from protecting ourselves from many other chronic diseases, we also enhance our physical fitness as well as energy levels. Bones being an essential part of our body, its health is also very important, as it is the basis of several physical motions made during the activities. By various physical movements the mechanical properties of the bones get improved by virtue of the inherent property of the bone. Bone is a Biomaterial, which responds to its internal stressing, which is the result of various types of loadings of the bones during various type of physical activities. The mechanical properties of the bones of the human body get improved, as it happens with other engineering materials like steel.

We undergo a series of physical activities in our daily routine, which brings in substantial improvements in the mechanical properties of the Bone. In this paper an effort has been made, realizing the mechanism involved, along with other facts and figures related to various physical activities, which improve the mechanical properties of the bones of human body.

ICARI-ME-16-02-042

## Identification of It Parameter for E-Retailing

Sanjeev Kumar, Mohit Tyagi<sup>\*</sup>, Saurabh Aggarwal

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** mohitmied@gmail.com

**Abstract:** In the current era of information technology, every field of business faces new type of competition. For getting higher sales and more revenue collection, management has to generate new ideas every time to improve its supply chain, so that it can compete with the market orientation and win the trust of customer. With the invention of internet, information technology (IT) affected the conventional ways of business tremendously by changing communication style among the supply chain stages ranging from supplier to consumer. Hence, conventional supply chain can be seemed in terms of IT enabled supply chain and traditional retailing or Brick and Mortar type retailing converts into electronic retailing i.e. e-retailing. The aim of this paper is to identify the IT- parameter, which may be considered as necessary aspects for the success of the e-retailing. To achieve the aim, various research papers and articles have been studied in order to choose the appropriate IT parameters. For better robustness, identified parameters were also discussed with field experts.

## To Study the Effect of Pulse Shaper on Dynamic Compressive Behaviour of Al2014 and Al7075

Sanjay Kumar<sup>\*</sup>, Vikrant Tiwari

Department of Applied Mechanics, Delhi Technological University Delhi, India

**Email:** sanjaydce2008@gmail.com

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**Abstract:** The dynamic compression behaviour of aluminium alloys Al2014-T651 and Al7075-T651 has been obtained by use of Split Hopkinson Pressure bar (SHPB). The percentage composition of both alloys are obtained by spectro analysis. During dynamic compression test pulse shaper of soft aluminium alloys are used and their effects are studied. The experiments are conducted at pressure 1bar. One dimensional wave theory is used to obtain mechanical properties at high loading rates.

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## Design of Multi Spindle Drilling Machine

Anmol Bhatia<sup>\*</sup>, Deepa Manani, Anubhav Grover, Jatin Kumara, Eshan Gupta

Department of Mechanical Engineering, The Northcap University (Formerly ITM University), Gurgaon, Haryana, India

**Email:** anmolbhatia@ncuindia.edu

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**Abstract:** In today's world, the growth of Indian manufacturing sector is highly dependent on how productivity and quality. Productivity can be increased by improving the efficiency of the operations carried out in the organization. This can be done by reducing the machining time, combining the operations etc. Thus special purpose machines need to be used and one such machine is multi spindle drilling machine which performs multiple drilling operations more accurately and conveniently. This paper presents the design and development of a multi spindle drilling machine which would have a higher productivity as compared to conventional drilling machines. The proper sequence wise design analysis of the components of multi spindle machine is discussed.

## Design and Experimental Analysis of a 200W Micro Wind Turbine

Raj Kumar Singh, Sajal Garg, Lohit Gudivada\*

Department of Mechanical Engineering, Delhi Technological University Delhi, India

**Email:** lohit\_94@yahoo.co.in

**Abstract:** Majority of the regions in India are characterized by moderate and low wind regimes. These regions have variable and gusty winds. Our low-wind energy turbine addresses this problem and is capable of providing power to millions of people not connected to the grid in low wind conditions.

Our objective is to design a suitable wind turbine applicable in low speed regions extracting maximum power output. Our team aims to take on the challenge of improving wind turbine efficiencies, at low to medium wind speeds, to reduce environmental impact and encourage adoption of wind energy at domestic and commercial building rooftops and small distributed systems.

Blade Element Momentum theory was adopted to find the suitable parameters at the required wind speeds.

Tools like Q-Blade and X-foil were used to optimize the CAD model of the blade.

A customised Wind tunnel was fabricated by the team to validate the practical results against the theoretical ones. Rapid Prototyping technique of 3-D printing was used to manufacture the blades.

Final results establish a close relationship between the theoretical and experimental values.

ICARI-ME-16-02-046

## Study of Variation in Parameters and Its Effects on Spot Welding of Advanced High Strength Steel

A. K. Madan

Department of Mechanical Engineering, Delhi Technological University Delhi, India

**Email:** prahlad.tewari@gmail.com

**Abstract:** Resistance Spot Welding being one of the focus areas of research in modern sheet metal manufacturing utilizes electric current through resistive circuit to generate enough heat at the point of resistance for spot welding of two pieces of sheet metal. The parameters that affect resistance spot welding include weld current, cycle duration and forging pressure which further impacts mechanical properties of spot weld joints. Complex and dynamic changes in the electrical, mechanical and thermal properties along with restricted availability of hardware, excessive time and cost pose a challenge for large scale employability in experimental procedures.

In the present work, experimental study was done to study the effect various parameters such as melting rate, indentation rate, nugget diameter and indentation diameter of two dissimilar dual phase steel having dissimilar thickness was done. Melting rate of DP600 side was higher than DP780 whereas indentation rate of DP600 side was lower than DP780 side of welded joints. The DP780/DP600 spot weld joint tend to get the larger nugget diameter than DP600/DP780. The geometry of electrode had influence on indentation diameter of DP600. FEM models can be easily applied for analytical analysis in such experimental studies.

## Implementation of Automated Material System in Assembly Shop

A. K. Madan

Department of Mechanical Engineering, Delhi Technological University Delhi, India

**Email:** prahlad.tewari@gmail.com

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**Abstract:** In material handling of hydraulic cylinder assembly line, automation is explored by the utilization of automatic devices that would aid in the reduction of physical and mental labour of humans. Traditionally part were being transported manually leading to high manpower cost, delay in transportation, interference with other handling equipment, chances of damage and high noise levels.

In the present work, automation of hydraulic assembly line was explored using alternatives such as AGV, In floor towline conveyor and Overhead trolley conveyor. These alternatives were evaluated by AHP technique and based on the overall highest ratings; overhead trolley conveyor was selected for automation.

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## Performance measures using Petri Net and ISM analysis in Flexible Manufacturing System (FMS)

A. K. Madan

Department of Mechanical Engineering, Delhi Technological University Delhi, India

**Email:** prahlad.tewari@gmail.com

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**Abstract:** Petri Net is being utilized for portraying and isolating the surge of data and control in frameworks, especially structures that may exhibit odd and concurrent activities. The use of Petri Net in Flexible Manufacturing System (FMS) is employed for graphical representation, machine uses, and throughput rates of parts, mean bolster inhabitancies and average holding-up time.

In the scope of present work, the PETRI-NET model is used in modelling, analysis and performance evaluation of FMS. The attempt was made to use this model for demonstrating the extensions of Petri net model for coloured PNS, Deterministic & Stochastic Petrinet (DSPN), and Generalized Stochastic Petrinet (GSPN) in various stages of Flexible Manufacturing System.

## Review of Waste Heat Recovery Technique from Automobile Exhaust Using Thermoelectric Generator

Vikrant Mishra

Department of Mechanical Engineering, Delhi Technological University Delhi, India

**Email:** mishra92vikrant@gmail.com

**Abstract:** In recent years, an increasing concern of environmental degradation due to automobile exhaust emissions and the limitations of energy resources has resulted in extensive research for novel technologies of generating electrical power. A thermoelectric generator using the exhaust waste heat from an automobile has the potential to replace the existing alternator system in an automobile, and thus improve fuel economy and reduce emissions. The conversion efficiency of modern thermoelectric materials has increased more than three-times in the last twenty years. But there are many challenges in the thermal design of Exhaust based Thermoelectric Generator (ETEG) systems, such as increasing the efficiency of the heat exchangers (hot box and cold plate) maintaining a sufficient temperature difference across the thermoelectric module during different operating conditions and reducing thermal losses through the system as a whole. This paper emphasizes the main objectives and challenges for designing efficient Waste heat recovery systems using Thermoelectric Generator. Finally, a review of ETEG research activities over the last decade is presented to focus on methods used by the research community to address such challenges.

## Analysis of Surface Roughness in CNC Pocket Milling– A Review

Pankaj Prasad, Mayank Singh, P. Mohan, Mohammad Basit Ali, Ranganath M.S.

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** p.mhn1994@gmail.com

**Abstract:** The parameters affecting the roughness of surfaces produced in the CNC pocket milling process for various materials have been studied by many researchers. Design of experiments were conducted for the analysis of the influence of the process parameters such as cutting speed, feed rate and depth of cut on the surface roughness. The results of the machining experiments were used to characterize the main factors affecting surface roughness by the DOE techniques like Taguchi, Full factorial, Response Surface Methodology (RSM) and other methods. The key element for achieving high quality at low cost is Design of Experiments (DOE). Taguchi method is a powerful tool for the design of high quality systems. It provides a simple, efficient and systematic approach to optimize designs for performance, quality, and cost. The methodology is valuable when the design parameters are qualitative and discrete. Taguchi parameter design can optimize the performance characteristics through the settings of design parameters and reduce the sensitivity of the system performance to sources of variation. Response surface methodology (RSM) is an effective tool for robust design, it offers a simple and systematic qualitative optimal design to a relatively low cost. A full factorial experiment is an experiment whose design consists of two or more factors, each with discrete possible values or "levels", and whose experimental units take on all possible combinations of these levels across all such factors. Such an experiment allows the investigator to study the effect of each factor on the response variable, as well as the effects of interactions between factors on the response variable. In this paper, an approach of DOE used by various researchers to analyse the effect of process parameters on the surface roughness of work material while machining with various tools and to obtain an optimal setting of these parameters that may result in good surface finish have been discussed.

## Study and Implementation of Automated Storage and Retrieval System in the Final Assembly Line

A. K. Madan

Department of Production and Industrial Engineering, Delhi Technological University, Delhi, India

Email: ashokmadan79@gmail.com

**Abstract:** Resistance Spot Welding being one of the focus areas of research in modern sheet metal manufacturing utilizes electric current through resistive circuit to generate enough heat at the point of resistance for spot welding of two pieces of sheet metal. The parameters that affect resistance spot welding include weld current, cycle duration and forging pressure which further impacts mechanical properties of spot weld joints. Complex and dynamic changes in the electrical, mechanical and thermal properties along with restricted availability of hardware, excessive time and cost pose a challenge for large scale employability in experimental procedures.

In the present work, experimental study was done to study the effect various parameters such as melting rate, indentation rate, nugget diameter and indentation diameter of two dissimilar dual phase steel having dissimilar thickness was done. Melting rate of DP600 side was higher than DP780 whereas indentation rate of DP600 side was lower than DP780 side of welded joints. The DP780/DP600 spot weld joint tend to get the larger nugget diameter than DP600/DP780. The geometry of electrode had influence on indentation diameter of DP600. FEM models can be easily applied for analytical analysis in such experimental studies.

ICARI-ME-16-02-051

## Welding Of Dissimilar Metal – An Overview

Adhirath Mandal<sup>a</sup>, Reeta Wattal<sup>b</sup>

<sup>a</sup>Department of Mechanical Engineering, Greater Noida Institute of Technology, UP, India

<sup>b</sup>Department of Mechanical Engineering, Delhi Technological University, Delhi, India

Email: adhirath.mandal@gmail.com

**Abstract:** In heat exchangers, tubing is required for the passage of the working fluid throughout the heat exchanger circuit. The requirement of the tubing inside the heat exchanger is of high heat transfer rate, thermal conductivity and ductility. For this purpose, Copper tubes are being used in the industry because they serve the above requirements optimally. But due to economic constraints their usage throughout the heat exchanger circuit is not profitable. For the rest of the tubing outside the heat exchanger, Stainless Steel tubes are used because of economic considerations and good corrosion resistance. Therefore replacement of copper components by stainless steel can be an attractive way to overcome the difficulty. There are different methods to weld copper with stainless steel and these are arc welding, diffusion bonding, laser beam welding and electron beam welding. Literature survey indicated that limited work has been reported on welding of dissimilar metal (copper with stainless steel) by gas tungsten arc welding method.

Gas tungsten arc welding (GTAW) offers many advantages such as it is relatively inexpensive, it offers an inert gas atmosphere at the weld using argon gas, which protects the weld pool from reacting with oxygen. These results in a more successful weld, the welding process is compatible with most product designs and so it offer flexibility. The equipment is relatively easy to use. So an attempt has been made to review the literature in this field.

## Electromagnetic Stir Casting Parameters and Squeeze Pressure Effects on Mechanical Properties of AA2014 alloy MMC and Hybrid MMC

Shashi Prakash Dwivedi\*, Satpal Sharma, Raghvendra Kumar Mishra

School of Engineering, Gautam Buddha University, Greater Noida, Gautam Buddha Nagar, (UP)

E-mail- shashi\_gla47@rediffmail.com

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**Abstract:** The main problem faced in the electromagnetic stir casting is the selection of optimum combination of input variables for achieving the required mechanical properties of composites. This problem can be solved by the development of relationship between the electromagnetic parameters and the tensile strength of composite by response surface methodology. This work focuses on the review of electromagnetic stir casting parameters effect on Mechanical Properties of MMC and Hybrid MMC. From the exhaustive review, it was observed that for better mechanical properties, lower porosity and finer grain structure of composite higher stirring current, higher stirring time and lower matrix pouring temperature required.

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## Solar Industrial Process Heating system for Indian Automobile Industry

Anubhav Uppal<sup>\*</sup>, J. P. Kesari

Renewable Energy Technology, Delhi Technological University, Delhi, India,

Email address:-Anubhav3365@gmail.com

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### Abstract

Solar thermal technology can be installed in the most automobile industrial sectors to lower consumption of fossil fuels, cut production costs, preserve environment by lessening CO<sub>2</sub> emissions. Also commercial viability of solar technologies is much higher for industries using furnace oil, coke or captive diesel based electricity. Aim of this paper is to develop solar-fossil fuel steam generation system for industrial applications for a more sustainable production in sectors such as automobile, food, textile, pharmaceutical and many others. This system consists of two main components: a solar concentrating collector field and a conventional steam boiler. With this system, integration of saturated steam supply for process heat applications in a reliable, energy efficient and cost effective way is possible.

## Precipitation Hardening Parameters Effects on Mechanical Properties of Extruded AA2014 Based Metal Matrix Composite

Shashi Prakash Dwivedi<sup>\*</sup>, Satpal Sharma, Raghvendra Kumar Mishra

Department of Mechanical Engineering, School of Engineering, Gautam Buddha University, Greater Noida, Gautam Buddha Nagar, Uttar Pradesh, India

**Email:** shashi\_gla47@rediffmail.com

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**Abstract:** Heat treatment of aluminium alloys are affected by means of precipitation hardening comprising the following steps: solutionizing, quenching and aging at room temperature (natural aging) or at elevated temperature (artificial aging). Nevertheless, during precipitation hardening of aluminium matrix-based discontinuously reinforced composites, in the solutionizing stage, the matrix alloy is modified quite significantly due to the occurrence of dislocations. The main problem faced in the heat treatment process is the selection of optimum combination of precipitation of hardening parameters for achieving the required mechanical and tribological properties of composites.

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## Study of Natural Gas Engine using non-premixed Combustion Model

Raj Kumar Singh, Aditya Kumar Singh, Aditya Anand

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** rajkumarsingh@dce.ac.in

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**Abstract:** Direct injection natural gas engines are used in many heavy duty vehicles. Similar to diesel engines, high thermal efficiency and power density is maintained in such direct injection natural gas engines. In such engines, natural gas is injected directly into the combustion chamber. Then the gas mixes with the high pressure air in the combustion chamber and combustion occurs. The main objective is to simulate a cycle, from the end of the compression stroke to 50° after TDC. Simulation would be done keeping methane as fuel. A 30 degree sector of a 4-stroke engine which corresponds to one fuel injector hole is modeled. Since combustion simulation is to be studied, the simulation starts at 20 degree crank angle (CA) before the start of injection (SOI) and ends at 50 degree CA after top dead center (TDC). A simplified model of the engine with no valves is modeled since during the entire combustion process, both the valves remain closed.

## Numerical Simulation of NACA2415 Airfoil at Different Low Reynolds Numbers and Angles of Attack

Aakash Srivastava\*, Vatsalya Tiwari, Raj Kumar Singh

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

Email: cheeku1612@gmail.com, vatsalya.tiwari.vns@gmail.com, rksingh.dtu@gmail.com

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**Abstract:** This project simulates NACA2415 airfoil on ANSYS Workbench and ANSYS FLUENT at low Reynolds numbers at different angles of attack. This is a 2-D simulation and Spalart-Allmaras is the preferred turbulent model solver for this process, it yielded more results closer to experimental results when compared against K-epsilon and other turbulent models. Contours of Pressure and Velocity are presented in this paper with their inferences discussed while Plots of Coefficient of Pressure ( $C_p$ ) about the chord lengths along the airfoil and Coefficient of Lift ( $C_L$ ) are plotted to compare the CFD and the experimental results. Effect of Reynolds number and Angle of Attack is thus studied and investigated.

## Performance Evaluations of Concentrated Solar Thermal Power Technology

Harwinder Singh, R. S. Mishra

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

Email: Harrymehrok14@gmail.com

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**Abstract:** This review work consists of detailed description on various types of research in the field of solar thermal systems and various methods to improve the performance of the collector systems. Concentrated solar thermal systems are the highly advanced and large scale technology, which is used to generate the thermal energy and converted it in to electric energy through the application of power producing device coupled with the collector systems, therefore from the research point of view improvement in the working performance of the solar thermal system is highly important to achieve the better efficient device

## Deep Drawing Behaviour of Cold Rolled Draw Quality Steel

Vijay Gautam

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** vijaygautam@dce.ac.in

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**Abstract:** Despite the fact that sheet metal forming techniques are extensively used in the modern industry, the use of new manufacturing concepts and advanced materials is of major interest to manufacturers of automobile sector. In this connection, the use of computer applications for the effective & precise analysis of sheet metal forming is quite important in the light of large number of variables which are influencing the process. The recent development of more reliable and flexible numerical and analytical methods provides economically sound solutions to many sheet metal forming problems. In sheet metal forming operations, cold rolled draw quality (CRDQ) steel has gained a lot of importance because of its extreme good deep drawing capabilities. In the present work, a sheet of CRDQ steel was selected and characterized for various mechanical properties. Finite element analysis software is used to perform the numerical simulation of the deep drawing of a fuel tank for a motorbike. Simulations were carried out for varying blank holding force during the draw for the analysis of punch force, strain distributions, drawbead and springback. For experimental work the necessary toolings have been designed to perform sheet metal forming operations. The punch force, strain distributions and springback have been analysed experimentally and results were compared with the FE simulation and are found to be in good agreement.

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## Effect of Grain Size on elastic behavior in bending of cold rolled Steel Sheets

Vijay Gautam

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** vijaygautam@dce.ac.in

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**Abstract:** In Bending operation, geometrical inaccuracies occur due to elastic recovery. To predict the springback, various bending parameters and material properties should be considered. In this paper effect of grain size on springback in bending of a cold rolled steel sheet has been investigated. To achieve coarse and fine grain sizes, vacuum annealing and oil quenching were adopted respectively. Microstructures of the heat treated specimens were studied to reveal the grain size. The tensile properties of the specimens were tested. The bend specimens were prepared in the size of 25X150 mm to ensure plane strain bending. The bending experiments were carried out with the help of a punch-die set with a punch profile radius of 12.5mm. Springback results were predicted with FE software and are in close agreement with the experimental results.

## Solidification Simulation of an Exhaust Manifold

Vijay Gautam

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** vijay.dce@gmail.com

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**Abstract:** In prevailing scenario, Casting has been proved as one of the versatile and high performing process which gives desired results at a lower cost than other manufacturing processes. This versatility is especially evident when it comes in making intricate shapes, casting metals which cannot be hot-worked and casting objects in a single piece which would otherwise require assembly of several pieces if made by other methods. In this research, casting of an exhaust manifold is designed and prepared with SiMo SG iron and in the first trail many casting defects were identified which were further minimized by optimum riser and gating design. This is achieved by using casting simulation software. Using simulation, we can estimate the position, size and shape of risers to achieve directional solidification. In the present work, an attempt has been made for minimizing the defects in casting of an exhaust manifold using casting simulation software. The material used is SIMO S.G Iron. The actual simulation is done by using Magmasoft casting simulation software. Here, we have replaced trial-and-error on the foundry floor (the traditional method) with trial-and-error on the computer. The advantage of doing this is that the time and cost have been reduced.

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ICARI-ME-16-02-61

## Finite Element Analysis of Sheet Rolling in a Mill

Vijay Gautam

Department of Mechanical Engineering, Delhi Technological University, Delhi, India

**Email:** vijay.dce@gmail.com

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**Abstract:** During the plate rolling process, considerable values of the forces of material pressure on the roll occur. These pressures cause the elastic deformation of the roll, thus changing the shape of the deformation region. Plate obtained from the rolling process always exhibits a variable thickness along the width. This state compels us to analyze and ensure that the rolling process is carried out correctly, as with the elastic deflection of rolls mounted on the rolling stand housing; it is possible to guide the rolled strip precisely in the centre of the rolling stand. Roll deformation should be, however, controlled, because its too large value causes the permissible deviations in the thickness of the strip along its width to be exceeded. A numerical simulation of roll deflection during cold rolling is presented in this project. The real conditions of the Plate Rolling Mill were taken for simulation in this project. The effect of rolled strip width on the deformation of the working and backing-up rolls was analyzed.

ICARI-ME-16-02-62

## Numerical Analysis of Air Cooling Application Counter Flow Shower Cooling Tower for Different Inlet Water Droplet Diameter

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, Delhi-42, India

**Email:** mzunaid3k@gmail.com

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**Abstract:** The two dimensional (2-D) counter flow shower cooling tower (SCT) mathematical model developed in MATLAB and used for this study. The mass conservation, momentum conservation, energy conservation and droplets trajectory equations are solved simultaneously for predict the exit conditions of air and water for human comfort. Experimental data obtained from SCT are used to validate the MATLAB mathematical model. In this parametric study, inlet water droplet diameter plays a significant role on SCT outlet parameters i.e. air dry bulb temperature (DBT), water droplets temperature, makeup water required and thermal efficiency. Results show exit air and water temperature increases with increasing the inlet water droplet diameter. Results also show thermal efficiency of SCT decreases with increasing the inlet water droplet diameter.

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ICARI-ME-16-02-63

## Mathematical Analysis of Air Cooling Application Counter Flow Shower Cooling Tower for Different Inlet Water to Air Mass Flow Ratio

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, Delhi-42, India

**Email:** mzunaid3k@gmail.com

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**Abstract:** This study present development of two dimension numerical model in MATLAB, in which mass, momentum, energy, exergy and droplet trajectory equations are solved simultaneously for predict the exit conditions of air and water for human comfort. Experimental data obtained from shower cooling tower (SCT) are used to validate numerical model. In this parametric study, inlet water to air mass flow ratio (RLG) plays a significant role on SCT exit parameters i.e. water droplets temperature, air dry bulb temperature (DBT), thermal efficiency of SCT, convective and evaporative exergy of air, exergy of water, total exergy destruction of system and second law efficiency. Results shows thermal efficiency of SCT decreases and second law efficiency of SCT increases with increases the inlet RLG.

ICARI-ME-16-02-64

## CFD Analysis of Industrial Used Counter Flow Shower Cooling Tower for Different Inlet Air Relative Humidity

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, Delhi-42, India

**Email:** mzunaid3k@gmail.com

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**Abstract:** This study presents three dimensional (3-D) computational fluid dynamics (CFD) analysis of shower cooling tower (SCT). SCT can be used in for industry to cool the hot water. Experimental data obtained from SCT are used to validate CFD model of SCT. In this parametric study, inlet air relative humidity play significant role on performance of SCT outlet parameters. Results show that outlet air dry bulb temperature (DBT), air specific humidity, water droplets temperature, and thermal efficiency of SCT increase with increasing the inlet air relative humidity. Results also show that exergy destruction and second law efficiency of system decrease with increasing the inlet air relative humidity.

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ICARI-ME-16-02-65

## CFD Analysis of Industrial Used Counter Flow Shower Cooling Tower for Different Inlet Air Dry Bulb Temperature

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, Delhi-42, India

**Email:** mzunaid3k@gmail.com

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**Abstract:** This study deals with three dimensional (3-D) computational fluid dynamics (CFD) analysis of induced draft counter flow shower cooling tower (SCT). To cool the hot water in industries SCT can be used. The main drawback of the conventional cooling tower is fouling due to salt decomposition on the fills, and it is a main reason of cooling tower performance decline. Changing and washing of fills are tough. Therefore, to overcome these weaknesses, SCT has been developed where fills are removed completely, and small sizes droplets replace the fill as the mode of simultaneous heat and mass transfer. The practical data found from SCT are used to validate CFD model of SCT. SOLIDWORK software used to make geometry of SCT and Fluent software used for analysis. Results show that exit air dry bulb temperature (DBT), air specific humidity, water droplets temperature, thermal efficiency, and second law efficiency (SLE) increase with increasing the inlet air dry bulb temperature (DBT). Results also show that total exergy of system decrease with increasing the inlet air DBT.

ICARI-ME-16-02-66

## CFD Analysis of Industrial Used Counter Flow Shower Cooling Tower for Different Inlet Water Temperature

Mohammad Zunaid

Department of Mechanical Engineering, Delhi Technological University, Delhi-42, India

**Email:** [mzunaid3k@gmail.com](mailto:mzunaid3k@gmail.com)

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**Abstract:** This study deals with three dimensional (3-D) computational fluid dynamics (CFD) analysis of induced draft counter flow shower cooling tower (SCT). To cool the hot water in industries SCT can be used. The experimental data found from SCT are used to validate CFD model of SCT. SOLIDWORK software used to make geometry of SCT and Fluent software used for meshing and analysis. Results show that exit air dry bulb temperature (DBT), air specific humidity, and water droplets temperature increase with increasing the inlet water droplet temperature. Results also show that thermal efficiency and second law efficiency (SLE) of SCT decrease with increasing the inlet water temperature.

## User opinion mining on social media sites using ANN and fuzzy logics

Deepti Juneja<sup>\*a</sup>, M.K. Sharma<sup>b</sup>

<sup>a</sup> Department of Computer Engineering, Jagnath University, Jaipur, India

<sup>b</sup> Department of Computer Engineering, Amrapali Institute Haldwani, Uttarakhand, India

**Email:** deepti171@yahoo.co.in

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**Abstract:** Social media sites are now very popular medium for showing your views and opinions to others with a great amount of various types of information uploaded by the social media users, a social web page can be a collection of pages, audio files, photographs, images, video files and other forms of data in structured or unstructured form. It is also huge, diverse, and dynamic, hence raises the scalability. The primary aim of web mining is to extract useful information and knowledge from web. This paper proposes an web based opinion mining system that can be used for social media sites for better classifications of user reviews. Feature-based classification is a multistep process that involves preprocessing to remove noise, extraction of features and corresponding descriptors, and tagging their polarity. The proposed technique extends the feature-based classification approach to incorporate with ANN and Fuzzy methods by using fuzzy and ANN functions to emulate the effect of modifiers, concentrators, and dilators.

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## Information Retrievals with Special Reference to Hindi Language Search Engines and Web IR

B. P Singh<sup>\*a</sup>, Anand Kumar<sup>b</sup>

<sup>a</sup> Department of Computer Engineering, Dayalbagh Educational Institute, Agra, Uttar Pradesh, India

<sup>b</sup> Department of Computer & Information Sciences, J. R. Handicapped University, Chitrakot, Uttar Pradesh, India

**Email:** bp.singh76@gmail.com

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**Abstract:** In the era of 20<sup>th</sup> century, web user's communities have appreciated to grab the importance of archiving and finding information from web in various languages. With the advancement of computers and technology, the vital amount of data and information become possible to store which is available to share relevant and useful information for human and machine. The people can explore useful information from such collections of information resources. The field of Information Retrieval (IR) came in reality in 1950s. Before last few years, IR field has more popular and established in the area of searching the information. Various IR systems are used on day to day by a wide variety of users. This article is a brief overview of the key issues searching in Hindi languages in the field of Information Retrieval. We are also exploring our observations to find the results after searching various Hindi language queries on different search engines.

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## Virtual Sober Companion-Mood Analysis

Krishna Balasubramanian<sup>\*a</sup>, Nikhil Gala<sup>b</sup>

<sup>a</sup> Department of Computer Engineering, Mukesh Patel School of Technology, Management and Engineering, NMIMS University, Mumbai, India

<sup>b</sup> Department of Electronics and Telecommunications, NMIMS University, Mumbai, India

**Email:** krishnabalasubramanian.nmims@gmail.com

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**Abstract:** The rehabilitation of drug addicts involves a phase of sober companionship where a person who has had a history with the drug but has maintained abstinence for more than three years is asked to accompany the recovering addict during all chores and tasks. The aim is to provide a cheaper alternative to human sober companions by introducing a virtual counterpart. Of the many facets to this application building and patient recovery project, Mood Analysis is the main module that is to be well understood and studied before any step towards making the application. The paper provides a review of all available works related to this domain.

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## IT/IS Issues and Challenges in Indian SMES: An Interpretive Structural Modeling (ISM) Approach

Nazir Ahmad, Jamshed Siddiqui

Department of Computer Science, Aligarh Muslim University, Aligarh, India

**Email:** ahmad\_amu@live.in

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**Abstract:** Assessment of IT/IS Adoption and market competitiveness is a crucial endeavor for today's competing SMEs. There has been an increasing value for enhancements among the business effectiveness as well as increasing the profitability consequently in order to enhance business venture, competitiveness. Interpretive structural modelling (ISM) has evolved as a means to analyze the relational aspects of the factors. The objective of this paper is to identify factors of IT/IS adoption and competitiveness and to establish and analyze associations among these factors applying interpretive structural modelling.

## Blur Image Classification using Object focusing technique in e-governance

Sandeep Kumar<sup>a\*</sup>, Rajeev Kumar<sup>b</sup>, Meenu Kansal<sup>c</sup>

<sup>a</sup> Department of Computer Science, Bhagwant University, Ajmer, Moradabad, India

<sup>b</sup> Department of Computer Science, Teerthanker Mahaveer University, Moradabad, India

<sup>c</sup> Department of Computer Science, Mewar University, India

**Email:** Sandeepkmr.nishad@gmail.com

**Abstract:** usually whenever Images is captured by satellite in different environment Like Landscape, forests, Hills, Dark, Shiny, Oceans Region and Different Geography. Than we have to improve these images because without clear images it's really hard to get information. There are several method used to enhance the perception of these images like Histogram Equalization Technique, Local Histogram equalization method, Discrete Cosine Transform, and Discrete Wavelet Transform technique. All these technology face troubles such as failure of image information, loss of edge details etc. Wavelet transforms have become one of the very important and very powerful tool of signal representation and we can enhance our images by using this technique. Bi-cubic interpolation is used as a intermediate stage for estimating high

Frequency components and it is more sophisticated than the nearest neighbor and bilinear techniques. The proposed technique has the advantages of superior resolution, sharper image and smoother edges by the DWT and bi-cubic.

## Web Content Management System

Abhilash Kumar, Mahendra Singh Sagar

Department of Computer Science, Teerthanker Mahaveer University, Moradabad, India

**Email:** abhilashkumar21@gmail.com

**Abstract:** This is a research paper on Web Content Management Systems. Web Content Management Systems are getting used in building number of websites now a day. This document discusses the difference between building a website using a WCMS than to building a web application using the existing web technologies like J2ee, dot net, php etc. WCM comes from enterprises' need to organize and update the high volume of information published on their website. Implementing a WCM software allows for managing a great amount of content (from text to sound, from images to videos) using simple and flexible instruments. WCM are the systems more commonly (and wrongly) called CMS. The misunderstanding is because CMS result from the application of WCMS to all the company's content (e.g.: management of all enterprise's content and not only the information to be published on the web, multi-channel ready publications, etc.). It also discusses the advantageous as well as disadvantageous of Web Content Management System.

## Adopting Cloud Supported E-Learning Framework in Government Schools and Colleges

Anu Sharma<sup>a</sup>, M. K. Sharma<sup>b</sup>, R. K. Dwivedi<sup>a</sup>

<sup>a</sup> Department of Computer Science, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

<sup>b</sup> Department of Computer Science, Amrapali institute, Haldwani, India

**Email:** <sup>1</sup>er.anusharma18@gmail.com

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**Abstract:** Cloud computing is becoming an increasingly popular enterprise model in which computing resources are made available on-demand to the user as needed. Through cloud computing we can access anything that we want from anywhere to any computer. In this paper we studied on the motivation factors of adopting cloud computing, focusing on the future scope for government school and colleges. Cloud computing in an academic environment such as school, colleges will be benefitted by every student, faculty, and administrators. We establish a theoretical background to cloud computing and discuss the benefits, challenges of cloud computing in the government schools and colleges enterprise. Providing various e-learning services using a cloud-based platform can reduce costs, can be easier to maintain and update, and offer benefits to end users in terms of security and compatibility.

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ICARI-CS-16-02-009

## High Performance Technology with Acceleration

Sachin Singh

Department of Computer Science, Teerthanker Mahaveer University, Moradabad, Uttar Pradesh, India

**Email:** Singh.sachin1986@gmail.com

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**Abstract:** High-performance Technology (HPT) uses Advance Computers and computer hub to solve advanced computation problems. HPT has come to be applied to business uses of cluster-based supercomputers, such as data warehouses, line-of-business (LOB) applications, and transaction processing. In the recent, a new group of HPT systems has emerged. These systems employ traditional processor architectures—such as IBM's Cell processor and graphics processing units (GPUs)—for heavy computations and use conventional central processing units (CPUs) mostly for non-compute-intensive tasks, such as I/O and communication.

## A Novel Approach for Third Party Auditing to Achieve Data Integrity on Cloud Computing

Sahana Lokesh.R

Department of Computer Science and Engineering, Teerthanker Mahaveer University, Moradabad, India

**Email:** sahana.lokesh@gmail.com

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**Abstract:** Security is the major issue in cloud computing and the services of the cloud computing is very huge in IT scenario. In cloud the user stores their data without the burden of local storage. So ensuring the data integrity is the major issue in cloud computing. To achieve data integrity auditing plays a important role in achieving data integrity in cloud. A third party auditor is essential to perform auditing to ensure data integrity on cloud services. In this paper, a Dynamic Third Party Auditing System is proposed in which a third party entity dynamically provides auditing services on cloud computing environment. TPA makes task of Client by verifying the integrity of data stored in cloud .The Dynamic third party auditing system does auditing using public key based homomorphism authentication

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## Securing Email using Voice Recognition

Imtiyazul Haq<sup>\*</sup>, Anil pandey

Department of Computer Science, Invertis University, Bareilly, India

**Email:** idealimtiyaz@gmail.com

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**Abstract:** We are living in the age of digitization. Everything is going to be digitized in next few years. Hence we are becoming more dependent on technologies like email, where we keep some necessary information viz; business information, financial information and personal information etc. Thus it becomes necessary to keep this information more and more secure from the intruders that are continuously targeting to our email for collecting confidential information. It is easy to hackers because of email spoofing, shoulder surfing and man in middle attacks. So in this paper, i proposed a new approach, using two layer authentication i.e. knowledge based (username and password) authentication together with Biometric based (Voice based) authentication to overcome the problem of existing system.

## Artificial Neural Network Based Quality Testing and grading of mangoes using Non Destructive Techniques of Computer Vision

Neeraj Chauhan, Ashutosh Kumar Bhatt, Rakesh Kumar Dwivedi

<sup>a</sup> Department of Computer Science and Engineering, Teerthanker Mahaveer University, Moradabad, India

<sup>b</sup> Department of Computer Science and Engineering, Birla Institute of Applied Sciences, Bhimtal, India

**Email:** neelu.rajpoot80@gmail.com

**Abstract:** Image processing and machine vision system is an automated fruit quality measurement system. In agricultural sector the efficiency and the accurate grading process is very essential to increase the productivity of product. Everyday high quality fruits are exported to other countries and generate a good income. That is why the grading process of the fruit is important to improve the quality of fruits. However, fruit grading by humans in agricultural industry is not sufficient, requires large number of labors and causes human errors. Automatic grading system not only speeds up the process but also gives accurate results. Therefore, there is a need for an efficient fruits grading or classification methods to be developed. Fruit's Color, size, weight, component texture, ripeness are important features for accurate classification and sorting of fruits such as oranges, apples, mangoes etc. This paper discusses the various developed methods and applications for automatic fruit quality detection using Artificial Neural Network and Image Processing techniques for feature extraction and classification for fruit quality measurement system.

## Free Vibration Analysis of Lamianted Sandwich Plate Structures

Aman Garga<sup>\*</sup>, H.D. Chalak

Department of Civil Engineering, National Institute of Technology Kurukshetra, Kurukshetra, India

**Email:** amang321@gmail.com

**Abstract:** Due to wide applications of laminated sandwich plates in various fields, it is becoming an area to explore. Various theories have been put forward employing various tools for solving the problems regarding free vibration analysis of laminated sandwich plates. Henceforth, an effort has been made to study laminated sandwiched plates under free vibration conditions with the help of ABAQUS software. Nondimensional natural frequencies are compared in order to calculate the results. The present results are compared with higher order shear deformation theories and higher order zigzag theories and a correlation between them is also discussed. At the end, results are drawn upon the applicability of the model for carrying out analysis upon free vibration of laminated plates. The article also discusses the strengths and weaknesses of some models based upon the literatures available and from present results also.

## Effect of Module Variation in a Diagrid Structural System

Arpit Bajaja<sup>\*</sup>, V. K. Sehgal

Department of Civil Engineering, National Institute of Technology Kurukshetra, Kurukshetra, India

**Email:** arpit.bajaj7@gmail.com

**Abstract:** The rapid increase in population and scarcity of land has increased the demand of taller buildings. The role of lateral loads i.e., seismic and wind loads becomes more prominent as compared to vertical loads in case of tall buildings. A number of structural forms have been put forward by various architects and engineers to serve this purpose. Recently, diagrid structures are gaining popularity as they not only provide structural efficiency and aesthetic quality but also provide the much needed geometric versatility. These systems cater loads more efficiently as compared to other conventional structures. The effectiveness of a diagrid structure depends mainly upon its module size. It's a crucial element as the entire load is distributed through it. Hence, it becomes necessary to study the effect of module variation on different analytical parameters. In the present article, dynamic analysis of 42 storey diagrid structure and the effect of module variation (horizontally as well as vertically) on various parameters such as maximum displacement, storey drifts etc., have been studied using ETABS 2015 software following Indian Standards.

ICARI-CV-16-02-004

## Q Anisotropy in the region of Garhwal Himalaya

Gaurav Sharma<sup>\*</sup>, Akshat Dimri

Department of Civil Engineering, National Institute of Technology, Kurukshetra, India

**Email:** gauravkrsharma@gmail.com

**Abstract:** Empirical relations have been found out to describe the decay in amplitude with distance of s-waves in the region of Garhwal Himalaya. These functions result from the analysis of spectral amplitudes of three component digital records from 19 local earthquakes obtained from 12-station seismological network deployed in the Garhwal lesser Himalaya. The events lie in a magnitude range from  $M_L$  2 to  $M_L$  4.5, epicentral distance 5 km to 120 km and focal depth from 5 km to 50 km.

To determine the variations of the quality factor  $Q$  in the direction of wave propagation ( $Q$  anisotropy), independent estimates have been made of the attenuation of SV- and SH-waves using vertically polarized and transversely polarized components, respectively. Frequency analyzed (1-12 Hz) and in the whole distance range, the frequency dependence of  $Q$  can be approximated as  $Q_{sh} = 74.3 f^{1.0}$  for the SH-wave and  $Q_{sv} = 81.5 f^{0.95}$  for the SV-waves. The small difference between SH and SV spectral decay, suggests that  $Q$  anisotropy is negligible. However, in the distance range of 5-50 km,  $Q_{sv}$  tends to be significantly greater than  $Q_{sh}$  at frequency  $> 8$  Hz. So in this distance range we observed  $Q$  anisotropy in the studied region. The dependence of  $Q$  value with frequency in this range is  $Q_{sh} = 110 f^{0.94}$  for SH-wave and  $Q_{sv} = 134 f^{1.0}$  for SV-waves.

## Review on Stabilization of Clayey Soil using different chemicals

Bhawna Sahay<sup>\*</sup>, V. K. Arora

Department of Civil Engineering, National Institute of Technology, Kurukshetra, India

**Email:** sweetysahay20@gmail.com

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**Abstract:** Soil stabilization is a technique of enhancing the geotechnical properties and strength of soil to modified the bearing capacity and durability of weak soil. There are numerous method of stabilized the soil such as soil replacement , grouting , geotextile and geo fabrics , mechanical ,electrical methods , using additives such as fly ash , rice husk, gypsum, cement. Chemicals such as lime, sodium hydroxide, aluminium oxide, phosphorus pentoxide are time saving method. All these chemicals are highly reactive in nature and react with clay particles during stabilization process which leads to improve the geotechnical properties of soil.

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## Progressive Collapse Analysis of R.C.C. Framed Structures

Sanjay Yadav<sup>\*</sup>, S.K. Madan

Department of Civil Engineering, National Institute of Technology, Kurukshetra, India

**Email:** sanjay2000yadav@gmail.com

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**Abstract:** Progressive collapse implies a phenomenon of sequential failure of part of the structure or the complete structure initiated by sudden loss of vertical load carrying member (mostly column). The failure of a member in the primary load resisting system leads to redistribution of forces to the adjoining members and if redistributed load exceeds member capacity it fails. Significance of designing structures to resist progressive collapse has been recognized following the collapse of World Trade Centre in 2001. In the present study progressive collapse potential of 5-storey RCC framed structure is evaluated. The objective of the presented study is to identify the modeling parameters affecting the final result i.e. progressive collapse potential. Linear static and dynamic analysis is performed according to the General Service Administration (GSA) guidelines for evaluating progressive collapse potential. Modeling, analysis and design of the buildings are performed using ETABS 2015 for three different threat-independent column removal conditions by following the alternate load path method.

## Effect of Coarse Aggregate Size on Strength of High Performance Concrete

Megha Kalra

Department of Civil Engineering, The Northcap University (Formerly ITM University), Gurgaon, Haryana, India

**Email:** meghakalra@ncuindia.edu

**Abstract:** The development of new methodologies for manufacturing high performance concrete has led to massive increase in its usage worldwide. The higher strength development in concrete has increased the construction of skyscraper, bridges and special structures. Apart from higher strength and better performance the usage of this concrete also lends technical and economical viability to the entire project. The main criteria of making high strength concrete are to reduce the water content and increase the cement proportions. This however leads to reduced workability which can be overcome by the use of different mineral admixtures like rice husk ash, silica fume and fly ash apart from chemical admixtures.

In our study, an attempt has been made to determine the effect of varying size of aggregate on high strength concrete using silica fume with and without fly ash. The concrete was manufactured using usual ingredients like cement, coarse aggregates, fine aggregates, water, and mineral admixture in the form of silica fume and fly ash and super plasticizer. Three sizes of coarse aggregates i.e., 10 mm, 12.5mm and 16mm with two types of fine aggregates with fineness modulus 2.65 and 2.88 were used in concrete. The percentage of silica fume and fly ash that replaced cement by weight was 7.5% and 10% respectively. It was concluded that concrete made from 10 mm coarse aggregate and with fine aggregate of fineness modulus 2.88 with silica fume showed higher compressive strength at 28 day curing.

ICARI-CV-16-02-008

## Study of Temporal Variation in Ambient Air Quality during Diwali Festival in Delhi – A case study

Gupta M, Sharma A, Bajaj N, Mandal A

Department of Environmental Engineering, Delhi Technological University, Delhi

**Abstract:** Fireworks are one of the most unusual sources of pollution in atmosphere containing harmful chemicals such as potassium nitrate, carbon and sulphur apart from an array of chemicals such as strontium, barium, sodium, titanium, zirconium, magnesium alloys, copper and aluminum powder to create the colorful effects. The boundless use of fireworks was found to be related to short-term variation in air quality of Delhi (28.6139° N, 77.2090° E). These variation episodes are responsible for high concentrations of pollutants (especially metals, organic compound and gases). In this paper the ambient concentrations of air pollutants (Sulphur Dioxide (SO<sub>2</sub>), Oxides of Nitrogen as NO<sub>2</sub>, Suspended Particulate Matter (SPM) and carbon monoxide) during Diwali has compared to the data of a typical day in Delhi, November 2015. The data reveals that there is a shift in meteorological parameters which resulted in easy dispersion of air pollutants due to which the concentration of pollutants was observed to be increased ~23-fold at few sites. The trend also shows that pollutants concentration increased just before Diwali and reached to a maximum concentration on the day of the festival. These results also indicate that fireworks during the Diwali festival affected the ambient air quality adversely due to emission, dispersion and accumulation of air pollutants.

## Application of Qual2e Model for River Water Quality Modeling

Nuzhat Parveen \*, S. K. Singh

Department of Environmental Engineering, Delhi Technological University, Delhi  
Email: nuzhatparveen018@gmail.com

**Abstract:** QUAL2E is an modeling software which simulates upto 15 water quality parameters in branching stream system. The model uses mathematical equations like finite-difference solution of the advective- dispersive mass transport and reaction equations. The program computes a series of steady- state water surface profiles and simulates changes in flow conditions along the stream. The model is applicable only to dendritic streams that are well mixed and it assumes that the major transport mechanism, advection and dispersion are significant only along the main direction of flow of the stream. QUAL2E can operate as either a steady state or a dynamic model and it simulates a dynamic diel heat budget and water quality kinetics for a one dimensional and steady flow system. QUAL2E program performs dissolved oxygen balance by including source and sink terms in mass balance equation and is used to quantify the non point sources loading rate, determine the pollutants, calculate the phosphorus and estimate the natural conditions. It accommodates four types of hydraulic and mass load functions in addition to local climate factors: headwater-inputs, point sources, inflow/outflow and downstream boundary conditions.

ICARI-CV-16-02-0010

## An innovative and eco-friendly process to treat the domestic wastewater without any chemical

Pawan Kumar Bharti <sup>a, b</sup>, A.K. Tyagi <sup>b</sup>

<sup>a</sup>Member, 30<sup>th</sup> Indian Scientific Expedition to Antarctica (MoES) Bharti Station, Larsemann Hills, Ingrid Christenson Coast, East Antarctica

<sup>b</sup>R&D Division, Shriram Institute for Industrial Research, 19, University Road, Delhi-7, India

Email: gurupawanbharti@rediffmail.com

**Abstract:** Primary treatment of water or wastewater consists of coagulation and flocculation processes, which results in a very high cost. Today, the prime concern of the environmentalists is how to reduce the coagulants and flocculants cost and to improve the characteristics of the produced water for safe utilization. In this work, it is tried to use the tissues of *BK Plant* (patented) as natural coagulant and develop an eco-friendly technology for turbid water and domestic wastewater. In wastewater treatment, coagulation–flocculation is one of the most important physico-chemical treatment steps to reduce the suspended and colloidal materials responsible for turbidity of the wastewater. During the last decade, more interest has been given on the use of natural coagulants in treating industrial and domestic wastewater. Natural coagulants are, in general, used as point-of-use technology in less-developed communities, since they are relatively cost-effective compared to chemical coagulants. Today, the prime concern of the environmentalists is how to lower the coagulants and flocculants cost and to improve the characteristics of the produced water and sludge for safe utilization and disposal respectively. In this work, it is tried to use the tissues of *BK Plant* as natural coagulant against turbid water and develop a chemical free eco-friendly technology for primary treatment of turbid water and domestic wastewater.

The present eco-friendly technology for primary water treatment will help to reduce the burden of chemicals used in water/wastewater processes. Raw material used in this technology is available in many states of India in plenty. It can be achieved at very low cost and can be utilized for the welfare of society. The outcomes of adopting this technique will give benefits to human society and will conserve the environment as well.

## Hybrid Intelligent Decision Support System for Malaria and Typhoid Fever Diagnosis

Chukwuedozie N Ezema

Department of Electronic Engineering, Nnamdi Azikiwe University Awka Anambra State, Nigeria

**Email:** ecnaxel@gmail.com

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**Abstract:** Health care facility should be accessible by all at all times. But some of the people that should access these facilities are far removed from these facilities. More so, in the few available facilities, qualified medical personnel are always key issues that need urgent redress. In view of the foregoing, it would be of great necessity to provide an intelligent decision support system that will provide a complementary medical service, such as medical disease diagnosis in places where accessibility is a problem as well as health care facilities where qualified experts are lacking, hence this research will focus on Intelligent Decision Support System for Malaria and Typhoid Fever Diagnosis. The software has been designed to be interactive with audio capability eliciting from the user if they have symptoms of the diseases. The user response helps the Intelligent Decision Support System to determine the level at which the disease is present. The user is further advised on what next to do. This software is implemented in visual basic programming environment.

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## Energy Efficient Hybrid Digital Weighing Scale

Chukwuedozie N Ezema

Department of Electronic Engineering, Nnamdi Azikiwe University Awka Anambra State, Nigeria

**Email:** ecnaxel@gmail.com

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**Abstract:** This main objective of this research was to design an energy efficient, hybrid digital weighing scale which can be used in all weight measuring operations. It is basically designed to take weights in kg and display on LCD. The design is justified on the basis of the purpose and importance of weight machine in various aspects. This machine can detect minute magnitude of weight placed over it and can accurately measure in kilograms and displays it over a digital scale. It could be used in homes, industries, shops and retail outlets for determining the weights of the various materials being sold to the customers so that the items may be correctly rated as per the displayed weight over the machine. It converts pressure into appropriate voltage levels. This voltage level is filtered and converted into digital data in the microcontroller which is then displayed on a LCD.

## IOT Based Sensor Network for Agricultural Application

Megha Milana.N, M. Z. Kurian

Department of Electronic Complication, Engineering, SSIT, Tumkur, Karnataka

**Email:** mac.megha@gmail.com

**Abstract:** A conventional sensor network is a radio network of sensor nodes with ability to sense physical parameters, store sensed data, carry out simple processing on data and forward the data through radio interface. The objective of such network is to push the data to a sink node which can then forward the data to server (or cloud). However many real time applications includes sensors spread over long areas. As such they are treated as independent networks. Internet of Things is a new paradigm of connecting devices like microcontroller and smart objects to cloud. Using IoT services, we can now connect sensors to internet directly. In the proposed work more comprehensive state of art cloud extension of WSN through IoT has been focused, more focus on being towards bettering each of the current state of art building blocks including but not limited to sensor network, coordinator protocol, data analysis in sensor network, cloud services, IoT protocols and so on.

ICARI-EC-16-02-004

## Design of a High Frequency Stable Oscillator with Tunable Frequency using Field Programmable CMOS Current Conveyor

Garima Kapur

Department of Electronic Engineering, Jaypee Institute of Information & Technology, Sector 62, Noida, India

**Email:** kapur.garima@gmail.com

**Abstract:** Design of a programmable frequency oscillator design using field programmable, analog, CMOS current conveyor has been presented; further, a design methodology to introduce on-chip /field programmability into the second generation current controlled current conveyor circuit (CCCII) is explained. To make the CCCII CMOS design programmable, a floating-gate transistor synapse is introduced to replace the MOSFETs in the design. The charge at the floating-gate can be programmed after fabrication, based on Hot-e-injection and Fowler-Nordheim tunneling techniques. This programming charge at floating-gate results in threshold voltage variation in such floating-gate(FG) MOSFETs, which in turn can modifies circuit specifications after fabrication. The high frequency small signal analysis of the design has been discussed and specifications of the design are derived in terms of threshold voltages of the respective FG-MOSFETs. To achieve CCCII circuit's AC and DC characteristics and to obtain programmable oscillations, the programmable CCCII and oscillator circuit using programmable CCCII, are simulated using BSIM3 level49 MOSFET models in T-Spice 0.35 $\mu$ m CMOS process. The simulated results show 13bit programming precision in current gain, 3dB bandwidth, input impedance, output impedance and dc offsets with respect to threshold voltage of respective FG-MOSFETs. Moreover on employing CCCII design with programmable current gain (about 0.91258- 1.2138) in an oscillator design with minimum passive components, variable amplitude oscillations can be generated.

## Imfouling, Cleaning & Sanitation Aspects of Membrane Processing

Hardik Chaudhary, Ashish Patel, Sunil Patel

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** ashishpatel4484@gmail.com

**Abstract:** Membrane processing is widely used as non thermal process in dairy and food industry. It has its own significance and advantage on final quality of product. Membrane is considered to be the heart of a membrane processing because it act as a selective barrier to permitting passage of certain components, while retaining others. In Membrane processing for efficient separation over a longer period of time it is required to keep membrane more clean and fouling free. Membrane fouling is defined as the process in which solute or particles deposit onto the membrane surface or into membrane pores such that membrane performance is deteriorated. It presents major obstacle for the wide spread use of this technology. Membrane fouling can cause severe flux decline and affect the quality of the water produced. Membrane lifetime and permeate productivity are primarily affected by concentration polarization and fouling at the membrane surface. Severe membrane fouling may require intense chemical cleaning or membrane replacement. As a result, operating costs of a treatment plant is therefore increased. There are various types of foulants namely colloidal (clays, flocs), biological (bacteria, fungi), organic (oils, polyelectrolytes, humics) and scaling (mineral precipitates).

Nowadays, fouling is the most critical phenomenon in membrane performance. Since the economical incidence of fouling can be very significant, minimizing this phenomenon is a must in membrane plants. In spite of methods for preventing fouling, such as good pre-treatment and suitable operating conditions, membrane cleaning is always necessary to improve membrane performance over its useful life. Research on membrane cleaning must continue in order to enhance a process that represents an important percentage of the operating costs. Within physical cleaning methods, the use of hypersaline solutions for backwashing and the application of ultrasonic or some kinds of magnetic and electrical fields seem to be very promising techniques in membrane cleaning. With regard to chemical cleaning, research should be focused on the combination with physical methods, such as air flushing, since greater efficiencies can be achieved when combining physical and chemical actions simultaneously.

ICARI-DE-16-02-003

## Application of Renewable Energy in Dairy Industry

Patel Ruchi, Patel Ashish, Upadhyay J. B.

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** ashishpatel4484@gmail.com

**Abstract:** Today India has become number one in milk production, producing 140 million tons per annum with approx. 20% of the total milk production is handled by the organized sectors. Dairy and food industries are fast growing industries and day-by-day newer technologies are being introduced to get better quality of foods. Most of the milk processing operations, room conditioning for milk product packaging and cold stores for milk & milk products are operating on grid electric supply. Energy is one of the critical inputs for economic development of any Country. In order to overcome the present energy scenario problems, energy should be conserved and since we are consuming disproportionate amount of energy that day is not far when all our Non-Renewable resources will expire forcing us to rely just on Renewable Sources. To overcome problem the use of renewable energy mainly solar & bio energy in the dairy is generally found for hot water supply to boiler, hot water generator for processing of milk or for CIP cleaning. Use of renewable energy has great scope for its commercial use in the dairy processing operations and It is estimated that renewable energy could contribute to at least half of all electric power in each of the large economies by 2050.

## Production, Packaging and Storage Aspects for Better Rheological Properties of Paneer

Hardik Chaudhary, Ashish Patel, S. M. Patel

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** ashishpatel4484@gmail.com

**Abstract:** India has witnessed a remarkable growth in milk production during the last few decades due to the success of the Operation Flood programme, which has led India to emerge as the largest milk producer in the world. Paneer is a South Asian variety of soft cheese obtained by acid and heat coagulation of milk. It is a non-fermentative, non-renneted, non-melting and unripened type of cheese. Paneer is popular throughout South Asia, used in raw form or in preparation of several varieties of culinary dishes and snacks. The ability of paneer to be deep fried is one feature that has led to its wider acceptance and a favourite for making snacks; pakoras or fried paneer chunks (Aneja 2007). Paneer is a rich source of animal protein available at a comparatively lower cost and forms an important source of protein for vegetarians. Over and above its high protein content and digestibility, the biological value of protein in paneer is in the range of 80 to 86 (Shrivastava and Goyal 2007). In addition, paneer is a valuable source of fat, vitamins and minerals like calcium and phosphorus. It has a reasonably long shelf life under refrigeration. Good quality paneer is characterized by a marble white colour, sweetish, mildly acidic taste, nutty flavour, spongy body and closely knit, smooth texture. Paneer provides an easy means of conserving and preserving valuable milk solids. It contains whole of milk casein, part of denatured whey proteins, almost all fat, colloidal salts and soluble milk solids in proportion to the moisture content. It has firm, close, cohesive and spongy body and smooth texture. The best quality paneer is made from buffalo milk. Paneer, like other indigenous product is a highly perishable product and suffers from limited shelf life, largely because of its high moisture content (Arora and Gupta, 1980). Therefore, its packaging must provide protection against these damages while maintaining its quality, sales appeal, freshness and consumer convenience. Various packaging materials utilized for packaging of paneer include polythene sachets, coextruded films, laminates, parchment paper etc.

## Membranes for Dairy Industry

ICARI-DE-16-02-005

Hardik Chaudhary, Ashish Patel, Sunil Patel, Sunita Pinto

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** ashishpatel4484@gmail.com

**Abstract:** In the era of global competition, Dairy and Food industry are faced with increased regulations. Membrane process technology is unique and revolutionized process for dairy industry. Variety of membranes are used in dairy industry for numerous objectives like extending the shelf life of milk without exposure to heat treatment, standardization of the major components of milk for tailoring new products as well increasing yield and quality of the dairy products, and concentrating, fractionation and purification of milk components especially valuable milk proteins in their natural state. Membrane filtration is a separation process which separates a liquid into two streams by means of a semi-permeable membrane. Membrane is considered to be the heart of a membrane separation process because it act as a selective barrier to permitting passage of certain components, while retaining others. The selection of an appropriate material for manufacture of membrane is therefore essential (Glover, 1985). Membrane is available in a wide range of natural and synthetic polymer and inorganic materials. The choice of a certain kind of membrane material is determined by a number of factors such as good permeability, chemical stability and compatibility, mechanical strength, resistance to fouling, amenability to casting in to a thin film pore characteristics and so on. Many novel polymers with excellent separation properties have been prepared in recent years. The range of materials from which it is possible to create something that resembles a membrane structure is extensive. Each year research papers in polymer and membrane science present many new examples of materials that demonstrate semi-permeable qualities at some scale. However, only a very limited number of these potential candidates make it to the commercial environment. Very few materials possess the right combination of structural and chemical properties necessary to render them suitable for application to industrial-scale membrane processes. The range of properties we are looking for will depend on the particular membrane application, but there are some common factors that are desired in a membrane, regardless of application. A region of discontinuity interposed between two phases Based on the above definitions, the membranes can be gas, liquid or solid, or combination of these phases.

## Use of Renewale Energy in Dairy Industry

Patel Ruchi, Patel, A. D., Upadhyay, J. B.

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** ruchi26patel@yahoo.com

**Abstract:** Today India has become number one in milk production, producing 140 million tons per annum with approx. 20% of the total milk production is handled by the organized sectors. Dairy and food industries are fast growing industries and day-by-day newer technologies are being introduced to get better quality of foods. Most of the milk processing operations, room conditioning for milk product packaging and cold stores for milk & milk products are operating on grid electric supply. Energy is one of the critical inputs for economic development of any Country. In order to overcome the present energy scenario problems, energy should be conserved and since we are consuming disproportionate amount of energy that day is not far when all our Non-Renewable resources will expire forcing us to rely just on Renewable Sources. To overcome problem the use of renewable energy mainly solar & bio energy in the dairy is generally found for hot water supply to boiler, hot water generator for processing of milk or for CIP cleaning. Use of renewable energy has great scope for its commercial use in the dairy processing operations and It is estimated that renewable energy could contribute to at least half of all electric power in each of the large economies by 2050.

ICARI-DE-16-02-007

## Ultrasonic Homogenization of Milk

I. A. Chauhan<sup>\*</sup>, A. D. Patel, A. K. Makwana, J. P. Prajapati

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** istiyakhusen@gmail.com

**Abstract:** Homogenization of milk is the process of reducing the size of the fat globules to extremely small particles and distributing it uniformly throughout the milk. When milk is properly homogenized, the cream will not rise to the top. Cream and other dairy and food products, such as ice cream mix, peanut butter, may also be homogenized to produce a stable emulsion, i.e., one in which fats or oils will not separate from other elements. A similar process is used in the manufacture of some cosmetics and pharmaceutical products. There are different theories of homogenization of milk and milk products. Shearing action, theory of explosion, theory of dispersion (shattering), theory of attenuation, theory of cavitation, vibration theory and wire drawing theory are the main theories by which homogenization of milk takes place. In pressure homogenization the combination of different theories are used.

Homogenization of milk and food product is very important unit operation in dairy and food industry. Ultrasonic have the potential to provide homogenizing effect in milk, different dairy & food product as well as in pharmaceutical products. Ultrasonic homogenizer is suitable for smaller to large capacity plant with batch to continuous system. It also require lower maintenance as compared to conventional homogenizers as there is no rotating/ reciprocating parts or hidden orifice. It is also useful in bacterial destruction. Ultrasonic is best option for future homogenizer.

## Ultrasonic Homogenization of Milk

I. A. Chauhan, Atanu Jana, A. K. Makwana

Department of Dairy Technology, Sheth M. C. College of Dairy Science, AAU, Anand, India

**Email:** [istiyakhusen@gmail.com](mailto:istiyakhusen@gmail.com)

**Abstract:** India today is already the worlds' largest producer of milk but the country is not a dominant force in the world market of milk and milk products. The growth potential of Indian Dairy Industry is enormous and challenges exist in improving the efficiency level and quality in complete chain of milk processing at every stage. The production of quality milk and milk products begins on the farm and continues through further handling, processing, packaging and distribution. One of the most important tasks amongst the quality control is to control and follow up regularly the fulfillment of quality standards at every stage of process flow in order to guarantee the best possible quality of end products through technological advancements. Engineering interventions have vital role to play in achieving this objective. Milk production, reception, processing, packaging, quality assurance, storage and distribution have been selected for engineering interventions for technological advancement in dairy industry.

ICARI-MG-16-02-009

## Importance of Informal Learning over Formal Learning in 21<sup>st</sup> Century

Radhika Mahajan

Department of Management, IINTM, Janak Puri, India

**Email:** [radhika.mahajan79@gmail.com](mailto:radhika.mahajan79@gmail.com)

**Abstract:** *“Informal learning is enhanced when humans participate in interactive experiences.”* – Allen (2004; Birchfield et al. 2008). The unique learning needs of every learner, support the positive human relationships needed for effective learning. Learning environments are the structures, tools, and communities that inspire students and educators to attain the knowledge and skills the 21st century demands of us all. So far, we have considered how buildings, schedules, and technology all contribute to 21st century learning. Now we come to the most essential element of all: the “people network.” This is the community of students, educators, parents, business and civic leaders, and policymakers that constitute the human resources of an educational system. The flexible spaces that enable productive learning and shared work/play opportunities, the creative uses of time that promote continuous learning, the extensible technologies that support collaboration among the school community and the outside world – all these systems are valuable only in so far as they effectively support the human connections on which learning depends

The age-old connection between strong minds and strong bodies has always made good sense, but we now have the educational research to back it up. If we want our children to have sound and agile minds, we need to help them achieve sound and agile bodies. To educate the whole child, though, schools must devote themselves to more than the mind-body connection alone. They must attend to the emotional and social learning needs of children, as well as to more traditional objectives of academic achievement and physical education. Research and observation shows that human ware with its par aphelia is most important. *Many of the successful organizations that we see around us today attribute their success to employees who are empowered to learn and innovate at great speeds. These are organizations that have buried their outlook about traditional styles of learning and development (L&D) and embraced new strategies or models. They have realized that, with the traditional approach, it is impossible to achieve a high growth or efficiency because the way people learn has undergone a disruptive transformation...from formal 'structured' learning' to informal 'social learning'.* – The 70:20:10 L&D Model for Developing a High-Performing Workforce

Citizens of the 21st century need to think critically and creatively, embrace diversity and ambiguity, and create as well as consume information. They need to be resourceful and self-reliant, while also skilled at collaboration and group process. They need to understand the many “languages” of modernity – such as mathematics, science, and technology – and be fluent in varied forms of communication – such as persuasion, presentation, and self-expression. *“You can see an evident shift from formal curriculum-based learning to informal just-in-time learning, and this is just the beginning!”* – Pooja Jaisingh

## Application of 5 M's of Management on Indian Railways

Divya Gangwar

Department MBA, Northern India Engineering College, Shastri Park, New Delhi, India

**Email:** divyagangwar2003@yahoo.com

**Abstract:** Business environment always remains in a transition phase evolving continuously as per the changes in technology, political situations, changes in policy and economic developments. All the business organisations have to evolve continuously to keep pace with the changing environment following different management techniques to achieve Business excellence. The term “excellence” was introduced by Tom Peters in 1982 and it led to development of various Management theories and principles to evaluate and improve the performance of an organization. Business excellence should be all-pervasive: improvements should be perceptible to all stakeholders — customers, investors, channel partners, supply chain, and so on. Total Quality Management (TQM) and Six Sigma are most commonly used theories to achieve Business excellence.

Indian Railways has been the backbone of freight and passenger transport of India over the years spread over a network of around 66000 route Kilometer carrying over 1.1 billion Tonnes of freight per annum and more than 3 crore passengers per day. However Indian Railways has been going through a financial crisis through last many years witnessing a continuous decline in the market share of transport. This public transporter is in need of a paradigm change to remain competitive in current environment where larger capacity road trucks, more comfortable buses, cheaper airlines and development of Inland waterways are posing strict challenge and threat of further erosion in the market share. Indian Railways has not changed its business model which worked well in the monopolistic conditions of yesteryear. In this paper we will critically evaluate the performance of Indian Railways and the changes required to remain competitive in transport business in changing technological and business environment.

ICARI-MG-16-02-004

## Resource Management and Service Level Agreements for Energy Efficient Cloud Services

Manju Lata<sup>a</sup>, Vikas Kumar<sup>b</sup>

<sup>a</sup> Department of Marketing, Shri Venkateshwara University, Gajraula, Uttar Pradesh, India

<sup>a</sup> School of Business Studies, Sharda University, Greater Noida, India

**Email:** prof.vikaskumar@gmail.com

**Abstract:** Cloud computing users and applications are growing across the Globe. However, the growing demand of Cloud infrastructure has drastically increased the energy consumption of data centers, which has become a critical issue. High energy consumption translates to high operational cost, which reduces the profit margin of cloud providers. Hence, energy-efficient solutions are required to minimize the impact of cloud computing on the environment. In order to design such solutions, deep analysis of cloud is required with respect to their power efficiency. Management of Resources and a careful design of service level agreement can play a vital role in management of cloud energy efficiency. Energy Aware SLA extends the existing SLA agreements to include energy and carbon aware parameters. In this design, there is a formal agreement between the users and service providers for the optimum resource utilization. One of the optimization challenges for reducing the data center energy requirements is to keep servers well utilized. During the peak hours a large amount of energy is required to process and execute the jobs by the cloud provider, here comes the significance of Energy Aware SLA. The Energy Aware SLA specifies certain requirements to the provider asking to hold back the low priority jobs for some period (that is during the peak time), which will in turn reduce the energy consumption. Certain jobs are done in a standardized way in order to achieve high amount of energy consumption with minimized effect on the efficiency and availability of the system. The associated carbon emission bound is also specified in the agreement so that the available energy is utilized in an efficient way also by reducing the amount of money at the customer side and the provider side. Energy aware SLA is given by the client as a XML file to the cloud provider in which in order to efficiently use energy especially at the peak load times by temporarily holding back certain jobs, say for example the low priority are kept in hold for some time. As a result the high priority jobs can use the enough energy from the available energy. Once the peak time is over, other jobs are allowed to resume thus creating energy efficiency for the cloud

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computing data center. The present work explains the resource utilization at the cloud service provider end and its integration with the service level agreement. The opportunities and challenges for the energy aware SLA have been discussed from the customer and service provider perspective.

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 ICARI-MG-16-02-005

## Flash Sales - The Game Changer in Indian E-Commerce Industry

Supriti Agrawal<sup>\*</sup>, S. Abhinav Sareen

Department of Marketing, Amity University, Noida, India

**Email:** abhinavsareen1992@yahoo.com

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**Abstract:** India's e-commerce market is expected to reach the \$100-billion mark by the end of 2020, triggered by increasing internet usage, discounting and investment by online retailers. Promotion the 4th 'P' of marketing is playing a major role. Promotion refers to the entire set of activities, which communicate the product, brand or service to the user. The idea is to make people aware, attract and induce to buy the product in preference over others. Flash sales, sometimes also called as deal of the day area part of sales promotion which provides its customer with a special deal or discounts on selective products for a limited time. It is helping companies to lure its customers to visit their web sites again and again. The study focuses on the role of online sales promotion done through flash sales in attracting customers and generating sales for web sites. The study is based on the previous researches, newspaper articles, magazines and journals. This Study indicates that a flash sale has helped companies to attract masses but they were not able to capitalize on the traffic generated.

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 ICARI-MG-16-02-006

## Impact of Anxiety, Stress & Strain at Workplace: A Comprehensive Study on Anxiety, Depression, and Absenteeism at Workplace

Shivani Gupta

Department of Management, Shri Venkateshwara University, Gajraula, Amroha

**Email:** guptashivani985@gmail.com

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**Abstract:** Stress plays an important and crucial role at workplace. Stress is nothing but it is our reaction towards various external stimulus, which effects our internal and external body system. Sometimes it changes our whole life, personally and professionally. And in current scenario it has become a part of our day to day life. We cannot avoid it because avoiding stress can become a big problem, which has no solution. Although stress always not harmful, sometimes taking stress can provide us desirable result at workplace. So it's a tough challenge to deal with stress and come out with proper solution. You can't control everything in your work environment, but that doesn't mean you're powerless—even when you're stuck in a difficult situation. Finding ways to manage workplace stress isn't about making huge changes or rethinking career ambitions, but rather about focusing on the one thing that's always within your control.

## Becoming an employer-of-choice: An effective Talent Management Strategy

Manupriya Bali

Department of Management, Guru Gobind Singh Indraprastha University, New Delhi

**Email:** manupriya.bali@hotmail.com

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**Abstract:** Abstract With more complexity in the business environment, organizations need to give even greater emphasis to meet their talent management needs. Attracting and retaining the right candidates has become critical. Developing and projecting a brand image that supports the talent management needs of the organizations is becoming need of the hour. Creating brand ambassadors of the existing employees also strengthens its talent management efforts. The process of branding the organization or employer branding draws its roots from marketing and branding literature and has gained its relevance in developing the image of the organization as an employer of choice. The paper discusses the scope of employer branding in attracting an experienced pool of employees and also as an enabler of organization's internal brand building effort. The process of developing the brand is extensive and requires commitment and support from all in the organization.

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ICARI-BT-16-02-102

## Some Hazardous Effects of Cadmium on Human Health: A Short Review

Shreya Banerjee, Nikunaj Bhardwaj

Department of Biotechnology, Noida International University, Greater Noida, India

**Email:** shreya2279@gmail.com

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**Abstract:** Heavy metals can be emitted into the environment by both natural and anthropogenic causes. The anthropogenic sources of emission are the various industrial point sources including former and present mining sites, foundries and smelters, combustion by products and traffics. Through rivers and streams metals are transported as either dissolved species in water or an integral part of suspended sediments. Human health is under constant risk of deterioration due to increasing chronic exposure of such metals that adversely affect the quality of life of people. The deterioration of human health due to exposure to heavy metals has become a major issue of concern worldwide. If one is exposed to cadmium a number of factors will determine whether or not a person will be affected. These factors are age, sex, diet, family; life style and state of health also tend to contribute to determine extent of exposure. The objective of this paper is to review available information on possible toxicities of cadmium on human health.

## Potential Socio-Economic benefits of Bt Brinjal in India: A review

Urvi <sup>a</sup>, Nand Kumar <sup>b</sup>

<sup>a</sup>Department of Biotechnology, Delhi Technological University, Delhi, India

<sup>a</sup>Department of Humanities, Delhi Technological University, Delhi, India

**Email:** jene.bhatia97@gmail.com

**Abstract:** Bt Brinjal is a genetically modified Brinjal created by inserting a crystal protein gene (Cry1Ac) from the soil bacterium *Bacillus thuringiensis* into the genome of various Brinjal cultivars. This study reveals the controversy about Bt Brinjal. As the decision to introduce genetically modified type of eggplant known as Bt Brinjal has been pending since many years. It sparked a heated debate over the potential benefits and dangers of genetically modified food crops. After critically examining the case of Bangladesh and other countries authors are of the view that Bt Brinjal has also a huge potential in India as well.

ICARI-BT-16-01-104

## In silico Identification and Optimization of Natural Inhibitors for Drug Target Sites in *Cryptosporidium parvum*: A Review

Pratibha Teotia, Neeraja Dwivedi

Department of Biotechnology, IFTM University, Moradabad, India

**Email:** erpratibha@gmail.com

**Abstract:** *Cryptosporidium parvum* is the most common enteric protozoan pathogens affecting humans worldwide. Currently approved drugs to treat cryptosporidiosis are ineffective and no vaccines exist against *C. parvum*. Here, We docked benzoxazole derivatives collected from literature with *Cryptosporidium parvum* inosine 5'-monophosphate dehydrogenase using AutoDock4.2 tool, which resulted in energy-based descriptors such as Binding Energy, Intermolecular Energy, Internal Energy, Torsional Energy, vdW + Hbond + desolv Energy and electrostatic energy. Molecular dynamics (MD) simulation studies were performed through the NAMD graphical user interface embedded in visual molecular dynamics. After that, we have built quantitative structure activity relationship (QSAR) model using energy-based descriptors yielding correlation coefficient  $r^2$  of 0.7948. To assess the predictive performance of QSAR model, different cross-validation procedures were adopted. Our results suggests that ligand-receptor binding interactions for inosine 5'-monophosphate dehydrogenase employing QSAR modeling seems to be a promising approach to design more potent inosine 5'-monophosphate dehydrogenase inhibitors prior to their synthesis.

## Food-Borne Diseases and Techniques to Detect Food-Borne Pathogens and Their Limitations

Bhawana Bhatt, Gaurav Nagar, Sonali Nagar, Nisha Tyagi

Department of Biotechnology, Noida International University, Greater Noida, India

**Email:** sonali.nagar@niu.ac.in

**Abstract:** Food safety is a global health concern. Food is one of the major sources of microbial pathogens in the developing regions. Food borne diseases or infections have increased over a year and ultimately resulted into severe health problems. Different type of food borne infections is detected by different type of microbes or pathogens contaminating the food items. Therefore, it is required to detect the pathogens in foods and recognition of problems associated with health and safety.

Hence, variety of techniques has already been developed to detect food borne pathogens or microbes as it is important in analysing the food samples. The detection of food borne pathogens by conventional methods is time consuming, tedious and laborious whereas rapid methods are time efficient, sensitive and much more specific. In general, these techniques play a vital role in preventing and treating the food borne diseases. The aim of this comprehensive literature is to give an overview in the field of food borne pathogen detection.

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ICARI-BT-16-02-006

## Biofuel Production from E.Coli: A Review

Sumit Joshi, Pratibha Teotia

Department of Biotechnology, Noida International University, Greater Noida, India

**Email:** erpratibha@gmail.com

**Abstract:** One of the major questions of the century is how to tackle the problem of pollution. There is not a single individual that has been left untouched with pollution. Our country is among top 10 most polluted countries. One of the solutions of this problem is the production and use of biofuels. Biofuels not only have a high calorific value but also are a great help to reduce the impact of pollution in our environment. A major breakthrough to tackle the problem of pollution is the use of microbes; it not only solves our problem but also adds value to our environment. This review presents a general review on the production of Biofuels from *E.Coli* – commonly found bacteria. The production of biofuel from *E.Coli* is a good example how we can use the bacteria for our good will. The production of biofuel from bacteria counteracts the thinking of a major class of people who think that bacteria only cause harm to the people. Let us know how *E.Coli* can be used to overcome the problem of the century

## Assessment of the plant growth promoting abilities of *Pseudomonas aeruginosa* using *Brassica juncea* as Model plant

Poonam Gusain<sup>\*</sup>, Vir Singh

Department of Agriculture, GB Pant University of Agriculture and Technology Pantnagar, India

**Email:** poonamgsn@gmail.com

**Abstract:** Inoculation of plant roots or seeds with indigenous rhizospheric populations is a common approach in the rhizoremediation. However, we introduced ten of the most abundant plant growth promoting bacteria that were previously isolated from metal and crude oil-contaminated soil instead of indigenous microbes. These isolates were screened in vitro for their plant growth promoting traits like production of indole acetic acid (IAA), siderophore and phosphate solubilization. To fulfill the demand in the present farming system for reducing the application of chemical fertilizers, we assessed the plant growth-promoting effects of the test inoculants on *Brassica juncea* vern Kranti, as a model plant system. Further in pot trials, a promoting effect of PGP1 (plant growth promoting group) bacterial series containing C3, C8, C9 and C6 *Pseudomonas aeruginosa* strains could be observed on germination (100% and 95.5%), shoot elongation (48.05%, 37.7%, 36.5% and 40.29%), average shoot weight (93.97%, 63.85%, 62.04% and 43.97%), root elongation (24.72 %, 6.95% and 4.72% declined with C6), root biomass (0.51g, 0.64g, 0.42g and 0.46g), pod numbers (70.9%, 14.79%, 18.53% and 3.5%) and average dry weight of seeds (68.8%, 8.55%, 64.17% and declined with C6) respectively. Overall, the results of our study suggest that seed inoculation with of *Pseudomonas aeruginosa* strains (C3, C8, C9 and C6) alone and their consortium C11 in combination with *Pseudomonas* sp, *Dietzia maris*, *Lysinibacillus* and *Bacillus* (C7, C4, C5 and C1) have the potential to increase the growth and yield, Indian mustard plant under natural field conditions.

ICARI-EN-16-02-002

## Concrete Pavement on Difficult Soil- using Electronic Waste

Umanshi Jasuja, Arihant Kumar, Gautam Agarwal, Bhavya Gupta, Keshav Karan, Kongan Aryan

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** drkonganaryandcedtu@gmail.com

**Abstract:** India is leading in electronics industry all over world. The Electronic waste material is playing one of the important roles for development of infrastructures like rigid pavements, landfills, air pollution, water pollution and even atomic nuclear structures construction.

We Civil, Environmental and Electronics Engineers must know how to use precious waste material for road constructions, sanitation constructions and radio-active construction. This paper will give the whole idea to develop Electronic Waste Management as Electronic Economic Management.

## Highway Traffic Noise Modelling

Ishant Goel, Shaurya Johari, Anubha Mandal

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** ishant.dce94@gmail.com

**Abstract:** Noise is distinctive in comparison to pollutants like air, water and soil. It does not have any residual evidence that can be able to show its unpleasantness. Models like Federal Highway Administration Model (FHWA), Calculation Road Traffic Noise (CRTN) etc. are used for traffic noise modelling in different countries like US, UK. So far, few models have been developed for Indian road conditions. A new road traffic noise prediction model for uninterrupted roads (i.e. highways), developed using the regression analysis, is presented in this paper. This model can be efficiently used as a tool for decision making of traffic noise prediction on Indian roads. The chosen location is on NH-1 (Near Amrik Sukhdev Dhaba, Delhi – Amritsar National Highway).

The present work uses Traffic volume, Percent heavy vehicle and vehicle average speed as the parameters to create the model. A large number of data sets were recorded for 1 hour duration at different timings on different days in order to account for statistical temporal variations in traffic flow conditions. The noise measurement parameters ( $L_{eq}$ ,  $L_{10}$ ) were recorded using Sound level Meter and Radar gun. The recorded Noise levels  $L_{eq}$  and  $L_{10}$  were used in regression analysis and the mathematical model was developed to predict  $L_{10}$  or  $L_{eq}$  level. It was concluded that value of coefficient of determination ( $R^2$ ) ranges from 0.1 to 1.0.

ICARI-EN-16-02-004

## Rigid Pavement on Collapsible Soil by using Electrical and Electronics Waste

Kongan Aryan

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** drkonganaryandcedtu@gmail.com

**Abstract:** The escalation in various types of manufacturing together with population growth has resulted in an alarming increase in production of various types of wastes over creating a problem of its disposal in an eco-friendly way.

The continuous use of natural resources, like river sand for construction the depth of river bed is increasing which results in drafts and also change in the climatic conditions. The need of hour is to preserve the natural resources like sand and stones.

Due to the increase in the generation of the electrical-waste and the recycled coarse aggregate the landfill has become a serious problem as the disposal at random places causes pollution. Therefore the waste management technique has to be adopted to dispose the wastes. Several factors such as economic sustainability, technical feasibility and a realistic level of social support for the disposal are to be considered for the development of such management system. One aspect of the strategy should include recycling and reuse of EOL (End of Life) electronic products in construction field.

Aggregates of concrete specimens are collected and are used with the e-waste by altering the proportions of these wastes. The compressive strength of M30 mix designed is assessed by casting blocks. This study is carried out to ensure the usage of electrical and electronics- waste and the recycled coarse aggregate as a replacement for economic road construction.

## Rigid Pavement on Collapsible Soil-using Electronics Waste

Kongan Aryan

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** drkonganaryandcedtu@gmail.com

**Abstract:** The escalation in various types of manufacturing together with population growth has resulted in an alarming increase in production of various types of electronics wastes over creating a problem of its disposal in an eco-friendly way.

The continuous use of natural resources, like river sand for construction the depth of river bed is increasing which results in drafts and also change in the climatic conditions. The need of hour is to preserve the natural resources like sand and stones.

Due to the increase in the generation of the electronics-waste and the recycled coarse aggregate the landfill has become a serious problem as the disposal at random places causes pollution. Therefore the waste management technique has to be adopted to dispose the wastes. Several factors such as economic sustainability, technical feasibility and a realistic level of social support for the disposal are to be considered for the development of such management system. One aspect of the strategy should include recycling and reuse of EOL (End of Life) electronic products in construction field.

Aggregates of concrete specimens are collected and are used with the e-waste by altering the proportions of these wastes. The compressive strength of M35 mix designed is assessed by casting blocks. This study is carried out to ensure the usage of integrated- waste and the recycled coarse aggregate as a replacement for rural road construction.

ICARI-EN-16-02-007

## Reducing Wastage of Blood and its Components, using Blood Bank Information System

Bibha Chaudhari<sup>a\*</sup>, Reema Chaudhary<sup>b</sup>

<sup>a</sup> Hamdard Institute of Medical Sciences and Research, Jamia Hamdard, Delhi, India

<sup>b</sup> Bhagwan Parashuram Institute of Technology (BPIT), Delhi, India

**Email:** bibhachaudhari@gmail.com

**Abstract:** Blood and its components being very essential resources associated to precious human life. It is also very important in this respect that due to acute shortage of these live components, we have to face loss of life frequently. Also it has been observed that at times blood and its components go as waste, because of various reasons like breakage, expiry or getting contaminated during prolonged storage, A proper storage management system with the facilities of upgradation of information as well as training of staff may be of a great help in ensuring proper utilization and wastage minimization of blood and its components.

‘Blood Bank Information System’ basically helps in managing the records of donors and acceptors at a blood bank. Its centralized database architecture, provides access through secured login, search facility based on various search criteria for donors and acceptors as well as updating of donors and acceptors details. In this paper a study has been done to address the issues and challenges in this field and effort has been done to find out the prospects of proper utilization of Blood and its components through ‘Blood Bank Information System’.

## Rigid Pavement on Expansive Soil- Using Plastic Waste

Kongan Aryan

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** drkonganaryandcedtu@gmail.com

**Abstract:** The escalation in various types of manufacturing together with population growth has resulted in an alarming increase in production of various types of plastic wastes over creating a problem of its disposal in an eco-friendly way.

The continuous use of natural resources, like river sand for construction the depth of river bed is increasing which results in drafts and also change in the climatic conditions. The need of hour is to preserve the natural resources like sand and stones.

Due to the increase in the generation of the plastic waste and the recycled coarse aggregate the landfill has become a serious problem as the disposal at random places causes pollution. Therefore the waste management technique has to be adopted to dispose the wastes. Several factors such as economic sustainability, technical feasibility and a realistic level of social support for the disposal are to be considered for the development of such management system.

This paper describes the use of recycled plastics as partial replacement of aggregate ingredients, with particular focus on the development of a pavement system for infrastructural applications. The tests performed on pavement materials included measurements of physical properties such as hardened density and water absorption, as well as mechanical behaviour such as compressive strength, flexural strength and flexural toughness. The effects of type of recycled plastics, content of recycled plastics as aggregate replacement and mineral admixture as cement replacement were investigated. Recommendations were given on utilization of recycled plastics in the sustainable development of the pavement system. The potential uses of recycled plastics for other applications in building materials were also explored.

ICARI-EN-16-02-007

## Rigid Pavement on Expansive Soil by using Tyre Waste

Kongan Aryan

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** drkonganaryandcedtu@gmail.com

**Abstract:** In today's day and age, when environmental problems relating to disposal of waste prevail, and there is shortage of resources, in addition to which, economic optimization is an essential factor, innovation needs to be clubbed with the practice of the 3 'R's:-RECYCLE, REUSE, REDUCE

As the world population grows, so the amount and type of waste being generated. Many of the wastes produced today will remain in the environment for hundreds, perhaps, thousands of years. The creation of non-decaying waste materials, combined with a growing consumer population, has resulted in a waste disposal crisis. One solution to this crisis lies in recycling waste into useful products.

Research into new and innovative uses of waste materials is continually advancing. Many highway agencies, private organizations, and individuals have completed or are in the process of completing a wide variety of studies and research projects concerning the feasibility, environmental suitability, and performance of using recycled products in highway construction. These studies try to match society's need for safe and economic disposal of waste materials with the highway industry's need for better and more cost-effective construction materials.

There are approximately 240 million waste tires generated approximately in India. A typical scrap tire weighs approx. 20 pounds and will provide about 60% rubber, 20% steel and 20% fibre and other waste products. Use of rubber in asphaltic concrete mixtures are being encouraged.

## Groundwater Pollution at Bhalaswa Landfill Site - An Overview

A. Pawar, D. K Verma, A. Meena, A Yadav, A Mandal

Department of Civil Engineering, Delhi Technological University, Delhi, India

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** dtu2k12anurag@gmail.com

**Abstract:** Improper Solid waste management at landfill sites became an effective cause of surface and ground water pollution. In India segregation of waste is negligible as compared to the waste generated. As a result unsegregated waste is collected on these landfill sites. In this unsegregated waste due to the mixing of disposed infiltrates and trapped water content leachate is formed. This leachate contains various hazardous organic and inorganic solutes which permeates through the soil to the ground water table and contaminates the ground water. Then contaminated ground water diffuses into the aquifer. In various research papers, the concentration of some polluting agents like total dissolved solids, chlorides, nitrates, various heavy metal and sulphates are found to be high. These water pollutants cause serious health and environmental issues near landfill site. The stated contaminants have a dire effect on health as they make the potable water unfit as per the parameters defined by Bureau of Indian Standards. In India, ground water is the major source for drinking water. It became very important to monitor ground water pollution near landfills in highly populated areas, so that contamination of the ground water should be minimized and it would be confirmed that the contaminated ground water would not be used for drinking. The results of the studies are alarming and clearly suggest that ground water in landfills in heavily populated cities must be checked on frequent interval of time. This paper also comprises of study of Bhalaswa Landfill site (28.7407346 N, 77.1560437 E), in which leachate was found having large concentration of TDS, Chloride, Sulphates. This study suggests that areas near Bhalaswa Landfill are health and environmental risk.

ICARI-EN-16-02-009

## Particulate Carbon-An Overview

Anushree Biswas, Smita Aggarwal, Papiya Mandal, Anubha Mandal

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** anushree0303@gmail.com

**Abstract:** Atmospheric particulate carbon has gained large importance with rapid industrialization and urbanization. Particulate carbon is mainly defined under two main categories: organic carbon (OC) and elemental carbon (EC). Particulate organic carbon has both primary and secondary origin while elemental carbon or black carbon (BC) has only primary origin. Both these carbonaceous species have high degree of rampant anthropogenic sources of emission like biomass cooking, steep rise in the number of vehicles leading to increased emissions from vehicles running on diesel, mobile tower DG sets, open household waste burning and burning of crops to prepare the land for next season of crops by farmers. OC and EC are found abundantly in both PM<sub>10</sub> and PM<sub>2.5</sub> pollution and become active sites for pollens, fungi and other viable and non-viable biological species altering their toxicity and morphology by various heterogeneous reactions. Various epidemiological studies have related particulate matter pollution to upper and lower respiratory tract diseases leading to mortality in severe cases. While organic carbon is the non-absorptive part, black carbon is the absorptive part of carbonaceous fraction and is highly aromatic. Unlike GHGs which mainly trap outgoing infrared radiation from the Earth's surface, BC absorbs both incoming and outgoing radiation of all wavelengths, making its contribution to global warming perilously larger if allowed to accumulate in larger concentrations. Also, it alters the albedo of ice and reflectivity of clouds. This paper attempts to review and discuss the various anthropogenic sources of particulate carbon and their average contribution to PM<sub>10</sub> and PM<sub>2.5</sub>, also enlightening the negative repercussions on health and climate by particulate carbon.

## Rigid Pavement on Collapsible Soil Using Biomedical Wastes

Kongan Aryan

Department of Environmental Engineering, Delhi Technological University Delhi, India

**Email:** drkonganyandcedtu@gmail.com

**Abstract:** Disposal of waste materials, including biomedical waste bags has become a grave trouble and biomedical wastes are burnt for apparent disposal which cause environmental contamination. Presently 20 times more plastic is produced as compared to 50 years ago due to its more consumption because of rapid urbanization and economic development. This biomedical waste contains polymers such as polyethylene, polypropylene, polyester, polyvinyl alcohol and other such compounds. Instead of disposing it we can efficiently make use of them in the pavement construction. They can be employed to make geo-grids which are used for making rigid pavements in collapsible soil. Geo-grids are formed by a regular network of tensile elements with apertures of sufficient size to interlock with surrounding fill material. This function of geo-grids makes soil non-collapsible. Geo-grids may be combined with geo-textiles to provide the best attributes of each material. These products are called geo-composites.

These polyolefins (polyethylene or polypropylene) can be extruded or oriented to form geo-grids known as extruded or integral geogrids. They may also be manufactured of multifilament polyester yarns, joined at the crossover points by a knitting or weaving process, and then encased with a polymer-based, plasticized coating. These types of geogrids are often called woven or flexible geogrids. A third type, a welded geo-grid manufactured, as the name implies, by welding polymeric strips together at their cross over points. All these manufacturing techniques allow geogrids to be oriented such that the principal strength is in one direction, called uniaxial geo-grids, or in both directions (but not necessarily the same), called biaxial geo-grids.

Geogrid reinforcement is used in permanent pavements in two major application areas – base reinforcement and sub-grade stabilization. In base reinforcement applications, the geogrids are placed within or at the bottom of unbound layers of a flexible pavement system and improve the load-carrying capacity of the pavement under repeated traffic. In sub-grade stabilization applications, the geogrids are used to build a construction platform over weak sub-grades to carry equipment and facilitate the construction of the pavement system without excessive deformations of the sub-grade.

ICARI-EN-16-02-011

## Occupational Hazard of Traffic Police – An Overview

Sandeep Kumar, Anubha Mandal

Department of Environmental Engineering, Delhi Technological University, Delhi, India

**Email:** sandeepkumar110694@gmail.com

**Abstract:** Pollution from automobile exhaust and vehicular traffic density has become a serious problem particularly in metropolitan cities in India. People who are most susceptible to air pollution are those who continuously work in that vicious air i.e. traffic police, street vendors, drivers, sweepers etc. Traffic police works on clean roads to raunchy roads without whom streets/roads may be jammed. These people standing under the sun blowing their whistles and signalling traffic to move or stop while inhaling dust and exhaust fumes and they are there day in and out and these days even at some hours of the night. Traffic police personnel work within the close proximity to the vehicles. So they are exposed to high levels of air and noise pollution in a regular manner, which is largely contributed by vehicles. Air pollution can also have adverse impacts on other important systems such as cardiovascular system and central nervous system. Their working conditions remain extremely precarious and unsafe. It can induce many diseases as the Automobile emit harmful gases. As the most common route for vehicular emissions to enter the human body is inhalation, the most common effect of air pollution is damage to the respiratory system. Exposure to air pollutants can overload or break down natural defence mechanisms in the body, causing or contributing to respiratory diseases such as lung cancer, asthma, chronic bronchitis and emphysema. In addition, polycyclic aromatic hydrocarbons are the major air pollutants of automobile exhaust and were found to be mutagenic and carcinogenic. The study evaluates the hazards associated with traffic when a traffic police works for hours a day. Recommendations were made to improve on safety and health issues in order to reduce the level of exposure of the workers to these hazards.

## Changes in Growth, Yield and Fruit Quality of Parthenocarpic Cucumber (*Cucumis sativus* L.) in Response to Foliar Application of K and GA<sub>3</sub> under Protected Conditions

Priyanka Pal<sup>a\*</sup>, Krishan Kumar<sup>b</sup>, Narender Singh<sup>a</sup>

<sup>a</sup> Department of Botany, Kurukshetra University, Kurukshetra, India

<sup>b</sup> Centre of Excellence for Vegetables Indo-Israel, Gharaunda, Karnal, Haryana, India

**Email:** palpriyanka247@gmail.com

**Abstract:** Cucumber (*Cucumis sativus* L) is important and commercially popular cucurbitaceous vegetable crops which hold a very desirable position in the vegetable market and it is one of the most nutritive vegetables rich in vitamins and minerals. A study was carried out at Centre of Excellence for vegetables, Gharaunda, Haryana to evaluate the potential of exogenously applied potassium (K) [1.0 (K<sub>1</sub>), 2.5 (K<sub>2</sub>) and 5 (K<sub>3</sub>) g/l] and gibberellic acid (GA<sub>3</sub>) [0.005 (G<sub>1</sub>), 0.01(G<sub>2</sub>), and 0.015 (G<sub>3</sub>) g/l] in combinations to leaves on growth and development of the parthenocarpic cucumber F1 hybrid during growth stages. Data were recorded for height, dry weight, number of leaves, days to fruit initiation, days to fruit maturity and harvest, chlorophyll and mineral contents during cucumber plant development. Fruit length, width, yield and quality were measured after the harvest. Foliar spray of combined K and GA<sub>3</sub> increased vegetative growth and development of plant parts compared to the control. The treatment containing Kat 2.5 g/l and GA<sub>3</sub> at 0.015 g/l was best for growth of cultivar. Mineral content also increase. Fruit average weight, number, quality and total yield were significantly higher in G<sub>2</sub>K<sub>2</sub> treatment over other treatments. Application of combined K and GA<sub>3</sub> may be effective to increase the growth performance, fruit quality and crop productivity.

ICARI-BO-16-01-002

## An Ethno Botanical Survey of Yamuna Nagar District Haryana (India)

Parul<sup>\*</sup>, B. D. Vashistha

Department of Botany, Kurukshetra University, Kurukshetra, Haryana, India

**Email:** drparulkasana@gmail.com

**Abstract:** There is very old evidence present that human beings are using plants for food, fodder and medicine etc. A wide research has been done on ethno botany and traditional medicine since the time of our VEDA'S mainly as herbal preparations, including very potent and powerful drugs which have stood the test of time and could not be replaced by modern medical preparations. Plants are used by the Rural peoples and traditional healers for the treatment of various diseases like diarrhoea, dysentery, male and female sexual disease, cardiovascular disease, headache, asthma, toothache, acne, diuretic, diabetes, gonorrhoea, skin disease, kidney stone, hyperthyroidism, piles and cancer. But due to the high rate of deforestation and rapid urbanisation biodiversity facing a threat of extinction and it is the base of many global problems. So there is an urgent need to conserve biodiversity and documentation of ethno botanical knowledge about traditional drugs.

So the purpose of our study is to highlight the ethno botanically important plant species growing in Yamuna Nagar district of Haryana. Yamuna Nagar district is one of 21 districts of Haryana state in northern India. Yamuna Nagar is located between 30°06' north latitude and 77°17' east longitude.

During our study More than 223 species of angiosperm have been till now collected belonging to 82 genera and 47 families are documented out of which 28 species of monocots.

Our information is based on survey, interview, collection and identification methods, different ethno-botanical information were considered. The most commonly distributed species all over the district belongs to families like Euphorbiaceae, Malvaceae, Leguminosae

Asteraceae, Amaranthaceae, Solanaceae and many plant species have been documented for their medicinal uses for example *Amaranthus spinosus*, *Argemone Mexicana*, *Boerhaviadiffusa*, *Capsella bursa-pastoris*, *Calotropisprocera*, *Cassia fistula*, *Cassia tora*, *Cuscutareflexa*, *Abelmoschusmoschatus*, *Abrusprecatorius*, *Abutilon indicum*, *Woodfordiafruticosa*, *Ziziphusenopolia*.

## Hand held Dermal Scanner

S. Saravana Prakash<sup>\*</sup>, P. Abinaya, L. Suganthi

Department of Botany, Biomedical Engineering, SSN College of Engineering, Chennai, India

**Email:** saravanaprakash.s.s@ieee.org

**Abstract:** Dermatology is a branch of science dealing with the studies of skin, hair, nails etc. Nowadays skin disorders are more severe and many new disorders are emerging rapidly. Many devices are used for diagnostic as well as therapeutic applications. In this paper, we proposed a diagnostic device which is used to capture the images of affected skin surface through raspberry pi controller module with camera and display the image in LCD screen. The SD card is connected with module is used to store images for further analysis. Real time recording of the images can be obtained, viewed and stored for further analysis. The acquired images can be sent to a dermatologist who is far away from the recording site. Hence Tele-dermatology is possible using this proposed device; both online as well as off line diagnosis can be empowered. The device is easily operated which does not require any specific technical skill to operate. Hence frequent self-examination for the patient with chronic skin disorder is possible with low cost. Thereby diagnosis, treatment, examination, continuous self-monitoring of skin conditions are possible using this proposed work.

ICARI-BO-16-01-004

## MK801 Mediated: An Ideal Model for in Vitro Investigation of Schizophrenia

Vandana Kala<sup>\*</sup>, Veerma Ram

Department of Botany, Sardar Bhagwan Singh Post Graduate Institute of Biomedical Science & Research, India

**Email:** Vandanakala13@gmail.com

**Abstract:** Schizophrenia is a multifactorial disease yet its etiology is unknown because of genetics, environment, neurobiology, and psychosocial stress contribute in schizophrenia. Some of the neuropathological changes in schizophrenia may be the result of increased free radical mediated or reactive oxygen species (ROS) mediated neurotoxicity. MK801 (NMDA receptor antagonist, mimics psychosis in experimental animal) shown to exacerbate psychotic symptoms in schizophrenia and have been proposed as a model both for positive & negative symptoms of schizophrenia. MK801, an uncompetitive blocker of the opened ion channel of NMDA receptor was shown to exhibit one of the most neurotoxic NMDA receptor antagonists. MK801 induced selective neurotoxicity was proposed as an animal model for psychosis. Hypo activation of glutamate in the brain and altered NMDA receptor-associated intracellular proteins such as PSD95 and SAP102 in the prefrontal cortex and thalamus are the common manifestation of schizophrenia. The mechanisms of neurotoxicity of NMDA antagonists in animals could be employed to describe the mechanisms of schizophrenia like psychosis in humans. It attenuates dopaminergic activity in the striatum and dopamine release from the hypothalamus. Administration of the MK-801 in mice attenuated the increased locomotor activity in mice. In all memory tests generally used in vitro including passive avoidance test, Morris water maze test and elevated plus maze test, MK801 impair the memory function significantly only after the 30 minute of the administration. So we hypothesized that the damaging effect of ROS might have an important role in MK801 induced model of psychosis. It may also affect the oxidant/antioxidant status of brain by stabilizing the membranous structures of cell. MK801 enhance the lipid peroxidation (MDA) and nitrite level, significantly in prefrontal cortex after 7 days compared to control. Accumulation of nitrite & MDA in the sample is an indicator of production of nitric oxide, lipid peroxidation which is produced due to oxidative stress in brain.

## An Innovative and Eco-Friendly Process to Treat the Domestic Wastewater without Any Chemical

Pawan Kumar Bharti <sup>a\*</sup>, A.K. Tyagi <sup>b</sup>

<sup>a</sup> 30<sup>th</sup> Indian Scientific Expedition to Antarctica (MoES), Bharti Station, Larsemann Hills, Ingrid Christenson Coast, East Antarctica

<sup>b</sup> R&D Division, Shriram Institute for Industrial Research, 19, University Road, Delhi, India

**Email:** gurupawanbharti@rediffmail.com

**Abstract:** Primary treatment of water or wastewater consists of coagulation and flocculation processes, which results in a very high cost. Today, the prime concern of the environmentalists is how to reduce the coagulants and flocculants cost and to improve the characteristics of the produced water for safe utilization. In this work, it is tried to use the tissues of *BK Plant* (patented) as natural coagulant and develop an eco-friendly technology for turbid water and domestic wastewater. In wastewater treatment, coagulation–flocculation is one of the most important physico-chemical treatment steps to reduce the suspended and colloidal materials responsible for turbidity of the wastewater. During the last decade, more interest has been given on the use of natural coagulants in treating industrial and domestic wastewater. Natural coagulants are, in general, used as point-of-use technology in less-developed communities, since they are relatively cost-effective compared to chemical coagulants. Today, the prime concern of the environmentalists is how to lower the coagulants and flocculants cost and to improve the characteristics of the produced water and sludge for safe utilization and disposal respectively. In this work, it is tried to use the tissues of *BK Plant* as natural coagulant against turbid water and develop a chemical free eco-friendly technology for primary treatment of turbid water and domestic wastewater.

The present eco-friendly technology for primary water treatment will help to reduce the burden of chemicals used in water/wastewater processes. Raw material used in this technology is available in many states of India in plenty. It can be achieved at very low cost and can be utilized for the welfare of society. The outcomes of adopting this technique will give benefits to human society and will conserve the environment as well.

ICARI-AS-16-02-003

## Impact of Scaling up on the Double Bottom Line of the Microfinance Institutions in India

Vasu Jain <sup>a\*</sup>, Nand Kumar <sup>b</sup>, Abhinandan Jain <sup>c</sup>

<sup>a</sup> Department of Mathematics, Delhi Technological University, Delhi, India

<sup>b</sup> Department of Humanities, Delhi Technological University, Delhi, India

<sup>c</sup> Department of Computer Science, BITS Pilani, India

**Email:** vasujain.dtu@gmail.com

**Abstract:** Increased competition and commercialization of the microfinance sector is a potential threat to its long term stability and success especially in the financial sector. As the competition has increased in the financial market in the recent years, it has led to different forms of capital and financing structures.

Authors in this empirical study consider 94 MFIs over the period 2000-13. The data have been taken from Mix Market, a nonprofit organization that collects data and helps its exchange between them, in Microfinance sector. This paper discusses the impact of scale on profitability and outreach of MFIs in India during 2000-13. The results indicate that the financial performance of MFIs is positively related with their scaling up. The result also shows that in large MFIs as the percentage of female borrower's increase the ROA and OSS of the MFIs also increase. This may be due to the fact that female borrowers generally tend to repay all outstanding balance hence improving the MFIs financial performance.

## Dielectric Properties of $\Phi$ (CCTO)-(1- $\Phi$ ) Silicone Resin Composites with 0-3 Connectivity

Sanjesh Babu

Department of Physics, Physics, Institute of Applied Sciences, Mangalayatan University, Aligarh, India

**Email:** sanjesh\_phd@rediffmail.com

**Abstract:**  $\text{CaCu}_3\text{Ti}_4\text{O}_{12}$  -silicone resin (CCTO-silicone resin) composites with various CCTO volume fractions up to 0.9 were prepared. Relatively high dielectric constant ( $\epsilon=151$ ) and low loss ( $\tan \delta=0.35$ ) of the composites with CCTO volume fraction at 0.9 were observed. Various theoretical models were employed to predict the dielectric constant of these composites, the dielectric constant obtained via Maxwell-Garnett model were in close agreement with the experimental data. Dielectric measurements were performed from 10Hz to  $10^6$ Hz and 30 to  $200^\circ\text{C}$ . Dielectric constant of CCTO-silicone resin composites showed weak temperature dependence at the measuring temperature range. The results show that the CCTO-silicone resin composites prepared in this study could find some practical applications in the electronic industry.

ICARI-AS-16-02-006

## Size-Strain Study of $\text{Ni}_{1-x}\text{Cd}_x\text{Fe}_2\text{O}_4$ Nano-particles using X-Ray Broadening Analysis

Sapna, Narender Budhiraja, Vinod Kumar, S. K. Singh\*

Department of Physics, DCR University of Science and Technology, Murthal, India

**Email:** sksingh2k6@gmail.com

**Abstract:** Nano-sized cadmium doped nickel ferrite nanoparticles,  $\text{Ni}_{1-x}\text{Cd}_x\text{Fe}_2\text{O}_4$  ( $x=0, 0.3, 0.7$ ) were synthesized by chemical co-precipitation method. The samples were characterized by X-ray powder diffraction for the analysis of crystalline properties. Average crystallite size and lattice constant increases with the increase in Cd concentration. The individual contribution of small crystallite size and lattice strain on X-ray diffraction peak broadening was studied using Williamson-Hall method and size strain plot method. The TEM results from the  $\text{Ni}_{1-x}\text{Cd}_x\text{Fe}_2\text{O}_4$  nanoparticles confirm that the morphology of particles is spherical. The elemental analysis has also been carried out using Energy Dispersive Spectroscopy (EDS) and the results revealed that the elements are as per the stoichiometric ratio in all the samples.

## DT-CWT Based Image Denoising using Block Thresholding

Sushil Kumar

Department of Mathematics, Rajdhani College, University of Delhi, New Delhi, India

**Email:** skazad@rajdhani.du.ac.in

**Abstract:** For image de-noising, Block thresholding is considered to be a better strategy than the term-by-term thresholding. There are number of Wavelet based thresholding techniques for image de-noising such as Visu shrink, Bayes shrink, Sure shrink, Neigh shrink, Bi-shrink, Prob shrink, Sure-LET and block shrink. Selesnick has extended the Bi- shrink method to DT-CWT and he has shown that the DT-CWT achieves better results than DWT for image denoising. Dengwen and Xiaoliu have shown that Block shrink enjoys a number of advantages over the other conventional image de-noising methods. Their experimental results show that Block shrink outperforms significantly classic sure shrink method and Neigh shrink method. In this paper we extend Block shrink approach to DT-CWT and compare it with the Bi shrink approach proposed by Selesnick. We analyzed these methods of noise removal from degraded images with Gaussian noise and compare the results in term of PSNR.

ICARI-AS-16-02-008

## DT-CWT Based Block Nonlinear Denoising

Sushil Kumar, Arun Chaudhary

Department of Mathematics, Rajdhani College, University of Delhi, New Delhi

**Email:** skazad@rajdhani.du.ac.in

**Abstract:** For image denoising, Block thresholding is considered to be a better strategy than the term-by-term thresholding. There are number of Wavelet based thresholding techniques for image denoising such as VisuShrink, BayesShrink, SureShrink, NeighShrink, BiShrink, ProbShrink, Sure-LET and BlockShrink. Selesnick has extended the BiShrink method to DT-CWT and he has shown that the DT-CWT achieves better results than DWT for image denoising. Dengwen and Xiaoliu have shown that BlockShrink enjoys a number of advantages over the other conventional image denoising methods. Their experimental results show that BlockShrink outperforms significantly classic SureShrink method and NeighShrink method. In this paper we extend BlockShrink approach to DT-CWT and compare it with the BiShrink approach proposed by Selesnick. We analysed these methods of noise removal from degraded images with Gaussian noise and compare the results in term of PSNR.

## Plastic Biodegradation – A New Perspective

Saurabh Jain, Shashank Sharma, S. K. Khanna

<sup>a</sup> Department of Applied Sciences, JMIETI (Kurukshetra University), Radaur, Yamuna Nagar, Haryana

<sup>b</sup> Research & Development Cell, Tulas Group of Institutions, Dehradun, UK, India

**Email:** shashank.enviro@gmail.com

**Abstract:** Modernization causes tremendous increase in use of different types of plastic which disturb the ecological balance. The plastics we use today are made from inorganic and organic raw materials and because of its xenobiotic origin and recalcitrant nature, its biodegradation is problematic. Synthetic plastics are extensively used in packaging of products are polyethylene (PE), polypropylene (PP), polystyrene (PS), polyvinyl chloride (PVC), nylons etc. Polymeric materials released into the environment can undergo physical, chemical and biological degradation or combination of all these due the presence of moisture, air, temperature, light (photo-degradation), high energy radiation (UV-radiation) or microorganisms (bacteria or fungi). Biopolymers are diverse and versatile class of materials that have potential applications in virtually all sectors of the economy. Many biopolymers are still in the developmental stage, but can directly replace synthetically derived materials in traditional applications. Hence there is an urgent need to develop efficient microorganisms and their product to solve this global issue.

ICARI-AS-16-02-010

## Energizing Women Empowerment in Slums: Clean Energy Access as a means to integrate Sustainable Slum Development with Women Empowerment

Vinita Srinivasan <sup>a\*</sup>, Nand Kumar <sup>b</sup>

<sup>a</sup> Department of Engineering Physics, Delhi Technological University, New Delhi, India

<sup>b</sup> Department of Humanities, Delhi Technological University, New Delhi, India

**Email:** vinita.srini@gmail.com

**Abstract:** Access to energy services is undeniably an indicator of not only the economic development of a country, but also of the social well-being of its citizens. This access assumes even more relevance in the context of the development of rural areas and slums, most of which are not connected to the grid. In this paper the role played by renewable energy sources to accelerate the development of slums and enhance the well-being and productivity of its inhabitants is examined, with a special emphasis on the women inhabitants. It stresses importance of carrying out slum development by adopting clean energy technologies which is a win-win situation for slum improvement, women empowerment as well as the environment.

## Removal of Congo Red Dye from Aqueous Solutions on Chitosan Beads

Anuja Agarwal, Vaishali

Department of Chemistry, J.V. Jain College, Saharanpur, India

**Email:** anujaagarwaljvjc@gmail.com

**Abstract:** The chemical contaminated water pollution, with a wide range of aromatic molecules is a serious worldwide environmental problem owing to their potential human toxicity. Congo red (CR) is such a benzidine based azo dye having high solubility in aqueous solution and is metabolized to benzidine, a known human carcinogen. CR mainly occurs in the effluents discharge from textile industries. Therefore, there is a need to develop technology that can remove CR from industrial waste waters. Adsorption has been recognized as the most popular treatment process for the removal of dyes from an aqueous solution due to its simplicity, high efficiency, easy recovery and the reusability of the adsorbent. In recent years, low-cost adsorbents for waste water treatment have attracted a lot of attention. Chitosan (CS), the deacetylated product of chitin, exhibits a high adsorption capacity towards many classes of dye. CS based hydrogel beads have shown the highest adsorption capacity for numerous dyes. We attempted to prepare chitosan hydrogel beads crosslinked with glutaraldehyde as an adsorbent to remove CR from waste water effluents.

A Batch adsorption study was conducted as a function of contact time, pH, temperature and initial dye concentrations. Dye concentration was estimated spectrophotometrically at  $\lambda_{\max}$  497 nm. The equilibrium dye removal capacity was reached within 24 hrs and the maximum adsorption capacity was around 29 to 83 %. Although dye removal was better in acidic condition yet neutral solution (pH 7) also in favor of the adsorption process. The results show that CS can effectively removed CR dye from textile waste water effluents.

ICARI-PH-16-02-002

## Clinical Trial in India: A Boon or Bane

Divya

Department of Pharmacy, T. M. College of Pharmacy, Teerthanker Mahaveer University, Uttar Pradesh, India

**Email:** upadhyay.divya80@gmail.com

**Abstract:** The study of Pharmacodynamic and Pharmacokinetic characteristics of new chemical entity (NCE), device on a specific kind of patient, different dose treatments, therapies and surgical procedures to observe behavioral changes due to drug, before making it publicly available. It also examines safety and efficacy of already marketed medication or device for a new indication. These studies help in ensuring the effectiveness of new medicine or device in comparison with the old ones. India emerged as the most suitable country in the world for clinical trial during 2006 and 2010. Many reasons and facilities attracted outsiders for clinical trial in India. Those were mainly big population, availability of new patients for diverse treatment, low cost of drug experimentation and speedy approval. This was a big advantage for our country in terms of financial and scientific gain especially for individual who could not afford for medicines because of poverty. However, unethical practices, noncompliance of regulatory guidelines and protocol, conduction of trials without the approval of ethics committee were some of the discrepancies which converted it from boon to bane. There were several reports of exploitation of the poor and illiterate Indians. It was assumed that they were treated as guinea pigs for clinical trials. Increasing reports of trial participant fatalities aroused the need of robust vigilance. In 2013, the Supreme Court of India took serious cognizance on the PIL filed by Non-Government Organizations. All trials of new drugs were subsequently put on hold and passed strict regulation of three tier screening of their clinical trial documents before supplying drugs to the market. DCGI and ethics committee are the supervisory body of clinical trial to ensure safety, efficacy and quality of trial.

## Wound Healing Potential of Methanolic Extract of *Cressa Cretica* on Incision and Excision Wounds in Wistar Rats

Nishant Verma<sup>a\*</sup>, Amit Chaudhary<sup>a</sup>, K. K. Jha<sup>a</sup>, Divya Pathak<sup>a</sup>, Reena Kumari<sup>a</sup>, Shamim Ahmad<sup>b</sup>

<sup>a</sup> T. M. College of Pharmacy, Teerthanker Mahaveer University, Moradabad (U.P.) 2440011

<sup>b</sup> Translam Institute of Pharmaceutical Education & Research, Meerut, (U.P.), India-2500012

**Email:** nishantvermamiet@gmail.com

**Abstract:** *Cressa cretica* has been widely used in the traditional system of medicine for the treatment of various diseases. The effect of methanolic extract of *Cressa cretica* were studied for wound healing activity in incision and excision wound models, after topical application as 1% and 2% ointment with extract and nitro furazone 0.2% (w/w) ointment used as a standard drug. Preliminary phytochemical studies were carried out to elucidate there components. The findings revealed a statistically significant ( $p < 0.05$ ) increased in the tensile strength of the 10 days old incision wound due to treatment of 1% and 2% ointment with extract and significant ( $p < 0.05$ ) increased in the percent reduction in wound size of excision wound as compared to control. Preliminary phytochemical analysis revealed the presence of flavonoids & terpenoids. The flavonoids and terpenoids are used as wound healing promoters because they have astringent and antimicrobial property. Flavonoids and terpenoids have been reported antioxidant property, which is very useful for wound healing activity.

ICARI-PH-16-02-005

## Relationship between Creativity and N Ach in Organizational Performance

Nidhi Verma

Department of Psychology, Ch. Ranbir Singh University, Jind, Haryana, India

**Email:** nidhi.nv2006@gmail.com

**Abstract:** The present paper focuses on the relationship between Creativity and need for achievement in Organizational performance. Prior researches suggest that there are numbers of factors responsible for individual's creative performance in any organization such as motivation (Intrinsic/Extrinsic), Intelligence, time limit or deadline but in our research we have taken Creativity & n ach and its effect on Organizational Performance. For this, samples of 100 research scholars/teachers were included, working in universities of Haryana and Delhi. The sample was administered with Torrance test of Creative thinking (Verbal) and Prayag Mehta's test to measure n ach. The scores were analyzed by using descriptive stats and Pearson's Product Moment Correlation. The results revealed significant positive correlation between factors of Creativity and n ach (intrinsic) which further will lead to organizational performance.

## Job Satisfaction and Organizational Commitment among University Professionals

Nidhi Verma

Department of Psychology, CRS University, Jind, India

**Email:** nidhi.nv2006@gmail.com

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**Abstract:** The objective of the study was to explore the relationship between employees' Job satisfaction as measured by the Job Satisfaction Scale by B.L. Dubey and Organizational Commitment (as measured on the Organizational Commitment Scale). Sample was conducted on a convenience sample of 100 employees of Kurukshetra University. Descriptive Statistics and Pearson's Product Moment Correlation was administered to the sample. Pearson correlation revealed that Job Satisfaction was positively correlated with Affective Commitment and Normative Commitment but results showed no significant correlation between Job Satisfaction and Continuance Commitment. The paper concludes that employees who are more satisfied in their jobs will be more committed to their organization leading to less Job turnover and more productive output. Implications included Strategies to deal with less Job Satisfaction which further can enhance Organizational Commitment leading to more productivity and growth.

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ICARI-AC-16-02-002

## Unleashing the Potential of ICT for Gender Equality

Sumanjeet, Kartik Shrotriya

Department of Commerce, Ramjas College, University of Delhi, Delhi, India

**Email:** sumanjeetsingh@gmail.com

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**Abstract:** This main objective of this research was to design an energy efficient, hybrid digital weighing scale which can be used in all weight measuring operations. It is basically designed to take weights in kg and display on LCD. The design is justified on the basis of the purpose and importance of weight machine in various aspects. This machine can detect minute magnitude of weight placed over it and can accurately measure in kilograms and displays it over a digital scale. It could be used in homes, industries, shops and retail outlets for determining the weights of the various materials being sold to the customers so that the items may be correctly rated as per the displayed weight over the machine. It converts pressure into appropriate voltage levels. This voltage level is filtered and converted into digital data in the microcontroller which is then displayed on a LCD.

## The Role of Literature in Self-Regulated Learning

Parinita Sinha

Department of Humanities, Delhi Technological University, New Delhi, India

**Email:** parinitasinha11@gmail.com

**Abstract:** This paper attempts to explore the ways in which teaching language through literature in a methodical way can lead to better learning outcomes and analyse how literature can be helpful in filling the gaps that are left in the learning process.

The time tested methods of acquiring knowledge through library searches and extra reading material are being challenged, as more learners are drawn towards new technologies which provide easy solutions, grammar lessons and online interactive sessions. While the benefits from these new advances are many, it is worth remembering that websites and libraries offer much more than what is required. Hence, mere reading of a number of books for enhancing language skills can become a fruitless exercise especially if it is not well planned.

It is at this point where planned environments for teaching language through literature play an important role in imparting necessary skills to learners. One of the aims of classroom teaching is to ensure that maximum number of students are motivated and have enough knowledge to create their individual self-regulated learning activities in future. The challenge lies in bringing out the nuances of language learning and academic writing skills, both of which share a common space with literature and enriching the learner's classroom experience in a way that educational benefits acquired help them transcend the boundaries of classroom and the syllabus.

ICARI-HU-16-02-003

## Happy Days- A Study in Existentialism

Barun Kumar Jha

Department of Humanities, LNMU Darbhanga, Bihar

**Email:** bkjhabaruar@gmail.com

**Abstract:** Happy Days is an interesting play of Samuel Beckett which deserves a serious analysis in terms of existentialism. The play is in search of the meaning of man's existence amid uncertainty in the world. Sometimes it is also interpreted as 'mockery of unhappiness.' This play is certainly different from other major plays of Samuel Beckett in which the protagonist seems a happy character, but, in fact, she frets in fever of the world. She is buried in a mound of earth and consumed by the earth every moment. After all, she gives the gesture of being happy. Both the characters Winnie and Willie are static, helpless and crippled like other characters of Beckett subject to suffering, frustration and absurdity in life. The play also delineates the sub- themes of existentialism like authenticity, death, bad-faith and nothingness with the help of these two characters. Moreover, the play develops in the tradition of absurd play challenging the classical norms of unities and plot. The stage setting in Happy Days seems strange like that of a realistic play reflecting the theme of existentialism. Lastly, the play gives the concept of absurd and cyclical time which presents the uncertainty of man's existence in the world. Thus, the play is a typical one for existentialist study.

## Role of Technology in Building Vocabulary

Reena Mittal

Department of English, DAK Degree College, Moradabad, Uttar Pradesh, India

**Email:** mittal.reena23@gmail.com

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**Abstract:** “Words, as innocent and powerless as they are, standing in a dictionary; how potent for good and evil they become in the hands of one who knows how to choose and combine them.”

— Nathaniel Hawthorne

Why is vocabulary learning so important? To understand a text, one must understand the words that represent the ideas or concepts. The role that vocabulary knowledge plays in second and foreign language acquisition has long been neglected. However, vocabulary is currently receiving increased emphasis in the language teaching curriculum. Vocabulary should be ubiquitous in our instruction. Vocabulary is central to English language teaching because without sufficient vocabulary students cannot understand others or express their own ideas. Students often instinctively recognize the importance of vocabulary to their language learning. It has to underlie and infuse every sphere of learning, including every element of literacy (reading, listening, discussing and writing) and every content domain. Words give power of speaking and writing. They give the ability to share thoughts and ideas. Written words can help tune in to the thoughts of people who lived long ago or far away. Words also help to imagine anything, never had and events far into the future.

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CARI-HU-16-02-005

## Dealing With Challenges in Teaching Decision Sciences

Nisha Arora

Independent Researcher, Gurgaon, India

**Email:** nishaarora4@gmail.com

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**Abstract:** The umbrella of decision sciences shelters applied mathematical areas such as optimization, and statistics, which helps in decision making in almost every field. Be it of managerial decision making for manufacturing or service industries, engineering, financial services, medical, psychological studies or any other aspect where there decision maker has an option to choose from alternatives available or make inferences on the basis of data, the role of decision scientist is inevitable. Although in different areas, terminology differs but the basics of decision sciences remains the same. Teaching decision sciences has always been a challenging task due to many factors, primarily the student’s phobia of mathematical subjects. Plethora of time, effort, patience and more importantly passion is required in preparing each class in an organized way. To present the complex mathematical concepts in cool understandable steps, to widen student’s interest by showcasing them applications of the same in their area of study, the part of instructor becomes very imperative. This paper discusses issues in teaching decision sciences, innovations in teaching pedagogy, and alternative assessment methods to create an enhanced learning environment. An attempt has been made to motivate the educator to focus their energy more on how to deliver the knowledge in a rhythmic pace to vastly improve student’s experience.

## Hand held Dermal Scanner

S.SaravanaPrakash, P.Abinaya, L.Suganthi

Dept. of Biomedical Engineering, SSN College of Engineering, Chennai, India Email:

saravanaprakash.s.s@ieee.org , abi.anju.aji@gmail.com, suganthil@ssn.edu.in

**Abstract:** Dermatology is a branch of science dealing with the studies of skin, hair, nails etc. Nowadays skin disorders are more severe and many new disorders are emerging rapidly. Many devices are used for diagnostic as well as therapeutic applications. In this paper, we proposed a diagnostic device which is used to capture the images of affected skin surface through raspberry pi controller module with camera and display the image in LCD screen. The SD card is connected with module is used to store images for further analysis. Real time recording of the images can be obtained, viewed and stored for further analysis. The acquired images can be sent to a dermatologist who is far away from the recording site. Hence Tele-dermatology is possible using this proposed device; both online as well as off line diagnosis can be empowered. The device is easily operated which does not require any specific technical skill to operate. Hence frequent self-examination for the patient with chronic skin disorder is possible with low cost. Thereby diagnosis, treatment, examination, continuous self-monitoring of skin conditions are possible using this proposed work.

ICARI-CV-16-02-011

## Application of Statistical Tools and Hypothesis Testing of Adsorption Data Obtained for Removal of Heavy Metals from Aqueous Solutions

Achla Kaushal<sup>a</sup>, S. K. Singh<sup>b</sup>

<sup>a</sup>Department of Chemical Engineering, Directorate of Training and Technical Education, Delhi, India

<sup>b</sup>Department of Environmental Technology, Delhi Technological University, Delhi, India

**Email:** achla001@hotmail.com

**Abstract:** Hypothesis testing is useful statistical tool understood as a critical testing of the experimental data. The experiment for the removal of heavy metal ions from aqueous solution by adsorption was carried out with the deliberate object of testing hypothesis through different tests meant for the purpose using available data obtained from experiments. Decisions about the validity and significance of the data were made on the basis of hypothesis testing. It enabled us to make probability statements about the adsorption parameters. In the present study, dried mango leaf powder was used to remove Cu, Zn and Pb from heavy metal samples prepared in lab. the experimental data was tested using different statistical tools namely Student's t-tests, F-test to test the equality of variance of two normal populations, Chi-square test to test the effectiveness of the adsorption in removing heavy metal ions, ANOVA for the analysis of significance of difference between means of multiple samples at the same time, all within 5% level of significance.

## Routing in Mobile ADHOC Network: Challenges and Performance Evaluation Consideration

Rahul Sachdeva

Department of Computer Science, CDAC Noida, India

**Email:** rahulsachdeva9333@gmail.com

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**Abstract:** A Mobile Adhoc Network is a collection of independent mobile nodes that can communicate to each other via radio waves. Ad hoc networks can be built around any wireless technology, including infrared, radio frequency (RF), global positioning system (GPS), and so on. Usually, each node is equipped with a transmitter and a receiver to communicate with other nodes.