KUMARAGURU
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KCT I-STEP

INTERNATIONAL CONFERENCE ON SCIENCE, TECHNOLOGY AND ENGINEERING PROMOTION 2017

18TH & 19TH
AUGUST
2017

ABSTRACT PROCEEDINGS

About the college

Kumaraguru College of Technology (KCT), Coimbatore is an Engineering College started in 1984 under the auspices of **Ramanandha Adigalar Foundation,** a charitable educational trust of Sakthi Group. It is situated in a sprawling campus of 150 acres in the IT corridor of Coimbatore which in many ways was a front runner in the eco system.

The able guidance and patronage of *Arutselvar* **Dr. N.Mahalingam,** *Founder,* Sakthi Group along with the efficient administration of **Dr.B.K.Krishnaraj Vanavarayar,** *Chairman,* the resourcefulness of **Sri. M.Balasubramaniam,** *Correspondent* and the foresightedness of **Sri. Shankar Vanavarayar,** *Joint Correspondent* have equipped the college with excellent facilities such as spacious classrooms, seminar halls, well-equipped laboratories, excellent sporting amenities, dedicated high-speed internet connectivity (broadband) and well-qualified faculty. Five Academic Blocks house the different departments. The administrative building, **"Dr.Mahalingam Vigyan Bhavan"** is an architectural beauty and a land mark in Coimbatore.

Currently the college, as an autonomous institution affiliated to the Anna University,offers 13 under-graduate (B.E., B.Tech.) and 14 post-graduate (M.E., M.Tech., MCA, MBA) programs of study. All the above courses have the approval of the All India Council for Technical Education (AICTE) and all the eligible UG programs have also been accredited by National Board of Accreditation (NBA). In addition, KCT has also been accredited by National Assessment and Accreditation Council (NAAC) of the University Grants Commission (UGC). 9 of the 15 academic departments have been recognized as research centers permitting research leading to Ph.D. degree by Anna University.

The value of the education and training imparted by the college is highlighted by the interest shown by leading companies for on-campus recruitments. Our alumni have done us proud by proving their worth in their chosen field of work.

About the I-Step 2017

I-STEP is an International conference on Science, Technology and Engineering Promotion that addresses the new advancements and challenges in the fields of Science, Engineering and Technology. This conference will create a strong platform for our science & engineering faculty members to publish their research work in SCOPUS/ WOS indexed journals with high impact factors. ISTEP will serve the profession with international conferences, quality proceedings books and leading edge digital library for professional growth. It is an international scientific activity for academics, and educators. It promotes the development and dissemination of theoretical knowledge, conceptual research and professional knowledge through conference publication. This forum will provide opportunity to network and discuss the practical challenges encountered and the solutions adopted in their respective domains worldwide

Scope

The ISTEP aims to diffuse the knowledge and researches among academicians and lead to development in science and technology. It also aims to bring together leading academicians, Scientists, Researchers, Scholars and Students to exchange and share their Knowledge, experiences and research results on the aspects of advancements in Sciences, Technological, Engineering and Management.

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MESSAGE

At the opening of the International Conference on Science, Technology and Engineering Promotion" KCT ISTEP 2017 on 18th and 19th August, 2017, it gives me great pleasure to send you a congratulatory message of support and good wishes.

I can assure you that, in my view, nothing is more important in the present world than the striving for excellence and updation of domain knowledge. This international conference serves as a apt platform for exchange of intellectual thinking and collaboration among institutions and individuals on contemporary issues in the science, engineering and technology fields.

The conference with active participation of more than 200 delegates and invited speakers, aims to bring together leading academicians, researchers, scholars and students to share their knowledge, experiences and research results on advancements in sciences, technological,engineering and management fields.

I am sure this conference will go long way in shaping our students, through knowledge gained and exchanged, to be fully ready for their current and future career requirements.

I commend the organizers for their endeavour in organizing this conference and wish all the participants and invitees a very fruitful and rewarding conference.

B.K.KRISHNARAJ VANAVARAYAR

MESSAGE

The KCT I-STEP 2017, International Conference on Science, Technology and Engineering Promotion 2017 is held on 18th and 19th August at Kumaraguru College of Technology. The conference title, “Science, Technology and Engineering” is an eye opener for our science & engineering faculty members to publish their research work in SCOPUS/ WOS indexed journals with high impact factors. It also aims to bring together leading academicians, Scientists, Researchers, Scholars and Students to exchange and share their Knowledge, experiences and research results on the aspects of advancements in Sciences, Technological, Engineering and Management. It is indeed a wide perspective to have an interaction among various departments.

I have no doubt in the organizing skill and executing abilities of the faculty, staff and students of the organizing departments who will make the event a grand success. This international conference will provide opportunities for all the participants from various places in gaining knowledge and experience in their domain. I believe that the deliberations will be very useful and fruitful for all the participants and research scholars. My best wishes to the participants who are attending this International Conference.

Dr. R.S. Kumar,
Principal

Message

The International Conference on Science Technology Engineering and Promotion 2017 (I STEP17) organised during August 18-19, 2017 is proud moment for the Kumaraguru College of Technology. It is common platform to present the advancements in Science and Technology happening to meet the recent requirements.

I would like to thank one and all for the sincere effort and contribution made to the I STEP17 a memorable event.

Finally. I am very grateful to our Management, Principal , Chief Guests, Key note Speakers, HoDs , Cluster coordinators , Organising committee members and faculty members for valuable suggestions, motivation, inspiration and guidance in this international conference in a grand manner.

I sincerely believe and hope that all the delegates attending the at KCT will have a inspiring and creative exposure in their research fields and I thank each and every one of you making this Conference a grand success.

Dr.R.Manivel
Professor , Mechanical Engineering
I STEP 17 Coordinator

Keynote Speakers

Prof. P. Ramasamy, Director of SSN College of Engineering, obtained PhD from the University of Madras in 1976 and received Governor-Chancellor Gold medal for the best PhD thesis that year. He was a faculty member at Anna University from 1973-2003, founder and Director of Crystal Growth Centre, Anna University and was the Vice-Chancellor of Algappa University 1994-97. He had published more than 630 papers in international/national journals in addition to extensive presentations in conferences. He had guided 76 PhD students and has written seven books. In a study undertaken by the National Institute of Science and Technology and Development studies, the Council of Scientific and Industrial Research (CSIR) Prof. Ramasamy was named among the Most productive scientists in India in the period 1996-2006.A method discovered by Prof.P.Ramasamy is named after him along with his former student. The method is called "SANKARANARAYANAN-RAMASAMY (SR) METHOD". Several laboratories in India and abroad are using this method. Nearly 100 journal publications have so far been published. More than 40 of them contain in the title itself SANKARANARAYANAN-RAMASAMY (SR) METHOD". Indian association for crystal growth has instituted"PROF. P. RAMASAMY NATIONAL AWARD FOR CRYSTAL GROWTH".In addition to several national awards he received the following international awards.

1. UNESCO Award : Niels Bohr Gold Medal – 1998

2.PrizeReceived from the President of the Islamic Republic of IRAN during the Kharazmi International Festival award 1998.

Dr. Alok Barua received a B.S. (Hons) in Physics (Calcutta University)in 1973, a B. Tech in Instrumentation and Electronics Engineering in 1977 and M.E.Tel.E. in Electronics and Telecommunication Engineering in 19980 (Jadavpur University) and a Ph.D. (Indian Institute of Technology, Kharagpur) in 1992. In 1985 he joined the Department of Electrical Engineering, IIT kharagpur, where is now a Professor. He received the **IETE's S.K. Mitra memorial best paper award** in 1982. With thirty two years of teaching experience he has published many papers in his teaching and research areas- instrumentation, image processing, testing and fault diagnosis of analog and mixed signal circuit. He also holds a patent for the design of 'See Saw Bioreactor'. He had delivered invited lectures in many different universities of USA, Europe and Far East. He worked as Visiting Professor/ Guest Professor/ Research Professor in University of Arkansas, USA, University of Karlsruhe, Frankfurt University, Yonsei University, Korea University and other institutions of the world. He co-authored, with S. Sinha, Computer Aided Analysis, Synthesis and Expertise of Active Filters (Dhanpat Rai & Sons, Delhi) in 1995. He also co-authored the book entitled "**Fault Diagnosis of Analog Integrated Circuit**", published Springer, USA in the year 1995. He authored the book entitled "**Fundamentals of Industrial Instrumentation**" in 2011, and "**Analog Signal Processing: Analysis and Synthesis**" in 2014 published by Wiley India. He also co-authored the book "Biorecators: Animal Cell Culture Control for Bioprocess Engineering", CRC Press in 2015 and two research monograms entitled "3D Reconstruction with Feature Level Fusion" in 2010 and "Studies on Certain Aspects of a Newly Developed See Saw Bioreactor for animal Cell culture" in 2011, published by Lambert Academic Publishing, Germany.

Prof. K. Porsezian, who is a professor in Department of Physics in Pondicherry University obtained his bachelor degree in 1983 and master degree in 1985 with first class distinction in university of madras. He obtained his first Ph.D. on nonlinear dynamics of the discrete and continuum spin under Prof. M. Lakshmanan in 1991 after his 6 year experience as research fellow in Bharathidasan University. He worked as research scientist for a year, lecturer while he was doing his second Ph.D. in Hannover University, Germany, reader for 4 years till 2006 and Assistant Professor in Anna University for 9 years. He was the Professor and Head in Pondicherry University in 2006 for 3 years. His specializations are Solitons and Modulation Instability in Nonlinear Fiber Optics, Fiber Bragg Grating, Photonic fibers, Bose Einstein Condensates and Self-Induced Transparency, Solitons in Magnetic Systems, Integrability Aspects of Nonlinear Partial Differential Equations.

Professor Jiri Militky is the university professor of Textile Science at the Technical university of Liberec Czech Republic. His scientific activities are in the areas of textile physics, textile material engineering, nanocomposites and statistical data treatment mainly. From 1991 to 1993 he was at the position of vice chancellor for foreign relations and from 1994 till 2000 he was dean of the textile faculty. From2001 till 2003 he was vice chancellor for science and foreign relations. Since 2004 till 2008 he was again a dean of the textile faculty. Currently he is Head of Textile Material Engineering Department. He is author or co-author of 18 books, about 250 scientific papers published in journals and more than 450 scientific contributions on the international conferences. He is organizer of conferences Textile Science and Strutex.

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Abstracts of Technical Papers

Stabilization of Single-axis Gimbal System with Cascade PID Controller using Relay Feedback Approach

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Abstract

In target tracking applications for pointing and tracking systems, an inertial stabilization subsystem is used for maintaining a tracking sensor always pointing towards a target irrespective of base motion. The stabilization of sensor is achieved by placing the sensor in a gimbal system and forming a control system for allowing the gimbal to follow a rate command by attenuating all the disturbances caused in the gimbal. In this paper, the stabilization of a single axis gimbal is achieved with a cascade proportional-integral-derivative (PID) controller. The equations of motion for the gimbal are obtained from a two-axis gimbal kinematics. The controller parameters have been found by using relay feedback method and the controller performance is simulated in MATLAB/Simulink. Simulation results clearly indicate that the performance of gimbal stabilization system is improved with cascade PID controller than a single PID controller.

Keywords: Stabilization, gimbal, Dc Motor, Cascade Control, Relay, Feedback, Tuning.

Numerical analysis of Aerodynamic Gust Response using the Open-Source SU2 Code

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Abstract

CFD has been used extensively in the past to compute gust responses of different flow configurations. Standard University approaches to incorporate a gust model into the governing equations which is based on boundary conditions, known as the far-field boundary condition approach (FBC) or through modifying each computational cell in the domain, known as the field velocity method (FVM). Recently, researchers demonstrated that the FVM approach fails to account for the effect of the body on the gust itself, and derived a new method – split velocity method (SVM). The SVM differs from the FVM through the addition of a source term which has major role to play. Nevertheless, both the SVM and FVM methods are easy to implement in existing CFD codes as it can be proved that the gust velocities appear as moving grid velocities to the governing flow equations on a moving mesh. Currently, the SVM has been tested out in the Open-Source code SU2.SU2 is the Stanford University Unstructured density based flow solver and is more popular for external flow applications such as the one presented in this work. To verify the SVM implementation, results are compared with the inviscid FVM and SVM results of Wales et al. The case used was that of a 1-cosine vertical gust at Mach 0.3 free-stream conditions impacting a NACA 0012 airfoil. The computational domain with 10216 unstructured elements is initialized with a steady flow solution and the gust velocity field starts to progress from the inlet of the computational domain. Having obtained confidence in the computed results, further work involves computing the gust response of the NASA CRM model.

Keywords: SU2, SVM, NACA, FVM, CFD, Gust, SVM, NASA CRM

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Study on Influence of Operating Wind Turbine on Upstream and Downstream flow using K-epsilon turbulence Model

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Abstract

The influence of upstream and downstream flow and its effect due to the operating wind turbine at various wind speeds are important in considering the wind turbine spacing in a turbine park. In this research paper study is made towards what extent the wind turbine with a rotor diameter D, influences the flow in upstream and downstream computationally. The reduction in the maximum power coefficient strongly depends on the distance between the turbines and the operating condition of the upstream turbine. Presently, the standard power curve measurements assumes that the turbine wind condition has negligible influence on the flow at two times the rotor diameter upstream. However, the upstream effect due to the operating wind turbine beyond two times the rotor diameter (2D) leads to the consequences of the power estimate for any given turbine and this leads to the wind farm for total power production. Similarly, the downstream of the operating wind turbine is equally important in terms of the power production of the wind turbine park. Numerical simulations are performed on a wind turbine with a rotor diameter of 80 m and the tower height of 100 m with various blade pitch angles. The NACA – 63-425 aerofoil is selected for the blade profile in this analysis. The result shows that the influence of the pitch angle will not influence much difference in upstream flow and much difference in the downstream flow. However, at the distance more than two times (> 2D) of the rotor diameter upstream around 3% change in the velocity is observed when compared to the free stream velocity. In the downstream, velocity the influence of operating wind turbine extends up to 6.5D for a velocity of 20m\s.

Keywords: Upstream effects, Downstream wake effect, Numerical simulation, Park power performance, pitch angle.

Experimental and numerical study to estimate drag effect due to cone fore-body on a Bluff body model

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Abstract

The subject of reduction in drag is an interesting problem with sample range of applications. At high Reynolds numbers the flow stream past a bluff body is portrayed by an extensive wake zone. The shear layers from the sharp corners sustain vortices to the wake. These vortices are shed constantly at downstream. The side faces and back face subjected to low influence, while the front face is subjected to high influence. With this flow stream pattern, pressure drag assumes to be very large for feign bodies with non-roundabout cross-segment and sharp corners with rounded back. The present work describes a numerical and experimental investigation on the effects of various cone shapes, placed co-axially as fore-body upstream of the bluff model. Remarkable decrease in the drag of such a system was observed for the certain combinations of the geometrical parameters, namely the diameter d_1/d_{h2} and gap g/d_{h2} ratios. The numerical and experimental investigation was carried out for the three-dimensional flow, with Reynolds number based on the hydraulic diameter of base model(d_{h2}) in the range 1.0-1.8 x 10^5,the fore body width $d1/d_{h2}$ and gap ratio g/d_{h2} were varied between 0.25 to 0.625 and 0.25 to 1.75 respectively. The first configuration was studied on the base model alone and its drag coefficient showed only a small variation with Reynolds number; C_{Do} = 1.18 at Re = 1 x 10^5, C_{Do} = 1.33 at Re = 1.4 x 10^5, C_{Do} = 1.38 at Re = 1.8 x 10^5.The second configuration studied was base model with cone shape fore-body. The finite volume solver ANSYS FLUENT is used to obtain the numerical solution of the three-dimensional steady-state, Reynolds averaged Navier–Stokes (RANS) equations. The numerical studies have been carried out by using validated k–ω (SST) turbulence model.

For the combination with diameter ratio (d_1/ d_{h2} = 0.625) and gap ratio (g/ d_{h2}=1.0) the drag reduction was achieved about 60%.

Keywords: Bluff model, Reynolds Number, Shielding effect, Profile drag, Turbulence intensity.

Numerical Study on Structural Health Monitoring for Unmanned Aerial Vehicle

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Abstract

Unmanned Aerial Vehicles (UAVs) are one of the important types of aircraft, which are controlled by a remote controller or pre-programmed method. Interest in UAVs for reconnaissance and surveillance has emerged steadily, in which the UAV design methodologies is designed based on trail-and-error production. Nowadays UAV is being proposed for many critical applications including crack detection on the buildings, disaster monitoring, detection of wildfires and animals, border surveillance, etc. therefore the designer must provides an UAV, which have the high lifetime, more secure on-flight and low maintenance cost in order to survive at critical infrastructure maintenance and inspection. Survive at the critical infrastructure may creates the structural failures of an UAV, which leads to reduce the usage of drones in the difficult applications. The main purpose of this paper is to provide a secure UAV for critical infrastructure surveillance by develop a structural health monitoring system, which is able to detect the structural crack on its surface based on image processing technique. The dynamic response of an UAV surface which is made-up of composite material is detected using camera sensor in order to reduce the maintenance cost as well as on-board accidents. Damage is simulated by slightly varying locally the mass of the panel at different zones of the structure. The proposed damage detection coding utilizes the collected image data with inclusion of different angles and different maneuvering, through various advanced levels of image processing techniques to identify the damage and its location. Number of cameras and its fixing location are depending upon an UAV size and its nature of work. In this work totally three cameras are suggested, which are planned to located in UAV tail part, nose part and surveillance location. The reference model of an UAV has been designed by CATIA. Crack detection simulation and image processing methodologies such as crack growth percentage, image orientation test are completed by MATLAB.

Keywords: Cracks, Feature extraction, Health monitoring, Numerical Simulation, Structural damage, UAV

Conceptual Design and Computational Investigation of the Secondary inlet of Rotary-wing Aircraft Engine

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Abstract

This paper presents an approach for optimizing the design point inlet mass flow rate and overall pressure ratio of an existing secondary inlet of rotary-wing aircraft engine in order to minimize drag over a medium transport-utility. The objective of this optimization is to improve the effectiveness of a rotary-wing aircraft propulsion system by re-designing the existing secondary inlet shapes i.e., scoop. The design of scoop for drag optimization and engine compartment cooling is analyzed for a rotary-wing aircraft with the help of Computational Fluid Dynamics (CFD) analysis. Instead of the scoop, the design of the louver is used to reduce the drag and various louver profiles is analyzed. The design of louver also considered for low power consumption. Based on the numerical simulation low drag component is selected as a best air intake in rotary-wing aircraft engine. A

commercial CAD package, CATIA V5 is used to model the scoop and louver with a geometric tolerance. Numerical simulation of scoop and louver is carried out using ANSYS Workbench 16.2.

Keywords: Drag; Louver; Optimization; Rotary-wing aircraft; Scoop

Conceptual Design and Structural Analysis of Composite Micro Aerial Vehicle

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Abstract

Interest in Micro Aerial Vehicles (MAVs) for reconnaissance and surveillance has emerged steadily, in which the present MAV design methodologies is based on trail-and-error method. This paper gives an idea about conceptual design and physics involved in structural analysis of high performance MAV which can able to operate at any complicated working environment. The term high performance explains the MAV speed and its strength, speed and quick mission process of a MAV to be achieved by its integrated design, which is characterized by the use of two counter-rotating propellers for vertical propulsive and able to execute the hovering mode. Also two propellers are located in the rear part of the MAV for forward force and yawing control. Unlike a conventional aircraft, the interaction between aerodynamic, propulsion and structural forces is not balanced in the MAV design also due to the effect of aerodynamic loads acts in the MAVs may cause to fail at unpredictably high an amount, which creates the MAVs to make structural analysis as important factors in its performance. The airframe and propellers of the MAV are preferred to be of composite materials, which allows for propeller flexibility without sacrificing durability. High lifetime and low probability of failures in terms of structural analysis is to be achieved by implementation of composite materials in MAV. The present work aims at performing a numerical simulation to be used for investigating structural behavior of the MAV, which made-up of Glass Fiber Reinforced Plastic (GFRP) by simulates the displacement and principal stress using Finite Element Method. The design process entailed the overall system design, component selection and placement in CATIA software package. Simulation of Stress and displacement throughout the composite MAV has been analyzed by ANSYS CAE package.

Keywords: Computational simulation, Conceptual analysis, GFRP, Integrated MAV.

Mechanical Characterization Studies on Cold Cracking Susceptibility of P92 Steel Weldments

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Abstract

Creep or Cold flow is the material property in which it flows and ends in permanent deformation under the action of stresses even underneath the yield strength of the material. Creep is more spelled in high temperature applications like Gas turbines, Oil, Gas and Petrochemical industries. The core material used in such red hot applications will near its melting temperatures. So a promising material which battles this condition is mandatory in order to achieve higher efficiencies and reduce emissions of environmentally detrimental gases and to carpet new power generation of Super critical and ultra-super critical (USC) technologies. So, Chrome moly is the idyllic select of metal suggested to be incorporated in such technologies. Among the recent emerged ferritic martensitic steels, T/P92 has creep strength 30% higher than the currently used modified 9%Cr T/P91 steel and has been specified as one of the major alloys for the construction of USC plant. So for effective utilization of these chrome moly steels, both metallurgical and in service behavior should be investigated. This work investigates the base metal characterization of P92 steels experimentally by mechanical testing and micro-structural examination. The fracture surfaces of P 92 were also characterized by Scanning Electron Microscopy.

Keywords Creep, ultra-super critical, ferritic martensitic steels, Scanning Electron Microscopy.

Development of Eco-Friendly Emission Control Unit Using TiO_2 Coated Catalytic Converter

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Abstract

Greenhouse gas emissions from transportation primarily come from burning fossil fuel in cars, bikes, buses, trucks, ships, and planes. When a liter of gasoline is burned, about 2.3 kg of CO_2 is released, For IC engine two-wheelers, fuel cycle CO_2 emissions are projected to rise from 6.68 to 111.63 million metric tons in 2021. In order to minimize CO_2 from two wheelers, this work deals with development of a prototype which is constructed and tested to measure CO_2 absorption compared with theoretical predictions. Titanium dioxide coated layer is used in a conventional catalytic converter which demonstrates the Photo Catalytic Effect of Titanium dioxide for reducing CO_2.

Keywords: CO_2, Catalytic Converter, Green House gases, Titanium dioxide (TiO_2), Photo Catalytic Effect

Design and Analysis of Suspension System for a three wheeler electric vehicle

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Abstract

A suspension system is a part of an automobile that gives ride comfort or a cushioning effect to the driver by taking up all the sprung/unsprung masses that are acting on it due to the vehicle load.The load is applied in the form of compression such that the spring undergoes deflection and then the shocks are being absorbed and dissipated in the form of heat .This paper deals with the design and analysis of a suspension system for an electrical three wheeled vehicle and the spring designs are subjected to different loading conditions, altered material properties and geometrical changes for better performance. The models are designed and analyzed using ANSYS 16.2 by keeping an objective of cost and weight reduction.

Keywords: Suspension system, electric vehicle, three wheeler, FEA

Modeling and Simulation of power converters for Polymer Electrolyte Membrane Fuel Cell

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Abstract

Development of mathematical model and control becomes the primary function of a transportation system. This system includes Polymer Electrolyte Membrane (PEM) Fuel Cell, Li-ion battery, DC- DC converters and load. Two power sources namely 50 kW fuel cell stack and the battery are employed in this system. The fuel cell acts as the prime source of power and is meant for charging the battery also. The battery is used during start-up and other peak load conditions. Two DC-DC converters are employed. One of the power converters is kept between the fuel cell stack and load. The other converter connected to Lithium-ion battery cluster, regulates the output voltage of the

battery pack. The fuel cell, battery, converters and load are modeled and simulated using Matlab - Simulink environment. Investigations on the power distribution between the battery and the fuel cell is made. The performance of each component is analyzed.

Keywords: PEM fuel cell, dc-dc converter, lithium-ion battery pack, hybrid power system

Design and Analysis of LCV Chassis (Tata 407)

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Abstract

LCV (Light Commercial Vehicle) is a commercial goods and passenger transport vehicle which is designed ruggedly and built with fuel efficient engine. The Chassis Frame serves as a member for supporting different components of the vehicle and its payload. It should be rigid enough to withstand the dynamic load conditions such as shock, twist, vibration and other stresses. In this paper a detailed study has been conducted on the design optimization of the chassis frame of TATA 407 with C, double C, I and Box type cross sections. A different material S-glass is also included for the analysis. It was found that S-glass has better mechanical characteristics and low weight to strength ratio than structural steel. The analysis results proved the above mentioned fact on the basis of maximum shear, equivalent elastic strain, equivalent stress and total deformation, particularly for the box section frame design than the other cross section designs. The overall chassis frame weight has got reduced upto 31% without compromising the functionality.

Keywords: **TATA 407 Frame, C Cross Section, I Cross Section, Box Cross Section, CATIA V5, ANSYS**

Study of Self Compacting Concrete with Partial Replacement of Sand by Quarry Dust

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Abstract

Self-compacting concrete is a fluid mixture suitable for placing in structures with congested reinforcement without vibration. Self-compacting concrete development must ensure a good balance between deformability and stability. Also, compatibility is affected by the characteristics of materials and the mix proportions; it becomes necessary to evolve a procedure for mix design of SCC. Self-compacting concrete, also referred to as self-consolidating concrete, is able to flow and consolidate under its own weight and is de-aerated almost completely while flowing in the formwork. It is cohesive enough to fill the spaces of almost any size and shape without segregation or bleeding. This makes SCC particularly useful wherever placing is difficult, such as in heavily-reinforced concrete members or in complicated work forms. All SCC mixtures exhibited greater values in both splitting tensile and compressive strength after being tested, compared to normal concrete. The splitting tensile strength increased by approximately 30%, whilst the compressive strength was around 60% greater. In addition, the SCC tensile strengths after 7 days were almost as high as those obtained after 28 days for normal concrete. This was possible due to the use of mineral and chemical admixtures, which usually improve the bonding between aggregate and cement paste, thus increasing the strength of concrete. The paper presents a study of hardened properties of self- compacting concrete such as compressive strength at 7 days and 28 days. Split tensile strength at 7 days and 28 days. Flexural strength at 7, 28, 56 and 90 days. Also studied about the structural behavior of self-compacting concrete with casting and testing reinforced concrete beam. Deflection test carried out and results are discussed in this report.

Keywords: Self Compacting Concrete, Quarry dust, Self-Consolidating Concrete, Super plasticizers, Viscosity-Modifying Agents, Normally Vibrated Concrete, ASTM, Glass Powder, Fly ash, EFNARC

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Experimental Study on Flexural Response of Engineered Cementitious Composite (ECC) Strengthened Reinforced Concrete Beams

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Abstract

Engineered Cementitious Composite (ECC) is an ultra-ductile cement-based material reinforced with fibers. It is characterized by high tensile ductility and tight crack width control. ECC is emerging in broad applications to enhance the loading capacity and the durability of structures. However, ECC also faces a limitation on dimensional stability and on economical and sustainable issues. The micromechanics concepts, which support the development of ECC, are also briefly presented.

Results of the beam test indicate that brittle failures as shear failure and bond splitting failure observed in the RC beams can be prevented by using PVA-ECC in place of the concrete. As a result, the beams with PVA-ECC indicate excellent ductile manner. The result is a moderately low fiber volume fraction (<2%) composite which shows extensive strain-hardening.

Keywords: Engineered Cementitious Composite (ECC), PVA-ECC, Poly Carboxylic Ether, Pozzocrete dirk 60, ITZ(Interfacial transition zone), Fly Ash, Plastic Hinge, Self-consolidation, Pozzolana.

A Study on Seismic responses of Reinforced Concrete (RC) buildings with Lateral Force Resisting Systems

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Abstract

Today, tall buildings are a worldwide architectural phenomenon and it is a major challenge to study the impact and performance of tall structures under wind and seismic loading. In the present work, Time History Analysis and response spectrum analysis are carried out for a G+19 multistory Reinforced Concrete (RC) framed building taken from Panchal and Marathe (2011)1 ,with minor changes made in the building. This RC frame along with three types of lateral force resisting systems such as brick infill and shear walls in two different types of placements are considered for the analysis. The influence of the lateral force resisting systems in the reduction of peak responses such as absolute accelerations, displacements and drifts of the bare frame under four types of Time History Earth Quakes (THEQ) are found out using the SAP2000 software. based on responses of the building. The Linear Time History Analysis (LTHA) of the frames subjected to four types of THEQ such as El Centro (EC), Kobe (KO), Northridge (NR) and S_Monica (SM) are carried out. The responses shows that provision of both models of shear wall considered for the buildings in the present work reduces the seismic responses effectively and responses are within the allowable limits prescribed in IS1893 (Part 1) :2002. The effective arrangement of lateral load resisting systems is found out for the RC building also by the response spectrum analysis of all the three types of models with brick infill and shear wall provisions. The peak value of inter storey drifts are reduced by 66.67 % with the provision of lateral force resisting systems in the bare frame.

Keywords: absolute acceleration, brick infill, drifts, seismic responses, shear wall, time history analysis.

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Seismic Response of Multistoreyed Steel Frame with Viscous Fluid – Scissor Jack Dampers

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Abstract

A 20-Storey benchmark steel moment resisting frame (Y. Ohtori et al., 2004) is taken for the study of seismic response reduction of the frame by providing viscous fluid dampers for scissor-jack mechanisms. The model linear time history analysis of the frame subjected to four types of time history earthquake loads with scissor-jack dampers is carried out using SAP2000 software. The four Time Histories considered for the frame analysis are N-S component of El Centro, N-S component of Kobe, N-S component of Northridge and S-E component of S_Monica. The Scissor-jack dampers are distributed along the height of the frame to reduce the seismic response of the building. Among the four time history analysis, the peak responses such as absolute acceleration, displacements, drifts, damper displacements, and damper forces for the six different models of the frame with scissor-jack dampers are found out. The average response reduction values between the bare frame and the six models are presented in this paper. The optimum and cost effective placement of damper in the bare frame is arrived by comparing the peak average response reduction values of the models. The peak average response reduction values of the optimum model for absolute acceleration, displacements and drifts are 71.3, 46.9 and 53.1 respectively.
Keywords: absolute acceleration, drifts, peak responses, scissor-jack dampers.

Implementing challenges of Extended Producer Responsibility

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Abstract

The electrical wastes generally known as e-waste gets deposited once the life time of the electrical goods gets overed. E-waste prone to numerous health hazards even to death, if not disposed properly.For safe disposal of electronic goods wastes, a policy tool known as Extended Producer Responsibility (EPR) have been introduced by e-waste management and handling rules. Hence a study on disposal of e-waste have been undertaken on sectors which consumes bulk of electronic goods. Questionnaire survey, personal interview and group discussion was conducted with different stakeholders of electronic goods and their responses were recorded. Finally collections of discussions and suggestions have been reported.
Keywords: e-waste, EPR, questionnaire survey, personal interview, group discussion

Durability gaining in an old structure using Retrofitting Techniques

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Abstract

Retrofitting' of a structure mainly deals with the addition of updated technology in an old structure to improve the strength and durability of the structure. This study deals with the adoption of new retrofitting techniques, methodologies and ideas to improve the life time of the old buildings in an efficient way. Fiber wrapping is the technique discussed in this study. By adopting this we can overcome external cracks in concrete and masonry structures. e-glass fiber or carbon fiber is used for this technique. Epoxy chemical is used for strong setting of fibers into the structure. In this study compression strengths are identified for both ordinary concrete cubes and also fiber wrapped concrete cubes and identified the percentage of strength improvement.
Keywords: Retrofitting, Fiber Wrapping, Epoxy

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Contamination of Soil by Tannery Waste Effluent

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Abstract

Most of the industrial effluents are disposed into land contains a variety of combination of chemicals that may bring in considerable changes in the geotechnical properties of soils. The tannery effluent is one such effluent characterized by high BOD and COD, high dissolved solids, high or low pH, presence of heavy metals, calcium salts, chlorides, sulfides, fat, liquor and organic dyes. This paper presents the laboratory results to study the effect of tannery effluent on the index and engineering properties of cohesive soil upon contamination. A series of laboratory tests have been carried out to evaluate the index and engineering properties of tannery contaminated clay soils. The virgin characteristic of clay soils is highly swelling clay of CH classification with differential free swell of 66 %. Virgin clay soils have artificially contaminated with varying percentage of tannery effluent collected from Pallavaram in Chennai and tested to evaluate various properties of soils. The results had shown an increase in Atterberg's limits as well as the shear strength with varying percentage of tannery effluent. The nature of the pore fluid has also found to significantly affect the index properties and shear strength.
Keywords: tannery effluent, clayey soil, swelling, shrinkage and shear strength.

Experimental Investigation on Flexural Behavior of Geopolymer Concrete

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Abstract

Inorganic polymer concrete (geopolymer) is a rising class of cementitious material in which bond is supplanted by flyash, one of the bottomless modern results on earth. Eight trial mixes are prepared for M30 grade concrete with 100% replacement of cement with ASTM class F flyash. In this project, NaOH of 12M and 14M are used as the alkali activator solutions in four different percentages viz., 0.4%, 0.45, 0.50% and 0.55% of flyash. Natural river sand and coarse aggregates of 20 mm maximum size are used for all the geopolymer concrete specimens. The optimum percentage of alkali activator solutions is arrived by conducting the tests for compressive strength, split tensile strength and flexural strength on the geopolymer concrete specimens. From the experimental results, it is observed that there is no significant variation in strength properties of geopolymer concrete mixes when compared to that of the normal concrete. Geopolymer concrete with 0.4% of alkaline solution of 14M is found to be the optimum mix proportion and its compressive strength is improved by 7% than that of conventional concrete specimen. The experimental investigation on the flexural behavior of geopolymer concrete beams are carried out by conducting two point load tests on three beams of size 1000mm × 100mm × 200mm. From the flexural tests, it is observed that there is no significant variation in the flexural behavior of geopolymer and conventional concrete. Therefore geopolymer concrete can be used in the place of conventional concrete with cement and thus provides the solution for both the disposal problem of fly-ash from the thermal industries and pollution threat for the environment due to Carbon-di-oxide emission during the cement production.
Keywords: flyash, geopolymer, alkali activator solution

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An Experimental Study on Behavior of Modified Bitumen using Recycled Plant

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Abstract

Plastic roads would be a boom for India's hot and extremely humid climate, where temperatures frequently cross 50°C and torrential rains create heavy damage, leaving most of the roads with big potholes. Since the road network is used so extensively in our country, we need a road network which is durable, strong, reliable, niggle Free, environment friendly & cost effective. Roads either have Flexible pavement or rigid pavement. The recent increase in traffic of commercial vehicles with notable variations in the temperature inevitably requires an alternative and improved pavement of high quality which shall also deliver good strength and better economy. To construct & maintain such a dense network of roads, we need heavy amount of raw materials which involves huge capital and time. The considerable use of packaged drinking water in the present days and the pollution threat imposed on the environment due to used non- degradable Polyethylene terephthalate [PET] bottles is very high. This demands the use of these waste PET bottles for some beneficial purposes. The present investigation was carried out to propose the use of shredded waste plastic bottles (PET) for the modification of bitumen binder with particular focus on the development of an effective pavement material that utilizes the plastic waste while catering to the needs of varying climatic conditions prevailing in India and also the heavy loads on pavements. This paper in detail presents the study on the methodology of using waste plastic bottles (PET) in modifying bituminous binders and the various tests performed on 60/70 grade bitumen. A detailed analysis of the engineering properties such as Penetration test, Ductility test, Viscosity test, Softening point test and Specific Gravity test are conducted on both conventional and modified bitumen samples for various percentages of replacements such as 0, 10, 20 and 30% respectively. This PET modified bitumen showed improved quality with % of optimum replacement falling between 10 to 20%.

Keywords: Recycled Plastic roads, Modified bitumen, Flexible Pavements.

A Novel Approach to Treat Sago Industrial Wastewater Using Anaerobic Hybrid Reactor (AHR)

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Abstract

Anaerobic Hybrid Reactor (AHR) is one of the modern day high rate reactors which combine the benefits of suspended and attached growth biological process in a single reactor to treat domestic and industrial wastewater. In the present study, experimental investigations were carried out to treat the sago industrial wastewater using a lab scale Anaerobic Hybrid Reactor (AHR) of 4 liters capacity with 42 numbers (60% of reactor volume) of polypropylene inert media fill inside the reactor. The reactor was started with a low Organic Loading Rate (OLR) of 1 g of COD / L.d with Hydraulic Retention Time (HRT) of 10 days and operated for 160 days with sago industrial wastewater as substrate. At the end of the experimental study, it was found that the AHR treating the sago industrial wastewater had reached the OLR of 11.84 g COD/L. d with HRT of 0.65 days with the threshold COD removal efficiency of 80%. The data generated from the above study were used in the two popular mathematical models namely Grau second order and Modified Stover-Kincannon to predict the effluent substrate concentration from the reactor and found that these two mathematical models could be conveniently used for the design of large scale AHRs treating sago industrial wastewater.

Keywords: Anaerobic Hybrid Reactor (AHR), Sago Industrial Wastewater, Organic Loading Rate (OLR) Hydraulic Retention Time (HRT), Inert Media

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Application of Nano Technology in Self Compacting Concrete-A Review

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Abstract

Self compacting concrete- a special concrete with an extra ordinary property of compacting itself, reduces the possibility of human error. With this, the combination of Nano technology gives a marvelous growth in the construction field .Though the use of SCC, reduces the cost of manual compaction ,the use of SCC along with Nano particles helps in finishing the construction work faster by acquiring strength faster .This present study is about the influence of Nano technology on the properties of self compacting concrete .By adding Nano materials like Nano silica, Nano Fe2O3,nano TiO2, Nano Al2O3 ,etc., to SCC, the rate of hydration, permeability ,Durability ,Compressive strength, Split tensile strength, Flexural strength is increased with increase in concentration of Nano materials. The outcome of this paper is to enhance the usage of nano particles in concrete to predict the properties of concrete.

Keywords: Self compacting concrete, Nano silica, Nano technology, Flexural strength, Durability, Compressive strength

Use of Polyethylene Terephthalate in Concrete-A Brief Review

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Abstract

Concrete, one of the major pollutants in the construction field to be made green is the need of the hour. Though concrete is largely used, its lifetime has become a huge concern due to the cracks produced in it as a result of shrinkage. The addition of fibers into the concrete has been found to improve several of its major properties like tensile strength, cracking resistance, impact, wear and tear, ductility etc as concrete is very much weak in tension which readily undergoes cracking. To resolve these problems and to make the concrete eco-friendly, waste plastic fibers can be employed in concrete in the name of Plastic Fiber Reinforced Concrete (PFRC). As far now, papers have been surveyed on concrete reinforced with plastic fibers such as polyethylene, polypropylene, polyvinylchloride,polyethylene terephthalate(PET). Regarding the domestic consumption of plastics these many years, PET stands first and therefore the use of concrete reinforced with recycled PET fibers as a construction material can be suggested.In future, we are going to propose and investigate the effect of the addition of various percentages of PET strips in the form of mesh in the plastic concrete.

Keywords: Waste plastic bottles, PET fibers, ductility, polyethylene terephthalate (PET), Polyvinylchloride, Plastic Fiber Reinforced Concrete (PFRC)

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Integrated Panchayat Response System Using Open Source GIS

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Abstract

The spatial technology makes considerable impact in planning related activities and decision making. Spatial information on various resources in the Panchayat level is very critical for effective planning and action of any scheme. The wide range of capabilities like overlay analysis, suitability criteria ranking, spatial and non spatial queries made GIS, an inevitable technology in any planning activity to arrive at any conclusions. The system is developed for a Panchayat village named Devipattanam covering an area of 16 sq km. Firstly the resources of the village are mapped as the following categories Land, Water, Vegetation and Infrastructure. The Layers created are maintained in a Postgre SQL database to enable spatial and non spatial queries. A customized GUI is developed using QGIS software to aid the village officers to use the system for any planning purpose at village level.GUI contains various estimation tools to plan and implement the schemes like NREGA.

Keywords: Village Panchayat, Postgre SQL, QGIS, GUI.

A STUDY ON PROPERTIES OF CONCRETE WITH CERAMIC WASTE REPLACED FOR FINE AGGREGATE

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Abstract

The continuous reduction of natural resources and the environmental hazards posed by the disposal of Construction and Demolition (C&D) waste has reached alarming proportion such that the use of C&D waste in concrete manufacture is a necessity than a desire.

Hence the fine aggregate can be replaced fully or partially by materials like M-sand, quarry dust, saw dust, rice husk ash, ceramic waste etc in concrete.

Ceramic waste may be used as an alternative for natural sand. The aim of this project is to determine the strength characteristics of recycled aggregates for application in concrete, with ceramic aggregates as an alternative material to fine aggregate in concrete. A total of three batches of concrete mixes of grade M20 were designed using various percentages (0%, 25%, 50% and 75%) of ceramic waste replaced for fine aggregates. From the results it is concluded that utilization of ceramic waste in concrete is more effective in strength as well as economic aspects.

Keywords: Compressive strength, Flexural strength, Marble waste, Mix design, Split tensile strength.

A Green Supply Chain Agility Index for E- Commerce Business: An Indian Perspective Using Interpretive Structural Modeling

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Abstract

India one of the fastest developing countries among BRICS nations with over a trillion US dollar market in Electronic Commerce (EC) for the next ten years makes the companies to have tremendous flexibility in their supply chain along with the concentration in environment is unavoidable. Therefore there should be an index to quantify the flexibility of Green Supply Chain (GSC) that is necessary for each and every EC organization to set a guideline and also to find their improvement in their GSC over a period of time. Green supply chain agility index (GSCAI) is the measure of the agility level of the GSC of an EC business which is framed based upon the drivers of GSC. This

research article provides a systematic framework for assessing the drivers towards the adoption of GSC practices and developing a method to calculate GSCAI in any EC business.
Keywords: Electronic Commerce, Green Supply Chain Agility Index, Interpretive Structural Modelling, Graph Theoretical Approach, India.

EXPERIMENTAL INVESTIGATION OF AN INDIRECT TYPE NANO COATED FLAT PLATE SOLAR COLLECTOR FOR DRYING PURPOSE

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Abstract

Solar energy is a freely available renewable energy resource in nature. Solar drying technology emerges as one of the vital processes in agricultural and industrial applications for drying of cereals, pulses,spices,bricks in refractory's and milk powder in dairy industry. Drying reduces the moisture content in the product which can be perishable for a long period of time. This research includes the design and fabrication of an indirect mode solar dryer with forced convection and its performance test on drying product(Groundnut).The solar absorber plate is made up of aluminium plate coated with graphene nano particles sizing of 50 nm,so that the heat transfer rate of the plate can be increased. The performance test of the dryer is conducted for 0.04% volume concentration of graphene nano coating at constant air flow rate.

Keywords: Solar energy, Moisture content, Indirect mode, Graphene nano Coating, Forced Convection, Drying time, groundnuts.

Experimental study on the wear characteristics of heat treated aluminium hybrid composites

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Abstract

The present experimental investigation was aimed to study the wear characteristics of an aluminium hybrid composite subjected to heat treatment. The matrix material selected for this study was Al6061. The reinforcement materials used are silicon carbide (SiC) and graphite particulates. The composites specimens have been prepared using stir casting method with 10 wt% of SiC and 2, 4 wt% of graphite particles. The prepared composite specimens and unreinforced alloy have been subjected to a temperature of 530°C for one hour. It is then followed by water quenching. Then artificial ageing to the quenched samples are done with different ageing durations like 4, 6, 8 hr at a temperature of 175°C. Rockwell hardness measurements were made using 'B' scale. Wear tests were carried out on the heat treated as cast 6061 alloy and its composites using pin-on-disc machine. Microstructure of the wear surface of heat treated composite specimens was taken using Scanning Electron Microscope (SEM) to study the wear mechanism. From this experimental study, it is concluded that heat treatment had a significant effect on hardness and wear property of both the unreinforced alloy its composites.
Keywords: Aluminium Metal Matrix Composites (AMCs), Heat treatment, Stir casting, Wear.

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Hybrid Solar Desalination and Water Heating System: A Review

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Abstract

The hybrid character of a solar desalination system consisting of a "Green House"- type conventional solar still coupled with a solar collector field and hot water storage tank was reviewed. The solar desalination systems are energy intensive, which consume high grade energy like gas, electricity, oil and fossil fuels. A review of these processes lead to carbon footprints, which causes depletion of ozone layer as well as health hazards on mankind. It is also lead to global warming which is the burning topic and becomes threat to life sustainability. The potential of harnessing solar energy is most efficient and effective for heat to heat conversion. This hybrid system shows significantly higher distilled water output compared with that of an uncoupled still, and moreover it has the advantage of supplying hot water from its storage tank. Effective hybrid system is performed concerning reduction of produced distilled water caused by storage tank hot water draw-off of different volumes at the end of the day. The pursuit of hybrid systems is an important research topic as it allows for further development of solar desalination technologies while providing an immediate solution that increases the use of solar power.

Keywords: Solar still; Hybrid desalination system; Harnessing, solar energy; Hot water.

An Application of Interpretive Structural Modeling to Assess Agility Index

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Abstract

In the volatile manufacturing era instability and unpredictability of markets create negative impacts in the business environment. The need to respond to ever changing environments has been addressed in recent years by the concept of agility. Agility is defined as the capability to survive in a competitive environment of continuous and unpredictable changes by reacting quickly and effectively to changing market. Over the years, manufacturing organizations could not cultivate all the necessary resources to compete and remain successful and have atlast realized that agility is their last hope for survival. The principal problem may be due to the lack of proper focus on analyzing the enablers needed to improve agility and assessing Agility Index. This attempt is to overcome such issues and create effective supply chains by developing Interpretive Structural Models (ISM) based on interrelationships between factors and understanding driver dependence power using the Structural Self Interaction Matrix (SSIM) and Graph Theoretic Approach (GTA). Identification of levels of impact of supply chain enablers and classification of supply chain enablers in order to surface the driver enablers will aid modern supply chain managers in conditions of chaos. The collective results of ISM have finally been comprehended into a quantitative model using permanent functions which has effectively been deployed for assessment of Agility Index which is a coveted expanse in the domain of supply chain agility.

Keywords: Agility Index, Interpretive Structural Model, Structural Self Interaction Matrix, Graph Theoretic Approach.

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CFD Assisted Design and Analysis of 10 Kw Double Throat Two Stage Air Supply Approach Downdraft Gasifier

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Abstract

The conventional experimental analysis of downdraft double throat gasifier for biomass with respect to different working conditions is more challenging, time consuming and expensive. A computational fluid dynamics (CFD) model to study the performance of a gasifier is required to improve the design of the gasifier. The main objective of this CFD is focused on analysis of combustion and reduction chamber for different equivalence ratio in single stage and two stage air supply approach in 10 kW_e double throat two stage downdraft gasifier using prosopis juliflora wood and the airflow behaviors with respect to biomass flowrate, temperature profile and chemical reaction process through the Gasifier and producer gas and other mass concentration of combustion and gasification products has been analyzed by CFD method using FLUENT software.The same CFD model has been used for simulation for two stage air supply ratio of 40 % AR used in gasifier with equivalence ratio varies from 0.2,0.3,0.35,040 also similar methodology used for single and two stage air supply ratio of 80 % with equivalence ratio of 0.30. For all the cases, the moisture content of the fuel has been kept at 5%.

Keywords: Downdraft Gasifier, Double throat, gasification, producer gas, equivalence ratio, CFD, Prosopis Juliflora wood .

Experimental Investigation of Inorganic PCM Based Solar Thermal Storage Device Enhanced With Heat Pipe

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Abstract

The scarcity of fossil fuels, electricity and increase in demand are the driving forces behind the continuous research for an alternative power source. The most untapped resources of energy are the solar energy and the excess heat from the industries has an evident potential to reduce the demand for energy and the CO2 mitigation. This work presents an innovative setup for the recovery and utilization of untapped resources and to investigate how salt hydrates Phase Change Materials (PCMs) play a crucial role in the storage of thermal energy. A square copper container apparatus is designed to obtain storage medium for PCMs. The salt hydrates used in this study are CaCl2.6H2O and MnSO4.H2O. Heat Pipe technology is incorporated to enhance the thermal recovery and transfer heat to the PCMs storage medium and it is experimentally investigated at various heat input ranges from 50 to 300 W. The heat from the PCMs is utilized through a copper pipe is circulated in-between Heat Pipe condenser region and storage container. In the first case CaCl2.6H2O is taken as a PCM and charging/ discharging process at various inputs were studied. At 200, 250 and 300 W heat input, the heat pipe transferred the heat effectively that decreased the charging time of thermal storage device. In the copper pipe area inside the storage medium, coolant (water) is passed at a different mass flow rate and identified the temperature rate for PCMs and water. The effect of coolant's mass flow rate on PCMs and coolant outlet temperature at 250 and 300 W heat inputs are investigated. In the second case, the Eutectic PCMs (CaCl2.6H2O and MnSO4.H2O) are taken in the ratio 85:15 respectively. The experiment is repeated under the same procedure for the eutectic composition and compared with the first case. The result reveals that Eutectic PCM had a long discharging time that can store heat for a long time and act as a better thermal storage device.

Keywords: PCM, salt hydrates, Thermal storage device, heat pipe.

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Effect Of Preheating Temperatures on Impact Properties of Chromoly Alloy Steel 4130 Weld Using Gas Metal Arc Welding

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Abstract

The influence of the preheating temperature on impact properties was studied in this work. The base plate made of chromoly alloy steel 4130 was welded by using gas metal arc welding process. The electrode used is ER70s-D2. single 'V' butt joint configuration is used in this study. The base metal chromoly was preheated at different temperatures such as 150°C, 200°C and 250°C. The effect of preheating temperatures on the impact properties is studied. Impact test was conducted in different working temperatures. Pendulum type impact machine was used to evaluate the toughness. From this investigation it was found out that the toughness varies based on preheating temperature. The microstructure of the welded metal for different temperature of preheating has been analyzed. The microstructure reveals that ferrite and pearlite boundaries influence the impact properties. It is evident that the preheating temperature has strong correlation with the toughness of weldments.

Keywords: Chromoly, Preheating, Microstructure, Impact strength, Alloy steel

Development of an Intelligent System for Optimization of Blanking Die Design Parameters Selection

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Abstract

Selection of optimum parameters for blanking die design is an important activity in stamping industries. Developing a Knowledge Based system is proposed that can elicit recommendations in selecting optimum die design parameters. Conventional die design method involves numerous considerations, calculations, tables and mainly depends on the ability of taking decision by process planners and die designers. This arrangement facilitates interfacing of die design with drafting and can be loaded in a PC. The proposed system is developed using rule based system approach of AI. It utilizes interfacing of AutoCAD and Auto LISP for automation of selection of blanking die design parameters. The system comprises four modules. Recommended Dimensional Tolerances for sheet-metal blanks produced with short-run tooling, recommended dimensional tolerances for sheet-metal blanks produced with blanking dies, recommended tolerances for fine-blanked parts, recommended trimming allowances are the four parameters considered in this system. The modules were developed based on information from manufacturing standards, industrial catalogues, brochures and best of industrial practices. Hence for the given input condition, the system generates an optimum parametric output on the screen during its execution. The system is flexible and can be upgraded depending upon both specific shop floor requirements and development of new technology solutions. The application of the proposed system is demonstrated through a sample run of four modules for a real time industrial component.

Keywords: Artificial Intelligence, Recommended Dimensional Tolerances, short-run tooling, blanking dies, fine-blanked parts, trimming allowances.

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Design and optimization in production of Air Receivers

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Abstract

The competitive environment in engineering drags to optimize the material and processing cost of air receivers. TRIZ (Theory to resolve inventive problems), a Russian concept and Design for manufacturing principles have been utilized for the arrival of solution. So far these concepts were used individually and are rare to find the synergistic approach. This paper proposes to integrate the benefits of TRIZ with DFM under a single roof in such a way that TRIZ gives the innovative solutions while DFM applies its design and manufacturing rules to narrow down in finding the exact solution. A case study has been taken in a fabrication sector for the design of dished ends of an air receiver and the existing elliptical type has been replaced with hemispherical type. As a result of this implementation the material and processing cost was significantly reduced. The present work gives an outline about the flexibility of the application of TRIZ with DFM for optimizing the design and process requirements.

Keywords: TRIZ, DFM, Optimization, Air receiver

Development of Aluminium Matrix Nano Composite through Polymeric Method

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Abstract

Multiwalled Carbon nano tubes have emerged as promising reinforcement for metallic matrix for their exiting strength, stiffness as well as conductivity property. In this present work, Aluminium composites were produced by combining pure Aluminium powder and Multiwalled carbon nano tubes through Mechanical milling and polymeric method. Compaction was performed by using Hydraulic Press Equipment. Controlled Sintering Process can be used to strength of composites throughout the structure. Mechanical properties of aluminium composites at various proportions of reinforcements were investigated. Microstructure analysis was carried out to identify the in-situ formed particles present in the composites.

Keywords: Metal Matrix composites, Multiwalled carbon nano tubes, Sintering, Compaction

Predicting the tensile strength of friction stir welded dissimilar aluminum alloy using ANN

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Abstract

An Artificial Neural Network (ANN) model was developed to predict the tensile strength of the dissimilar aluminum weld using Friction Stir Welding (FSW) process parameters. The aluminum plates selected for the weld study are AA2014T651 and AA6063T651. The plate AA2014T651 which is the harder metal kept on the advancing side and AA6063T651 kept on the retreating side. The input FSW process parameters such as pin diameter, tool geometry, tool offset and the output parameter -tensile strength as were taken the development of ANN model. Good performance of the ANN model was achieved. Eighteen experiments were conducted and responses of tensile strength of the weld were measured. The 70% of data were used for training purpose, 15% for testing the model and 15% for validation. Levenberg-Marquardt algorithm was used for training the ANN model. The ANN model was able to predict the tensile strength with an accuracy of ± 98 % i.e. within an error of ± 2%. The optimized process parameter based on ANN model are 7mm pin diameter and 4 degree tilt angle in which tool is offset towards advancing side exhibits better tensile strength.

Keywords: Friction stir welding; Mechanical properties; ANN; Modeling.

A Study on the Effect of Process Parameters of Laser Hardening in Carbon Steels

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Abstract

Surface hardening at functional areas of engineering components is an energy saving process. The components made of En8, En24, En36 and HCHCr steels are hardened in specific areas to meet the functional requirements at effective cost. The formation of martensite structure, leading to hardening, is decided by the composition of the material. Laser beams are used to perform hardening with almost zero deflection. The experimental study is to optimize the process parameters and selecting suitable material for manufacturing components working under critical loads. A 150 W, CO2 continuous wave laser source has been used in the experimental study. Power and scanning speed are the major influencing parameters in hardening process. The results showed that reducing the scanning speed increases hardness and depth due to increased interaction of beam with the work piece. Increasing the power starts melting the surface due to increase in energy. Improved hardness and wear resistance were observed in specimens with higher carbon content.

Keywords: Carbon steel, CO2 Laser, Surface hardening, Hardness and Wear resistance.

Process Optimization of GMAW over Aa6351 Aluminium Alloy using ANN

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Abstract

Welding of Aluminium and its alloys are becoming very crucial and increasingly significant now-a-days. Researchers around the world are taking up the challenges in analyzing the weldability of aluminium and its alloys. One of the aluminium alloy AA6351 is used for its medium strength with good fatigue and impact resistance and for its extrusion property. Only few researches have been done regarding welding of Aluminium AA6351 using GMAW welding process. In this paper, efforts are made to study welding of GMAW over AA6351 and to examine the optimum weld parameters for the same. Taguchi L9 orthogonal array deign is used to conduct the experimental runs. The controllable parameters which affect the GMAW process that are considered in this paper are welding current, shielding gas flow rate and electrode feed rate. Parameters that are affecting the weld bead geometry which are related directly to the weld bead viz. weld bead width, penetration depth, reinforcement height, dilution percentage are considered as responses. The GMAW welding process is optimized using Artificial Neural Network in MATLAB® software with respect to the maximum percentage of dilution.

Keywords: GMAW, Aluminium Alloy, AA6351, Process Optimization, Artificial Neural Network

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Modal Analysis of MWCNT Reinforced AA5083 Composite Material

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Abstract

Material selection for structural application is the one of the major challenges faced by the designer because of the development of newer materials in the recent past. Aluminium alloy 5083 is widely used for structural applications due to its strength to weight ratio and resistant to corrosion environment. By adding, Multi-wall Carbon nanotube with Aluminium alloy 5083 in different compositions, the mechanical property of the composite material is enhanced. Mechanical properties of the material play a vital role for evaluating the frequency and deformation under different loading conditions. In this present work using Finite Element Method, free vibration study was carried out to find the natural frequency for the alloy and composite material. Modal analysis results show, the shifting of frequency than for the composite materials compared to the base alloy due to the addition of Multi-wall Carbon nanotube (MWCNT) and the results are validated using analytical method. The findings lead to selection of the operating conditions for the dynamic structural applications to avoid failure due to resonance.
Keywords: AA5083, Multi-wall carbon nanotube, Compo-casting, Damping capacity, Resonance;

Effect of inlet valve modification on swirl ratio in a compression ignition engine

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Abstract

The effect of turbulence on the compression ignition engine has the influence on combustion and engine performance. Obstructing the air entering into the combustion chamber has the turbulence effect on the combustion. An inlet valve taken from the diesel engine was modified to make obstruction in the intake air flow into the cylinder. The turbulence effect between the normal valve and the modified valve was compared using the CFD fluent software. From the analysis, it is found that the designed obstruction has a better effect on turbulence and the turbulence energy has been doubled.
Keywords: Swirl, Turbulence, Inlet valve, diesel engine, combustion, compression ignition

Prediction of Tensile Strength and Elongation in Hybrid Aluminium Composite Using ANN

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Abstract

A feed-forward back propagation neural network model was been developed to predict the tensile strength and elongation in LM6 aluminium alloys reinforced with SiC and flyash. The particulate size and weight percentage of each of the reinforcement has been varied in the study. The hybrid composites, prepared by stircasting as per the combination of parameters determined using central composite rotatable design, were tested in UTM. Closeness of ANN prediction with experimental values demonstrated that multi layered feed-forward back propagation network can be used to satisfactorily predict the tensile strength and elongation in hybrid MMC.
Keywords: LM6, SiC, flyash, ANN, tensile strength, elongation, composite

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Investigation of Antimicrobial Activity of Medical Grade HEPA Filter with Copper Deposition

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Abstract

Alarming threat in the hospital environment is the nosocomial infections one such to mention is ventilator associated Pneumonia (VAP). The incident of the infection due to micro organisms is increasingly reported even after motivation of appropriate measurement and hygiene practices. The pore size of the HEPA filter (high efficiency particulate air filter) is minimized by depositing copper using DC sputtering by making single, double and triple coating in such a way the sputtering is done for 30 seconds, 1 minute and 1minute 30 seconds. The pore size is reduced significantly from 17.437 μm for uncoated HEPA filter to 4.3811 μm for triple layer copper coated HEPA filter observed using optical microscope and pore size analyzer. The efficiency of the medical grade HEPA filter is compared with the copper coated HEPA filter using microorganism growth test over time which shows the amount of bacteria in the sample. The results of the test incubated for various duration of time shows a control in the bacterial growth for the copper coated HEPA filter than uncoated HEPA filter.

Keywords: Ventilator associated pneumonia, medical grade HEPA, copper deposited HEPA (Cu-HEPA)

Investigation on the Microstructure and Wear Characteristics of Heat Treated Hybrid Aluminium Composites

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Abstract

The present work aims to investigate the wear characteristics of heat treated Al 6061 Silicon carbide - Graphite particulate reinforced hybrid composites subjected to the constant aging duration of 4hr.The composite specimens were prepared for different weight percentages of SiC and graphite particles through stir casting, followed by the heat treatment on cast Al 6061 alloy and its composites at a specific temperature of about 803K for 1hr followed by quenching in water. The aging of the quenched samples was done artificially for the constant duration of 4hr at a temperature of about 448K. After fabrication, the hardness of the specimens was also measured. The microstructure of the specimen, before and after heat treatment was observed using scanning electron microscope and the wear behavior is predicted using the pin-on-disc apparatus. From the results of Scanning electron microscope, it is observed that the abrasion and delamination are the predominant wear mechanisms. It is evident from the results of hardness measurement that hardness increases with a decrease in the weight percentage of graphite particulates. It was found that the wear resistance of the specimens increases with increase in aging duration during the observation of wear. This is an original research work carried out in aluminium composites and the outcome of this work is useful to the automobile industries for making brake drums.

Keywords: Aluminium composites, Wear, composites, Heat treatment, Hybrid composites, Hardness, Surface roughness.

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Pharmaceutical Inspection using Machine Vision

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Abstract

In pharmaceutical industries, tablet tracking and sorting is the major task that needs to be done at final dispatch. Manual sorting is the traditional approach that has been preferred by industries. In this approach, visual inspection is performed by human operators. This traditional approach is tedious, time-consuming, slow and inconsistent. Therefore the efforts are made to design and implement the technique of automation to determine colour based tablet inspection and sorting using image processing technique. In this paper, image of a colored tablet strip which is rolling over a conveyer belt has been captured using appropriate image acquisition device. Using image processing, the tablet of desired color has been tracked using thresholding technique. Once the colour of the object is determined, the system will automatically inspect and sort the objects as per its colour and counts in the strip. In this machine vision system, algorithm for tablet colour determination has been developed in MATLAB software and object sorting assembly has been designed using Arduino microcontroller circuitry.

Keywords: Pharmaceutical, Tablet Tracking, Machine Vision, Image Processing, Thresholding, Object Sorting.

Automated pH Monitoring System for Dyeing Process

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Abstract

A pH monitoring system for the continuous working situation in the Bio-Chemical dying industry is designed and fabricated. Our problem is to design a pH monitoring system to be used in the high temperature and high pressure environment for the bio-chemical dyeing industries where the usage of various synthetic chemicals for pH maintenance is reduced. The sensor selected is 396R/396RVP Retractable pH/ORP Sensor with maximum pressure specifications of 150 psig (1136 kPa [abs]) and silcore™2technologies provide increased sensor life when used in elevated temperature applications. The microcontroller due to simple approach, Arduino UNO with 16MHz clock speed and 7V to12V input is selected. The program with the set of functions and control limits for various color codes is written using Arduino C and uploaded to microcontroller. The program includes the control limits for various colors.

The color selection is done through the Numpad Code input. A Numpad input module is connected with the microcontroller module through which the Color code input is given. The microcontroller is programmed to send signal to two terminals - one to indicate the operator and another is a direct signal to stop the complete operation through emergency stop system on the control limit breach. This monitoring system will pave the way to more chances for survival of eco friendly dyeing culture through decreasing the recycling cost by reducing 12000 to 15000 ppm TDS(Total Dissolved Salt) in the used water.

Keywords: pH monitoring system, Arduino, TDS

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Extrusion Process Parameters Optimization using Hybrid Algorithm

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Abstract

Extrusion is the process, in which a block of material is forced in to a die orifice to get the required shape. Dies for extrusion can be designed using various methods. Here in this work, upper bound solution is used for formulating the mathematical model for the extrusion of circular rod through a conical converging die. A Hybrid Algorithm, combining genetic and simulated Annealing Algorithm, is used to minimize the extrusion Pressure by optimizing die cone angle and friction factor. Results are shown graphically.

Keywords: Extrusion, Hybrid Algorithm, Cone angle and Friction factor.

Power Optimization of Unmanned Aerial Vehicles using solar energy

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Abstract

Unmanned aerial vehicles (UAV's), widely known as drones are being extensively used for many applications including defence and commercial needs. Though UAV's are being widely accepted, there are few limitations of its own. One such limitation is the endurance that the vehicle can achieve with the existing power source used. Hence, this paper is proposed to motivate research on aerospace renewable energy sources and primary aims was to make calculations and respective designs to create an e-aircraft model, capable of powering its flight using solar energy, overcoming the challenges by increasing the range and endurance of the UAV using the solar power. The creation of power depends on the working geographical region, climate and number of solar cells used on the UAV. The project deals with the design, construct, flight test of a solar powered UAV. Finally, a prototype will be developed which has better range and endurance.

Keywords: Border surveillance, image processing, renewable energy, solar cells, UAV.

Open cv Based Autonomous RC-Car

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Abstract

Controlling the traffic in the metro cities is the huge due to increase in the vehicles population and increase in accidents too. To prevent, many of the plans are implemented but fails. To overcome these problems we come up the idea of "Controllable Traffic Autonomous Car". The cars most nowadays are smart we utilize that idea and make a prototype which control according to the traffic signals and to prevent the accidents by the machine learning prediction and image processing technique. The main controlling unit if the car is raspberry pi which teaches the car to move in the path and to stop when the red signal in the traffic, to maintain the speed and to stop the car if it get collide with nearby vehicles. The distance between the cars is monitored with the help of ultrasonic sensor. It also associated with the GSM and GPS technique to locate the car and to alert in case of the emergency situations .The result that going to obtained based of the qualities of the image frame from the camera and the collision avoidance according to the sensor data from the ultrasonic sensor. The machine learning and the image processing are done by using the opencv module in python. The self is going to done by the convolution neural network and the object prediction by the harr classifiers. The advance is going to done by the deep learning of the objects

Keywords: Open cv haar classifier, Monocular vision, Region of interest (ROI), Hue saturation value (HUI).

Automatic railway gate control using magnetic sensors

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Abstract

The main objective of this paper is to reduce the number of accidents taking place due to level crossing by automating the railway gate at level crossing which replaces the gates operated by the gatekeeper. In general, the gatekeeper receives the information about the arrival of the train from a nearest station. When the train starts to leave the station, the station in-charge informs the gatekeeper to close the gate and the gate is closed. In situations where the train is late due to some reason, the gates remain closed for long durations causing dense traffic jam near the gates. This too can be prevented by automation. The proposed system uses the Magnetic sensor (Hall Effect sensor) to detect the arrival and departure of trains at the railway level crossing and Arduino to control the opening /closing the gate. The system uses one Hall Effect sensor to detect the arrival of the train and another Hall Effect sensor is used to detect the departure of the train. When the first Hall Effect sensor receives the signal, the buzzer at the railway crossing will blow, the signal turns to red and motor is operated to close the gate. When the train departure is detected by the second sensor, the traffic signal turns green and the motor is operated to open the gate. Thus, the automation of the gate operations at the railway level cross is achieved using sensors.
Keywords: Automation, Hall Effect sensor, Railway level crossing

Finite Element Analysis of landing grid Ship Assembly For 6.5 Tonnes in Vertical Loading conditions

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Abstract

The parts considered for analysis are the Grid and the grid support, which is mounted on the upper deck of the ship. Ship deck is meshed using shell mesh of shell 63. Support pins between the grid and the grid support are modeled as tapered beam of circular cross section as they have different diameter at ends. The support pins are modeled using beam44 element type. The grid is meshed with tetrahedral elements solid 45 and the grid support is meshed with hexahedral elements solid 45.The grid assembly is to be analyzed for vertical loading conditions and to calculate the stress and the deformation by using FEA Methods .
Keywords: Shell Elements,FEA

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Fluid Flow and Heat Transfer Analysis in a Micro-Channel with a Baffle

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Abstract

In the present study, heat transfer and pressure drop characteristics of a primary vortex in a micro-channel with step flow are investigated by introducing a baffle in the flow field, which isa two dimensional computational domain. The height and the location of the baffle are considered to be the factors affecting the heat transfer augmentation. Two dimensional mass, momentum and energy equation are solved using finite volume method. The flow is assumed to be laminar and steady in the presence of vorticity for the Reynold's number (Re=117). This numerical study reports that the baffle has enhanced the heat transfer and the parameters influencing the heat transfer enhancement have been optimised.

Keywords: Laminar, Steady flow, Primary flow, Heat Transfer augmentation

Shear Strength of High – Strength Steel Fibre Reinforced Concrete Rectangular Beams

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Abstract

In IS 456-2000, the design equation proposed for shear strength of concrete beam does not consider the effect of steel fibres. In this paper, the experimental shear strength by various authors and the predicted shear strengths using the proposed equations in the literatures were reviewed and also experimental investigations were carried out on the shear strength of High Strength Steel Fibre Reinforced Concrete rectangular beams of characteristic compressive strength 80MPa. The ratio between the experimental and theoretical strength possess wide variation, so an equation is suggested for shear strength by comparing the experimental results with that of the theoretical results. Six beams were tested with varying fibre content and shear-span to effective depth ratios. The experimental results were compared with the strengths obtained using the equations proposed in the literature and also with the analytical results. This study reports that the ultimate strength increases significantly as the fibre content increases.

Keywords: High strength Concrete, Steel Fibres, Beam, Shear Strength, Analytical model.

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Characterization of Particulate-Reinforced Aluminium 7075 / TiB_2 Composites

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Abstract

Aluminum-based metal matrix composite (MMC) materials are used in the design of ground transportation vehicles and aircraft due to its light weight and high strength to weight ratio. Compared with conventional, unreinforced alloys, composite materials usually exhibit higher strength, both at ambient and elevated temperatures, as well as good fatigue strength and wear resistance. Stir casting process is one of the most effective methods for manufacturing Metal matrix composites (MMCs) due to its high volume reinforcement and fairly uniform distribution. This work deals with the production of Aluminium 7075 alloy reinforced with TiB_2 particle. The composites were fabricated by three varying the volume % of Titanium diboride (TiB_2) particles. The mechanical properties and microstructure analysis are identified from the experimental results and the ability of the manufactured aluminium matrix composite from the different reinforcements.

Keywords: Metal matrix composite, Reinforcement, Microstructure, Mechanical properties;

A review of Advanced Casting Techniques

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Abstract

Nowadays, in the area of casting, the focus is on cost and resource efficient production of increasing complex shapes, miniature precision component along with the considering environmental issues,put an all stringent requirements on the advances in casting technology. Casting is the primary manufacturing process is being developed at each and every stages over centuries of years to satisfy the needs of the customer. This paper reviews most of the advanced casting techniques and their advantages, limitations and applications in the field of engineering. The paper is divided into four sections, the first section details about the casting process within expandable mold with expandable patterns such as investment casting, full mold process and replicast process. The second section describes about the semisolid process such as thixocasting, rheocasting and thixomolding. The third sections explains non-bonded sand molding process such as vacuum molding and magnetic molding and the fourth sections associates with the centrifugal casting process such as De Lavand process and Moore casting process.

Keywords: Semisolid process, Centrifugal casting process, Replicast process, Expandable Mold with Expandable Patterns

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Investigation on wear behavior of Al6061 hybrid metal matrix composite in braking applications

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Abstract

The present article investigates the dry sliding wear behavior of Aluminium 6061 hybrid metal matrix composite (ALHMMC) and compare the results with cast iron(ci). The (ALHMMC) possess light weight, low corrosion and high strength which offer unique property, which can use in automobile brakes. The main objective of this work to investigate the sliding wear behavior of al6061 composites reinforce mos_2 particles and to optimize the process parameters in braking applications. the composite were prepared by using stir casting technique and optimization were done by using taguchi technique. The optimal combinations input parameters which will positively influence the wear rate and coefficient of friction. Dry sliding wear test method wasused to conduct the experiments by using pin-on-disc wear testing machine. design of experiment was selected for analysis of the data. Investigation about applied load, sliding speed, sliding distance on wear rate and coefficient of friction during wearing process was carried out using ANOVA. results show that applied load has the highest influence followed by sliding distance and sliding velocity.

Keywords: Aluminium Hybrid Metal Matrix Composite(AlMMC), Wear, Stir casting, pin on disc, Design of experiments (DOE), brake

A Review of Cofiring Technologies to Reduce Greenhouse Gas Emissions from Coal Fired Power Plants

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Abstract

The need for finding renewable sources of energy together with the necessity of searching for new technologies to reduce the negative impact of waste accumulation has led to the possibility of using biomass as an alternate fuel, especially in electric utilities. Most of the industrial sources of pollution come from coal-fired power plants, which necessitate the need to find ways to decrease the Greenhouse gas emissions from these. Also, the ratification of the Kyoto Protocol and the tightening environmental regulations means that by the year 2008, countries would need to implement measures to meet these standards. One of the options that need to be considered is the application of cofiring technologies to coal fired power plants. In this paper, we seek to review the various cofiring technologies available and also at the methods by which these standards could be met.

Keywords: Renewable energy, biomass, greenhouse gas.

Low Power Real Time Surveillance CCTV Recording using Msp430

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Abstract

In recent day's conventional CCTV surveillancesystem recording continuously, so it occupies huge memory space and power consumption even there is no object in monitoring area. In addition the continuous CCTV surveillance recording consumes more time to review the stored video. Aforesaid parameters limit the effectiveness of traditional CCTV surveillance system. The proposed CCTV system initiate the recording

process whenever the object movements in the camera coverage area. This system provides solution for enhancement in recording system. Proposed CCTV surveillance system uses MSP430 controller, microwave motion sensor and camera. When object movements in monitoring area are identified by the microwave motion sensor, MSP430 controller enable the memory storage system. While no movement of object in coverage area, the system avoids the video recording. So that the system utilizes less electric power, reduced memory space and reduces review time of stored video.

Keywords: MSP430 Controller, Microwave sensor, CCTV, Digital video recorder, Light source.

Generate Electricity from Hybrid Road Speed Breaker

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Abstract

A hybrid energy system usually consists of two or more energy sources used together to provide increased system efficiency as well as greater balance in energy supply. “Conversion of potential energy to electrical energy” is the basic principle of our invention. A crank shaft mechanism is used to generate power when a vehicle moves up on a speed breaker. Piezoelectric and hydraulic system is used in addition to the above to build a hybrid system in production of electricity.

Keywords: Hybrid, Crank Mechanism, Piezoelectric, Hydraulic.

Driver Fatigue Detection Using Image Processing and Accident Prevention

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Abstract

Driving at night has become a tricky situation with a lot of accidents and concerns for the transport authorities and common man especially because of the increasing heavy vehicle movement. The drivers are forced to drive with minimal rest which takes a toll on their driving capability after a few days of continuous driving leading to reduction in their reflexes and thus causing accidents. In most of the cases of accidents, fatigue is found to be the reason for nodding off. In this paper, a system is developed to detect if the driver is sleepy through eye movement detection of the driver who is driving the car. Analysis and detection is carried out by means of image processing and alert system to alert the driver as well as others is developed in hardware along with a control system to stop the car after ascertaining the position of the car and nearby vehicles.

Keywords: Fatigue, Sleepy eyes detection, accident prevention, alert system, car movement control

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A Novel Method of Supervision and Control of First Order Level Process Using Internet of Things

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Abstract
Level process is one of the basic parameters which play a major role in most of the power plants and other process stations right from huge power plants to breaking oil level measurement in vehicles and also water level in domestic purpose. The level measurement and control is much important since the level is one aspect which intends to change or disturb other parameters. The level process is one process where its value changes continuously and rapidly and takes more effort for process monitoring and control. On a part of controlling levels in tanks in industrial applications the most widely used controller is the Supervisory Control and Data Acquisition to acquire values and present it in GPU, the monitoring of process value is local and lagging in remote accessibility. The measurement of level is a continuous process where the variable changes continuously with respect to time for which monitoring is required in remote places. This Proposed work, deals with the implementation of multi position, discontinuous controller for the level process system with the usage of raspberry pi module acting as controller of cloud database (Thingspeak) for storing and retrieving data for remote accessibility. Hence this level process prototype helps in controlling and remote monitoring the level process parameter used in most of the industries.

Keywords: Level Process Station, Internet of Things, Raspberry Pi, Cloud Computing, Data logging, Discontinous Controller

Electrical Demand Response Using Electric Vehicle and Renewable Energy Sources

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Abstract
The modern civilization and urbanization has led to the increase in conventional transportation and industrialization. This has created enormous CO_2 emission which drastically degrades the environment. Hence, this is a urgent need to find alternate sources of energy for transport and industry. This paper proposes a new energy management system for controlling electric vehicles and renewable power sources which are considered as alternative solution for CO_2 emission. The system includes standalone PV system and plug in electric vehicle. The demand side management is designed such a way that the load is splitted in the two modes namely online and offline mode. During online mode based on pricing and demand like Time of use pricing, critical peak pricing, real time pricing, peak load reduction credit criterias to be used. In offline mode based on previous and forecasting data we are classified in to peak hours and off peak hours. Smart meter is used to calculate import and export powers and IoT technology is used to manage all the things like data logging online price fetching process. In this paper we are dealing with MATLAB/SIMULINK model for PV and Electric vehicle and their corresponding simulation results.

Keywords: Plug-In Electric Vehicle(PEV), Photovoltaic system(PV), Online mode, Offline mode, Peak demand, Off peak demand, Time of Use(TOU), Critical Peak Pricing(CPP), IoT, Smart meter.

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Performance Analysis of Multilevel Spatial Modulation of DM Technique (MLSM-MIMO)

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Abstract
Multiple–Input-Multiple-Output (MIMO) techniques are the key technology for next generation wireless communication standards, since it provides improved performance with bandwidth efficiency. The applications such as high speed internet, multimedia data transmission, and medical telemetry data which include images need high data rate transmission. The need for wideband channel and the scarcity of the available wireless spectrum are the main driving forces believed the development of new technologies such as adaptive coding techniques, STC, UWB, MCM and OFDM for the future generation wireless communication standards. MIMO-OFDM is a powerful combination and has already been adopted in many of the wireless standards to enhance system capacity. The main problem with these systems is increasing in computational complexity. Multilevel coding and multistage decoding has been proposed as a solution. In this paper MLSTTC-OFDM and MLSM-OFDM have been proposed and analyzed over frequency selective fast and slow fading channels. Simulation results show that MLSM-OFDM outperforms MLSTTC-OFDM over correlated fast and slow fading frequency selective channel conditions with 40% less computations.

Keywords: Multiple–Input-Multiple-output (MIMO), Orthogonal frequency Division Multiplexing (OFDM), Fading channel, Multilevel coding, multistage decoding, STC (Space Time Coding), SM (Spatial Modulation)

Solar Powered Intelligent Street Lighting System for Highway Application

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Abstract

With the increased energy crisis and global warming, energy saving is inevitable with proper selection of renewable resource. The proposed system relies on effective use of solar energy to drive the street lights. Infrared (IR) sensor and LDR (Light Dependent Resistor) are employed in design for detecting motion of vehicles and atmospheric lighting conditions. Relays are used for switching between grid and solar power based on power availability. Light Emitting Diodes (LED's) are employed for lighting purpose. GSM module is directly interfaced with the controller to intimate the failure condition of the lamps to the specified authority. The system is developed using microcontroller and practically implemented for realization.

Key words -Energy saving, LDR, Microcontroller, IR sensor, GSM module, Solar street lighting, LED's

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Broadbanding Microstrip Patch Antenna Using Electromagnetic Band Gap Structures

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Abstract

In this paper design, simulation and fabrication of Wideband Microstrip Patch Antenna has been done by inserting Electromagnetic Band Gap (EBG) structures. Microstrip patch antennas suffer from a number of limitations as compared to conventional antennas. The bandwidth, efficiency, gain and power handling capacity of microstrip patch antennas are low compared to conventional antennas. Using EBG structure with Microstrip patch antennas increase their gain, improve their radiation pattern and reduces the side lobe and backlobe levels. The antenna has been designed for the 4 GHz to 6 GHz frequency range of operation. The Simulation of the antenna characteristics has been done using CST microwave studio. The simulation and fabricated results for return loss and radiation pattern are presented.
Keywords—Wideband Microstrip Patch Antenna; Electromagnetic Bandgap; CST Microwave Studio

A Circularly Polarized Triangular Slot Reconfigurable Antenna for Wireless Applications

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Abstract
In this paper, a circularly polarized triangular slot reconfigurable antenna is proposed for wideband application using switches. Reconfigurable antennas are designed to cover various wireless services operating over a wide frequency range. To achieve circular polarization, inverted L shape strip is attached to the ground plane. Gain enhancement of the proposed antenna is achieved using a double layered square loop frequency selective surface (FSS). The ON and OFF states of the switch provide wider bandwidth and multiple narrow bandwidths respectively. The proposed antenna has been designed and simulated using High frequency structural simulator (HFSS).
Keywords: Reconfigurable Antenna, CPW Feed, Circular Polarization, High Gain, Frequency Selective Surface.

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Implementation of Data Gathering System using Mobile Relay Node in Wireless Sensor Network

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Abstract

Wireless Sensor Networks (WSN) are infrastructure-less network to monitor and share the physical conditions in the environment. There is a growing need for securing the data sharing in WSN. Because it is vulnerable to access unauthorized. In this paper, data sharing is secured by context based cryptographic algorithm which is not only depends on secret key but also depends on context which is set by the sender. To collect secured data from the sensor nodes, Mobile Relay Node (MRN) is used. It is a mobile device which roams around the network for data gathering using Wireless Personal Area Network (WPAN). The sensor nodes and data center are developed using ARM LPC2148 Processor and Mobile Relay Node (MRN) is developed using PIC16F877A microcontroller. To evade the illicit access of the data, context based cryptographic algorithm is developed and loaded into the ARM based sensor nodes and data center.

Keywords – Wireless Sensor Network, Mobile Relay Node, Wireless Personal Area Network, ARM LPC2148, PIC16F877A, Cryptography.

IOT Based Smart Security and Monitoring Devices for Agriculture

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Abstract
In the real world, many farmers face problem in monitoring their farms. The farmers have more difficulties to monitor all the farms at the same time. Hence the project is developed to monitor the farms in the field using the concept of IOT (Internet of Things). Temperature level, soil moisture and water level are monitored according to the readings of these sensors and the pump is switched on to provide adequate water to the fields. Here all the data's are parsed into the server and are able to monitor the plants continuously and easily able to monitor the health of farms. By using the IOT, the development time gets reduced and thus time for monitoring the farms. Also need not to worry about the health of crops and the readings are displayed in the server automatically through the wireless network. The pump can be switched ON or switched OFF from any part of the world using the concept IOT (Internet of Things). Moisture sensors sense the soil moisture content and switch on or off the pump according to the readings displayed in the web page. Temperature sensor sense the heat in the atmosphere, according to the climate, the switch will be automatically ON/OFF motor.

Key words: PIC (Peripheral Interface Controller), IOT (Internet of Things), A/D(Analog to Digital converter), Wi-Fi(Wireless Fidelity), SQL(Structured Query Language), HTML(Hypertext Markup Language), PHP(Hypertext Preprocessor).

Design and Stability Analysis of Buck-Boost Converter for Harnessing Energy from Bicycle Pedaling

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Abstract

As power crisis is increasing day by day a simple and eco-friendly way to generate pollution free power is the need for the day. In this paper, pedaling of exercise bicycle with efficient power conversion technique is utilized to power up the electrical equipments. Permanent magnet generator is employed to convert rotatory movement from bicycle into electrical energy. A gear setup is used to enhance the speed whenever pedaling is done. The Buck-boost converter has been used to regulate the voltage in the range of 7V to 60V generated by the PMG into 14.37V regulated voltage to charge the battery. Hardware prototype is implemented and the various voltages obtained from the permanent magnet generator at different RPM has been tabulated. An inverter circuit has been designed to supply the AC load. The stability of the converter is examined by adding damping filter. The efficiency and ripple of the converter for various values of load current are analyzed.
Keywords: Permanent Magnet Generator, Buck boost Converter; Switching frequency

Fuzzy Logic Based Direct Torque Control of Three Phase Induction Motor

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Abstract

This paper presents the comparison between three different Direct Torque Control (DTC) strategies for the speed control of Induction Motor (IM): (i) DTC strategy with Hysteresis controllers (ii) DTC-Space Vector Modulation (SVM) with Proportional Integral (PI) controller and (iii) DTC-SVM with Fuzzy Logic controller (FLC). Dynamic behavior as well as steady state behavior of all the three methods is analyzed using MATLAB/SIMULINK. Simulation results show that, the FLC based DTC-SVM gives excellent dynamic and steady state performances. Also DTC SVM gives low torque ripples and maintains the switching frequency constant.

Keywords: Direct Torque Control, Space Vector Modulation, Fuzzy Logic Controller, Induction Motor, Torque Ripple Minimization.

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Performance Analysis of Sensor less BLDC Motor Using PI and ANFIS Controller

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Abstract

The development of power electronics the converters are widely used in motor drive application. Industrial Applications make use of variable speed drives, because of its efficient performance. With the different PWM techniques projected for voltage fed inverters. , there is an increasing trend of using space vector PWM (SVPWM. It is easier digital realization, low level harmonics, concentrated switching losses. It is better DC bus utilization which is used here. In usual control and other sensing techniques there is a necessity to measure the speed and position of rotor by using sensors. It is because the inverter phases acting at any time, must be commutated depending on the rotor position whereas in sensor less control. The performance and reliability of BLDC motor drives have been increased much greater. BLDC Motor involves the estimation of parameters of drive system using Adaptive Neuro Fuzzy Inference system (ANFIS) algorithm which makes use of both adaptive neural networks and fuzzy logic for the estimation of rotor position and aims at minimization of error. This method is like a fuzzy inference system using a back propagation output layer. Therefore, the combination of least squares estimation and back propagation for membership function is used in ANFIS which tries to provide a faster and good dynamic response thereby speed control of BLDC motor. The torque ripple reduction is carried out. The results obtained by using MATLAB/Simulink.
Keywords: BLDC Motor, Sensorless Control, FOC, PI Controller, ANFIS Controller, Dynamic stability of motor.

Design of UPQC Based on Modular Multilevel Matrix Converter for Mitigation of Voltage Sag and Current Harmonics

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Abstract

The broadside of this paper is to presents a model aim to design a Single Phase Unified Power Quality Conditioner (UPQC) based on Modular Multilevel Matrix converter (M3C) which is used to mitigate Voltage Sag and Current Harmonics in the medium voltage power distribution system. This Modular Multilevel Matrix converter based UPQC consists of four identical multilevel converter arms and its corresponding filtering inductors and capacitors. In this context a five level multilevel converter is chosen as modular multilevel matrix converter which is controlled by integrated control strategy which uses the arm currents and voltages so as to reduce the Total Harmonic Distortion of load voltage and current. The simulation of Modular Multilevel Matrix converter based UPQC has been carried out using MATLAB / SIMULINK 2013. The effectiveness of the proposed methodology is validated by comparing the THD values of proposed methodology and the system with ordinary UPQC.

Keywords—Unified Power Quality Conditioner, Modular Multilevel Matrix Converter, Five leveL,Multilevel Converter, Voltage Sag, Current Harmonics.

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An Experimental Investigation of PFC BLDC Motor Drive Using Bridgeless Cuk Derived Converter

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Abstract
BLDC Motor Drives are finding greater role in low and medium power applications owing to their electronic commutation feature and superior performance. These drives combined with the usage of power electronic based converters, poses a severe challenge to the power quality with the most common problem being distorted supply current and low power factor. In order to overcome this problem, it is proposed to employ a Bridgeless Cuk Type III Converter, which has an inherent feature of providing Power Factor Correction, smooth variation of DC link voltage, current flow through a less number of switches. This proposed method has been analyzed using both Simulink Model and suitable hardware setup. The comparative analysis of simulation and hardware results indicates satisfactory performance of the proposed model in terms of power factor improvement and smooth speed control.

Keywords: BLDC, CUK Converter, PFC, Harmonics, Bridgeless topology.

Three Phase Load Balancing and Energy Loss Reduction in Distribution Network using LABIEW

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Abstract

The aim of this paper is to develop a simulation package using Lab VIEW for energy loss reduction. The daily load usage pattern of typical distribution network is to be studied for energy loss reduction. It can be observed by downloading the data from the energy meter fixed in the distribution transformer. The individual phase voltages, current, power factor can be downloaded by using common meter reading instrument. By using this VI profile, LabVIEW based simulation package is developed. It measures the power and predicts the unbalance current in three phase distribution network. The simulation package tries to shift the specific number of consumer load points for three phase load balancing.

Key words: Current Unbalance, Distribution Automation, Distribution system, Expert system, Fuzzy Logic, Lab View

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Analysis of Power Quality in Grid-Connected Wind Energy System with UPFC using Soft Computing Techniques

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Abstract
Energy is a prime factor that decides any nation's Gross Domestic Product (GDP). Reliable power from renewable energy sources has become very important in today's energy scenario mainly due to the shortage of fossil fuels. Wind energy is one of the promising renewable energy sources for the future. But the fluctuating nature of wind introduces power quality issues like harmonics and deviations in voltage waveform in the grid, which in turn affects the stability of the entire grid. This paper aims at reducing these issues using Unified Power Flow Controller (UPFC), one of the Flexible AC Transmission System (FACTS) devices. The incoming power from the wind power plant is fed through Unified Power Flow Controller (UPFC), which is connected at the Point of Common Coupling (PCC). The power quality is analysed using Total Harmonics Distortion (THD) as a performance measure which is simulated in SIMULINK/MATLAB. The UPFC is controlled using Fuzzy Logic and Neural Networks instead of conventional Proportional Integral (PI) Controller and the results are compared. It is found that the Neural Network control gives the lowest THD among all the three methods.

Keywords: FACTS, PCC, THD, WECS, UPFC, Neural Network, Fuzzy Logic.

Dimension Reduction of Multispectral Images Using PCA and Folded PCA

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Abstract
Multispectral satellite imagery provides us with useful but redundant datasets as it contains several bands of data. Analysis and implementation of such remotely sensed images is much complex and takes lot of time. Using dimensionality reduction algorithms, these datasets can be made easier to explore and use. In this paper, Principal Component Analysis (PCA) and Folded-PCA (F-PCA) in processing of multispectral satellite images have been highlighted. PCA uses orthogonal transformation to convert high dimensional data into linearly uncorrelated variables, namely principal components. Often, the number of principal components is significantly reduced in comparison to the original feature dimension. In F-PCA, the spectral vector is folded into a matrix to allow the covariance matrix to be determined more efficiently. With this matrix-based representation, both global and local structures are extracted to provide additional information for data classification. Also, it reduces the computational cost and the memory requirement against PCA method. The main objective is to reduce the dimension of multispectral images using Folded-PCA method with stopping rule. The sub objective is to compare the performance of the proposed algorithm with existing algorithms such as PCA.

Keywords: Dimension reduction, Feature extraction, Folded-PCA (F-PCA), multispectral imaging, Principal Component Analysis (PCA)

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A Low Cost Quad-Band Microstripline Bandpass Filter for Cellular, C-band downlink and WLAN Applications

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Abstract
The proposed work includes, a quad band bandpass filter design using open stub methodology which will reduce the insertion loss and improve the return loss for the applications like Cellular with a frequency band of 1.9-2.6 GHz, C band downlink with 4 GHz frequency and Wireless Local Area Network (WLAN) with 5 GHz and 5.4 GHz frequencies. Microstriplines for the band pass filter are designed using FR4 substrate with a dielectric constant of 4.6 and a thickness of 1.6. The proposed open stub microstripline band pass filter is simulated using the Advanced Design System 2016.01 (ADS) simulator and the performance measure is analyzed using the results obtained.

Key words: Bandpass filter, quad band, microstripline, ADS, C band downlink, cellular, WLAN.

MPC for Internal Temperature of Distillation Column in Petroleum Refineries

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ABSTRACT
In petroleum process industries, fractional distillation columns are used to extract the different end products from crude oil. Distillation columns are more complex and non-linear in nature. The optimum control for extracting the end product from the fractional distillation columns will be difficult and it is one of the major threats for the process engineers in the refineries. Petroleum refineries fractional distillation columns are used to extract a maximum of fifty by-products from crude oil with various temperature level of volatile component of crude oil. Due to temperature variation that occurs during nights, winter session and heavy rainfall, the internal column temperature of the fractional distillation columns will be affected and this leads to the decrease of the quality of the end product. The continuous temperature variation of a fractional distillation column is the critical process variable to control within a preset limit as the internal temperature tends to decrease due to environmental conditions. The stability and purity of the end product in a distillation column is in relation to the internal temperature of the column. But it is very difficult to maintain a constant value of the internal temperature by using a conventional control methodology (P+PI+PID). To overcome the drawbacks of the existing system, Model Predictive Control (MPC) is been introduced and implemented.

Keywords: MPC, Distillation Column, Internal Temperature, feed flow, feed temperature, coolant temperature.

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Functional Distance Based Test Vector Reordering for Low Power Testing of VLSI Circuits

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Abstract
Power dissipation in latest VLSI circuits and systems is not only an issue during design part but also during testing phase. Testing is an experiment in which the circuits are exercised with binary patterns called test vectors to detect the faults. Literature survey results show that testing power raised up to threefold when compared with normal power. Main reason for this high power is that the test vectors are random and there is less correlation between successive test vectors. This randomness reduces the correlation further and hence integrated circuits dissipate more power during testing. In this research article, functional distance based test vector reordering algorithm is proposed to minimize the power dissipation during testing. Hamming distance function is used commonly in all literatures of test vector reordering. In this research article, five different functional distances are used to measure the switching activity between successive test vectors to reorder the test vectors such that the distance is minimum. Minimum distance assures high correlation among test vectors and power dissipation is minimized. The proposed method is experimented with ISCAS85 benchmark circuits to prove the effectiveness of reordering algorithm. Comparison results show that other distance functions are also perform better than the hamming distance function. Maximum power reduction of 50% is achieved for Cosine distance while hamming distance achieved 45% only.

Key words: VLSI Testing, Functional Distance, Reordering, Testing Power

Three Port DC-DC Converter for Standalone Photovoltaic System

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Abstract

The most commonly used renewable energy is the solar energy. The Efficiency and cost of the PV system is an important criterion. In this paper, a three - port DC-DC converter for Photo-Voltaic system is designed with improved forward-fly back topology. This converter is designed to achieve high step-up capability and its system efficiency improvement using multiple operation modes of a converter. In this paper, the coupled inductor which acts as the transformer provides flexible voltage conversion ratio and galvanic isolation. Switching pulses to the converter are generated by PWM and Phase shift control technique thereby giving almost constant output voltage regulation. The design of proposed converter is done with MATLAB Simulink software. The converter with three operating modes is designed and results analyzed with experimental work. The proposed converter results compared with Two port converter.

Keywords: DC-DC conversion, MPPT, PWM, Phase shift Technique

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A Novel Integrated Approach of Wind Energy Conversion Systems with Optimized Matrix Converter Fed Grid Under Different Load Conditions

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Abstract

Matrix converter uses the different techniques to produce the high quality waveforms in the input and output side and also produces the desired output compared with Back to back converter. Genetic Algorithm based PI controller with Space vector modulation technique for Matrix converter under different load conditions fed in to grid are initially presented. This is to improve input power factor and to reduce the harmonics in the output of matrix converter in the integrated approach. The input power factor varies for different load conditions. So it is required to compare the performance under different loads. Results for light and high load conditions and compared results are presented. It is a practice to implement each Wind Energy generation system in wind mills connected to micro-grid with same AC-DC-AC converter technique. Harmonic cancelling is effective but not complete in standard approach due to the dc-link voltage difference. But in the proposed method, integrated approach is used. To reduce harmonics in load and improve the input power factor, integrated approach uses optimized Matrix converter (in the previous section) to one of the WECS (Wind Energy Conversion System) and standard converter to other WECS connected to same grid of wind system. Conventional converter based harmonic performance analysis has been done and compared with integrated approach. Input power factor improvement is also achieved and compared with standard approach. Simulation results are presented which is modelled using MATLAB/Simulink. The output voltage THD, output current THD, lower order harmonics till13th harmonic and input power factor for Matrix Converter with optimized PI controller fed grid in the integrated approach are better compared to conventional Wind energy conversion systems from the proved results.

Key words: Matrix Converter, Total Harmonic Distortion, Lower order harmonics, Input Power Factor, Space Vector Modulation, PI controller, WECS.

Early stage Diagnosis of Red Lesions in Diabetic Retinopathy

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Abstract
Diabetic retinopathy is a common diabetic eye condition which is the prime reason behind a number of cases of blindness. It is caused due to variations in the blood vessels of the retina. If these variations were diagnosed at an early stage, through screening methods, the treatment and healing would be more promising. One of the key symptoms is development of red lesions like micro aneurysm and white lesions like exudates and cotton wool spots. Our work deals with the detection of red lesions only as it is a sure shot indication of diabetic retinopathy and an algorithm has been proposed to this effect.

Key words: Retinopathy in diabetic, red lesions, Digital signal processing, Fundus Image, Digital Image Processing, correlation filter.

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Dual Band MIMO Antenna Using Decoupling Slots for WLAN Applications

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Abstract
A compact dual band antenna system with reduced mutual coupling for WLAN. The antenna design is such that it operates with two loops which cover two frequency ranges. Inner loop covers 1 – 3 GHz and Outer loop covers 4 – 9 GHz frequency ranges. There exist a few methods to minimize the mutual coupling effects between antennas which lead to performance degradation. In this paper reduced mutual coupling is achieved by introducing decoupling slots by etching the ground plane below the substrate. U-Shaped decoupling slots and rectangular slots are analyzed for which the results are found .FR4 substrate is used for printing the antenna. The simulated return loss for the proposed MIMO system with rectangular slots is in the range of - 25 dB to -51 dB for inner and outer loops with VSWR of 1.5. The obtained gain is 20.95 dB.
Key words— MIMO, Decoupling Slots.

Design of Multiband Antenna using SRR Structure for LTE, Radar, ISM and X-band Applications

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Abstract

The proposed work makes use of the advantages of Split Ring Resonator (SRR) structure in antenna which improves the return loss characteristics at the desired frequencies as well as the multiband behaviour of the antenna. The compact, low profile and cost effective multiband antenna was designed for the frequencies of Long Term Evolution (LTE), Radar, Industrial, Scientific, and Medical (ISM) radio band and X-band applications. Flame Retardant (FR4) substrate with a thickness of 1.6 and a dielectric constant of 4.6 is used for the design and fabrication of antenna. High Frequency Structural Simulator (HFSS) is used for the simulation of the proposed antenna design and the design is fabricated and tested. The performance of the proposed antenna at the desired frequencies is evaluated based on the tested results.

Key words: LTE, Radar, ISM, X-band, multiband, SRR.

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Modelling and Analysis of Single Stage Single Phase Boost Inverter

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Abstract
Solar cells are used to generate electric energy from the renewable energy source such as sunlight which can be used to charge a battery. The battery voltage is converted into 230V ac supply using inverter for driving single phase load applications like home appliances. The output of the conventional voltage source inverter is lower than its input and is used to drive the loads after removing the ripples by using filtering circuit. The main attribute of the boost inverter is that it produces an ac output voltage higher than the input dc supply depending on the instantaneous duty cycle. The output of boost inverter can be used to drive the autonomous loads and home appliances without any filter. The main advantages are low cost, less number of switches used, compact size and reduce the power processing stages into single stage.

Keywords: Solar cell, Boost inverter, Inverter, Filter

High Throughput Quaternary Signed Digital Adder Design for Portable Electronic Applications

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Abstract
The requirement for prime speed digital circuits became additional important as handy electronic applications, desegregation informatics and computing. The flinch of the recent electronic devices is high latency of Arithmetic operation; Arithmetic Circuits play an essential role in both broad-spectrum and high bandwidth computational circuit applications. To overcome the latency, we design the QSD (Quaternary Signed Digit) number system with respect to base-4 numeral system. In this proposed QSD number system, it needs a special set of prime modulo primarily based logic components for every mathematical process. The prime modulo are designed by multi level voltage scaling by using TSMC 180nm Technology. The intra and inter delay free mathematical process is achieved employing a higher number QSD number representation system which provides higher performance when put next to Binary CMOS design. An 8 bit and 16 bit adder is designed in both CMOS and QSD and the simulation outputs are verified by the ISCAS workbench circuits. The schematic design and simulation was carried by Tanner 13 and Layout design by micro wind software tools.

Key words: CMOS VLSI Design, QSD, Adder, layout design, Dynamic dissipation.

A Design, Simulation and Fabrication of Modified Sierpinski Gasket Fractal Antenna for Wideband Applications

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Abstract
As the growth of antenna systems are in rapid to achieve the higher directive gain with Broad Bandwidth.Eventhough fractal elementary antennas possess broad bandwidth but its fails to meet high directive gain expectations. In order to fulfill this high directive gain expectation, an array is normally used to increase the directive gain. Different types of fractal arrays are proposed to increase the directive gain such as Koch fractal array, Sierpinski fractal array, Cantor and so on. In this paper, a design of modified Sierpinski Gasket Fractal Antenna (SGFA), whose geometry is modified using circular shape. It is designed with relative permittivity of 4.4 and having dimensions (17.89 x 21.45 x 1.6) mm^3.The proposed antenna has return loss of -16.96 dB at 5.1GHz. Probe feed is used to feed the antenna. Antenna has a gain of 13.48dB at 9.8GHz. The simulation of proposed antenna is done using High Frequency Structural Simulator (HFSS) Software and it has been fabricated and tested for the design specification.

Keywords: Modified Sierpinski Fractal, Resonant Frequency, Return Loss, Fractal Antenna, VSWR

Simulation Study of Optical and Electrical Characteristics and Its Performance Behavior of a Quantum Dot Based Solar Cells

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Abstract
Solar cells are constructed with the incorporation of Quantum dot layers in it. This technology of using Quantum dots in the solar cells now has become an emerging area of research in the nano-technology field. A new design of Quantum dot based solar cells with the use of different material layers to study the electrical and optical characteristics of a solar cell which influences the performance is developed. Cross light-APSYS software tool has been used to design the quantum dot solar cells using ZnO/CdZnO as photosensitive layer. Bandgap energy, Concentration of holes and electrons, current trap occupancy graphs are obtained from the simulations.

Key words— Quantum dot, Solar cells, photovoltaic material, quantum confinement.

A Non Invasive Identification of Malignant Thyroid Nodules with Ultrasound Images using Textural Features Classification

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ABSTRACT
Focal and diffuse thyroid abnormalities are commonly encountered while performing computed tomography (CT) examination for various clinical purposes. These findings can often lead to a diagnostic dilemma, as the

CT reflects nonspecific appearances. Ultrasound (US) examination has a superior spatial resolution and is considered the modality of choice for thyroid evaluation. Suspicious thyroid conditions are indicated with the existence of palpable nodules with solid or cystic composition. Solid nodules have high possibility to be malignant than cystic. An effort to detect and classify the internal aggregation of thyroid nodule is a challenging area of research. Interpretation of disease condition in ultrasound imaging is operator depend. We propose a technique to automate the interpretation which works on texture analysis of histogram statistic, gray level co-occurrence matrices (GLCM) and gray level run length matrices (GLRLM). The fine needle aspiration (FNA) is a type of biopsy procedure requiring needle intervention into the area of abnormal-appearing tissue or body fluid usually used for identification of malignant lesions. It can be directly replaced with the proposed textural classification because the textural pattern is significantly different between solid and cystic nodules or be used as a guide to aid FNA. The Artificial Neural Network (ANN) Multi-layer perceptron (MLP) was adopted to do classification process for thyroid images yielding appreciable accuracy.

Key words: ANN, MLP, Texture classification, Thyroid Nodule; Ultrasound imaging.

Generation of Electricity using Waves

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Abstract
Ocean waves are huge, largely untapped energy resource. Wave energy convertors capture the energy obtained in ocean waves and use it to generate electricity. This review introduces the general states of wave energy and evaluates the device types that represent current wave energy converter (WEC) technology. With respect to the present techniques, this form of production would create an upcoming impulse.

Keywords: Ocean waves, Electricity, Wave Energy

Energy from Outer Space by the use of Hybrid Solar Cells in Space Based Solar Power (SBSP)

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ABSTRACT
Energy plays a vital role in the economic growth of a country. Everything in the world depends on the availability if energy. Energy is mainly being extracted from renewable and non renewable sources. Energy from non renewable sources has destroyed our environment. The problems like global warming is at it's peak. Extraction of energy from renewable sources like solar, wind, etc. is playing a major role. Though solar energy on earth has a lot of potential we all obviously know that only a very small fraction of the solar radiations from the space enters earth. Human needs for energy in this world are increasing day by day. The search for alternative energy sources has made human to extract energy from outer space. We all know that universe is full of energy and it has a lot of potential to meet our raising demands of energy requirement. Sun is the major source of energy in space. The basic model of solar power plants can be used in space to generate energy. Thus the maximum of sun's energy can be captured and utilized. Outer space consists of huge amount of un interrupted solar energy. So, space based solar power generation is capable of generating energy almost all the time irrespective of day and night cycle , climatic conditions filtering effects of earths atmospheric gases, etc.

Space based solar power generating system mainly consists of satellites installed with solar panels which traps solar energy and converts it to DC current which is then transformed into micro wave radiations and transmitted to earth via wireless transmission system by the use of an antenna facing towards the earth. The ground based rectennas fixed on the earth can receive these signals and convert them back to DC current. This is one of the ways of generating energy from outer space. Our idea is to enhance or increase the amount of energy received by this method. This can be done by the use of hybrid solar cells instead of using ordinary solar cells. Organic or inorganic hybrid solar cells have a lot of potential. Inorganic silicon semiconductor particles in nano size have promising properties such as high charge mobility, thermal stability, photo conducting and luminescent properties. If we use organic materials such as conducting polymers the solar cells would be easy processing, recyclable, relatively low cost, scalability, etc. In order to utilize the advantages of both hybrid solar cells with both organic and inorganic materials can be used for targeting a better power conversion efficiency.

Keywords: Space Based Solar Power, Hybrid solar cells, Si-P3HT, Nano rod coaxial Si.

Incremental Conductance Method of Maximum Power Point Tracking for Photovoltaic Array with Single Switch DC/DC Converter

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Abstract
The increase in electricity requirements of the world and the power demand has been running ahead of supply. Conventional power sources like coal, natural gas results in significant emission of CO2 into the earth's atmosphere and these sources are depleting in nature. Therefore, the world is switching over to renewable energy sources like solar, wind etc. The major advantages of these renewable energy sources are that these sources are eco-friendly and exists abundant in nature. In this paper, the focus is on the solar energy and extracting the maximum power from the solar array using maximum power point tracking (MPPT) algorithm. Also single switch DC/DC converter is used. Even though many MPPT algorithms were suggested in the literature, the Incremental Conductance algorithm is proved to be an efficient technique for solar PV system with single switch DC/DC converter. The purpose of the analysis is to determine the parameters like voltage, current and power for the proposed system using single switch DC/DC converter connected with the motor load. The entire system is modelled and simulated using MATLAB/ Simulink 2012a software.

Key words: Incremental Conductance, Maximum Power Point Tracking(MPPT), Single switch dc-dc converter.

Intelligent Controller based Dynamic Sag Compensator

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Abstract

Switching of heavy loads and abnormalities in the utility grid cause voltage sag, swell, flicker, interruptions, harmonic distortion and other power quality problems. The effects of the voltage deviations are the tripping or malfunctioning of the sensitive equipments and protective devices. For compensating the voltage sag instantaneously, an intelligent controller based dynamic sag compensator has been designed and implemented. This controller responds to the system parameter variations and maintains the voltage level constant. Photovoltaic system is incorporated with PI controller and an additional DC source is provided as a backup. The

proposed fuzzy logic control system is simpler than the model based controller. The dynamic sag compensator has been designed and implemented in Simulink environment and the result has been verified.
Keywords: Dynamic Voltage Restorer, Phase Locked Loop, Photovoltaic Cell, Fuzzy Controller, Voltage Source Converter**.**

A New Modulation Strategy of L-Z-Source Inverter in DG System

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Abstract
This paper presents on the beginning of open loop L-Z source inverter. The capacity of converters is not used for all time by reducing the harmonics in the distributed generating system. The distributed generating system is linked to the grid by using the power electronics converter. The input voltage to be boosted is done, by adding inductance and diode to the input side of power electronic converter. It reduces the inrush current and eliminates the ripples in the input current. In normal DC-DC converter is not used for the high range of distributed generating system. The special power converter need for the interfacing with grid. Based on the presentation, the proposed L-Z-source inverter will be suited. The power quality of the grid is to be improved by the harmonic reduction. The results obtained by using the MATLAB Simulink software. The obtained result is tested with it.
Key words —Inductor-Impedance Source Inverter, Total Harmonic distortion, Grid, Power Quality

A Modified Single Phase Multilevel Inverter Topology for Distributed Energy Resources

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Abstract
Distributed energy resources systems are small scale power generation which is used to modernize advanced renewable technologies to facilitate smarter grid. Even though MLI holds special features such as betterquality waveform, low electromagnetic interference, harmonic reduction but then usage of more switches in conventional MLI poses a constraint. The objective of this paper ismainly focused on single phase Multilevel Inverter (MLI) for distributed energy resources thereby minimizing power electronic switches for higher level output which essentially reduces the cost, switching losses and harmonics for real time application. The proposed inverter is modeled and compared with Cascaded H-Bridge MLI; simulation results are shown for 15-level and performance of MLI is validated using MATLAB 7.10 version (Simulink).

Key words: Multilevel inverter (MLI), gate pulses, distributed energy resources (DER), harmonics, switching losses.

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A Dynamic Carpooling System with Social Network Based Filtering

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Abstract
In this 21st century, India is the second largest populated country in the world. According to the future projection of population growth, India will reach more than 5.4 billion people around 2030. Population is concentrated more in urban areas than in rural areas [1,2]. People prefer to travel by car than using a public transport system. As a result, the problem of traffic congestion increases heavily. In order to overcome the problem, a Real time ridesharing is proposed. This method is put into an operation by developing an Android application. Real time ridesharing is an extension of carpooling to best suite one's preferences using the data composed from Social networking. It enables users, particularly colleagues, classmates to share their vehicle among the fellow passengers to the same or nearby destination. The system gives real time guidance in a map, with addition to ridesharing. Users can either set their travel to be private or public by making to available to some of their friends using privacy settings. The concept can also be extended to taxis and rickshaws and can also be implemented in any other public transport systems. Execution can be done by integrating with social networking sites, by identifying the location using GPS. For simplicity this is mainly incorporated in mobile phones. The system supports the use of mass public transport system and taking a trip together will become obligatory to manage the depletion of fuel, making the atmosphere green and to control traffic.

Key words: Web service, Client application, Carpooling, Rating services, Ridesharing.

Smart Public Transportation System using Android App

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Abstract
Road transport is highly affecting the routine activities of the people due to over population and availability of poor resources. In order to utilize the precious time available in an efficient manner an Android App could be a solution. This paper aims in providing a dynamic time chart for the Public who rely on the bus transport facilities. In the proposed work the Android App continuously sends information regarding the location of the bus to the database linked with the APACHE server. The database also contains the distance and the location of the bus stop. The time taken to reach the destined bus stop is calculated using the database. On opening the webpage the publics can select the bus stop and view the arrival time of the buses to the respective bus stop. By linking the app with the traffic monitoring system of that area an accurate arrival time of the buses could be predicted to suite the real time scenarios

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Colour Image Encryption Using Chaotic System

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Abstract

In this paper, color image encryption using the chaotic algorithm for a highly secure transmission is proposed. The RGB image matrices are divided into blocks of 16 pixels such that every 16 pixels will be encrypted with different session keys using chaotic logistic map. This is done by changing the initial condition with change in key for every block of pixels. The proposed scheme utilizes two chaotic logistic maps and an external key of 80-bit. To make the cipher more sheltered, the secret key is customized after encrypting a block of pixels of the image. To improve the speed and Accuracy, the number of blocks of pixels for which the key has to be changed, is increased. The results of several experimental, statistical analysis and key sensitivity tests show that the proposed image encryption scheme provides an efficient and secure way for real-time image encryption and transmission.
Key words -Secure image encryption, Logistic map, Pixels Block division.

Comparative Study of Pentagon Shaped Patch Antenna with Different Substrates operating at WLAN Frequency

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Abstract
Microstrip antenna finds a great attention for the past four decades due to their low profile, low cost and ease of fabrication. This work presents a design and analysis of pentagon shaped patch antenna operating at 5.8GHz (WLAN frequency). Substrate plays a vital role in the design antenna in terms of Miniaturization and bandwidth broadening. The comparative study is made by choosing different substrates such as FR4 and Roger in the design of proposed antenna. The effect of changing substrate material for the given antenna is observed in term of its gain, directivity, return loss, VSWR and Bandwidth. Size of the antenna is $25\times25\times1.6$ mm^3 makes it convenient for wireless communication systems. High Frequency Structure Simulator (HFSS) software is used to simulate the proposed antenna design.
Key words: Patch Antenna, Substrates, FR4, Roger, WLAN

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Quantum Key Distribution (QKD): A Review on Technology, Recent Developments and Future Prospects

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Abstract
Quantum Key Distribution (QKD) provides promising secure communication, the crucial need for online security in Public Key Infrastructure (PKI). QKD is mainly used for distribution of keys securely between two parties and is a commercially available application of Quantum Cryptography (QC). QKD has the ability to enable the authenticated users to detect unwanted attempts by the intruder in trying to gain knowledge of the secret key. Through the fundamental nature of quantum mechanics, in Principle QKD has the distinction of being, unhackable. Quantum cryptography harnesses the counterintuitive behavior of elementary particles such as photons and ensures the confidentiality of information transmitted between two parties. There are many QKD protocols that provide a secure key which include BB84 protocol, BB92 protocol, SARG04 protocol, E91 protocol, COW protocol, DPS protocol ect.,. In this review the trends and challenges in Quantum Key Distribution isdiscussed .Also the contribution of QKD towards network security is presented by analyzing its strengths and weakness..
Key words: Quantum Mechanics, Quantum key distribution, Quantum cryptography, QKD Protocols, PKI, Network Security

Power Generation Using Solar Panel and IR Grid

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Abstract
Increasing power demand provokes the young minds to found alternative solution to generate power using various modes. Among the various method of conventional power generation, solar is a prominent energy source for generating power. But the availability of the same is possible only during the day time and is also affected by monsoon variations. An alternative effort to solve this problem is proposed in this paper using IR sensors. The IR sensor in a grid arrangement could be used for energizing the solar panel during the night time and even during the days of monsoon variations. This work analyzes the efficiency and driving capacity of the IR grid used for power generation. This paper also focuses on the alternatives to the IR sensor which is under the study for future development.
Key words :(Power generation, IR grid, Solar Cells, Photovoltaic Effect, LDR).

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IOT Based Accident Prevention and Emergency Services

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Abstract

In this accelerated world, many technologies have been evolved for each and every second to improve human life style. There have been massive advancements in automobile technologies and still to come. Though advancements are made for the comfort of people, there are lot of accidents taking place because of increased vehicle density, violation of rules and carelessness. During night travel many drivers feel drowsy, they fall asleep unknowingly which leads to accident. To prevent this, sensor is used to detect whether the driver is dozy or not. If the driver is dozy the driver is alarmed through a buzzer and the speed of the car is drastically reduced. Hence, reduces the risk of major accidents. If accident occurs due to other reasons like violating the traffic rules then the accident is detected by a vibration sensor and the current global position of the vehicle is sent to nearest ambulance server by the use of Internet of Things (IoT) and ambulance can reach the accident spot immediately which in turn saves any human lives.

Key words: IoT, Traffic density, Accident prevention, Global Positioning System, Automatic Emergency services

Spectrum Sensing Techniques for Cognitive Radio Application: A Review

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Abstract
In the advanced technology, nearly 70 to 80% of the radio spectrum remains un utilized, while at the same time the other region of the spectrum is overcrowded, so we are approaching the cognitive radio network. The ultimate need for this new approach is to sense the unused spectrum, by avoiding any interference with the primary or licensed user and allocate them to the secondary users, thus by improving effective Spectrum utilization. Spectrum sensing is a key function of Cognitive radio networks. An important achievement of the Cognitive radio network is to utilize the unused spectrum. Detecting the primary users is the most efficient way by detecting the empty spectrum. The various spectrum sensing techniques includes Energy detector, Matched filter, Cyclostationary feature detection. The spectrum sensing depends on the sensing time and the fusion scheme for its performance. In this paper, the different techniques are going to be compared.

Key words: Cognitive radio, Cooperative spectrum sensing, Energy detection, Matched filter, Cyclostationary feature detection.

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IOT based Home Automation System through Adaptive Decision Making Fuzzy Algorithm

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Abstract

Real time automation is increasingly gets popular due to its flexibility in utilizing open source tool and adapting the new node without any complexity in programming. This paper proposes the human machine interface through context aware and decision support system using distance based fuzzy algorithm which utilizes the user's domain knowledge to frame the rules. The developed system is based on Linux OS and the algorithm is developed in python and results were stored in internet by FHEM API, used in Raspberry Pi B+ kit which is an IoT application and the mobile SSH settings using Wi-Fi modem. Using this app we can access through home automation systems by connecting IP address of the web server and also voice assisted module helps the patients to control the appliance through voice control. Effective algorithmic decision making and voice assisted automation produces the better result in automating the things in real world.

Key words: Real time automation,human machine interface, decision support system, FHEM API, Raspberry Pi B+, voice control.

Telemedicine Approach For Patient Monitoring System Using Iot

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Abstract

Accessing the hospitals in emergency situations, from any rural area for providing appropriate medical assistance is the biggest challenge in saving the life of a patient. Also, the patients who have undergone surgery should be monitored on a 24*7 basis. The above problems can be solved with a help of Health monitoring system using IoT. The proposed system continuously monitors the diagnosis parameters such as heart beat, pressure, activeness and temperature using appropriate sensors like heartbeat sensor, pressure sensor, MEMS sensor and temperature sensor. The sensed medical information is collected and stored in the database of the server which is a Raspberry Pi device. The Raspberry Pi processes these data and displays the values on the web page. It also sends the alert messages to the Doctor, Care taker as well as the patients using the GSM module connected to the Raspberry Pi. This enables the review of reports and real-time video of the patient through patient monitoring system from a remote area thereby reducing the periodical visit.

Key words: Raspberry Pi Processor, ECG Sensors, Pressure Sensors, Temperature Sensors, MEMS Sensors, IoT

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An Efficient Fuzzy Based Feature Selection Algorithm for High Dimensional Data

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Abstract
Optimization algorithms have become a common choice for problem solving which are difficult to solve by conventional methods. In this paper, a novel fuzzy based feature selection is implemented for feature reduction in unsupervised environment. Correlation of fuzzy clustering is done using fuzzy K-means clustering to make the raw data to be correlated into clusters. Optimization algorithms namely genetic algorithm, Particle Swarm Optimization are used along with an approximation technique. Each optimization technique uses rough set as a function handle and performs feature selection with necessary optimization. Then, fuzzification is done which includes the reduced feature set along with the raw data features which are not correlated based on kernel mapping method, net similarity is calculated and adjusted to the fuzzy membership value and finally plotted as several group of clusters. Then comparison is made between the optimization algorithms with real world and synthetic dataset based on the clustering quality and result is depicted.
Keywords: Optimization algorithms, fuzzy based feature selection, rough set, fuzzification, kernel mapping method, clustering quality

A New Approach to Image Retrieval Based On Sketches Using Chamfer Distance

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Abstract

Sketch based image retrieval (SBIR) is an emerging research area in which retrieval of an image is done based on input query as a sketch instead of the content of images (such as textures, shapes, colour, etc).This paper presents a new methodology for retrieval of natural images based upon user hand drawn sketches. Initially Geometric transformations are applied over the user input sketches and the testing is carried out over a data set of 100 natural images which includes 10 different types of images. Chamfer matching method has been used for the matching process between input sketch and database images. Experiments are carried out and the results are discussed based upon the performance measures such as precision and recall.
Keywords: Chamfer, image retrieval, Sketch

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Normalized page count and text based metric for computing semantic similarity between web documents

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Abstract
Nowadays, web-based metrics that measures the semantic similarity between words or terms are expected to have increasingly important in the future. Semantic similarity is a dynamic phenomenon that changes over time and across domain. The fundamental assumption is that similarity of context implies similarity of meaning, where relevant web document are downloaded from a web search engine and contextual information for words of interest are compared. We basically use two types of metrics. The first one is normalized page count based metric and second one is context based metric. These two types of metric are unsupervised metrics. It means the proposed system does not require any ontology and human resources. The result of proposed work are compared the correlation factor of different page count metrics including our normalized mutual information metric and retrieved the accuracy of web documents.
Keywords: Jaccard (J) and Dice (C) coefficients, Page Re-ranking, Semantic similarity

Automating the Irrigation System

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Abstract

In India, agriculture plays a vital role in our day to day life and the Future India depends on our agriculture. Agriculture depends on monsoon condition, soil quality to make the crops to grow and water is required to plant crops sufficiently. The field of agriculture farmers face major issues in watering their crops. It is a result of not having a correct plan concerning the supply of water facility. The farmers have to make arrangements to pump water and need to wait till the land is completely wet, that compels them to prevent doing other activities. They lose their precious time. Also irrigating water to the plant in excess, which increases the concentration of high soil content and endeavouring the plant (crops) to destroy. In this paper, automation of irrigation system based on Arduino microcontroller and GSM module is proposed and implemented. This system controls the exact condition of water level of the agriculture land based on the soil quality.
Keywords: Irrigation system, Soil moisture sensor, GSM, Arduino Microcontroller, Arduino software

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A Prototype Model for Automatic Vehicle Detection in Toll Plaza enabling Easy Entry

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Abstract
In this era of technological advancements, we are marching towards automation in every field. The technological development of any country is based upon its basic amenities and infrastructure offered to lay man. Toll plaza is a common occurrence in the day to day life of all. On the outset we see vehicles arrayed in long queues to pay the toll fee and pass through the toll gate. These toll plazas are operated manually and consume valuable journey time and fuel. Further the emission of carbon dioxide results in pollution and degrades the environment. This paper proposes a model for automatic vehicle detection in toll plaza entry by using Internet of Things technology. The proposed prototype model can also be deployed in any organization that has security checks at the gates and allows only registered and authenticated vehicles to enter the campus. This automated system involves paperless and cashless method for toll fee collection. We use cameras, sensors and mini-computers to choose the type of token the traveler wants and display the current operation status.
Keywords: IoT, Toll Plaza, automatic vehicle detection, security

An Incremental Learning with CGHSSL for Unsupervised Feature Selection of Benchmark Dataset

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Abstract

Feature Selection is a key mechanism in machine learning and pattern classification, especially for high-dimensional data. The existing unsupervised cluster learning based feature selection techniques, are not at all times accurate for the assignment of class labels, and are not enough to deal with ultra-high dimensionality dataset. To provide a solution for these drawbacks, an unsupervised feature selection algorithm is proposed by using Hybrid Support Vector Machine along with optimized realizations. This is clustering-guided with HSVM based sparse structural learning (CGHSSL). It is an integration of HSVM for the class label assignment along with a sparse structural analysis into a joint framework. Nonnegative spectral clustering is developed for learning cluster labels of the input. The prediction of the cluster labels is done by HSVM by utilizing the hidden structure shared by diverse features. The parameters of HSVM is then optimized by the Particle Swarm Optimization (PSO) that can explain the feature correlations to render the results. Row-wise sparse models are then balanced to build the model proposed. The experimental results indicate that the proposed algorithm is effective, scalable and robust, with a lesser computational complexity, but also accomplishes good learning accuracy when compared to the state-of-the-art CGHSSL and FS techniques
Keywords: Feature Selection (FS), Nonnegative Spectral Clustering, Row-Sparsity, High Dimensionality, Hybrid Support Vector Machine (HSVM), Particle Swarm Optimization(PSO)

Performance Analysis Of Compressing Sensing Framework On Interactive Media Content

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Abstract

Compression has constantly assumed an important part in storing and transmission of heavier interactive media documents. The presence of compression calculations are over two decade old. The ordinary compression calculations are infrequently not required to prepare a flag as a rule where the signs are scanty. In such cases, compression detecting exceptionally contributes and repays the issues of traditional compression calculations as it performs examining and in addition compression at a same time. The idea of compression detecting is very new and is very little in developed stage. Our discoveries announced in this paper is a consequence of perception being done on all significant research diaries, which expresses that there are little measure of studies being done on compressible detecting and reproduction of sight and sound substance. The paper additionally examines about the huge research hole and assesses the viability of existing systems.

Keywords: Compression Sensing, Interactive media, Scanty

Secure and Enhanced Information Encoding In Matrix Barcode

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Abstract

This paper presents a high cutoff shading cross area organized tag and addresses titanic number of parts which must be considered while improving printed marks for their use in preservationist applications. The sorted out ID that is proposed uses the cyan, red, yellow colorant divisions open in shading printers and associates with high most extraordinary by methods for self-governingly encoding data in each of these separations. In each colorant channel, payload data is passed on by using an eccentric show of circularly formed bits whose individual associates are balanced with encode the data. The peruser recuperates the institutionalized stamp data from an anticipated shading degree of the scanner tag, using red, green, blue channels correlative, to print C, M, and Y channels. To beat the shading impedance making in light of colorant ingestion in non - looking at scanner channels, a novel deterrent convincing data encoding.

Keywords: Matrix barcode(QR) , Circular Specks, Colorant ingestions, Interference.

Next Generation Vehicle Diagnostic Systems

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Abstract

Engine Control Unit (ECU) plays a vital role in an automobile industry which allows the automobiles to be more fuel efficient and to provide optimal performance. It is the core part of vehicle engine and consists of microprocessor, peripheral hardware and control software. It ensures the proper functioning of a vehicle. A large number of micro controller chips are embedded inside the ECU and ensuring accurate functioning of these chips is essential, because proper functioning of these chips ensures the proper functioning of vehicle. The proposed work deals with ensuring the proper functioning of ECU. It makes use of Robert Bosch's CarPU Flash Interface (CFI) tool to test thirteen different micro controller chips embedded inside the ECU. CFI tool enables initialization, programming and testing of ECU. Proposed work involves ensuring whether the chip performs its

assigned functionality accurately. To accomplish this Application Specific Integrated Circuit (ASIC) description file and test step algorithm are generated for individual chips based on the information provided in the data sheet. These data are inserted into XML file and this XML file is used to generate interface to read inputs from the user. The input provided by user is converted to low level form and transmitted to the CFI tool to check the chip functionality.

Keywords: Engine Control Unit, Controller Area Network, CarPU Flash Interface.

Smart Security Surveillance Rover

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Abstract

India's land border has extended over 15,207km with the coastal area extending over 7517 km in length. A total of ninety-two districts over seventeen states are meant for the bordered districts. Large tracts of India's political borders square measure controversial, poorly demarcated or not demarcated by natural features. In addition, the risk of conventional international disputes these unsure borders additionally gift the challenge of cross-border infiltration, smuggling, illegal migration, and other forms of criminal activity. Hence, the human labor is wasted in the form of mere monitoring activities. Instead it could be used productively in case of attacks and defense scenarios where the human intervention is really necessary. The surveillance robot serves as a security monitoring device which replaces the human security at less critical areas where humans are really not necessary. The recorded evidence also hence take necessary action with automatic alerts from the robot when unusual activity occurs.

Keywords : Internet of Things (IoT), Image Processing, Ultrasonic Sensor, Raspberry Pi, Arduino.

Adoption Of Knowledge Management Framework In Academic Setting – An Experimental Study Conducted for Capturing Student's Learning in Computer Laboratories

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Abstract

The gamut of Knowledge Management (KM) for creating, disseminating and retaining information for divergent usages in academic environments has gained momentum and regularly appreciated. It is also found evident that literature and experimental studies have reiterated that, success for growing organizations widely relied upon the ability to share their knowledge. Apparently, the increased interest and the need to examine the ways to share tacit knowledge among learning platforms is gaining significant attention during recent times. To substantiate, this paper attempts to report the study results of deploying a web based Knowledge Management System for Computer Laboratories (KMSCL) framework for the Post Graduate students to facilitate knowledge sharing in regular computer laboratory environments. Using a questionnaire survey, the data was collected to study the student's perception, support and usefulness level of various tools in the framework. The findings of the study suggest that adoption of the KMSCL framework enables the student community to collaborate and learn effectively.

Keywords: Knowledge Management, Tacit Knowledge, Computer Laboratories, Learning Support, Collaboration, Rough sets

Detection of Abnormalities in Color Fundus Images of Diabetic Retinopathy using Bootstrap Segmentation with Learning Classifier

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Abstract
DIABETIC RETINOPATHY (DR) is the most important cause of blindness in the working population of the world. It affects blood vessels in the light-sensitive tissue called the retina. A different signs in DR can indicate the presence of lesions. The most prominent signs of abnormalities visible on retina images are microaneurysms, haemorrhages, and exudates. The early detection and diagnosis of retinal lesions is inevitable to save the vision of diabetes patients. Realizing it's important, Computer-Aided Detection (CAD) system has been developed as a double reader to improve the performance of opthalmologists. The proposed system includes pre-processing for lesion detection, extraction of features and classification. The proposed method is capable of segmenting the regions of varying intensity distribution in a retinal image. The publicly available database called DRIVE and STARE are used to test the proposed method. The new CAD system is evaluated based on performance measures such as sensitivity, specificity and accuracy and the results are encouraging. It is found to be robust with respect to changeability in image resolution, quality and acquisition system.
Key words: Diabetic Retinopathy, lesion, Computer aided detection, Segmentation, Feature extraction, Classification.

Combining Intelligent Web Caching with Web Pre-fetching Techniques to Predict Tourist Places

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Abstract
Internet has become the universal source of information for billions of people, at homes, at educational institutions, and at workplaces. The number of Internet users is continuing to be on the rise and is expected to cross 50% of the world population in the next few years. Internet users experience significant delay in access to information due to this enormous growth in web traffic. To overcome this delay, the frequently accessed information may be maintained in a location nearer to the user, typically in a cache memory. As the cache size is limited, efficient replacement techniques have to be deployed when the cache becomes full. Web caching is the process of maintaining copies of web objects in the cache memory that are available in the original server, thereby having the distinct advantage of serving the user requests immediately. Web pre-fetching is a technique, that is used to preload the yet to be requested web objects with an expectation that a user will be requesting it in the future. In this paper, we combine web caching techniques with web pre-fetching technique to predict

attractive tourist places that are to be visited next based on visit history of various users. The proposed approach demonstrates the performance of the various machine learning techniques in terms of Hit Ratio.

Keywords: Web Cache, Classification, Support, Confidence, Hit ratio, Machine learning

An efficient approach for analyzing and improving data quality in data integration

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Abstract

In data integration, the existing methods tend to improve the quality of the end users' data by selecting best quality data sources during data integration, choosing best query plan and using quality metadata of data sources. Nevertheless, the quality of end users' data set could not be predicted before integration. To mitigate the above issues, DEduplication and Completeness (DEC) approach has been proposed to achieve the quality of the service for the end users' data. The duplicate records of the end users' data are detected and removed using record linkage and Markov Logic Networks approach. The incompleteness is detected and resolved using different types of completeness such as source completeness, tuple completeness and attributes completeness. The deduplication and completeness improves the precision of the data integration. The E-shopping for computer peripherals application has been proposed to analyze the performance of the DEC approach. Experimental results illustrates that the proposed DEC approach is relatively better precision than the traditional data integration. It is observed that the precision of deduplication has been improved by 26% than the record linkage and precision of data integration has been improved by 12% than the Fusionplex approach.

Keywords: Data integration, data quality, deduplication, completeness, Markov logic networks

Geo- Intelligence System: A Frame Work for Agricultural Improvements

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Abstract

This paper sets out a conceptual framework to guide farmers and to help the stakeholders in agricultural sector. Its prime focus is to increase the productivity in this sector by proper utilization of Information and Communication Technologies (ICT). Geo-Intelligence is an agricultural knowledge base that can help the farmers to be connected with agriculture knowledge services like weather details, soil fertility related information, crop patterns, pest alerts, and government schemes. It reviews and analyzes the past data on agriculture and farming activities to assess and provides the necessities and requirements to the farmers. This framework forge linkages with the stakeholders like farmers, government, experts, and academician that can help them to transfer more timely knowledge and technology enhancements in agricultural enrichment.

Keywords: Agriculture, Data Mining, Knowledge Base, Spatial Data, Data Analysis

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Smart Vehicle Collision Detection and SOS Service

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Abstract

The in-vehicle monitoring technology (black box) is growing rapidly in the world and many different forms of this technology is now available. Essentially, it monitors how, when and where a vehicle is being driven, records the data, and provide an analysis as feedback to the driver and/or other parties. Some also offers in-vehicle alerts if predefined parameters are exceeded (eg, hard acceleration). In this paper, the black box created will be connected to the cloud to provide continuous updates, which helps to inform the nearest hospital of a crash instantly.

IOT based Garbage Monitoring System

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Abstract

The aim is to cover all the rural and urban areas of the country to present this country as an ideal country before the world. With the proliferation of Internet of Things (IoT) modules such as smartphones, sensors, cameras. It is possible to collect massive amount of garbage. In the metropolitan cities it is not possible to check each and every place where the garbage dump yard is full or not. So we have introduced a new concept using load cell. This is a sensor which intimates about the load placed on it. So that the garbage can also be checked in this way. Here we are using AT89S52 as our controller. A threshold value is set in the controller. Controller will monitor the status load cell. When that value is met then an intimation will be sent to the officials through IoT about the over load and also to clear the garbage as soon as possible.

Keywords: Load sensor, IOT module, AT89S52, embedded system

A survey on healthcare and social network Collaborative service utilization using internet of things

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Abstract

Applications of internet of things have evolved with multiple numbers of real time problems. This paper proposes a (MPU IoT) Most People Usage Internet of Things structure to solve issues in the applications of people recognizable services in the fields of health care and social networks, which face the most unsolved issues in reality. Healthcare systems face a lot of issues due to unavailability of doctors, diseases which are hard to diagnose and cure and deficiency of medicines in the markets. Social networks can provide solutions for these problems or issues in the healthcare systems but have the security problems like privacy preservation, attractive advertisements, publishing more self-information and, unknown friend request acceptance. Existing survey analysis provides diverse methodologies to solve the issues occurring in these two separate sectors of

applications. The proposed MPU-IoT is designed to share and connect information in these two different sectors and at the same time will provide better solutions for the issues raised in them. It also solves the security issues that are identified during the transmission of information from Healthcare to social networking systems.
Keywords: Most People Usage Internet of Things (MPU-IoT), Health Social Cloud Center (HSCC), Agent Tracking System (ATS), Expert Member (EM), Monitoring Locate Center (MLC), Type Network Center (TNC), Health Social Distributor (HSD)

Posteriori Probability inspired Minimal Rule Generation in Associative Classification

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Abstract
Conventional Association rule mining technique in data mining produce large number of candidate rules in each phases during database scans. This is used to find frequent itemset in the form of x -> y, means that if a database contains antecedent x then it will likely to contain consequent y as well. Associative Classification (AC) is a branch in data mining approach that combines association rule and classification technique applies in decision support system of finding accurate informative pattern in classifying the data. Output of this AC in the form if-then rule, which is easier to recognize by the end user and better prediction of class label. Generally, AC generate a large number of class Association Rules (CAR) that lead to high processing overhead. This paper proposed Posteriori Probability based AC method which generate minimal order rule during class prediction using Posteriori probability property. This method highly suitable when the datasets that require quick response over time. Experimental analysis reveals the proposed method over performs the existing methods.
Keywords*:* Association Rule Mining, Classification, Associative Classification, Cogency

Pstree Based Associative Classification of Data Stream Mining

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Abstract
The data streams have a modern technique to examine the problems of continuous data. Mining with data streams is the process of extracting knowledge structures from continuous, rapid data records [1]. An important goal in data stream mining is mainly used to generate a compact representation of data. The main aim of the proposed work is used to build efficient classifiers and improve the performance by aligning the datasets with a stream. This method m is also useful in reducing the time and space needed for further decision making process. In this paper, a new scheme called Prefix Stream Tree (PST) for associative classification has been proposed that helps in the compact structure of data streams. The Pstree has been developed based on a single scan. Pstree discovers the exact set of frequent itemsets from a single Scan.

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Dynamic Virtual Machines Generation to Improve the Query Response Rate in Cloud Environment

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Abstract
Dynamic provisioning of resources in cloud environment supports parallel processing that leads to better utilization of resources. Effective resource utilization reduces the information retrieval cost in cloud computing. High resource utilization can be achieved by generating a number of virtual machines dynamically based on the application requirements. Distribution of queries among Virtual Machines(VM) helps in load balancing that is needed to be addressed in cloud computing. This work focuses on efficient database fragmentation, query decomposition and query distribution techniques. High parallelism is achieved by increasing the number of VMs in CPU bound tasks whereas number of VMs is reduced in case of small applications to avoid the needless energy consumption. The experiments analyse the impact of high resource utilization on energy consumption with an efficient load analyser. The experimental result reveals that the proposed approach increases the performance in terms of query response cost.

keywords: Parallel query processing, dynamic virtual machine creation , Database fragmentation , Query decomposition and distribution , Load balancing.

A critical review on Parkinson's disease due to Pesticides exposure

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Abstract
An idiopathic disease called Parkinson's Disease (PD) second most common neurodegenerative disorder disease which affects the nervous system and causes tremor or shaking, slowed movement, rigid muscles, impaired posture and balance. Pesticides employ their neurotoxicity in many ways. The exact causes of Parkinson's remain unknown, many researches are undergoing on two factors genetic and environmental causes. Persons with Parkinson's exhibit several problems like signs of depression and eventually lead to cognitive problems, including dementia. Dousing crops with large amount of pesticides increase the risk of Parkinson's. The people who are working in farms and living in rural areas have high exposure to pesticides which leads to PD patient. This paper is proposed to detail study of pesticide which is one of the environmental factor and their effects on human body

Keywords: Parkinson's, Pesticides, Dopamine, Alzheimer's disease

Best Classification Threshold Identification for Imbalanced Datasets

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Abstract
The world today is witnessing an exceptional growth in data from various fields of science and technology, triggered mostly by developments in technology. A consequence of this increased the need for efficient and

effective data mining to uncover the information contained implicitly in the data. In medical field, there are millions of protein sequences in medical database and new protein sequence is found day by day. In existing systems, it is difficult to find the similarity between a newly found protein sequence and the sequences in the database. In addition, classification of protein sequence depends on the threshold value which is not constant for all families. In general, the classification threshold is simply fixed to a random value, which is usually unsuitable for an imbalanced dataset. This paper proposes a novel framework for finding the best classification threshold value according to the data in a particular family. The proposed model using Random Forest algorithm with Auto-tuning, reduces the misclassification rate and increases the classification accuracy for imbalanced classes.

Keywords: Imbalanced dataset, Random Forest, Auto-tuning, SMOTE

Sentiment Analysis System

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Abstract
Sentiment Analysis system is mostly used in order to find the views of the people on a certain movie or product based on the tweets that are posted in a social website such as Twitter. This system helps to analyze the peoples' sentiments based on the usage of the words and their meanings. The proposed system would be built using classification algorithms like Naive Bayes and SVM. A comparison of these two algorithms would be carried out for producing correct reviews of a certain movie or set of movies in accordance with the original movie reviews. This system can be used by people in the cinema industry and movie goers to attain knowledge about today's views of the people on the movies released and those yet to be released.
Keywords: Sentiment analysis, Naive Bayes, SVM, movie review, Twitter, machine learning

A Study on the Comfort Properties of Multi Layer Weft Knitted Fabrics

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Abstract
Apparel industry has been using stretchable fabrics for years and apparel marketing campaigns have done a good job advertising the temperature control and moisture management factors as benefits to consumers. Most consumers have experienced pleasing benefits when wearing apparels such as stockings, long johns, bras, briefs, gloves, headbands, made from fabrics with a compression factor, In this research work a detailed study on the properties of Polyester and Cotton weft knitted multilayer fabric with various loop lengths has been done. The multi-layer knitted fabric is produced by using Polyester (30s)and Cotton (30s) Combed yarn and dyed using reactive dye. The fabrics are produced with three different sets of loop lengths of 3.90mm/3.68mm,3.42mm/3.30mm, 3.08mm/3.00mm The GSM of the fabric is maintained as 197, 221, and 240. The comfort properties like absorbency, wicking, wetting, thermal conductivity, thermal resistance and air permeability of the knitted fabric produced with the above mentioned specification were studied. Fastness properties of the fabric with respect to washing, perspiration, rubbing and light have been analysed. The mechanical properties of the multi-layer fabric with respect to bursting and pilling has been analysed. The optimization of the findings has been done using statistical tools.
Keywords: Multi layer fabrics, Loop length, pilling, combed yarn, wicking, thermal resistance

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Effect of plasma Treatment on Antimicrobial properties of Silk Suture

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Abstract
The effect of plasma treatment on the mechanical and antimicrobial properties of silk braided suture was investigated. The surface modification was done by using atmospheric plasma with oxygen as treatment gas for 2min, 6min and 10min. The SEM observation clearly showed the degradation of the structure treated for more time. It was found that moderate increase in treatment time increased the wettability of the suture material. The plasma treated suture was subjected to antimicrobial study [AATCC 100] against *S. aureus* and *E. coli* and found that plasma treated suture possessed the bacterial reduction percentage of 43% and 38% respectively.
Keywords: Degradation, plasma, silk, suture, wicking

Development of sericin coated knitted polyester blend fabric Used for wound dressing

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Abstract
Sericin is a silk protein which is removed by the degumming process during the manufacture of silk to ensure its lustrous appearance. Sericin is found to have wide range of application in the medical textile field as a bio active material. Researchers have found that it has enhanced moisture absorbency, smoothness, hygroscopicity, antimicrobial, antistatic and wicking property. Sericin coated polyester / cotton blend fabrics can be used as a bioactive material in the applications such as wound care, wound dressing, medical wipes, medical drapes and surgical meshes which will enhance the skin healing properties of the fabric.
Keywords: Sericin, wound healing, bio-active, medical wipes and drapes, antimicrobial

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Development of Mesta Fabric Composites for Automotive Applications

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Abstract

This research work has been carried out by production of Mesta (*Hibiscus sp.*) fiber reinforced composite with polypropylene as the polymer by uni-polymer compression moulding technique. Four composite samples using plain woven, twill woven, satin woven with grams per square meter (GSM) of 107 to 120 and needle punched non-woven fabric with 57 GSM were produced and tested for the properties tensile load bearing capacity, tensile strain and flexural rigidity. The test results were analysed by statistical method and it can be concluded that woven fabric reinforcement composites have higher extension rate, higher impact strength compared to nonwoven fabric. Further the woven mesta fabric reinforced composites with twill weave exhibited higher impact strength, higher flexural strength compared to plain and satin weave structure. By considering the advantages and applicability, the composite produced from the Mesta fibre twill fabric can be used in the automotive parts such as, Dash boards, Door panels, Head liners and Trunk liners etc.

Key words: Mesta fibre, Natural fibre composite, Flexural rigidity, reinforcement, polymer, needle punching.

Development of Natural Fibre Composite for Acoustical and Thermal Insulation Applications

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Abstract

There is an increasing demand for the Natural Fibre Reinforced composites in marine, agriculture industry, construction, automobiles and home decoration material. The study has been carried out with Agave Americana and Wool, since both of them are natural fibres. Agave Americana is a cheap and highly available fibre which has hollow structure, high bundle strength and it can withstand heat to a high temperature. Hollow structure of the agave makes it suitable for acoustic application. Wool fibre naturally has good thermal insulation property. Acoustic, Thermal Insulation, Tensile Strength and Flexural Strength testing were carried out for the samples produced. Sample with combination [40:40:20 Agave (40%), Wool (40%), Polypropylene (20%)] found to have the better Acoustical, Thermal and Mechanical properties. These developed composite materials might be suitable for applications such as falls roofing, Room Separators, Automobile applications, Office tables, Cardboards, Exam pads, Switch boxes etc.

Key Words: Composite, Agave, Wool, Acoustic, Thermal, Mechanical properties

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UV Protection for Window Textiles

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Abstract
Cotton fabrics were treated with natural agents such as (combination of eucalyptus leaf and egg albumin powder extract in the ratio 1:1) and synthetic agents namely Titanium dioxide to evaluate Ultra Violet Protection (UV) Efficiency. The extract (only for natural agents) was done through Soxhlet apparatus method and the extracts obtained from the experiment were applied on cotton fabric by conventional pad-dry-cure method. The purpose of this investigation was to determination of UV protection properties of the finished fabric and to compare the natural and synthetic agent's effect on cotton fabric. The UV protection properties were evaluated by functional testing of UV protection factor (UPF values). The synthetic agents have a standard effect on UV blocking values almost 100%, while UPF values ranges in between 217 -234. On the similar stage UV blocking values were in the range 95 - 99%, while UPF values obtained as nearly 2000 range for combined (eucalyptus leaf & egg albumin) powder extract.
Key Words: Cotton, Eucalyptus leaf, Egg albumin powder, Titanium dioxide, Pad-dry-cure

Investigation on Effect of Salt-Free Electrochemical Dyeing of Cotton With Reactive Dyes

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Abstract

The major disadvantage of dyeing of cotton requires large amount of salt which increases the effluent load. This paper investigates the effect of salt-free electrochemical dyeing of cotton with reactive dyes. Anthraquinone based Reactive Blue 4 and azo based Orange 4 reactive dyes were taken and four process conditions like applied voltage, distance between electrodes, electrifying time and dyeing time were optimized. The electrochemical dyed samples were evaluated for the K/S values, colour fastness properties and for dye effluent it was evaluated for colour analysis and TDS values in comparison with the conventional dyeing process with salt. The K/S values of the electrochemical dyed fabric samples shows significant increase in the dye strength compared to the conventional dyed samples. There is no significant change in the colour fastness to washing and rubbing, but the TDS of dye bath effluent is reduced by 70 % than the conventional dye bath effluent.

Key Words: Effluent, Electrochemical dyeing, K/S value, TDS, Reactive dyeing

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Design and Development of Fibre Reinforced Composite for Road Barrier

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Abstract

In Geo Textiles, the road barriers are playing vital role especially in road safety aspects. In recent days, various composite materials are experimented in road barrier. In this analysis a composite road barrier/divider is designed and developed using textile sub-wastes. Textile sub-wastes are materials like glass fiber, coir pith, crushed rock and marble sludge. Fabrication of composite barrier is carried out by hand layup process using E-Glass/ Epoxy bidirectional laminates built up by applying a serious of fiber glass and liquid resin layers and evaluated for the impact and compressive strength.

Keywords: Geo Textile, Reinforced composite, Glass fiber, Coir pith, Marble sludge

Online Sewing Defect Monitoring For SNLS Machine by Image Processing Technique

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Abstract

Apparels are subjected to visual examination to detect sewing defects after making of the garments which results in higher rejection, time, cost etc. Sewing defects must be detected early i.e during sewing itself and accurately to overcome above quality issues. Apparels are mostly sewn with lock stitch in straight and curve directions, with different colours and stitches per inch. The paper discuss the on line detection of sewing defects occurring during the sewing process. Common defects such as skipped stitch, missed stitch, or loose stitch occurring in lockstitch are detected and marked. Using image processing methods, the proposed work follows the stitch path by capturing digital images of stich lines in lock stitch sewing machine and processed through PYTHON software to detect the sewing defects and subsequently stop the machine during sewing.

Key Words: Sewing, Defect, Online, Image processing, SNLS

Development of Eco-friendly Water Repellent Fabrics

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Abstract

Lignin a natural source which is abundant, has a complex structure that doesn't allow water to escape outside and this paper investigate the possibility of extracting and coating of lignin in an eco friendly approach on textile materials. Laccase enzyme was extracted from Pleurotusostreatus mushroom showed an activity of 2.2.Enzymatic extraction of lignin from sugarcane bagasse and coir fibre was done, the amount of lignin isolated was 19% and 25.5 % respectively. The extracted lignin was coated on 100 % cotton and silk fabrics by pad – dry –cure process. Three different composition of cross linking agents and extracted lignin were taken and out of which 1% glutaraldehyde , 10% gelatine and 84 % lignin showed effective spray rating test result of 80. The SEM analysis of the cotton and the silk fibre reveals that the water proof coating is uniform in cotton than that of the silk fabric.

Key Words: Water repellent fabrics, lignin, coating, coir, sugarcane bagasse

Investigation of micro polyester fabric finished with sericin

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Abstract

Synthetic fibers, especially micro fiber development, have made a big way for sophisticated textiles and apparel, medical and allied applications. Micropolyester fabric is known for its liquid moisture transmission property, also provides thermo physiological comfort. The present study is concerned with application of sericin on 100% Micropolyester fabric using cross linking agent like Glutaraldehyde. The combination of sericin and Micropolyester fabric makes suitable for applications in medical textiles. The micro polyester fabric has been pre modified with alkali and it has been treated with glutaraldehyde as a cross linking agent. The treatment has been carried out in Padding Mangle in the temperature of 70°C for 1hour and the treated sample has cured at 130°C for 3minutes. Then the treated samples are analyzed for Bending length, Wicking, Moisture vapour transmission and air permeability. Results shown that Moisture Vapour Transmission, Anti bacterial activity and Bending length increased when the concentration of the sericin increased whereas the reverse trend was seen in Wickability and Air Permeability.

Keywords : Sericin, Micropolyester, Air Permeability, Water vapour transmission, Medical garment.

Development of Wet Wipes from Natural Herbal Extracts

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Abstract

A wet wipe is a small moistened piece of paper or cloth that often comes folded and individually wrapped for convenience. Wet wipes are used for cleaning purposes, like personal hygiene or household cleaning. This project aims at manufacturing wet wipes for cosmetic purpose with pure natural ingredients rather than chemicals widely used in commercial wipes. Viscose fiber is used to provide a soft, gentle feel for contacting the skin of the user and polyester fiber is used to provide strength and. Natural extracts used are aloe vera, mint, nutmeg, glycerin, rosewater and lemon. Using these ingredients, three recipes have been developed and a comparison study has been made between the shelf life of the commercial wet wipes and the herbal wipes. Sample A has the combination of aloe vera, mint, and lemon extracts. The sample B has nutmeg, rosewater extract. The sample C has the combination of rosewater extract and glycerin. The anti-bacterial and anti-fungal test has also been made for the herbal wipes and commercial wipes, and the results are found to be satisfactory.

Key words : Wet wipes, herbal extracts, aloe vera, mint, nutmeg, glycerin, rosewater, lemon, anti-bacterial

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Fabrication and characterization of wool fibre reinforced polypropylene composites

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Abstract

Wool fibre reinforced polypropylene composites were fabricated by compression moulding technique by varying the fibre weight fractions (20%, 30%, 40%, 50% and 60%). The influence of fibre weight fraction on mechanical properties of the composites was investigated. It was observed that the composites containing 40% fibre weight fraction has given better mechanical properties of 14.62 MPa, 196.64 MPa, 12.84 MPa, 274.14 MPa and 12.82 Kj/m^2 respectively for tensile strength, tensile modulus, flexural strength, flexural modulus and impact strength. It was also observed that the incorporation of wool fibres in polypropylene resin has improved the mechanical properties when compared to polypropylene composite.

Keywords: Composite, wool, tensile strength, polypropylene, impact strength, compression moulding

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Study of Kenaf-Cotton blended yarn for the Development of Sustainable Textiles

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Abstract

In the recent years, developing new yarn is the fundamental phenomenon for technical textiles. Different yarns are required now days for both technical as well as for aesthetic properties. Kenaf has good antimicrobial, fire resistance and absorbency that can be utilized in various textiles needed for society. The Kenaf cotton blended yarn of 50%-50% was produced through rotor spinning and was spun into 10Ne count. The quality was evaluated for yarn strength, yarn elongation, evenness and hairiness. The quality parameters of Kenaf-Cotton blended yarn were compared to 100% cotton yarn. The results reveal that the Kenaf-Cotton blended yarn were in comparable quality with 100% cotton and can be made into fabrics of different weave structures and can be utilized for various potential applications like home textiles and medical textiles focusing towards a sustainable environment.

Keywords: Kenaf, Cotton, Yarn, Quality, Sustainability

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Process optimization for plasma treatment of recycled polyester knitted fabric using box & behnken design

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Abstract
Specialized materials are being used to develop functional sportswear to enhance performance. Polyester has many properties suitable for sportswear, but hydrophilicity is lacking in the fiber. Knitted fabric from Recycled Polyester (RPET) was subjected to plasma treatment to improve its hydrophilic properties. The aim of the study was to determine the effect ofplasma parameters like distance between electrode plates, duration of plasma treatment and applied voltage on single jersey knitted fabrics. The optimal experimental conditions and their effects have been ascertained by response surface methodology using the Box-Behnken design. The optimum values were found to be electrode distance 4.5mm, time 8 min. and 400 volts. Based on the results of the study it can be understood that plasma treatment performed with these optimal values is suitable for improving the hydrophilicity of single jersey fabrics made from recycled polyester.
Key Words: Plasma Treatment; Recycled Polyester; Box and Benkhen Statistical Design

DEVELOPMENT AND CHARACTERIZATION OF BAMBOO AND BANANA FIBER BASED NON WOVEN FABRICS FOR WOUND DRESSING APPLICATIONS

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Abstract
This paper reports study on the development and characterization of wound dressing and hygienic product made from two different fibres bamboo (Regenerated fiber) and banana (Natural fiber) with three different fibre blending namely in the blend ratio of 50:50, 60:40 & 40:60 and layer (Sandwich) blending namely in the blend ratio of 50:50, 60:40 & 40:60. The ultimate aim is to increase antibacterial activity which reduces frequency changing of wound dressing. Antibacterial activity tests have been carried out on wound dressing against Gram positive S.aureus and Gram negative E.coli. Also various tests are conducted such as tensile strength, air permeability, absorption capacity, liquid strike through; water vapour permeability and p^H have been carried out to study the performance of the wound dressing. The results are found that the wound dressing made from the bamboo and banana fiber exhibits better performance sophisticated multifunctional systems with optimal wear time.
Keywords: Wound dressing, Anti bacterial activity, liquid strike through; water vapour permeability, Layer & Fiber blend

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Development of chitosan finished bamboo wipes for skin care

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Abstract:

Skin operates a complex organ of numerous structures serving vital protective and metabolic functions. Skin care supports the skin integrity including nutrition, avoidance of excessive sun exposure and appropriate use of emollients that enhance appearance. 100% bamboo needle punched nonwovens fabric was prepared and coated with chitosan to develop skin care products. The developed nonwovens have been finished with lime dissolved chitosan using the pad-dry-cure method. Chitosan(gms), lime solution(ml) and water(ml) were the variables used in the Box Behnken experimental design(BBD), to optimize the chitosan treatment for the nonwoven fabrics. 15 samples have been developed based on the 15 runs developed in the BBD. All the 15 samples were tested for drop penetration test, air permeability, thickness and wickability which test the suitability of the skin care properties of the wipes. With air permeability as the response parameter, the chitosan treatment has been optimized. 1 gm of chitosan dissolved with 50 ml of lime solution in 200ml of water was optimized as best variables to treat the 100% bamboo nonwoven fabric with chitosan. The antimicrobial activity of this best sample was tested and SEM characterizations were done.

Keywords: Skin care, wipes, chitosan, bamboo nonwovens, Box Behnken experimental design

Investigation of phytochemical and anti- bacterial activity on *rhizophora apiculata* ethanolic extract for medical textile applications

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Abstract

The serviceable requirements of medical textiles have led to the innovative use of variety of natural plants with enhanced hygienic properties for medical applications. The *Rhizophora apiculata* herb is one of the very important natural resource which is available in the tropical areas with plenty of hygienic and comfort properties. In this research work *Rhizophora apiculata* plant leaves were collected and extracted and it was applied on cotton fabric. The extract was tested under qualitative phytochemical screening and the test results revealed the presence of phytochemical constituents. The anti-microbial property of rhizophora extract 10% and 20% concentrated treated samples were tested using standard AATCC 147 qualitative and AATCC 100 quantitative tests against both gram positive bacterial pathogens *Staphylococcus aureus*, *Klebsiella pneumoniae* and gram negative bacterial pathogens *Pseudomonas auruginosa*, *Escherichia coli* . The test result shows that the rhizophora apiculata treated samples has good antibacterial activity.

Keywords: *Rhizophora apiculata*, Ethanolic extract, Phytochemical constituents, Antimicrobial activity, Microorganisms, Agar well diffusion

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Jute Fiber Reinforced Polymeric Composites in Moulded Furniture Making

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Abstract

The jute fibre reinforced nonwoven composites with low melt polyester fibre undergone for hot compression moulding process. According to the need, the mould was developed and the weight of the material decided on the basis of toughness required. A number of fibres increased the strength of the composites improved. It is proven by tensile strength, Rockwell hardness and Charpy impact strength test. This kind of natural fibres composites replaces the plastic furniture material, it reduces the environmental pollution through manufacturing process and scraps through land filling.

Keywords: Jute, low melt Polyester, Nonwoven composites, Mechanical properties

Development of Disposable Herbal Treated Skullcap

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Abstract

Malassezia and alopecia are the most common hair problems that people are facing in their day-to-day lives. Malassezia is a dandruff problem and Alopecia is a hair fall problem. While wearing helmets people sweat and this is one of the major reasons for hairfall and dandruff. 100% polyester non-woven skull caps have been developed with herbal finishes to treat the problems. The herbal plants include Hibiscus rosasinensis (hibiscus), Phyllanthus emblica (gooseberry) and Wrightia tinctoria (neem leaves). The herbal solutions were extracted from the medicinal plants using methanol as a solvent. The treated non woven fabrics have been tested for antifungal, anti – bacterial and air permeability. These herbal finished disposable skull caps can be used in helmets, caps, scarfs, etc.,

Key Words: Skullcap, Polyester, Nonwoven, Antibacterial assessment**.** Anti allergy test.

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In Vitro Antioxidant Properties of Tabernaemontana Heyneana wall. Flowers

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Abstract

Antioxidants play a vital role in the prevention of various diseases. In this background, methanolic flower extract of *Tabernaemontana heyneana* was evaluated for the antioxidant properties. Significant metal ion (ferric, cupric and ceric) reducing power was observed in the methanolic extracts. Appreciable ferrous ion chelation (74.55% ± 4.62; IC_{50} = 589 µg/ml) and poor hydroxyl ion scavenging (28.53% ± 6.53; IC_{50} = 639 µg/ml) properties were recorded. Similarly, one way ANOVA results of ABTS and DPPH assays proved that there is no significant difference at 5% ($p > 0.05$) between the extracts and standard molecules, and the results were also supported by substantially recorded IC_{50} values. Hence, the flower extract of *T. heyneana* may be considered as a promising herbal medicine to cure a wide spectrum of diseases.

Key words: ABTS, antioxidant, DPPH, *Tabernaemontana heyneana*

Multiobjective Optimization Of Cucumber Juice With Lactobacillus Acidophilus Using Response Surface Methodology

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Abstract

Probiotic juices are non-dairy products suitable for any common man to enjoy the promising value added health benefits and nutritional effects. The aim of this study was to develop a probiotic juice using inulin, stevia and *Lactobacillus acidophilus*. The are several factors which influence the probiotic juice like pH, titratable acidity ,salt, sugar and many more. A 3-factor, 3-level Box-Behnken design was used to optimize the chemical properties of probioticated cucumber juice. The independent variables selected were Inulin, stevia , and *L.acidophilus*from 1-4% respectively. The effect of pH, acidity, total sugars and reducing sugars reveal the cucumber can be probioticated with *L.acidophilus* along with its synergistic effect using inulin and stevia for its survival. So, with these results optimized, it can be concluded that the under utilised cucumber can be probioticated for any individual to obtain its health benefits.

Keywords: Response surface method, cucumber juice, *L.acidophilus,* inulin, stevia

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Central Composite Design Optimization Of Fluoride Removal By Spirogyra Biomass

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Abstract

In this work, microwave assisted thermally activated adsorbent was prepared from Spirogyra biomass and the variable affecting adsorptive efficiency for fluoride removal were simultaneously optimized using the central composite design (CCD). The effects of variables viz. adsorbent dosage (0.1 – 1.0 g L^{-1}), sample pH (3 – 9), initial concentration (30 – 60 mg L^{-1}), and temperature (25 – 45°C) were optimized. The statistical parameters were calculated and the quadratic polynomial model with R^2 = 0.9886 and F value = 7168.95 was obtained. Further, the response surface diagrams were plotted accordingly . Non-linear optimization was carried out and under the defined optimum conditions the predicted fluoride removal efficiency with 95% confidence level was found to be 88.74±2.1%, which is in agreement with the experimentally arrived value of 87.96±2.3%.

Keywords: *Adsorption; Optimization; Spirogyra; Response Surface Methodology; Fluoride*

Purification and Characterization of a New Organic Solvent Tolerant lipase from *Cladosporium Cladosporioides* sp. Strain nk-lf36

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Abstract

An extracellular lipase from *Cladosporium cladosporioides* was purified by ammonium sulphate precipitation followed by ion-exchange and gel filtration chromatography. The enzyme was purified 156.7 fold with 51.75% recovery after gel-filtration chromatography. Lipase with specific activity of 335.33 U/mg displayed a single band on both SDS-PAGE and native PAGE indicating purification to homogeneity. The molecular mass of the purified lipase was estimated to be 62 kDa. The optimum pH and temperature of the enzyme was 6.0 and 30°C respectively. The enzyme retained 85% of the activity at 40°C and pH 7.5 respectively. Ca^{2+} and Mg^{2+} ions stimulated lipase activity. The enzyme retained 105% activity in n-butanol and more than 80% of the activity in toluene and n-hexane. The enzyme was specific for the substrate *p*-nitrophenyl palmitate, showing a low K_m value of 0.82 mM and a V_{max} value of 12.5 mM min^{-1}. The lipase from NK-LB36 was thus characterized as mesophilic and solvent-tolerant suggesting that it can be a potential catalyst in biodiesel production.

Keywords: *Cladosporium cladosporioides, Solvent tolerant lipase, Gel filtration chromatography, Ion exchange chromatography, SDS-PAGE*

Extraction of Dye from Ixora coccinea and Beta Vulgaris for Eco-dyeing

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Abstract

Dyeing is an important application in textiles because; it allows people to wear fabrics of different shades. Environmental issues of synthetic dyes led to gained customer interest in the natural dyeing sector again. In this article an effort has been made to use two plant sources as natural dye. Beta vulgaris commonly known as beetroot or sugar beet has several applications in food sector. Ixora coccinea is generally used as ornamental plant but it has been found to have several medicinal properties. In this study, extract from the flowers of Ixora coccinea and extract obtained from the peel of Beta vulgaris using methanol as solvent were analyzed for their phytochemical properties using TLC. The phytochemical compounds were identified as anthocyanins, phenolic acids in Ixora coccinea and carotenoids in Beta vulgaris. The extracts were then applied to treated, desized cotton fabric using various natural and chemical mordants. Based on analysis, the best mordant and technique for using mordant were determined for dyeing fabric. The fabric was subjected to dyeing and tested for its color fastness such as rubbing, washing and sunlight to know the best of all, with a view to natural dyeing of fabric and minimizing synthetic dyes, consequently to save environment.

Keywords: Ixora coccinea, Beta vulgaris, TLC, anthocyanins, phenolic acids, carotenoids, mordants, color fastness.

A Big Picture On Antimicrobial Strategies Then And Now

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Abstract

Antimicrobial resistance (AMR) pose a serious threat to the physicians as bacterial strains evolve to counteract the effects of medication. Staphylococcus aureus is one such bacterial strain that was well known for its resistance to methicillin - a narrow-spectrum β-lactam antibiotic of the penicillin class. Although Methicillin-resistant S. aureus (MRSA) is not always pathogenic but historically associated with Hospital Acquired Infections (HAI), respiratory infections such as sinusitis, and food poisoning. In the recent years, bacterial strains such as Pseudomonas aeruginosa, Escherichia coli, Enterococcus faecalis, Streptococcus pyogenes have also been identified and well-studied for their ability to counteract antimicrobials. On this note, this article provides a comprehensive understanding on the antimicrobial strategies adopted globally to overcome the threat of drug resistant bacterial strains.

Keywords: Bacterial strains, Antimicrobials, Antimicrobial strategies, Drug resistance, and Antibiotic

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Glow discharge Plasma Treatment on Nonwoven Fabrics for Medical Application

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Abstract

In this paper, glow discharge plasma operating in air atmosphere has been used to improve the surface hydrophilic and antibacterial properties of polyester non-woven fabric. The wicking height results show that the surface hydrophilic property of the fabric samples is greatly improved with plasma treatment. The analysis of SEM shows that the surface roughness of the treated fabric samples increases due to etching in plasma processing. The analyses of FTIR and XPS indicate that oxygen-containing and nitrogen-containing polar functional groups and addition that copper are embedded on polyester surface in plasma processing. Plasma-treated samples will use to good padding cloth and dressing cloth.

Keywords: Polyester non-woven fabric, Surface modification, Glow discharge, Hydrophilic property, Medical application

Implementation Of Fuzzy Linear Programming Technique For Traveling Salesman Problem

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Abstract

This paper mainly deals with the Fuzzy Multi Objective Linear Programming model for symmetric Traveling Salesman. Fuzzy Multi-Objective Linear programming especially concerns with convertible target that are indicatory of optimality while inspecting all objectives concurrently with probable variance in objectives or limitations in ambiguous environment. The main objective of this work is to minimize the price, length covered, time, fuel price, vehicle maintenance price, traveling allowances during the traveling among the places by the Salesman. The proposed model for determining multiple objectives provides an appropriate result with acceptable tolerance level in ambiguous environment. The numerical computation is examined to demonstrate the procedure of appropriate solution.

Keywords: traveling salesman problem, symmetric tsp, fuzzy multi-objective linear programming, optimal route

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The A-chromatic and b-chromatic number of Sun Graph, Barbell graph and Some Named Graphs

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Abstract

In this paper, we discuss the structural properties of central graph of Sun graph and central graph of Barbell graph. Here we find out the achromatic and b-chromatic number of Sun graphs and Barbell graph. We apply the achromatic and b-chromatic colouring to these graphs. In addition to that, we find the achromatic and b-chromatic number of Central graph of some named graphs.

Keywords: achromatic number, b-chromatic number, Barbell Graph, Central Graph, Sun Graph

Investigations on Vickers microhardness and its related constants of Single crystal: L-Histidinium semisuccinate (LHS)

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Abstract

Single crystals of L-Histidinium semisuccinate were grown by slow cooling technique. Single crystal X-ray diffraction study confirms the formation of crystal structure. Vickers microhardness studies were carried out on the grown crystals of L-Histidinium semisuccinate over a load range of 10-500 g. It was found that the grown crystal exhibits normal indentation size effect as the hardness number decreases with increase in load. The Meyer's index number 'n' was found to be greater than 1.6, showing the grown crystal belongs to soft material category. The resistance pressure 'W' was calculated using Hays-Kendall approach. The values of fracture toughness (K_c) were determined from the measurements of crack lengths and the types of cracks were identified. Brittleness indexes (B_i) and yield strength (σ_y) were also assessed from the values of Vickers hardness number (H_v). The elastic stiffness coefficient (C_{11}) values have been calculated using Wooster's empirical formula. The results were discussed in detail.

Keywords: Solution growth, Vickers hardness, Work hardening co-efficient, Elastic stiffness constant

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Single Valued Neutrosophic Exponential Similarity Measure For Medical Diagnosis And Multi Attribute Decision Making

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Abstract

Neutrosophic set (NS) is very useful to express incomplete, uncertainty, and inconsistent information in a more general way. In the modern medical technologies, each element can be expressed as NS having different truth – membership, indeterminacy – membership, and falsity – membership degrees. Thus, the similarity measures for NS are important tool to deal with the decision making problems with neutrosophic informations. However, to overcome some drawbacks of existing similarity measures, this paper focus on introducing Single Valued Neutrosophic Exponential Similarity Measure (SVNESM) and weighted SVNESM. Then, we compare the proposed SVNESM with the similarity measures available in the literature and show their efficiency using some numerical examples for overcoming the drawbacks. Finally the similarity measure is applied for a medical diagnosis problem and Multi Attribute Decision Making (MADM) problem.

Keywords: Neutrosophic Set (NS), Single Valued Neutrosophic Set (SVNS), Similarity measure (SM), Single Valued Neutrosophic Exponential Similarity Measure (SVNESM), Medical Diagnosis, Multi Attribute Decision Making (MADM)

Experimental and Theoretical Investigation on Corrosion Inhibition of Mild Steel in Sulphuric Acid by Coccinia Indica Leaves Extract

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Abstract

Experimental and theoretical investigation on corrosion inhibition of mild steel (MS) in sulphuric acid by Coccinia indica (CI) leaves extract was studied using mass loss and quantum chemical calculation methods. The inhibition efficiency increased with increase in concentration of the extract but decreased with raise in temperature and increase in acid strength. Furthermore, the inhibition efficiency synergistically increased on the addition of halide ions. Thermodynamic parameter indicates the spontaneous adsorption of inhibitor on MS surface. The adsorption of CI on MS surface obeyed Langmuir adsorption isotherm. The individual compounds present in the CI extract were identified by GC-MS. FTIR and optical profiler images confirmed the adsorption of CI on MS surface. Quantum chemical studies confirmed that the MS is protected from corrosion by adsorption of the constituents in CI extract.

Keywords: Corrosion inhibitor, Steel, Surface roughness, Thermodynamics, Quantum mechanics

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Synergistic Effect of Gum Exudate on Substituted Piperidin-4-One in Corrosion Inhibition of Mild Steel in Acidic Medium

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Abstract

Moringa oleifera gum exudate a non-toxic organic compound, is introduced as a synergist to 3,5-Dimethyl-2,6-diphenylpiperidin-4-one and the corrosion inhibition of mild steel in Hydrochloric acid medium is studied using weight loss method, potentiodynamic polarization and electrochemical impedance spectroscopy. Results show that 3,5-Dimethyl-2,6-diphenylpiperidin-4-one alone provided an average inhibition on the corrosion of mild steel and it was found that the inhibition efficiency increased synergistically in the presence of Moringa oleifera gum exudate. The inhibition efficiency increased with increase in concentration of the inhibitor but decreased with rise in temperature. Polarization studies reveal that the inhibitor system is of a mixed type. Impedance studies point out that a protective film is formed on the mild steel surface in the presence of the inhibitor. Fourier transform infrared spectroscopy and Scanning electron microscopy studies were used to investigate the nature of protective film formed on the mild steel surface.

Keywords: Corrosion inhibitor, Mild steel, Weight loss, Electrochemical impedance spectroscopy, FTIR, SEM, Surface morphology.

Modified Cellulose with Tertiary Amine and Schiff Base Chelating Sites for The Removal Of Heavy Metal Ions from Aqueous Solution

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Abstract

Cellulose being the most abundant, renewable and natural green raw material has the potential application in adsorption of heavy metal ions. Among the various chelating groups in a cellulose matrix, the capacity of the –N (CH) $_3$ and –N=CH- chelating groups are higher and hence their binding capacity towards the metal ions are better. Cellulose bearing –N(CH_3)$_2$ and –N=CH– chelating groups (Cell-TA) was synthesized through two step chemical reaction process and its adsorbing efficiency towards the Pb(II), Cu(II) and Ni(II) metal ions from aqueous solution was evaluated. The structural characteristics and the metal ion adsorbing features are examined through FT-IR, isotherm and kinetic models with thermodynamic studies.

Keywords: Cellulose, Schiff base, Spectral studies, Thermodynamics

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Synthesis Characterization and Photophysical Investigation of Aggregated Electron Rich Zinc Phthalocyanine

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Abstract

Zn-Phthalocyanine is well known for its chemical and thermal stability. In the present work we have synthesized a electron rich tetra carboxyl substituted Zn-Phthalocyanine derivative possess S atom. The synthesis is carried out by employing phthalimide as starting material. Final ZnPc derivative was synthesized by employing hexamethyl disilazane (HMDS) as the nitrogen source, which involves the cyclization of phthalonitriles co-ordinated by zinc metal ion. The synthesized molecules were characterized by IR, NMR and HR-MS spectroscopy techniques. Absorption, fluorescence and time-correlated single photon counting studies were carried out. Aggregation of ZnPc in DMF was revealed from absorption spectral studies. Singlet and triplet quantum yields were calculated. Further transient absorption studies were also carried out for triplet lifetime.

Keywords: ZnPc, TCTZnPc, aggregation, stacking, phthalonitrile, DMF

Properties of Nano Generalized- Semi Closed Sets in Nano Topological pace

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Abstract

The properties of a new class of sets, namely nano generalized-semi closed sets in nano topological space are analysed in this paper. The relation of these sets with already existing well known sets are studied.

Keywords: Nano g-closed sets, Nano gs-open sets, Nano gs-closed sets, Nano gs-closure, Nano gs-interior, Nano gs- neighbourhood.

Synthesis, Characterization and Antimicrobial Activity of Ruthenium (III) (E)-2-((6-Methylbenzo[D]Thiazol-2-Ylimino)Methyl)Phenol Complexes

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Abstract

Ruthenium(III) complexes of the type [$RuX_2(PPh_3)(L)$] (where X = Cl/Br; L = Benzothiazolyl-Salal Schiff base ligand) has been synthesized. The synthesized complexes were characterized by various physico-chemical and spectral techniques. An octahedral geometry has been tentatively proposed for all the complexes. The cytotoxic activity of the synthesized ruthenium(III) complexes has shown significant activity against a panel of microbes.

Keywords: Ruthenium(III) complexes · Schiff base · Benzothiazole · Bacteria · Fungi.

A study on structural analysis of electroplated Nano crystalline nickel based thin films

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Abstract

The present work focuses on the synthesis and structural characterization of nickel based thin films like NiFeAg, NiMo, NiMoW and NiFeP through electrodeposition method. All these nickel based thin films were successfully coated on the copper substrate at constant current density of 10 A/dm^2 and 30 minutes time of deposition. The chemical composition of the synthesised thin films was analyzed by using Energy Dispersive X-ray Analysis (EDAX) spectrograph. The surface morphology of the electroplated films was investigated by using Scanning Electron Microscope (SEM).The X-ray diffraction pattern of coated thin films reveals the crystalline nature, structure and size. The nickel based thin films already have numerous industrial applications which include Micro Electro Mechanical system (MEMS). The main aim of this current research work is to develop the new permalloy ($Ni_{80\%}$ $Fe_{20\%}$) based thin films for fabrication of MEMS devices.

Keywords: Synthesis, electrodeposition, NiFeAg, thin films, crystalline and MEMS

Vital Role of Human Mind for Prosperous Life

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Abstract

The human mind perceives and relishes everything in the Universe. Living without understanding the qualities and the greatness of the mind is a meaningless existence. The Mind +Humanity = Human. Humanity – Mind = Not Human (Like Animal), so man without mind can't be able to live. This knowledge gives essential prosperity and happiness to life. To understand the mind fully, the Divine State from which it has been originated has to be realised, followed by a knowledge of the origin and existence of the living and non-living things in the Universe. This paper discusses about the Mind is the field which gives birth to all actions.

Keywords: Mind, Perceive, Prosperity, Divine State, Realise.

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Digital Topological Concepts Applied to Medical Image Processing

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Abstract

This paper presents an automatic method relevant to medical image segmentation of magnetic resonance image with tumors, by means of a hybrid filter and connected component extraction. A center weighted hybrid max filter (CWHM) is used to remove the impulse noise from the medical image and the topological concepts are applied to extract connected components and edge detection.

Key words: Image segmentation, Topological space, Medical image, center weighted hybrid max filter.

Homotopy on Subspace Topology

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Abstract

In this paper, the concept of subspace homotopy is been introduced among the continuous functions. The fundamental group on subspace homotopy is been established by defining an equivalence relation among the homotopy functions. Further, the concepts of digital subspace homotopy and digital subspace path homotopy have been introduced and some of their properties are discussed.

Keywords: Subspace Homotopy, Subspace Path Homotopy, Digital Subspace Homotopy, Digital Subspace Path, Digital Subspace Path Homotopy.

A Study on M/M/C Queue Model under Monte Carlo simulation in Traffic Model

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Abstract

In this paper we present a stochastic queuing model for road traffic which captures the stationary density flow relationships. We have analysed the performance of controlling the homogeneous road traffic using Monte Carlo simulation with different service distributions. The future behaviour of road traffic network both in simulation and analytic methods have been analysed. Examples to illustrate these methods have been discussed.

Keywords: Inter arrival pattern, Service pattern, M/M/C Queue, Monte Carlo Simulation

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Comparative study on the Dyebility of cotton, silk and polyester fabrics by conventional and electrochemical methods

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Abstract
Cyclic Voltammetric experiments were carried out for the five different classes of dyes to understand the redox behavior (anodic oxidation / cathodic reduction). The redox property of dyes in relation to the dyeability was studied. The dyes selected were of anionic in nature. In the electrochemical method, the fabric was embedded on the anode and potential was applied for coloration purpose. The dyeability results revealed that the depth of shade was independent of fabric substrate. The color strength (K/S) was measured by Computer color matching machine and the results were compared between the samples colored by both conventional and embedded systems. The uptake of dye on to the fabric increased with increase in applied potential.

Keywords: Cotton, Silk, Polyester, Dyeing, Conventional, Electrochemical

Generators in Intuitionistic Topological Spaces

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Abstract

The aim of this paper is to show that the possible number of intuitionistic sets for a nonempty set with ‘n’ elements. Also a new class of sets called intuitionistic generator and intuitionistic prime generator are defined and using it intuitionistic generator topology and intuitionistic prime generator topology are formed and their special properties are studied.

Key Words: Intuitionistic Generators, Intuitionistic Prime Generators.

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Non Destructive Flaw Detection by Laser Speckle Photography

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Abstract
Laser Speckle Photography, a non destructive optical method is presented to study the defect of a metal surface with the help of image processing technique. The speckle effect is due to the self-interference of coherent light source of He-Ne laser incident on an optically rough surface. This method is employed to identify the flaws by examining the induced strain concentration due to deformation. The fringe pattern is obtained and the defect can be analyzed by Fast Fourier transform.

Key words: Non Destructive Testing, Laser speckle photography, Fast Fourier Transform.

Shelf-Life Study of Java Plum (Syzygium Cumini) by Laser Speckle B/D Pixel Counting Technique

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Abstract
In this paper, shelf-life period of fruit Java Plum or Black Plum (its science name Syzygium Cumini) is assessed by biospeckle image analysis techniques. Laser biospeckle method is a non-destructive and non-invasive optical technique. This study was carried out through capturing the temporal history of the speckle pattern (THSP) by illuminating the surface of the fruit with a high coherent laser beam. The biological activity has been inferred from the changes of intensity fluctuations with respect to time. These changes have been measured from beginning to end by means of correlation functions. As a novelty, numerical analysis of the binary images with B/D pixel counting method reflects the state of investigated object.

Keywords: Biospeckle, Time History of Speckle Pattern, B/D pixel counting.

Weakly Generalized Locally Closed Sets in Intuitionistic Fuzzy Topological Spaces

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Abstract

In this paper, we introduce and study some new classes of weakly generalized locally closed sets and mappings in the context of intuitionistic fuzzy topological spaces.

Keywords: Intuitionistic fuzzy weakly generalized locally closed set, intuitionistic fuzzy weakly generalized locally continuous mappings, intuitionistic fuzzy weakly generalized locally irresolute mappings, intuitionistic

fuzzy weakly generalized locally connected spaces and intuitionistic fuzzy weakly generalized locally compact spaces.

A New Approach to Adaptive Neuro-Fuzzy Modeling Using Kernel Nonnegative Matrix Factorization (KNMF) Clustering For Weather Forecasting

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Abstract

In meteorological applications, weather forecasting has remarkable importance in both scientific and technological challenges. The challenges exist due to its significance based on two main factors: 1) wide usage for several human activities and 2) several prospects created due to technological advancements in weather forecasting linked to applications such as computation evolution and the measurement systems. In order to forecast harsh weather conditions for enabling needed precautions, several mechanisms have been proposed for predicting and offering timely warning on hazardous weather phenomena. In the present work, various datamining methods have been proposed to improve the weather forecasting techniques. The weather forecasting being a well-known predictive challenge has been resolved primarily based on various model-based methods. There is a need for exploring new directions in weather forecasting weather owing to critical challenges related to collection of huge data related to space and time observations. In this work, enhancing prediction efficiency is specifically focused based on hybrid approach by combining discriminatively trained predictive models such as Genetic Algorithm (GA) along with Adaptive Neuro Fuzzy Inference System (ANFIS) for data modeling using a group of weather-related variables. As there is a scope for improving the proposed ANFIS-GA classifier using Kernel Non-negative Matrix Factorization (KNMF) method. The improvisation method follows spatial interpolation as the well-known long-range spatial dependencies and hence referred as Kernel Nonnegative ANFIS-GA (KNANFIS-GA) method.

Keywords: Genetic Algorithm (GA), Adaptive Neuro Fuzzy Inference System (ANFIS), Kernel Nonnegative Matrix Factorization (KNMF) and Fuzzy k-Nearest Neighbor Algorithm (FKNN).

physical properties of microwave-assisted ZnO nanostructures using wet chemical synthesis

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Abstract:

ZnO nanostructures were synthesized by wet chemical method using surfactant PEG6000 with two different molar concentrations (0.1M & 0.5M). The morphology of the ZnO crystals was investigated by Scanning

Electron Microscopy (SEM) technique. The results indicate that the presence of surfactant significantly modify the shape and size of ZnO particles. In order to examine the possible changes in other properties of ZnO characterizations, FT-IR and UV-visible spectroscopy analysis were also studied and discussed.

Keywords: Zinc oxide, PEG6000, wet chemical synthesis, Surfactants.

A Study On Optimisation Of Master Health Checkup Process At A Multispeciality Hospital In Coimbatore

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Abstract
It has become a fact that any human being is prone to diseases irrespective of various factors. Long waiting hours during master health checkup makes the process more tedious and time consuming. This research study focuses on the master health check-up (MHC) department of a multispecialty hospital in Coimbatore with the objective of optimising the process using lean management techniques. A time study was conducted; the bottle necks in the process were identified and a current state Value stream map was developed. Also the future state VSM was developed explaining how the proposed suggestions like sequencing, modeling a patient tracking system and developing an online application for registration would improve the process by reducing waiting time thereby improving the quality of service. A prototype of the android application was also developed during the period of study.

Key words: Value Stream Mapping (VSM), Master Health check-up (MHC), Sequencing, Waiting time.

Evaluation of Supply Chain Performance for Packaged Dairy Products

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Abstract
Determining the supply chain length help companies to know how fast its products move from manufacturer to distributor, from distributor to retail outlets and from retail outlets to end-customer. Based on the literature review carried-out, it was found that many researchers have studied the supply chain performance using metrics at supply stage, manufacturing stage and distribution stage. Length of the supply chain of products is one of the important metrics to evaluate the supply chain performance. When it comes to perishable products, length of supply chain measured in terms of time indicates how fast the product moves and reaches the costumer hands from the time of manufacturing. No study has been attempted so far to measure the supply chain using time duration for perishable products. This paper focuses on measuring the supply chain length of products manufactured in one of the leading milk products manufacturing company located in Erode, an emerging city in south India. The sampling frame comprises the retailers those deals with dairy products in Erode district. A random sampling method is used by selecting 64 retailers. Retailers located in seven small cities in Erode district were considered for the study. Retailers taken for the study include those sell dairy and related products. 168 complete filled-in forms were collected directly in person from the owners of retailers. Five fast moving

products were selected for the study that includes Panner, Lassi, Cheese, Curd and Ghee. Primary data were collected using a questionnaire. The length of the supply chain was arrived using the methodology based on time factors at the manufacturing stage, retailer stage and customer stage. Data on primary variables viz. Stock level, sales quantity, and date of manufacture were collected to determine the supply chain length. Test results on comparing the time taken for products across various locations, it was proved that there is a significant difference in the time taken to reach the customers between products at various locations. Supply chain performance is classified into the Rapid Responsive Supply Chain (RRSC) and Slow Responsive Supply Chain (SRSC) comparing the time difference between the estimated supply chain length and actual supply chain length of products.

Keywords: Supply Chain Length, Supply Chain Evaluation, Rapid Responsive Supply Chain, Packaged Dairy Products

An Analysis On Reducing The Process Time In Manufacturing Industries Through SMED

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Abstract
The aim of this study is to reduce the bottlenecks present in the machining process. A work order, though it is simple or complex takes multiple days to undergo processing. This time delay is mainly due to the idle time present at each stage of the process. The machining process has a number of sub processes like cutting, forging, CNC operation, VMC operation, deburring and packing. The objective of this study is to identify the time taken for each process and reduce the idle time. For this case, time, motion and method study has been made to identify and debug the bottleneck. The principles of SMED has been applied in order to enhance the study.

Keywords: SMED, Process reduction and CNC machining

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