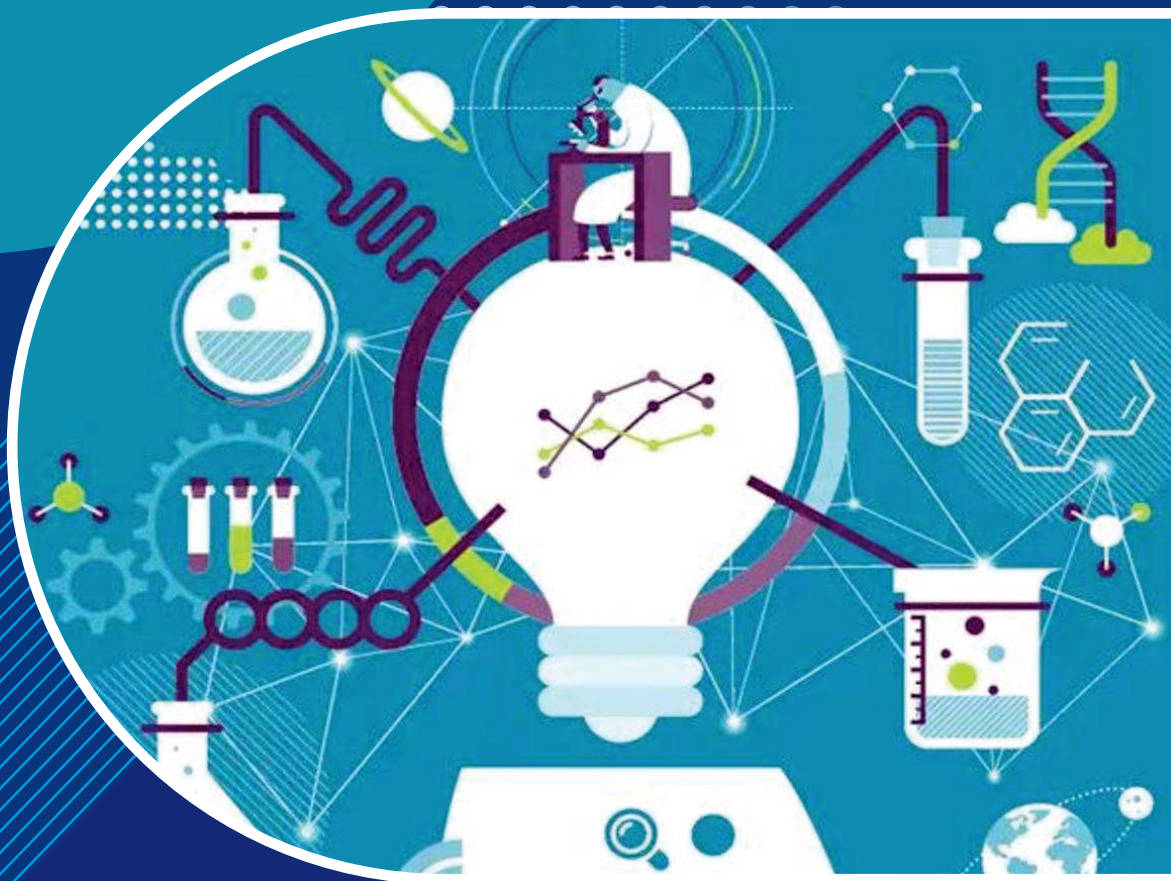


A COMPENDIUM OF RESEARCH PUBLICATIONS 2019

VOL - IV



St Joseph Engineering College

(Affiliated to VTU, Belagavi and recognised by AICTE, New Delhi.
B.E. - CSE, ECE, EEE, ME Accredited by NBA, New Delhi)

Vamanjoor, Mangaluru - 575 028, Karnataka, India



Research!

“

Research is to see what
everybody else has seen,
and to think what
nobody else has thought.

——— Albert Szent-Györgyi ———

”



ESTD: 2002

ST JOSEPH ENGINEERING COLLEGE

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2020



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“He who does not research has nothing to teach”

I am delighted to pen a message down for the fourth volume of the Compendium of Research Publications 2019, a compendium that records faculty research and publications report to showcase how our faculty members are actively engaged in the creation of knowledge, and to profile their publications and professional achievements.

Research allows you to pursue your interests, to learn something new, to hone your problem-solving skills and to challenge yourself in new ways. A good academician becomes a powerful scholar with frequent publications. Frequent research publications by an individual will result in increasing the researcher's credit. Publication is very important in the academic career as researches provide the researcher with information and knowledge. Academic articles improvise on one's own research skills. Research and publications are crucial and essential to grow and prospect in an academic career. We as a college have grown over the past couple of years and one of the things that has seen a significant growth is the field of research, and this compendium with more than 80 research papers of our very own faculty members is a testimony of our college transforming itself as a successful research centre.

I laud the effort of the editorial team for coming up with this volume in the limited time they had. I also congratulate every faculty member for their immense contribution to this volume.

Thank you and God be with you all.

Rev. Fr Wilfred P. D'Souza
Director - SJEC



The Scientific and Research papers published in reputed National and International Journals and Conferences by the faculty of SJEC is being compiled in one volume. The scientific papers with research interest in the respective fields are useful for faculty and budding researchers if a Compendium of such Research Publications is published and made handy for reading in one volume.

I hope that the publication of Compendium of Research Publications by SJEC is well received by all the stake holders. If this publication inculcates in the faculty and research scholars of SJEC to undertake new research activities and publish the research articles in reputed Journals & Conferences, the effort of editorial team will be considered as successful.

I congratulate the Editorial team for the efforts undertaken and all the faculty who have contributed to this Compendium.

Rev. Fr Rohith D'Costa
Assistant Director



“Research is to see what everybody else has seen and to think what nobody else has thought”

- Albert Szent Gyorgyi

The quest for knowledge is the basic principle behind research. The quality of research work directly translates to the quality of publications. With the intension of boosting interdisciplinary research publications among the faculty, SJEC brings out the Compendium of Research Publications annually. I would like to complement the entire faculty who have contributed to this Compendium.

I gratefully acknowledge the yeoman service of the Editorial team in bringing out this Compendium of Research Publications successfully.

Rev. Fr Alwyn Richard D'Souza
Assistant Director



To achieve and promote excellence in applied research, SJEC has taken the initiative to launch a “Compendium of Research Publications” since 2016. This year SJEC is pleased to present before you the Fourth Volume of the “Compendium of Research Publications” which showcases an array of fascinating and enterprising abstracts of the publications of our faculty published in peer reviewed journals. This is an add-on to the enriched catalogue of college publications and academic literature.

In order to enhance the research environment, our college has introduced the publication incentive scheme. It is heartening to learn that as an effective outcome of this scheme many scholarly articles have been published in different international and national journals of repute. I would like to compliment the entire faculty who has contributed their novel research articles to this Compendium. Going by the trends we are anticipating more and more fruitful researches to be carried out by our faculty at different disciplines and would like to assure that SJEC will continue to support the entire faculty in your endeavor.

I also congratulate the entire editorial team for bringing out this Compendium meticulously which will definitely boost the interest of the budding researchers.

Dr Rio D'Souza
Principal

This is the fourth year in succession that SJEC is bringing out the compendium. In this Compendium, it is encouraging to see a remarkable amount of abstracts which reflect the commitment of our faculty and research scholars. The full texts of these abstracts are published in reputed National/International Journals, Conference/Seminar volumes, Books and Book Chapters.

This Compendium consists of 83 research articles published during 2019 by the SJEC faculty at different International and National Journals and presented at International and National Conferences. Out of the 83 research articles 54 were published in International Journals, 2 in National Journals. They also published papers in 18 International Conferences and 6 National Conferences and 3 in Book Chapter

We thank the members of the Editorial Board for their constant support in bringing out this Compendium. Thanks to the Management, Principal Dr Rio D'Souza, the contribution of Library & Learning Group for bringing out this Compendium. We thank and congratulate our esteemed faculty and research scholars for their contribution.

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NC	-	4	2	-	-	-	-	-	6
IC	1	2	6	-	6	2	1	-	18
NJ	-	-	-	-	-	-	-	2	2
IJ	6	3	5	-	25	2	-	13	54
BC	2	-	1	-	-	-	-	-	3
TOTAL	9	9	14	-	31	4	1	15	83

NC-National Conference, IC–International Conference, NJ- National Journal, IJ- International Journal,
BC- Book Chapter



COMPUTER SCIENCE AND ENGINEERING

A Rule-Based Approach for Multi-Perspective Adaptation of Service-Based Systems

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ABSTRACT

A key feature of any business process (BP) implemented as service based system (SBS) is adherence to compliance. BP workflows are frequently prone to faults or anomalies of various kinds namely, functional, temporal, structural, regulatory or technological updates. If faults are not handled in a timely manner, it may result in violation of service level agreements (SLAs). Therefore it is crucial for any BP to be flexible enough to adapt to changes of various categories. Current adaptation approaches try to adapt from either data (interface) mismatches from service perspective, temporal requirements from business perspective or resource constraints from the infrastructure perspective. We propose an adaptation framework which is capable of recovering from data, control-flow, temporal and infrastructure faults. The prototypical implementation using rule based approach is applied on a laboratory simulation.

**Full Paper: International Journal of Electronic Governance (IJEg), Vol.11, Issue No.2, 2019, pp 132 – 154*

Temporal Impact Analysis and Adaptation for Service-Based Systems

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ABSTRACT

Temporality is an influential aspect of service-based systems (SBS). Inability of a service to achieve time requirements may lead to violation of service-level agreements (SLA's) in a SBS. Such non-conformity by a service may introduce temporal inconsistency between dependent services and the composition. The temporal impact of the anomaly on related services and also the composition will need to be identified if SLA violations have to be rectified. Existing studies concentrate on impact analysis due to web service evolution or changes to a web service. There is a huge lacunae regarding studies on impact of time delay on temporal constraints of dependent services and obligations of business process. Although reconfiguration of SBS to overcome failures is extensively addressed, reconfiguration triggered due to temporal delay is not well explored. In this study, we try to fill the gap between reconfiguration and impact analysis invoked due to temporal violations. Once the impacted region and the amount of temporal deviation to the business process are known, we try recovery by localising the reconfiguration of services to the impacted zone.

**Full Paper: International Journal of Information and Communication Technology, (IJICT), Vol.14, Issue No.4, 2019, pp 403 – 426*

A Survey on Various Cloud Storage Schemes for Preserving Privacy and Preventing Data Loss

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ABSTRACT

Cloud storage is provided as a service where data is managed, maintained and also made globally available to the service requesters. The data uploaded by requesters is managed by Cloud Service Provider (CSP). This leads to separation of ownership and management of data. CSP has free access to such data which is also vulnerable to attack from outsiders. Data stored in cloud is also susceptible to cloud server failure. These circumstances lead to risk of information leakage and data loss. In this paper we review the various methods which address privacy issues and data loss in Cloud computing.

**Full Paper: International Journal of Engineering Research & Technology (IJERT), Vol 7, Issue No. 8, 2019, pp 1-4*



Compliance Management in Business processes

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ABSTRACT

Business Process Compliance refers to the act of conformance of a business process with policies, regulations and rules that govern the organization. An imperative requirement of business processes in various fields such as Health care, Insurance, Finance and Online Trade is adherence to a large number of compliance requirements, constraints and quality policies from various sources. Lack of compliance may result in huge compensations and loss of customers and reputation. Compliance issues can be handled either retrospectively i.e. after non-complaint situations are observed or they can be handled proactively i.e. anticipation of possibilities leading to non-compliant circumstances during process execution which may prevent occurrence of deviations and thus save upon compensation effects. Hence compliance management tasks need to be incorporated into each phase of the lifecycle of a business process. In this article we discuss contemporary activities related to lifecycle of compliance management in business processes which involve compliance elicitation, compliance formalization, compliance implementation, compliance verification and compliance improvement based on existing literature. Compliance Monitoring Functionalities (CMFs) which may be used to categorize and also assess existing compliance management approaches and frameworks are also discussed.

**Full Paper: Lecture Notes on Data Engineering and Communications Technologies, Digital Business - Business Algorithms, Cloud Computing and Data Engineering, edited by Patnaik S and others, 2019, pp, 53 - 91*

IoT Device and Service Discovery Framework

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ABSTRACT

Internet of Things (IoT) is a unique domain which works on various aspects, which is blanketed, interconnected and thereby enables the humans to interact with the web services and creates a smarter world. There is severe problem in the unified way for discovering IoT devices and services in the present existing infrastructure. The current device centric approach is not in consistent with the growing network. There is no standard method which allows the user to find IoT devices and services in a single framework. Users looking for services will not be aware of potential services available to satisfy their needs. The proposed concept uses unified service discovery broker based architecture using web services. Broker based architecture allows the different providers to register their devices and services at one place and based on the user query, matching of suitable device and appropriate service will be done and the service data corresponding to the specific query of the user will be provided by using semantic search. Hence, the user can find in a single framework the registered devices and services separately which will be bound together to process the IoT device data stored on cloud. In future, IoT applications would be deployed in several domains like home automation, smart cities, intelligent transport and e-health. Complex service request made by the user can also be resolved using service composition to get the final result.

**Full Paper: International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878, Blue Eyes Intelligence Engineering & Sciences Publication, Vol. 8 Issue No. 2S6, July 2019, pp 490-496*

Speech Based Emotion Recognition Using Combination of Features 2-D HMM Model

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ABSTRACT

In this article, we study how the numbers and statistical values of speech characteristics affect the precision of recognition of feelings from human speech. We recognize two efficient characteristics with Gaussian Mixture Model (GMM), namely Mel Frequency Cepstrum Coefficients (MFCCs) and Auto Correlation Function Coefficients (ACFC) found directly from the audio signal. Using GMM super vector molded by importances of MFCCs with berlin emotional folder considering six earlier proposed emotions: fear, anger, happy, disgust, sad and neutral. Our technique accomplished an emotion recognition rate of 74.45%, suggestively better than 59.00% achieved formerly. We also perform experiments with a distinct set of feelings to demonstrate the wide applicability of our technique: anger, boredom, fear, happiness, neutrality and sadness. Our 75.00 percent emotional identification rate again exceeds 71.00 percent of the concealed markov model technique with MFCC, delta MFCC, cepstral coefficient and speech energy.

**Full Paper: Proceedings of the 3rd International Conference on I-SMAC IoT in Social, Mobile, Analytics and Cloud, I-SMAC 2019, IEEE, pp 381-385*

Lightweight Context-Based Web-Service Composition Model for Mobile Devices

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ABSTRACT

With the widespread use of mobile devices having powerful processing capabilities, there is an ever-increasing demand to localize essential mobile services on these mobile devices to increase convenience. Most of the current computation concentrates on collecting service information from mobile devices and processing it at the server side. This is because semantic analysis of the service description in the mobile device is a resource intensive process. One of the main processes involved in the semantic analysis is the Parts of Speech (POS) Tagging. Currently, POS tools are not available for mobile devices. POS tagging however is a resource intensive application which is a challenge in the context of mobile devices due to limited availability of resources such as power, memory and processing capability. This chapter discusses a new, lightweight, context based web service composition model for mobile devices. The main idea is to build a lightweight POS tagger in the mobile device itself. The POS tagger finds its application in the context of identifying services requested by users in the form of natural language queries. Once the service names are identified in the mobile device, the request is sent to the web-service providers for their response and these responses are composed in the mobile device.

**Full paper: Lecture Notes on Data Engineering and Communications Technologies, Digital Business, edited by Patnaik S and others, DOI:10.1007/978-3-319-93940-7_9, Vol. 21, pp 199-222*

A New Framework to Locate, Connect and Share Mobile Web Services Through Intelligence Techniques

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ABSTRACT

The advancement in mobile technology is taking place at very high speed, especially in the case of smart devices. In recent years, the use of mobile phones has changed the life style of common people. As days pass, new and better technologies are emerging in this field which make the life of people easier and also help people to connect with one another in a better way than before. Initially, the usage of mobile phones was restricted only to make phone calls and send messages. The current use of mobile phones has evolved into a new revolution. The current smart phones provide almost all features that a laptop or desktop provides. It is also seen that social network has influenced a lot of message and call transfers among the known group of users. There are thousands of mobile applications available and most of these applications communicate to a well-known server or cloud service provider through the Internet and gives back an appropriate response to the mobile user. It is really challenging to find an interesting service provided by an unknown mobile user to another mobile user who is interested in receiving that service. In the present scenario, people find it difficult to pursue their interests or connect to other people of similar interests. Most of the times, mobile users are unaware of the activities that are happening around them. The main idea behind this work is to provide a framework to notify a mobile user about his interests currently available near him/her or in different locations. It connects people of similar interests in the location where they are currently in. This framework uses the existing SOAP and HTTP technologies along with redefined WSDL for describing web services on the mobile device. The data to be shared by the mobile web service provider may be generated by the sensors within the mobile device or the data is explicitly updated by the user dynamically or the data is collected from the external sensors/devices connected to internet of things through the mobile device. The cloud service is used to enable the service request mapping and repository. This framework may be used to define any web service on mobile devices and make them available to users based on interest, location and time. The main objective of the proposed work is to identify various dynamic location based mobile web services and to provide them a framework to share their services with the interested mobile service consumers.

**Full Paper: Evolutionary Intelligence, 2019 (Article in Press).*

Illumination Enhanced Face Recognition for Smart Access System

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ABSTRACT

Principle Component Analysis (PCA) is a widely used technique in the field of face recognition. Any system will have its own pros and cons. One of the disadvantages of PCA is its bonding with the light variation. By focusing on this issue, an improved algorithm is proposed by combining PCA with the Fast Fourier Transform-2. This solution is then applied to a real time environment which provides the smart access to the house. The user interface is provided using the Android application installed on the user's smart phone. The communication between the smart access system and the application can happen remotely. The mechanical door lock is controlled using the system which can receive and transmit the command.

**Full Paper: International Journal of Mechanical Engineering and Technology, Vol. 10, Issue No. 2, 2019, pp 501-510*



Experimental Studies on Geosynthetic Vertical Barrier Around the Dumpyard

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ABSTRACT

The water sources surrounding the Mangalore dumpyard have been highly contaminated by the leachate percolating to the water bodies as it contains high content of toxic metals like Lead, Mercury, Cadmium, Arsenic etc. The Geo-synthetic Clay liner at the bottom of the dumpyard is worn out and hence there is direct percolation of water into the water bodies. Geo-synthetic membranes is latest and the most effective for containing the contamination. In this paper the use of Geo-synthetic membrane or simply Geo membrane as a filter material for filtering the toxic metals is explained. A miniature model of the dump yard is prepared and Geo membranes were laid around the periphery of the model. Geo membranes like polypropylene of matrix density 500,600,700 have been used and a considerable reduction in contamination percentage has been obtained.

**Full Paper: Proceedings of the International Conference on Civil Engineering Trends and Challenges for Sustainability, NMAMIT, NITTE, 23-24 May 2019, pp 101*

Development of Water Filtration Unit using PVA Based Composite Membrane and Fly Ash

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ABSTRACT

Surface water sources have become highly contaminated due to the presence of undesirable substances making unfit for consumption and other uses. The concentration of impurities can be reduced by several methods. Membrane technology is the latest and the most effective one. In this paper, Glutaraldehyde grafted Chitosan-PVA polymer composite membrane have been synthesized and characterized. Solution casting method has been used to synthesis the membrane. PVA is dissolved in distilled water and then Chitosan powder is added to the solution. Membrane is fabricated and then grafted with Gluaraldehyde. Scanning Electron Microscopy (SEM) was used to characterize the developed composite membrane in terms of morphology and performance. Water optic studies were carried out to study the pore size of membrane. This paper is aimed at developing a simple water filtration unit using adsorbents like coarse aggregate, activated Charcoal sand, and Composite membrane.

**Full Paper: Proceedings of the International Conference on Civil Engineering Trends and Challenges for Sustainability, NMAMIT, NITTE, 23-24 May 2019, pp 102.*

Analysis of Steel Framed Structure using Steel Bracing System for Seismic Load

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ABSTRACT

In General, the structure located in more seismic prone zones are more susceptible to the severe damage. Steel has got few major physical properties like high strength and ductility as compared to reinforced concrete structure. Properties of steel are to be considered while designing seismic resistant structure. This research explains the analysis of steel framed building with different bracings. The analysis of steel framed structure is carried out using ETABS Software. In this paper, the main parameters evaluated are Base shear, storey shear and storey drift for zone IV. The models are analyzed by equivalent static analysis as per IS 1893:2002.

**Full Paper: International Research Journal of Engineering and Technology, E-ISSN: 2395-0056, P-ISSN: 2395-0072, Vol. 6, Issue No. 4, April 2019, pp 4408-4413*

Study on Adoption of Appropriate Cost Effective Technologies for a Building

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ABSTRACT

It is of vital importance to one's life to have provision of adequate and suitable shelter to live under. Non-affordability of housing by economically weaker sections of society and low income families is rising rapidly. Adequate shelter for all people is one of the pressing challenges faced by the developing countries. India is currently facing a shortage of about 17.6 million houses. Realizing the gravity of this situation, Sustainable low cost housing technologies which could provide houses to masses at affordable cost assumes greater significance. The present strains on Indian economy and the ever-growing demand for housing, call for adoption of appropriate building technology which could achieve utmost economy and speed in construction.

There will also be reduction in the use of scarce materials. Low cost house can be constructed in less time. This proves that using low cost housing technologies is a cost effective construction approach for the industry.

**Full Paper: National Conference on Advancement and Innovations in Civil Engineering, ISBN 978-81-926416-6-9, PES Institute of Technology and Management, Shivamoga, Karnataka. 16th May 2019*

Study on Traditional and Alternate Low Cost Construction Technologies for Building Design

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ABSTRACT

In India construction cost is increasing at around 50% over the average expansion levels. It is registered to increase up to 15% every year especially due to the cost of fundamental building materials such as steel, cement, bricks, timber as well as cost of labour. Due to this, the construction cost using traditional building materials and its construction is becoming beyond the affordable limits particularly for low-income groups of population as well as the middle - income groups. As we all know, food, shelter and clothing are the basic needs of all human beings. Adequate shelter for all people is one of the pressing challenges faced by the developing countries. India is currently facing a shortage of about 17.6 million houses. Hence, it has become a necessity to adopt cost effective housing technologies for the construction of houses and buildings for enabling the common people to construct houses at affordable cost. This paper compares construction cost for the traditional and low cost housing technologies. Construction methods of foundation, walling, roofing, flooring, doors, windows and lintel etc. are compared. It is found that about 26.9% of the construction cost can be saved by using low cost housing technologies in comparison with the traditional construction methods. There will also be reduction in the use of scarce materials. This proves that using low cost housing technologies is a cost effective construction approach for the industry

**Full Paper: National Conference on Jnanasangama - 2019, Vivekananda College of Engineering & Technology, Puttur, 11th May, 2019*

Design and Analysis of Deck Slab and Girder of a Bridge

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ABSTRACT

The aim of this research study is to analyse and design a bridge next to the already existing bridge across Palguni river at Manjalpade. A Bridge is built to enable movement through an obstacle by not closing the way below. The existing bridge was in a collapsible state and hence we have proposed for the new bridge next to it. When the concrete is presumed to be elastic, then concrete and steel function together elastically and the relationship between the loads and stress is linear, then the working stress method is used for the reinforced concrete design. Design of the bridge includes the design of the girders and deck slab. We have used working stress method for the above said designs.

**Full Paper: National Conference on Advancement and Innovations in Civil Engineering, PES Institute of Technology and Management, Shivamoga, Karnataka, 16th May 2019*



Design of Box Culvert Using Visual Basic

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ABSTRACT

Culverts are defined as structures which provide a passage over a gap without closing the way beneath which may be needed for the passage of railways, roadways, footpath and even for the carriage of fluids. The purpose of this project is to introduce to the users the systematic methodology for problem solving of designing of box culvert for any vent using programming language Visual Basic 6.0, one of the most popular and widely used computer language. The onus of working out the algorithm for solving any problem in computer is still on us. This very project provides development of designing box culvert by allowing easy access to what was once a daunting task. Before developing the program the box culvert of one vent is designed manually. The main parameter in this program are concrete and steel property, number of vents, dimension of the box and height of the earth fills.

**Full Paper: International Research Journal of Engineering and Technology, e-ISSN: 2395-0056, p-ISSN: 2395-0072, Vol. 6, Issue No.4, 2019, pp. 4625-4631*

Study on Treatment of Automobile Service Station Effluent by Adsorption Process by Using Natural Adsorbents

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ABSTRACT

In India, most of the car wash centres do not having proper filtration systems to treat the waste water after washing of cars. This paper intends to provide a multimedia filter technology for treatment of wastewater obtained from car service stations. A filter is simplest and lost cost treatment technology. The aim of this study is to reduce the content of oil and grease and COD and analyze pH, turbidity and hardness of the waste water using the process of adsorption. The adsorption is done using natural adsorbents like sugar cane bagasse and corn cobs.

**Full Paper: National Conference on Advancement and Innovations in Civil Engineering, PES Institute of Technology and Management, Shivamoga, Karnataka, 16th May 2019*



Study on Increasing the Efficiency of the Existing Sequential Batch Reactor of St Joseph Engineering College

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ABSTRACT

The present study was carried out to evaluate the efficiency of SBR of St. Joseph Engineering College. Wastewater samples were collected in daily basis and analysis of various water parameters were performed. Such as COD, BOD, pH, Specific conductivity, Turbidity and hardness. Increase in aeration time resulted in decrease in the values of the water parameters. Usage of tubesettlers with algae resulted in better water quality. Our study on characteristics of wastewater resulted in reduction of aeration time 8hours to 5 hours.

**Full Paper: International Research Journal of Engineering and Technology, e-ISSN: 2395-0056, p-ISSN: 2395-0072, Vol. 6, Issue No. 4, 2019, pp. 4472-4476*



ELECTRONICS AND COMMUNICATION ENGINEERING

User Satisfaction-Based Resource Allocation in LTE-A

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ABSTRACT

The resource allocation issue in LTE-A is a challenge as it is a combinatorial optimization problem, involving several constraints. The resource blocks (RBs) can be scheduled to a user at every 1 ms, following the adaptive modulation coding (AMC) techniques. In this paper, we address the resource allocation problem for a unicast scenario (i) to maximize the number of satisfied users and (ii) to maximize the overall throughput by packet-level scheduling when the resources are limited. Both problems are NP-hard, and as a result, we proposed two heuristic algorithms that could meet the said objectives in polynomial time by adaptively selecting the RBs. The performance evaluation of the proposed algorithms shows that these algorithms outperform the conventional greedy method in terms of user satisfaction, resource consumption, and system throughput.

**Full paper: Proceedings of the International conference on Advances in Communication, Signal Processing, VLSI, and Embedded Systems (VSPICE 2019), Lecture Notes in Electrical Engineering, Springer, Vol. 614, May 2019, pp-247-262.*

Incentive Based Relaying in D2D Social Networks

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ABSTRACT

Co-operative data transmission between Device-to- Device (D2D) user terminals is a challenging task due to the selfish behavior of the D2D users (DUs). Incentivizing the DUs can promote communication which in turn also reduce the trans-mission burden on the base station (eNB). In this work, we con-sider a scenario, in which eNB pays incentive to DUs to relay the data among its best neighbors; while the communication is regulated by wireless channel, and social influence factors. In case, DUs refrain from relaying, the eNB ought to transmit di-rectly which increase the cost of the eNB several folds. We mod-el this problem as a Stackelberg game, in which eNB plays the role of a leader to minimize its cost and DUs will be the follow-ers who aim at maximizing their utility. We propose an iterative algorithm to establish the existence of equilibrium. We also prove the equilibrium of DUs subgame for a special case by relating it to a 0/1 knapsack problem. The simulation results show that the proposed algorithm has a better performance in terms of Utility and total base station cost than the conventional schemes.

**Full paper: Proceedings of IEEE International Conference on Advanced Networks and Telecommunications Systems (ANTS), Goa, December 2019*

An Efficient VLSI Architecture for Two-Dimensional Discrete Wavelet Transform

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ABSTRACT

In this paper, a memory efficient 2-D discrete wavelet transform (DWT) structure is presented for high-speed application. The architecture is based on the modified lifting scheme to reduce the critical path to one multiplier delay. In order to increase the speed of processing, four pipeline stages are introduced in the structure. The computation time for an $N \times N$ image is $N^2/4$, as the throughput rate of the structure is four. The results after comparison reveal that the proposed architecture has a temporal memory lower than the other DWT architectures. The Z-scan method is employed to fetch the input data which suits the transpose unit design. Five registers and a multiplexer constitute a transpose unit, which is required to transpose the data between the row and the column processor. The proposed 2-D dual-scan DWT architecture has the merits of low latency, low control complexity and regular signal flow, making it suitable for a very large-scale integration (VLSI) implementation. The architecture is modelled in VHDL and synthesised with the CMOS 180 nm technology.

**Full paper: International Journal of High Performance Systems Architecture, Vol. 8, Issue no. 3, 2019, pp. 179-191*

Low Power Modified Shift-Add Multiplier Design Using Parallel Prefix Adder

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ABSTRACT

Multipliers are the building blocks of every digital signal processor (DSP). The performance of any digital system is dependent on the adder design and to a large extent on the multiplier block. Area and power dissipation are the major considerations in a multiplier design due to its complexity. In this paper, an efficient multiplier "bypass zero feed multiplicand directly," based on shift-add multiplication, has been proposed for low-power application. As the shift-add multiplication is a repetitive process of addition, the implementation time of an adder is reduced by using the proposed parallel prefix adders designed based on revised Ling equations. The proposed 8-bit, 16-bit and 32-bit multipliers are implemented using 180-nm and 90-nm CMOS technologies. Simulation results reveal that the proposed multiplier is fast and lowers the power by 35% predominantly for a 32-bit multiplier.

**Full Paper: Journal of Circuit, System and Computers, Vol. 28, Issue No. 2, 2019, pp. 1950019-1 to 1950019-18*

Perceptual Linear Prediction Feature as an Indicator of Dysphonia

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ABSTRACT

Voice is the most widely used form of communication in humans. The analysis of human voice is one of the areas that has been of great significance. This area is studied for its various applications in the field of medicine and engineering. The analysis in general deals with the extraction of some parameters of the voice signal for investigation and processing. A system that diagnoses the patients from their speech signals is proposed in this work. It includes detection and classification of certain common medical conditions which affect the voice patterns of the patients. The feature vectors of the speech samples are obtained by using Perceptual Linear Prediction (PLP) and Relative Spectral Transform Perceptual Linear Prediction (RASTA-PLP) feature extraction methods. The detection and classification of voice pathology are done by using the support vector machine (SVM) classifier. The accuracy of the classifier is computed using speech samples of Gastro esophageal Reflux Disease (GERD) and vocal fold paralysis from the pre-classified database.

Supervised Learning at Chest Radiography using Artificial Neural Network

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ABSTRACT

Chest X-Rays are a low cost medical screening technique widely used to screen the interstitial lung diseases. Since the images produced are 2D, it requires a highly experienced and qualified radiologist to review and detect the disease correctly. Also X-Rays are more prone to noise and therefore it is difficult to see the findings with naked eye. Lack of qualified radiologists paves way for CAD techniques to interpret the X-Rays. The method proposed in this paper uses various image processing techniques along with supervised learning at CXRs, to screen the diseases and classify them into normal and abnormal. K-means clustering is used to segment the lung region and features such as mean, variance, entropy, kurtosis and skewness are extracted using Local Binary Pattern Histogram. The features are validated using t-test and significant features are used to train the classifier. ANN is used for classification as it produced better classification results with 85% accuracy, 80% specificity and 90% sensitivity.

** Full paper: National Conference on Communication, Signal Processing, IoT, Networking and Embedded Application (NCCOSINE-2019), organized by Department of ECE, The National Institute of Engineering(NIE), Mysore, 16-17 May 2019*

Role of Normalization of Breast Thermogram Images and Automatic Classification of Breast Cancer

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ABSTRACT

Breast thermography is a non-invasive imaging technique used for early detection of breast cancer based on temperatures. Temperature matrix of breast provides minute variations in temperatures, which is significant in early detection of breast cancer. The minimum, maximum temperatures and the their range may be different for each breast thermogram. Normalization of temperature matrices of breast thermograms is essential to bring the different range of temperatures to the common scale. In this article, we demonstrate the importance of temperature matrix normalization of breast thermograms. This paper also proposes a novel method for automatically classifying breast thermogram images using local energy features of wavelet sub-bands. A significant subset of features is selected by a random subset feature selection (RSFS) and genetic algorithm. Features selected by RSFS method are found to be relevant in detection of asymmetry between right and left breast. We have obtained an accuracy of 91%, sensitivity 87.23% and specificity 94.34% using SVM Gaussian classifier for normalized breast thermograms. Accuracy of classification between a set of hundred normalized and corresponding set of non-normalized breast thermograms are compared. An increase in accuracy of 16% is obtained for normalized breast thermograms in comparison with non-normalized breast thermograms.

* Full paper: *The Visual Computer*, Springer, Volume. 35, No.1, 2019, pp 57-70

Adaptive Bi-threshold Algorithm for ECG Compression Based on Signal Slope

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ABSTRACT

Electrocardiogram (ECG) is used to record electrical activity associated with the functioning of the heart. These signals are highly data intensive and have higher resolution; thus, ECG signals require large space for storage in database and more transmission bandwidth. The ECG signals contain information signal with some redundancies; by removing these redundancies, better ECG signal compression can be achieved. The ECG compression algorithm should have high compression ratio (CR), low percent root-mean-square difference (PRD), low reconstruction error, and less computational complexity. DCT/FFT methods use frequency transformation and parameter extraction techniques. In dynamic compression scheme, IF sampler and lossless encoder are used. Both methods require preprocessing of the ECG signal. In the proposed method, the preprocessing of ECG signal is not required; signal compression is based on two threshold values, and the noise is eliminated. Using these techniques, better CR, PRD, and less storage space are achieved.

** Full paper: Proceedings of the International Conference on Advances in Communication Signal Processing, VLSI, and Embedded Systems, Lecture Notes in Electrical Engineering, Springer, Vol. 614, Singapore, May 2019, pp 227-237*

Novel Methods of Complex Key Generation Techniques for Vernam Cipher with Secured Seed Exchange

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ABSTRACT

The randomness of the number used for coding the data with a complex algorithm that makes more difficult for the middle man or the intruder is an unauthorized person to decrypt. The paper speaks about the three different methods of pseudorandom generation and analysis by comparing the number of occurrence of digits with respect to length of the different keys. The methods are Vulgar fractions, $3n+1$ algorithm, Magic square $n \times n$ and the combination of this number's generated sequences. The conclusion is based on the analysis of number of occurrences of digits, hence the cryptographer can select and adopt the any appropriate key for data encryption. The three different methods are for number generation, this sequence of numbers are nothing but keys used for encryption with strong algorithm are explained in combination with existing cryptosystems, Vernam cipher and for seed exchange Massey- Omura protocol.

** Full paper: International Conference on Laser Deposition, Alva's Institute of Engineering and Technology, Moodbidri, November 2019.*



Defeating Attack in Massey-Omura Cryptosystem

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ABSTRACT

The message transmission via the well known Massey –Omura cryptosystem is not secure because it is vulnerable to man –in the middle attacks. This is a novel method of authenticating the message such that message tampering and message forging kind of attack is detected. The computer technology presently has been highly developed. Numerous applications of various types have been written. Many of them require that their data be secured, shielded from unwelcome users. Different types of application require specialized security levels. It is often desired that a simple cryptosystem be used instead of a complex ones. Massey-Omura crypto system is one of such simple systems, not demanding much overhead processing

** Full paper: 3rd International Conference on Recent Trends in Sciences, Engineering and Mathematics, Goa, September 2019*

Identification of Fruit and Subsequent Automated Peeling and Cutting Based on the Type

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ABSTRACT

Human beings are trained to identify different varieties of fruits and vegetables but time taken by the person for cutting or peeling of fruits and vegetables is more and it is not feasible with the requirements of a large kitchen. In order to minimize the time consumed in this process, a project is designed. This project has two parts. The first part of the system is based on image processing, which consists of capturing an image of the object, comparing it with the images stored in the database and identification of image. Accuracy achieved in this process is more than 90%. The second part of the project is segregation of the fruits or vegetables and cutting of the fruits or vegetables depending on the requirements. A hardware system is designed to perform the segregation and cutting process.

* Full paper: *Proceedings of the National Conference on Jnanasangama 2019, VCET, Puttur, May 2019, pp 118-122*

Design and Self-Stabilization of Unmanned Aerial Vehicle (UAV) using PID Controller

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ABSTRACT

In today's advanced technological life, self-ruling quad copter or unmanned aerial vehicle (UAV) is gaining more importance because of their various applications. UAV is accurately made to keep up harmony between velocity, weight, soundness and force. UAVs are widely used in military operation as well as industries nowadays because of their reliability, cost effectiveness and multi functionalities. The idea behind the project is to implement an UAV with self-stabilization system. The idea started by building a quad copter with help of KK board which controls the basic movement of the quad copter such as yaw, roll, pitch and throttle. KK board was the efficient one for self-stabilization but does not guarantee efficient results in stabilization of the quad copter. Arduino platform is the other way for the stabilization operation, where four accelerometers are used to read the X, Y, Z axis values when the quad copter positions are changed. By this the behavior of quad copter is analyzed for different quad copter movements with efficient algorithm using PID controller. The above system constantly measures the angle of the drone and compares that value with the desired value and rectifies the error if there is one. But using this method stability was not up to the mark. Another method for developing stability system for quad copter is by using Arduino mini along with other component such as GPS module, telemetry devices and Pressure sensors along with compass. This packed system will help in attaining the maximum stability. This system has a special feature such as even if the signal between the transmitter and receiver is lost, with the help of GPS module the quad copter can be landed in same position where it was taken off.

* Full paper: *International Journal of Engineering Research & Technology*, Vol. 8, Issue No. 5, May 2019, pp 826-832

Department Information System-Web Application

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ABSTRACT

Nowadays all sectors and firms use web application to hold the details. It becomes very necessary to have a web application that supports less human efforts. The database has come into light with an intention to store huge data. Institution is one such place where huge amount of data is generated and processed, this necessity has given us an opportunity to develop the project named Department Information System-Web Application. This application creates an environment which supports access of college department admin, staffs and students. This information system serves as an effective communication channel. It lets the institution exchange information within the department and makes fast, secure interaction. However, effective communication is only possible when the organization is able to capture and store all the required data, and have a means of processing this information and presenting the results to the user. Web applications use a combination of server side scripting language (PHP) to handle the storage and retrieval of the information, and client side scripting language (JavaScript and HTML and SQL) to present the information to the use in the web browser. Considering the security, as it is a prime concern for any web application, encryption and decryption of the data is performed.

** Full paper: International Journal of Engineering Research & Technology, Vol. 8, Issue No. 5, May 2019, pp 849-853*

An Efficient CMOS Mixed Signal Demodulator in 90Nm Process

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ABSTRACT

This paper emphasizes on the design of a fully integrated low-power mixed-signal demodulator for multi-gigabit operations in 90 nm CMOS technology. A 3-bit ADC can be used to convert the analog inputs to digital form. But these baseband ADC's experience clipping distortions. This can be reduced by employing wide automatic gain control (AGC). The front-end of the system includes IQ mixers, a QVCO, frequency synthesizer, and AGC. This constitutes the analog block of the demodulator. AGC consists of Variable Gain Amplifier (VGA), power detector circuit, Differential to single ended amplifier and Operational amplifier. 6-bit current steering DAC is used to digitally control the output power of VGA. In order to recover OOK modulated signals, the analog signal processor (ASP) is used. This paper focuses on the design of fully integrated receiver consisting of broadband demodulator with embedded analog and digital signal processors in deep-submicron CMOS technology.

**Full Paper: 4th International Conference on Recent Trends on Electronics, Information, Communication & Technology, Bangalore, 17-18 May 2019*



MECHANICAL ENGINEERING

Influence of Injection Strategy on B20MOME Fueled CRDI Engine with Toroid Shaped Piston Cavity

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ABSTRACT

New technologies in the fuel injection system have improved the performance of the CI engine. Even though the biodiesel is universally accepted as a suitable alternate fuel for the CI (compression ignition) engine, there have been limited study reported on its utilization for single cylinder CRDI (common rail direct injection) engine. Use of biodiesel with diesel in a CRDI engine reduces proportionate consumption of diesel. In the present study, performance and combustion tests were carried out with the CRDI engine using the B20 blend of mahua methyl ester in diesel on volume basis called (B20 MOME). This study was conducted on a CRDI converted variable compression ratio engine with toroidal shaped cavity in the piston adopted. The tests were carried out at three injection pressures of 400 bar, 600 bar and 800 bar and for three injection timings of 15° BTDC, 20°BTDC and 25°BTDC, respectively. The results of the combustion and performance tests with the CRDI engine were compared with the performance of a CI engine at specified operating conditions with mechanical injection system using diesel as the fuel. The results indicated significant increase in the performance of the engine with increase of injection pressure. At 800 bar injection pressure, brake thermal efficiency of 29.98%, 27.61%, and 26.98% was attained at 15BTDC, 20BTDC and 25BTDC, injection timing respectively using B20 MOME.

Optimization of Oil Extraction from Vateria Indica Seeds by Solvent Extraction Process using Response Surface Method

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ABSTRACT

Vateria Indica is a multipurpose tree that is much used locally in India. It provides food, medicine and a range of other commodities. It is often planted along avenues in India. The use of vegetable oil as feedstock for biodiesel production is divisive as an outcome of the challenges of a food-fuel catastrophe linked with the use of fit to be eaten oils for biodiesel making. The present study is focused on the extraction of oil from vateria Indica seed using a solvent extraction method, evaluation of optimal conditions for oil extraction. A Box-Behnken design of response surface methodology (RSM) with 15 experimental runs is used to study the optimum environment for the withdrawal, and the variables of interest are effective solvent/seed ratio 1 ml/gm, 1.25 ml/gm and 1.5 ml/gm. extraction temperature 60 °C, 65 °C, 70°C, and extraction time 3 hr, 4 hr, 5 hr. From the current study it is observed that the optimized oil yield using the solvent extraction is found to be 22.85% at temperature of 66.6 °C, extraction time of 4.41 hour keeping the solvent to seed ratio of 1.353 ml/g after adopting response optimization technique.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092914>, Vol. 2080, Issue No. 1, 08 March 2019, pp 030011-1 - 030011-7

A Study on Wear Properties of SWCNT Reinforced Polymer Nanocomposite

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ABSTRACT

Natural fiber reinforced nanocomposites are acquiring massive attention among researchers and academicians nowadays because of the features like sustainability, eco-friendly nature, easy availability and economy. Numerous blends of fiber and filler fillings are being attempted to come up with materials with improved wear properties. The present study deals with banana fiber reinforced nanocomposites through Single Walled Carbon Nanotubes (SWCNT). The composite material samples were prepared by hand-layup technique with room temperature curing under pressure. Different samples were obtained by varying gap between individual fibers and tested for their wear properties. It was found that wear properties were influenced by distance between the fibers.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.50928962080>, Vol. 2080, Issue No. 1, 08 March 2019, pp 020013-1 - 020013-4.

Design and Analysis of an Open Circuit Subsonic Wind Tunnel

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ABSTRACT

Wind tunnel is an instrument having wide application in aerodynamics field. It is used to study the effect of airflow around test objects. The present work deals with the design of an academic open circuit subsonic wind tunnel using J. B. Barlow's method. The diffuser and settling chamber geometry are obtained using standard formulae. The contraction cone profile which is very crucial in ensuring uniform flow with negligible losses and boundary layer growth is obtained using MATLAB. The modeling is done using SOLIDWORKS and the geometry is analyzed for flow velocity and static pressure using ANSYS FLUENT. Analysis is performed for three contraction cone profiles and second order polynomial profile is found to be the most appropriate.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092923>, Vol. 2080, Issue No. 1, 08 March 2019, pp 040005-1 - 040005-7

High-Temperature Wear Behavior of the ZE41 Mg Alloy

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ABSTRACT

High-temperature wear and friction properties of ZE41 alloy were evaluated using a pin on disc tribometer. The microstructure of the alloy has the equiaxed grains of $72\pm 20\mu\text{m}$ decorated with the rare earth rich precipitates. Result shows that wear rate decreases upto 100oC and then increases until 250oC for all the loading conditions. The wear mechanism study revealed that the underlying thin oxide tribolayer minimizes the wear rate upto 100oC. Above 100oC, thickening of oxide layer due to enhanced oxidation rate results in breakage of the layer. Further, the increase of temperature softens the alloy which deforms and fractures in the subsurface at low critical load resulting in more delamination wear. The combined effects of oxidation and delamination wear are accentuated with the increase of load and temperature resulting in the increase of the wear rate. Comparing the influence of load and temperature on the wear rate, contact load is more.

* Full paper: *Materials Science Forum*, Trans Tech Publications Ltd, Switzerland, Vol. 969, 2019, pp 86-92.

Notch Tensile Behavior of the Mg-Zn-Gd-Zr Alloy

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ABSTRACT

The Mg-Zn-Gd-Zr alloy is one of the important aerospace alloys in the aircraft gearbox applications. The complex geometry of the gearbox introduces several stress concentration points with various intensities. These regions are susceptible to catastrophic failure under mixed loading condition. Therefore, it is important to understand the deformation and failure mode of this alloy for various plastic constraint conditions. In the present work, Mg-4%Zn-1.5%Gd-0.5%Zr alloys were prepared with four different increasing notch root radii (1, 2, 4 and 8 mm). These samples were tested for tensile properties and compared with the smooth condition. In addition, notch sensitivity was determined analytically. The microstructure and fracture samples of the alloy were characterized with the aid of an optical/scanning electron microscope. Tensile test results show that the alloy is notch sensitive and shows notch-strengthening effects. The notch strength ratio increases with the decrease in the notch root radius due to the strong plastic constraint. The predicted and experimental results of the fracture strain with the notch root radius are in qualitative agreement. The void growth rate prediction is qualitatively in agreement with the tensile and fractography results and suggests that the notch geometry has a significant influence on the plastic strain of the alloy. The microstructure of the alloy has equiaxed grains of 74 ± 24 μ m with the grain boundary eutectic. The eutectic is composed of Gd-rich Mg phase. The fracture surface has a distinct change from mixed mode to complete cleavage with the increasing notch root radius. The fractography results show that the fracture mode is predominantly intergranular for all the cases.

* Full paper: *Journal of Materials Engineering and Performance*, ISSN 1059-9495, DOI 10.1007/s11665-019-04095-y, Vol 28, Issue No. 6, 2019, pp 3393–3401.

Comparative Study of Journal Bearing Performance with Ferrofluid and MR Fluid as Lubricant

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ABSTRACT

This paper presents a comparison of performance characteristics of a hydrodynamic journal bearing lubricated with plain engine oil, Ferrofluid and Magnetorheological (MR) fluid. The magnetorheological behaviour of micro and nano sized magnetic particles dispersed in silicone oil is analysed and their effects on bearing characteristics is studied. A test bearing with provision to vary the magnetic field strength is used for the study. The frictional force in the bearing is measured using torque arm principle. Dispersion of the additives is achieved by mechanical agitation and immediately tested to negate the problem of dispersion stability. The variation of frictional force at various bearing speeds is obtained by using plain engine oil as lubricant and then compared with the frictional force variation on lubricating with MR fluids and Ferrofluids of different volume fractions subjected to varying magnetic field strengths. It was observed that the MR Fluids show a significant change in rheological characteristics for varying strengths of magnetic fields. The frictional forces at the bearing surface when lubricated with magnetized MR fluid was much higher compared to that generated with plain engine oil; however the frictional force generated when lubricated with magnetized Ferrofluid was much lower than the frictional force in MR Fluid lubrication subjected to the same magnetic field. Results show significant increase in load bearing capacity of journal bearing when lubricated with MR fluids as opposed to plain engine oil.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092926>, Vol 2080, Issue No. 1, 08 March 2019, pp 040008-1 - 040008-5

Effect of TiO₂ Nanoparticle Concentration in Pongamia Pinnata Methyl Ester on Performance and Emission Characteristics of CI Engine

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ABSTRACT

For the present study, Titanium Dioxide nanoparticles (TiO₂) are used as the nanoadditives with Pongamia Pinnata biodiesel as the base fuel. The nanofuel samples are prepared by dispersing 25ppm, 50ppm, 75ppm and 100ppm of TiO₂ nanoparticles in the B20 blend and sonicating the mixture using a Probe Sonicator. Performance test and emission test are conducted in a VCR computerized CI engine for the nanofuel blends to optimize the concentration of nanoparticles in the base fuel. From results obtained B20+75ppm TiO₂ nanofuel sample is considered as the optimum blend among all other blends tested under the same conditions. It is observed that the percentage increase in Brake Thermal Efficiency (BTE) for B20+75ppm TiO₂ fuel sample is 2.38% when compared to BTE value of B20 blend without nanoparticles. B20+75ppm TiO₂ fuel sample shows a 2.89% reduction of BSFC when compared to B20 blend. A slight increase in NO_x emission of 4.9% for B20+75ppm TiO₂ blend is observed compared to the B20 blend. Smoke emission reduced by 10.22% for B20+75ppm TiO₂ as compared to B20 blend.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092909>, Vol 2080, Issue No. 1, 08 March 2019, pp 030006-1 - 030006-6.

Design and Fabrication of Torsion Viscometer for Viscosity Analysis of Oils

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ABSTRACT

In this Project, the torsion viscometer is safe designed to determine fluid viscosity. It is supported by a steel base and column. The components of the torsion viscometer are designed, fabricated and assembled followed by calibrating it to obtain the experimental results using standard fluids. The calibrated torsion viscometer is being used to test various oils like SAE 20W 40, SAE 15W 40, SAE 80W 90 and SAE 50 in the present study. The angle of extra swing is obtained at different temperature for which the Redwood seconds are obtained from the standardized graph. The experimental values of viscosity are compared with theoretical values and error is found. It is observed that for all the oils tested, the obtained values of viscosity are more accurate in the temperature varying from 40°C to 50°C. It is also observed that it can be used to measure viscosity of thick oils only and not thin oils.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092905>, Vol 2080, Issue No. 1, 08 March 2019, pp 030002-1 - 030002-6

Effect of Magnetite Nanoadditive in Waste Cooking Oil Methyl Ester on the Performance and Emission Characteristics of CI Engine

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ABSTRACT

The performance and emission characteristics of CI Engine are investigated using Magnetite (Fe_3O_4) Nanoadditive with waste cooking oil Biodiesel Blend. The samples studied in this work are diesel oil, B20, B20M25 (B20+25ppm.), B20M50 (B20+50ppm.), B20M75 (B20 +75ppm) and B20M100 (B20 +100ppm). Physio-Chemical properties of above samples are determined and the test results showed that the calorific value, density and viscosity increases with increase in Nanoadditive concentration. The performance of CI engine was investigated using CI engine test rig at constant injection pressure 200 Bar and compression ratio 17.5 by varying the load. From the experimental investigation it is found that B20M100 has improved performance and emission characteristics compared to B20. At full load for B20M100 blend, BTE increases by 1.49% and BSFC decreases by 2.21% when compared to B20 blend. NOX, CO and smoke opacity emission decreases by 7.43%, 2.08% and 10.43% respectively for B20M100 compared to B20 at full load.

Mechanical Properties of Coconut Shell Ash Reinforced Aluminium Metal Matrix Composites

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ABSTRACT

One of the major agricultural wastes alongside rice husk, bagasse, corn hub etc. is coconut shell. These agricultural wastes can be found in abundance in South Asian countries like India. Throughout the recent studies it has be found that these agricultural wastes can be effectively recycled in engineering and other scientific applications. In the present study, the authors have tried to introduce coconut shell as a reinforcing particle into the aluminium matrix to prepare a metal matrix composite. The composites were prepared using stir cast technique which has a provision of bottom pouring. The fabricated composite specimens were tested for their mechanical properties such as density, hardness, tensile strength. The results on the samples showed a considerable improvement in the properties.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092897>, Vol 2080, Issue No. 1, 08 March 2019, pp 020014-1 - 020014-6.

Study of Tribological Properties of Al 7079 Alloy Reinforced With Agro Waste Particles

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ABSTRACT

Due to the high need of producing good quality and high performance materials in the recent years a swing has been observed monolithic materials to composite materials. Aluminum based metal matrix composites are extensively used in the automobile and aerospace industry because of their improved strength to weight ratio, better resistance to corrosion and wear and excellent performance at high temperatures. Stir casting technique has proven to be the best process to produce metal composites when using reinforcements like SiC, Al₂O₃, graphite, ash particles etc. This paper deals with reinforcing Al 7079 alloy with a defined weight percentage of coconut shell ash and graphite particles and to study their tribological properties under varying conditions. From the results obtained through the wear test, it was concluded that, the addition of coconut shell ash has a tendency to reduce to material loss of the produce composite and the similar trend was noticed when reinforced with graphite as well.

Plastic Lumber Product Development Using Commingled Waste Plastics

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ABSTRACT

Waste Plastics is one of the most important problem in today's modern world, and it is not only causing environmental issues, but the disposal of waste plastics is also turning out to be a crisis. The key aim of this research effort is to develop different types of products using plastic lumber which is made from commingled waste plastics. The product, plastic lumber is developed by using Washing and Shredding machine and Two stage Extruder-Injection Molding Machine, and the product plastic lumber is developed with different composition of commingled (mixed) waste plastics, along with rubber powder as reinforcement and fly ash as filler material. The solution is to use the waste plastic lumbars in development of useful products like pallets, signpost, fences, barricades, chair, table, bench and other outdoor furniture etc. The building materials formed out of waste plastic lumbars are not only beneficial to the environment but are also durable, strong and cheaper and reduces the usage of wood. The results and outcomes of this work will be used for further development of plastic lumbars in the planned waste segregation and processing facility.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092935>, Vol 2080, Issue No. 1, 08 March 2019, pp 050007-1 - 050007-6.

Application of Taguchi Techniques to Study the Effect of Alkaline Treatment and Fiber Length on Mechanical Properties of Short Bamboo Fiber Reinforced Epoxy Composites

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ABSTRACT

In this paper the effect of alkaline treatment and fiber length on tensile and flexural property are analyzed using statistical approach. The bamboo fiber is extracted from the bamboo stem and cut to three different sizes (5mm, 10mm and 15mm) and chemically treated with three different percentage of NaOH (4%, 6% and 8%). The composites specimens are fabricated by hand layup technique, tensile and flexural test conducting as per Taguchi design. Analysis of variance (ANOVA) was performed, it was observed that fiber percentage is the most significant factor effecting tensile and flexural property, followed by fiber length and NaOH %. The main effect plot revealed that composite prepared with fiber length of 10mm length, treated with 6% NaOH and filled with 10 wt % of fiber exhibit superior tensile and flexural property. A correlation between tensile and flexural property with fiber length, NaOH% and fiber content were obtained by multiple linear regressions.

Adsorption Based Solar Refrigeration System

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ABSTRACT

This Paper presents experimental investigations of a solar cooling method, based on a principle of adsorption, using activated carbon and methanol pair. Adsorbent system uses a portable adsorber, during refrigeration cycle. A refrigerator with a quantity of 42 liters, is focused to design for the preservation of perishable food items in remote areas, where there is scarcity of electricity. Based on research, solar refrigerator for remote areas can be designed by modifying the various parameters.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092917>, Vol. 2080, Issue No. 1, 08 March 2019, pp 030014-1 - 030014-6

Investigation on the Performance and Emission Analysis of Al₂O₃ Nanoparticles as an additive to a B20 blend of Lard Oil Methyl Ester on a CI engine

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ABSTRACT

In the present study, performance and emission tests were conducted on a CI engine using a blend of B20 Lard Oil Methyl Ester (B20 LOME) without nanoparticles and a B20 LOME blend dispersed with 50, 75 and 100 ppm of Alumina (Al₂O₃) nanoparticles. The experimental results show that at full load, the addition of Al₂O₃ nanoparticles to B20 LOME slightly increases the brake thermal efficiency and decreases brake specific fuel consumption of CI engine as compared to B20 LOME without nanoparticles. The blends of B20 LOME with Al₂O₃ nanoparticles show reduced emission of Hydrocarbons (HC), Carbon monoxide (CO) and smoke as compared to B20 LOME blend without nanoparticles. The NOX emission is slightly high for B20 LOME blends with nanoparticles at all loads as compared to B20 LOME blend without nanoparticles.

** Full paper: Proceedings of the 8th International Engineering Symposium - IES 2019, Kumamoto University, Japan March 13-15, 2019, pp M2-2-1 - M2-2-4.*

Tribological Characteristics of Spray formed Al-Si Quaternary Alloys

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ABSTRACT

In the present study, the preforms of hypo-eutectic, eutectic and hyper eutectic Al-Si quaternary alloys were prepared by spray forming. The wear tests were conducted using pin on disc Tribometer, under varying load conditions. The results indicated that, silicon content has a considerable influence on dry wear properties of spray deposited Al-Si alloys. The wear rate increased as the load increased for all the alloys. However the wear rate of hyper eutectic alloy has been the lowest compared to that of eutectic and hypoeutectic alloys. The better wear resistance of hypereutectic spray formed alloy has been explained in the light of the morphology of its worn out surfaces.

* Full paper: *Proceedings of the 8th International Engineering Symposium - IES 2019, Kumamoto University, Japan, March 13-15, 2019, pp M2-7-1- M2-7-1.*

Investigation on the Performance and Emission Characteristics of a Variable Compression Ratio Engine Operated With Cardanol Ricebran Blends with Diesel

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ABSTRACT

In this study , performance and emission tests were conducted on a four-stroke variable compression ratio 5.2-kW diesel engine using cardanol which is a renewable biofuel was blended with Rice bran oil and diesel as a test fuel in a Volume basis of C5R5 (5% cardanol+5%Ric bran oil+90% diesel),C5R10,C5R15 and C5R20 (5%cardanol+20%Rice bran oil+75% diesel) were prepared and tested at various load like 0%,20%, 40%, 60%, 80%and full load conditions and compared with baseline diesel. From the result it was observed that the brake thermal efficiency of C5R5 is 29.23% comparatively similar to that of diesel 31.05%. The lower emissions of CO, hydrocarbon except NOx are encouraging to recognize Cardanol rice bran blends as an optimized fuel blend for a compression ignition engine. The significant factors of cardanol bio-fuel include its low cost, non-edible, abundance, and it is a by-product of the cashew nut industries this study demonstrates that cardanol Ricebran blends can be used as diesel engine fuel with any engine modification.

** Full paper: Proceedings of the 8th International Engineering Symposium - IES 2019, Kumamoto University, Japan, March 13-15, 2019, pp M5-3-1- M5-3-6.*

Effect of Injection Pressure on Performance and Emission Characteristics of CI Engine Fuelled with blends of Honge, Rice bran hybrid bio fuel with Diesel

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ABSTRACT

In the present study the performance and emission characteristics of single cylinder 4 stroke diesel engine using Honge and Rice bran oil (RBO) with diesel and its blends . The effect of variation in fuel injection pressure on the performance parameters like brake specific fuel consumption, brake thermal efficiency and emissions characteristic like CO, HC and NO_x were studied at constant speed. The test results showed that, the Honge and Rice bran hybrid biodiesel blends at 220 bar injection pressure exhibited better performance and low emission than at 180bar injection pressures except No_x. Results were also showed that performance and emissions of Honge and RBO biodiesel hybrid blends were near to diesel.

** Full paper: Proceedings of the 8th International Engineering Symposium - IES 2019, Kumamoto University, Japan, March 13-15, 2019, pp M5-4-1- M5-4-6.*

Investigation on the Performance and Emission Characteristics of CI Engine Fuelled with blends of Cardanol, Honge bio diesel with Diesel

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ABSTRACT

In this study the performance and emissions tests were conducted on a single-cylinder 5.2kW Kirloskar TV1 diesel engine using a non-edible plant-based bio-fuel Cardanol produced from cashew nut shell liquid (CNSL) blend with Honge methyl ester and diesel. The bio-fuel blends 5C5H (5% cardanol+5%Honge+90% diesel), 5C10H, 5C15H and 5C20H (5% cardanol+20% Honge+75% diesel) were prepared and tested at various loads (0%, 20%, 40%, 60%, 80% and full load conditions) and compared with baseline diesel at 205bar injection pressure and 17.5 compression ratio. The experimental results show that at full load, the brake thermal efficiency of 5C10H is 29.35% comparatively similar to that of diesel is 31.05%. The lower emissions of CO, hydrocarbon except NO_x are encouraging to recognize 5C10H as an optimized fuel blend for a compression ignition engine. The significant factors of cardanol bio-fuel include its low cost, non-edible, abundance, and it is a by-product of the cashew nut industries.

* Full paper: *Proceedings of the 8th International Engineering Symposium - IES 2019, Kumamoto University, Japan, March 13-15, 2019, pp M5-6-1- M5-6-6.*

Effect of Compression Ratio on the Performance and Emission Characteristics of CI Engine Fuelled with Honge, Hybrid Bio-Fuel with Diesel

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ABSTRACT

In this present study, the performance and emissions of a single-cylinder Kirloskar diesel engine using a non-edible Honge oil and waste edible oil (WEO) with diesel and its blends were carried out. The bio-fuel blends H5W5 (5% Honge, 5% waste edible, 90% diesel), H10W5, H15W5 and H20W5 were prepared and tested at various load conditions (0%, 30%, 50%, 70% and 100% of full load) compared with diesel at different compression ratio (14.5:1, 15.5:1 and 16.5:1). Results indicated that the brake thermal efficiency of H20W5 was 30.75% at 16.5:1 compression ratio comparatively similar to that of diesel (32.36%). The lower emissions of CO, hydrocarbon except NO_x were encouraging to recognize H20W5 as an optimized fuel blend for a compression ignition engine at 16.5:1 compression ratio compared low compression ratio. Results were also showed that performance and emissions of Honge and WEO biodiesel blends were near to diesel.

* Full paper: Proceedings of the 8th International Engineering Symposium - IES 2019, Kumamoto University, Japan, March 13-15, 2019, pp M5-7-1- M5-7-6.

Lean Six Sigma for the Healthcare Sector: A Multiple Case Study Analysis from the Indian Context

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ABSTRACT

Purpose: The purpose of this paper is to explore the voice of the customer, key performance indicators, critical to quality characteristics, critical success factors, and commonly used tools and techniques for deploying the Lean Six Sigma (LSS) strategy in Indian private hospitals, with special attention to the medical records. **Design/methodology/approach:** The study utilizes the action research methodology to obtain a greater understanding of the use of LSS in the Indian healthcare sector. Multiple case studies were designed and successfully deployed to understand and ascertain challenges in LSS implementation. Five case studies were carried out in the Medical Records Departments (MRD) of four private hospitals in India. **Findings:** Patients perceive that waiting in queue harms their health, which can be rectified by addressing the cycle time of the system. The research also found that effective leadership, availability of data, involvement of cross-functional team and effective communication are critical to the success of LSS projects. In addition, control charts, cause and effect diagram, 5S, gemba, two-sample t-test, standardization, waste analysis and value stream mapping are some of the common tools used to improve healthcare systems. **Research limitations/implications:** The research was restricted to studying the impact of LSS on the workflow and resource consumption of the MRD in Indian allopathic hospitals only. The validity of the results can be improved by including more hospitals and more case studies from the healthcare sector in different countries. **Originality/value:** The findings will enable researchers, academicians and practitioners to incorporate the results of the study in LSS implementation within the healthcare system to increase the likelihood of successful deployment. This will provide greater stimulus across other departments in the hospital sector for wider and broader application of LSS for creating and sustaining process improvements

* Full paper: *International Journal of Quality & Reliability Management*, Vol. 37, Issue No. 1, 2019, pp 90-111

Effects of Dual-Phase Reinforcement Particles (Fly Ash + Al₂O₃) on the Wear and Tensile Properties of the AA 7075 Al Alloy Based Composites

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ABSTRACT

In the present study, Al₂O₃ and fly ash-reinforced Al 7075 alloy composites were processed using stir-casting process. To study the influence of reinforcement on the tensile strength, density and wear resistance for the four different volume fractions (5%, 10%, 15% and 20%) are considered. The hardness and tensile properties are evaluated for each composition. Further, wear tests are carried out at the load (10 N, 20 N, 40 N, 80 N), sliding speed (1.45 m/s) and sliding distance (500 m). It is noticed that the density of the composite depends on the reinforcement. Density increases when the Al₂O₃ fraction increases and decreases with the fly ash. The addition of Al₂O₃ in the soft Al 7075 matrix linearly increases the hardness, and the similar results are obtained for the tensile strength. Although the addition of fly ash has no significant effect on the tensile strength and hardness, the better results are obtained when both Al₂O₃ and fly ash are mixed with Al 7075 matrices. It is found that wear resistance of the composite increases with the addition of Al₂O₃ and fly ash, which agrees with the hardness results. Improved wear resistance is obtained for the Al 7075 + 10% Al₂O₃ + 10% fly ash composite.

White Light Emission by Energy Transfer from Areca Nut Husk Extract Loaded With Carbon Dots Synthesized From the Same Extract

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ABSTRACT

Natural dyes having ability to emit white light have gained great attention in recent years as they have the potential for use as sensors, back-lights and display systems. In this work, luminescence decay and energy transfer in a natural dye extracted from the husk of areca nut, loaded with carbon dots, have been studied for their emission properties. These carbonnanoparticles are prepared from the natural dye of areca nut by a simple and facile hydrothermal treatment. White light emission is achieved from a mixture of areca nut extract and carbon dots prepared from the same extract with good Commission Internationale del' Eclairage (CIE) index values (0.28, 0.34) onphotoexcitation at 380 nm. The areca nut juice is extracted from the husk of the ripened fruit and the carbon nanoparticles prepared have sizes in the range 4–5 nm. These findings suggest auspicious opportunity for using natural dyes with fluorescent nanoparticles for developing white luminescent display systems.

* Full paper: *Journal of Luminescence*, Vol. 208, April 2019, pp 356-362

Design and Fabrication of a Hovering Multipurpose Agro Carrier

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ABSTRACT

The HMAC (Hovering Multipurpose Agro Carrier) is designed to minimize the efforts of the farmers for spraying the pesticides and transferring small objects from one place to another by hovering above the ground. Lithium Polymer batteries power the HMAC. It has 700 KV and 1600W brushless out-runner motors with 15 x 5.5” propeller, which gives 7.5 kg thrust on each motor. HMAC is a twin-ducted device so it can produce a total thrust of 15kg. The motors are connected to flight controller through ESC’s (Electronic Speed controllers). The KK2.1.5 flight controller is used for the stability of the HMAC during its flight. The forward and backward motion is coordinated by lowering the speed of 1 motor and increasing the speed of another. The sideward motion is controlled by using the concept of VTOL (Vertical take-off and lifting). The weight of the frame is 4.2 kg which includes motors, ESC’s, Batteries, flight controllers and receiver. The total thrust that it can produce is 15kg. With the losses, it can carry a payload of around 10 kg, which includes pesticides, tank, DC pump and spraying nozzle. After using various fabrication processes, the frame was constructed. The electronic parts after assembling were calibrated. After successful calibration, HMAC took its first flight and was able to achieve its objectives.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092927> Vol. 2080, Issue No. 1, 2019, pp 040009

Dry Sliding Wear Behavior of Cast Iron Powder Filled Epoxy Composites

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ABSTRACT

This study examines the potential of using recycled cast iron powder as a micro-filler for epoxy polymer in sliding wear applications. The test samples were manufactured from vacuum assisted casting route. The dry sliding wear study was performed using pin-on-disc test setup at ambient temperature. Tests were performed for different loads and sliding velocities considering a constant sliding time. The surface morphology of selected specimen was observed under scanning electron microscope (SEM) to understand the wear mechanisms. The study revealed that incorporation of waste metal powder has beneficiary effect on the sliding wear performance of polymer. The performance measuring parameters, namely, specific wear rate and the coefficient of friction had reduced in case of filler modified composites compared to neat polymer. Both wear and friction parameters were found to show a mixed trend with the sliding conditions for different test samples. The microscopic study revealed different wear mechanisms such as plastic deformation of polymer, micro-ploughing and micro-cracks.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092903>, Vol. 2080, Issue No. 1, 2019, pp 020020

Design and Fabrication of Automatic Arecanut Processing Unit

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ABSTRACT

The processing of raw arecanut in Malenadu region involves four steps de-husking, cutting, boiling and drying. All these four steps are automated and in this paper the design and fabrication of all the processing unit are presented. Two pneumatic cylinders and a specially designed attachments are used to dehusk the arecanut which is actuated using a solenoid valve. The arecanut seed is cut into two halves using a blade which is mounted on a high torque motor. Then the nut is transferred to the container where it is boiled using steam from the boiler. An electric heater is used to generate the steam. Then the boiled arecanut is sent to the drying unit where the moisture content is removed using hot air blowers. For automation of the entire setup Arduino UNO and 24 V DC battery have been used. During the testing, it has been found that the complete set up was working as per the requirement and found reliable, efficient and safe.

Design and Development of Controlled Arm Using Electromyographic Signals

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ABSTRACT

Prosthetics came into existence to simulate the physicality and functioning of missing limbs. Physical impairment can limit the physical function or fine/gross motor ability of limbs of an individual. In the cases of individuals with physical impairment, overall quality of life is severely affected. Technology could play a crucial role in enabling the physical functions of such individuals by developing prosthetics that are economical and seamless in appearance and usage. The present work aims to demonstrate the feasibility of designing a prototype of a controlled arm as a first step towards the development of low-cost prosthesis as a possible aid for low income people with disabilities. The prototype is controlled through a sensor that collects electromyographic (EMG) signals generated by flexing muscles in the user's body. The design is realised using 3D printing technology.

** Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092925>, Vol. 2080, Issue No. 1, 2019, pp 040007*

Lean-TRIZ - A New Philosophy in Service Sector Organization and the Readiness Factors Influencing Its Implementation

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ABSTRACT

The purpose of this paper is to study the Lean-TRIZ initiative within the context of service sector organizations. In addition, article has the objective to determine the Readiness Factors (RF) for the successful implementation of Lean- TRIZ in service sector organization. The research has utilized secondary data to justify the need for RF. Data from various indexed papers and conference papers were studied. The data thus obtained was coupled with the vast experience and the expertise of the authors in Lean implementation in service sector organization. The papers present RF which are essential for the sustainability of Lean-TRIZ in a service sector organization and provides a framework for the successful implementation. This is a theatrical paper based on the author's vast experience in service sector organization and existing literature. Lean-TRIZ is still in embryonic stage with most of the academic literature only in conferences and there is a serious dearth in literature. Future researchers can focus on empirical studies in specific service sector organizations.

** Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092941>, Vol. 2080, Issue No. 1, 2019, pp 060006*

Experimental Investigation of Compression, Flexural Strength and Damping Behaviour of Granite Particulate Epoxy Matrix Composite

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ABSTRACT

The precision machine structures necessitate light weight and high vibration damping structures for better finish in the work done. Research is going on to find the alternate material to the existing Cast Iron conventional material as it is observed to be denser and also damping of vibration is lesser. Granite particulate epoxy composite is one such recent material to replace with the conventional one. In present study Granite powder- epoxy composite has been made on varying the granite particulates content on weight percentage. The Compressive strength and flexural strength has been studied followed by the damping analysis. The composite specimen is prepared by hand molding at room temperature. From experimentation it is observed that the maximum compressive strength of 111 MPa for 20% weight epoxy and 80% granite grit weight percentage. Also the damping is favorable at the same composite mixture ratio.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092895>, Vol. 2080, Issue No. 1, 2019, pp 020012

Equal Channel Angular Pressing of Mg-Y alloy

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ABSTRACT

Tribological wear behaviour of Mg-Y alloy in as cast and ECAP'ed condition has been studied using a pin on disk wear testing machine under the load of 10N & 50N with a sliding temperature of 25°, 50° and 100°C with a sliding velocity of 0.3 m/s and sliding distance of 3000m. ECAP was done at a temperature of 350°C up to 4 passes using the route B_c. It was observed that, wear rate was decreasing with increase in the temperature and wear rate was increasing with increase in the applied load after the ECAP. Rockwell hardness test was used to evaluate the hardness of the sample. It was found that, hardness of the alloy was increased nearly about 85% after four ECAP pass which may be due to the grain refinement.

* Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5092901>, Vol. 2080, Issue No. 1, 2019, pp 020018



MANAGEMENT AND BUSINESS ADMINISTRATION

Co-ordination of Training Activities: Travails and Imperfections

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ABSTRACT

The chairman and managing director (CMD) of Coastal Bank Ltd, Mangalore, had received a lot of complaints regarding the process of training needs identification, training evaluation as well as overall coordination of training programmes indirectly through the office of personnel administration division (PAD) headed by general manager (GM) of his bank. The CMD's office had also received a bunch of complaints regarding interpersonal conflicts arising out of attitudinal disorientation and also due to employees' inadaptability to upgrade the knowledge to the requirements of the day. Since the bank had invested thousands of dollars on training and development, expecting it to be the key instrument in transforming the skills of the employees for better work culture, the problem had to be analysed from the angle of the ineffectiveness of the training process in establishing the supportive work culture in different departments. Mr Sham Rao, CMD, called a governing council meeting where training review committee was a part, which was headed by the GM of PAD. The governing council meeting was also attended by executive director (ED) as well as GMs heading various divisions of the bank. In the meeting, they decided to consult Colaco & Co., leading consultants in India to analyse the existing training practice from the angle of training needs identification, evaluation as well as the coordination process in training and development to diagnose the problem. Colaco & Co. conducted the process of consultation and survey to detect the problems in the area of training. Consultants detected the problem areas by proposing the plumages of ideal training system as well as the training model that could be used by Coastal Bank Ltd, in particular, and any commercial bank, in general. The real problem was the total lack of coordination of the training activities which made the training a real liability. At the governing council meeting, the CMD along with the ED of the bank requested the GM of PAD to solve this problem by following the recommendations presented by Colaco & Co.

**Full Paper: Asian Journal of Management Cases, <https://doi.org/10.1177/0972820119825991>, Vol 16, issue No. 1, 2019, pp 113-136*

Corporate Social Responsibility Trends in India with special reference to CSR amendments of Government of India under the Companies (Amendment) Act, 2019

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ABSTRACT

Since the applicability of mandatory Corporate Social Responsibility (CSR) provision in 2014, CSR spending by corporate India has increased significantly. Organizations in India have been quite sensible in taking up CSR initiatives and integrating them into their business processes. Companies now have specific departments and teams that develop specific policies, strategies, and goals for their CSR programs and set separate budgets to support them. India is the first country in the world to make corporate social responsibility (CSR) mandatory, following an amendment to the Companies Act, 2013 in April 2014. Many studies have been conducted on social aspects of business in India and their findings suggest that most of Indian companies believe their earnest responsibility towards shareholders, employees, customers and society at large in that sequence. Even at the risk of reduced profits the companies feel that they must exhibit socially responsible behavior through CSR initiatives. This conceptual paper tries to give a brief overview of CSR initiatives of some of the Indian companies and the positive impact it has created on the society. The paper also tries to highlight the impact of CSR amendments of Government of India under the Companies (Amendment) Act, 2019 upon the companies in general. The paper tries to make the reader understand the basis of promoting various social causes unrelated to the organization's core business by the companies belonging to different sectors. How the CSR initiatives of companies under study integrated to ensure convergence with government's vision for a better India are the highlights of the present paper.

**Full Paper: International Conference On Economic Development and Sustainable Development: Emerging Trends, Shri Dharmasthala Manjunatheshwara Institute for Management Development (SDMIMD), 15th & 16th November 2019*

Non-Performing Assets: A Study on Selected Public Sector Banks in India

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ABSTRACT

Banks play an important role in the economic development of a country. Banks are growth-driver and the banking business is exposed to various risk, such as credit risk, liquidity risk, interest risk, market risk, operational risk and management risk. Apart from these risks the very important risk is loan recovery. The sound financial position of a bank depends upon the recovery of loans or its level of Non-performing assets (NPAs). Reduced NPAs generally gives the impression that banks have strengthened their credit appraisal processes over the years and growth in NPAs involves the necessity of provisions, which bring down the overall profitability of banks. Keeping this view in mind the research tries to explore whether there is any difference in the NPA occurrence between the selected banks from 2014 to 2018 and also the research tries to draw a view on the status of the NPA in selected public sector banks.

**Full Paper: International Conference on Economic Development and Sustainable Development: Emerging Trends, Shri Dharmasthala Manjunatheshwara Institute for Management Development (SDMIMD) 15th & 16th November 2019*

Motivation and Blockades for Entrepreneurship among Graduates

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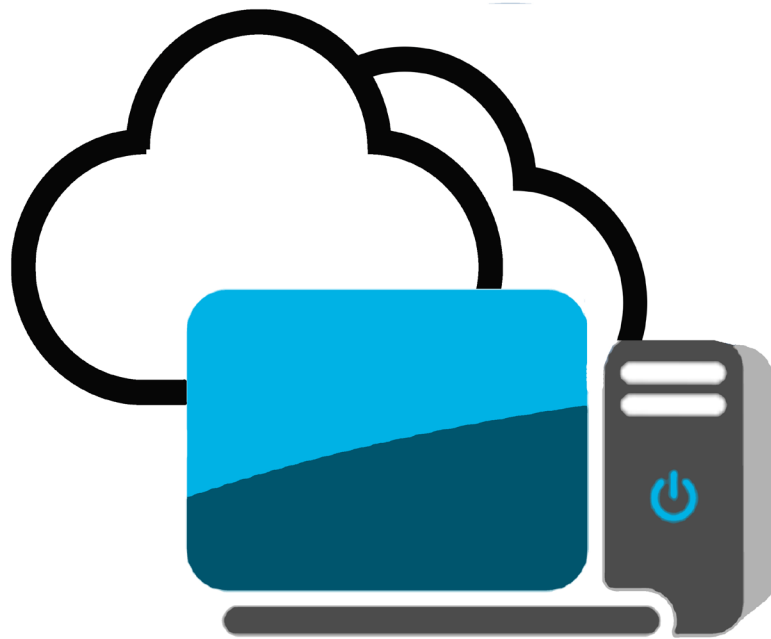
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ABSTRACT

The Indian government is facing a main challenge of youth unemployment for decades. Entrepreneurship is a frequent topic of discussion to many academicians and research scholars. It is a treasured supplementary tactic to generation of jobs, upgrade lifestyle and economic freedom of young people. With potential efforts and strategies by the government, educational institutes and the communities, it is important to boost employment and job creation for the youth of our country. Entrepreneurship has been an engrossing subject for most of the researchers and it has been put forth regarding an individual's skills, characteristics, and interests. The study focuses on the entrepreneurial intention in general and to analyse the blockades and motivating factors for business start-up among graduates. The study consists of final year graduate students studying in different colleges affiliated to Mangalore University. The study is exploratory in nature and the sample size consists of 433 final year students from various colleges within Mangaluru city. The data is interpreted through descriptive statistics, factor analysis, and correlation tests. The results reveal that most of the students are not certain about their future goals. It is explored that they have a significant correlation between inclination towards entrepreneurship and desire for autonomy, self-determination, realisation of own ideas, thinking innovatively and ability of risk-taking. Meanwhile, the students also lack creative skills, confidence, and business idea. It is concluded that the graduates are found to be reluctant towards entrepreneurship. It is necessary to inspire them to take up challenges and think creatively through various entrepreneurship related activities in the colleges.

Full Paper: International Journal of Scientific & Technology Research, Vol 8, Issue No. 12, December 2019, pp 821-828



MASTER
OF
COMPUTER APPLICATIONS

Hybrid Teaching Model to Persuade Different Dimensions of Felder-Silverman Learning Style Model

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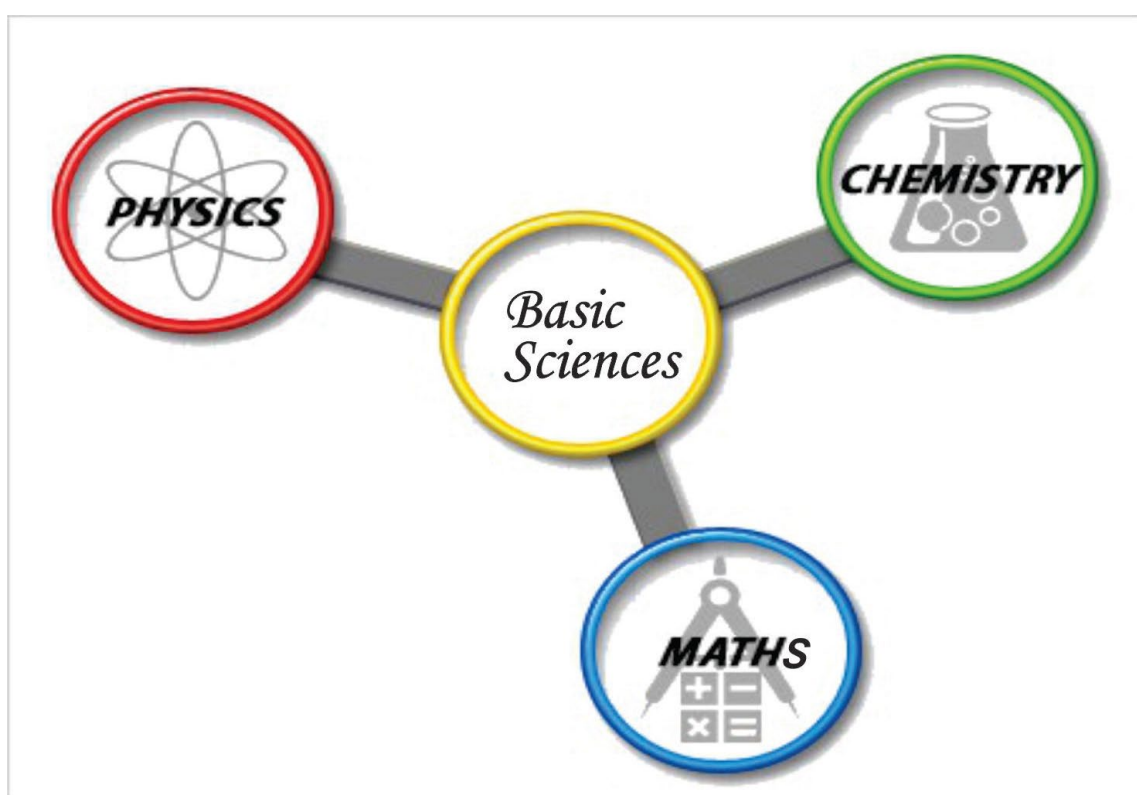
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ABSTRACT

Abstract— The student learning and listening style always changes generation by generation. It is a need and challenge for the teacher to keep the class environment active for the entire session. In this busy and competitive era, to cope-up with the student's skill sets and mindset, the teaching-learning should happen efficiently within the time bound. The available infrastructure should be well synchronized along with the current generation, educational type, topic and situation etc. The observation in the class room as well in the as student evaluations strongly proven that when new technologies are adopted in teaching modalities like remote class room, virtual class room, google class room and even a power point presentation always some section of learners not actively participated in the learning process. The reaching out of all section of students if only traditional class room technique where used is also not good for all the learners. The goal of a teacher is to map the course design to the student skill set along with the cost and time efficient teaching methodologies. This could be done by adopting the technology bounded teaching skills. The Silverman Learning Style model gave us a room to think about the different levels and capacities of student learnings. It means that when different types of modalities adopted for the particular topic there will be a greater possibility of imbalance in the learning at the receiving end. The proposed hybrid model expects to address all the types of learners in the Silverman Learning Style Model. It will ensure a balanced traditional and technology learning happens within the available infrastructure efficiently managed with time. The efficiency of this model enables the students to perfectly undergo with the basic conceptual learning and feel the power of technology in the teaching.

Full paper: Proceedings of the 16th International Conference on Remote Engineering and Virtual Instrumentation (REV2019), B.M.S.College of Engineering, Bengaluru, India, 03–06 February 2019, pp 514



Synthesis, Characterization, Crystal Structures and Biological Screening of 4-Amino Quinazoline Sulfonamide Derivatives

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ABSTRACT

Three quinazolin-4-ylamino derivatives containing phenylbenzenesulfonamides (**7a-7c**) were synthesized by reacting (*E*)-*N'*-(2-cyanophenyl)-*N,N*-dimethyl formamidine (**6**) with different 4-amino-*N*-(phenyl)benzenesulfonamides (**4a-4c**) and characterized by different techniques such as HRMS, IR, ¹H NMR and ¹³C NMR spectroscopy. The structural properties were further examined by single crystal X-ray diffraction method. The X-ray data shows that compounds **7a** and **7c** contain two molecules and **7b** contains one molecule in the asymmetric unit. Comparison of conformation of two distinct molecules, “A” and “B”, in the asymmetric unit of **7a** and **7c** were studied with the aid of reported literature. The *in vitro* antiproliferative activity of the compounds was tested against two breast cancer cell lines (MDA-MB-231 and MCF7). Compound **7b** observed as a highest potent candidate against MDA-MB-231 with IC₅₀ of 5.44 µg/mL. Antimicrobial activity was also screened against bacterial and fungal strains. Compound **7a** with chloro substitution was observed as the most potent candidate against the Gram-negative bacterial strains, whereas the compounds showed no significant activity against the fungal strain.

Synthesis, Structural, Biological and in Silico Studies of New 5-Arylidene-4-Thiazolidinone Derivatives as Possible Anticancer, Antimicrobial and Antitubercular Agents

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ABSTRACT

A new series of halogenated 4-thiazolidinone derivatives bearing sulfonamide moiety has been synthesized and characterized by FT-IR, ¹H NMR, ¹³C NMR, HRMS and single crystal X-ray techniques. The newly synthesized target compounds were screened for their *in vitro* cytotoxicity on HepG2 and MDA-MB-231 cell lines, antimicrobial and antitubercular activity. The compounds have shown promising anticancer activity towards MDA-MB-231 cell line and trichloro derivatives with *p*-chloro substitution (**6i**) and *p*-hydroxy substitution (**7e**) exhibited excellent anticancer activity. Compounds **6b** and **7c** observed as moderate antimicrobial agents. The highest potent seven anticancer agents were further studied their antitubercular activity against *M. tuberculosis* strain and found that the compound **7e** showed significant antitubercular activity. The potent candidates were also tested for hemolysis activity against human RBC cells and found to be non-toxic. The mode of action for the observed anticancer activity was further supported by molecular docking studies of potent compounds against the enzyme Aurora Kinase (PDB ID: 4ZTR). Molecular dynamics (MD) simulations were performed further to study the stability of the ligand-protein complex.

Interval Valued L-Fuzzy Prime Ideals, Triangular Norms and Partially Ordered Groups

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ABSTRACT

We introduce interval valued equiprime, 3-prime and c-prime L-fuzzy ideals of a nearring N by using interval valued t-norms and interval valued t-conorms. We characterize interval valued prime L-fuzzy ideals in terms of their level subsets. We define interval valued equisemiprime, 3-semiprime and c-semiprime L-fuzzy ideals of nearrings and study their properties. We find interrelations among different interval valued prime L-fuzzy ideals. We study these concepts further in a partially ordered group and define implications based on interval valued L-fuzzy ideals.

**Full Paper: Soft Computing, Vol. 23, Issue No. 6, 2019, pp 907-920.*

1-Edge Balance Index Sets Of $C_n \times P_3$ And $K_{n,n}$

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ABSTRACT

Let G be a graph with vertex set V , edge set E and $Z_2 = \{0, 1\}$. Let f be a labeling from E to Z_2 , so that the labels of the edges are 0 or 1. The edges labelled 1 are called 1-edges and edges labelled 0 are called 0-edges. The edge labeling f induces a vertex labeling $f^* : V \rightarrow Z_2$ defined by

$$f^*(v) = \begin{cases} 1 & \text{if the number of 1-edges incident on } v \text{ is odd,} \\ 0 & \text{if the number of 1-edges incident on } v \text{ is even.} \end{cases}$$

For $i \in Z_2$ let $e_f(i) = e(i) = \text{card}\{e \in E : f(e) = i\}$ and $v_f(i) = v(i) = \text{card}\{v \in V : f^*(v) = i\}$. A labeling f is said to be edge-friendly if $|e(0) - e(1)| \leq 1$. The 1-edge balance index set (OEBI) of a graph G is defined by $\{|v_f(0) - v_f(1)| : \text{the edge labeling } f \text{ is edge-friendly}\}$. The main purpose of this paper is to completely determine the 1-edge balance index sets of $C_n \times P_3$, $K_{n,n}$.

A Conductive Mechanism of PVA (Mowiol 10-98) filled with ZnO and MWCNT Nanoparticles

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ABSTRACT

Polyvinyl alcohol (PVA) hybrid nanocomposites are prepared via an ex situ approach with ZnO and MWCNT nanoparticle fillers and their conductive mechanisms have been investigated. The tailored hybrid nanocomposite conformation and their microstructural disparities for different filler concentrations were studied using an X-ray diffractometer. The direct current (DC) conductivity studies show an increase in the conductivity from 1.0528×10^{-11} to 2.1514×10^{-8} S cm⁻¹ up to a percolation threshold filler concentration of $x = 7.5$ wt%. The dielectric constant substantially indicates a decreasing trend with increasing frequency. The exaggerated dielectric constant values of 11.8 at 5 kHz, 6.3 at 100 kHz, 5.86 at 500 kHz and 2 at 1 MHz are observed for 7.5 wt% filler hybrid nanocomposites, which indicate their potential application as a gate material in metal-oxide-semiconductor field-effect transistors (MOSFETs). The alternating current (AC) electrical conductivity demonstrates an increasing behaviour up to $x = 7.5$ wt% filler concentration. The smaller values observed in the real part of the electric modulus (M') indicates a riddance in electrode polarization. The observed higher frequency shift in the imaginary part of the electric modulus for increasing the filler concentration up to $x = 7.5$ wt%, decreases the relaxation time of the dipole orientation thereby increasing the conductivity mechanism of the hybrid nanocomposites. Apart from these, its small relaxation time with high electrical conductivity favours this material PVA/(x) MWCNT (15 - x)ZnO to have prospective application in microwave absorption appliances. The increase in the surface roughness of the film seen from the AFM images up to $x = 7.5$ wt% concentration supports an enhancement in the crystalline nature of the filler. Differential scanning calorimeter studies show an enhancement in glass transition temperature (T_g), melting temperature (T_m) and decomposition temperature (T_d) for PVA filled with MWCNTs and ZnO composites for optimum filler concentration $x = 7.5$ wt%.

*Full Paper: *Bulletin of Materials Science*, <http://doi.org/10.1007/s12034-019-1803-7>, Vol. 42, Issue No. 124, 2019, pp 1-8

Effect of Nano fillers on Electrical, Mechanical, Fluorescent and Third Order Nonlinear Optical Properties of PVA

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ABSTRACT

This paper explores the preparation of TiO₂, MoO₃ nanoparticles and PVA/(x) TiO₂ (15-x) MoO₃ nanocomposites for filling concentration $x = 0, 1, 5, 7.5, 10, 14$ and 15wt% via solution casting method. The XRD spectra of prepared samples confirm the formation of nanocomposites based on the observation of the peaks representing PVA and TiO₂, MoO₃ nanoparticles. The aforementioned reconnoitres the crystalline parameters specifying a high percentage crystallinity for $x=10\text{wt}\%$ filling concentration. The structural confirmations of nanocomposites are done using FTIR spectroscopy. The UV-Vis studies also reflects the same trend of decreasing energy gap for $x=10\text{wt}\%$ filling concentration. This surveillance is due to the interaction of added dopants with the OH group of host PVA. IV studies spectacles a high conductivity and low resistance for $x=10\text{wt}\%$ optimum filling concentration. The UTM explores the high tensile strength and Young's modulus for $x=10\text{wt}\%$ filling concentration. The surface morphological studies determined by means of AFM shows average roughness of 125.3nm. Photoluminescence studies gives an emission band at 390 nm corresponds to the surface trap induced effects and intense emission band at 680nm resemble the electron hole recombination of TiO₂ and MoO₃ nanoparticles. AC conductivity shows that the conductivity increases for different doping concentrations with the rise in frequency. The frequency dependent dielectric constants with various doping concentrations of the prepared nanocomposites have been recorded. Using Z-scan technique the sign and magnitude of the third-order NLO properties of prepared nanocomposites were studied. From closed and open aperture Z-scan statistics it is perceived that the material exhibit strong two-photon absorption (2PA) with the nonlinear absorption (NLA) coefficients (β), nonlinear refractive index (NRI) and third order Non-linear optical susceptibility (χ^3)

*Full paper: *Materials Research Express*, <https://doi.org/10.1088/2053-1591/ab17f6> , Vol. 6, Issue No. 7, 2019, pp.1-28

Promising PVA/TiO₂, CuO Filled Nanocomposites for Electrical and Third Order Nonlinear Optical Applications

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ABSTRACT

In this paper, we report enhancing the structural, morphological, mechanical, linear and nonlinear optical properties of polyvinyl alcohol (PVA) encapsulated with titanium dioxide (TiO₂) and copper oxide (CuO) nanoparticles. PVA/(x)TiO₂(15-x)CuO nanocomposites for x=0 wt%, 1 wt%, 5 wt%, 7.5 wt%, 10 wt%, 14 wt% and 15 wt% filling concentration are prepared using ex-situ and solvent casting technique. The XRD spectra of the prepared nanocomposites endorse the semi-crystalline nature of PVA nanocomposites. The atomic force microscope (AFM) image displayed the uniform grain structure for pure PVA and change in surface morphology for prepared nanocomposites. Universal testing machine (UTM) explored high tensile strength and Young's modulus of 1685.70 MPa for x=10 wt% filling concentration. PVA/(x) TiO₂ (15-x)CuO nanocomposites shows an enhanced electrical conductivity of $3.21 \times 10^{-8} \text{ Scm}^{-1}$ for x=10 wt% filling concentration. UV-Vis spectroscopy exposed the reduction in optical energy gap with the increase in filling concentration. Photoluminescence (PL) studies spectacles maximum enhancement in PL intensity for x=10 wt% filling concentration. The Z-scan technique shows third order nonlinear absorption coefficient of $8.17 \times 10^{-4} \text{ cm/W}$, the nonlinear refractive index of $2.56 \times 10^{-8} \text{ cm}^2/\text{W}$ and nonlinear optical susceptibility of $1.48 \times 10^{-6} \text{ esu}$ for optimum nanocomposites.

*Full paper: *Optical Materials*, ISSN: 0925-3467, <https://doi.org/10.1016/j.optmat.2019.109218>, Vol. 95, September 2019, pp 109-218

Effect of MoO₃ Nanofiller on Structural, Optical, Mechanical, Dielectric and Thermal Properties of PVA/PVP Blend

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ABSTRACT

Polyvinyl Alcohol (PVA)/Polyvinylpyrrolidone (PVP) (50/50) blends consisting of various concentrations of (0%, 2%, 4%, 8%, 12%, 16%) Molybdenum trioxide nanoparticles (MoO₃) have been prepared by solvent casting technique. The structural studies were carried out using FTIR and XRD. The optical properties were studied using UV Visible and fluorescence spectroscopy. The energy gap of the films found decreasing with the increase in doping concentration.. The maximum Young's modulus of 1477.73 MPa is observed for the blend with 12 wt% MoO₃. The AFM analysis indicates that the surface roughness of the films increases upon doping with MoO₃ nanoparticles. The dc conductivity is increased from 7.19×10^{-8} S/cm for the pureblend to 5.49×10^{-7} S/cm for PVA/PVP blend with 12 wt%MoO₃ nanofiller. The thermal stability of the films found increased upon doping. The prepared films were explored for supercapacitor applications as separator.

**Full paper: Materials Research Innovations, DOI:10.1080/14328917.2019.1653558, ISSN: 1432-8917 (Print) 1433-075X (Online), 2019, pp 1-9*

Structural, Optical, Mechanical and Dielectric Properties of Titanium Dioxide Doped PVA/PVP Nanocomposite

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ABSTRACT

We report preparation of Titanium dioxide (TiO₂) nanoparticles doped PVA/PVP polymer nanocomposites by solvent casting technique. FTIR spectra and XRD studies signify the structural modifications taking place in the nanocomposites. The optical energy gap decreases by the addition of TiO₂ nanoparticles. The mechanical properties such as tensile strength and Young's modulus are enhanced by the addition of Titanium dioxide (TiO₂) nanoparticles. The Fluorescence studies indicate that photoluminescence intensity is maximum for 4 wt% doping concentration of TiO₂. The AFM analysis provides information about the surface roughness of the polymer film. The dielectric plot shows that the dielectric constant increases up to 12 wt% doping of TiO₂, a further increase in the doping concentration results in the reduction of dielectric constant. The dielectric constant decreases with an increase in the frequency for all the films. The above properties show TiO₂ doped PVA/PVP nanocomposite films are a prominent material for potential applications.

**Full paper: Journal of Polymer Research, <https://doi.org/10.1007/s10965-019-1762-0>, Vol 26, Issue No. 99, 2019, pp 99*

Enhanced Third Order Optical Nonlinearity in Ultrathin Amorphous Film of Tetraphenyl-Porphyrin in Pico second Regime

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ABSTRACT

The third order optical nonlinearity of ultrathin 5, 10, 15, 20-Tetraphenyl-21H, 23H-porphine (TPP) films fabricated on an ultrasonically cleaned glass-substrate, by high vacuum thermal evaporation method is investigated. The powder X-ray diffraction (XRD) pattern demonstrates the amorphous nature of the fabricated thin film. The atomic force microscopy (AFM) and the field emission scanning electron microscope (FESEM) images show that the surface morphology of thin film composes of randomly oriented particles with the mean surface roughness of 17.73 nm. The structure of TPP thin film portrays a characteristic UV–Visible spectrum due to π - π^* transitions in the porphyrin molecule. The photoluminescence spectroscopic study reveals that the TPP exhibits excellent fluorescence emission from S1 singlet excited state. The third order optical nonlinearity is studied using single beam Z-scan technique at 532 nm with picosecond pulsed ($\Delta\tau=30$ ps) laser. The TPP thin film exhibits saturation absorption property, with the effective two-photon absorption coefficient (β_{eff}) of the order of 10^{-6} m/W. The observed nonlinear saturation absorption behavior is largely influenced by one-photon absorption due to the filling effect of the surface states and the localized defect states in the thin film. The closed aperture Z-scan study highlights the self-defocusing nature of the TPP thin film with negative nonlinear refractive index (n_2) of the order of 10^{-13} m²/W. The enhanced n_2 value is attributed to the highly polarizable structure of free base TPP molecule and modified electronic band structure due to the strong intermolecular interactions observed in the condensed state.

**Full paper: Optics & Laser Technology, Vol. 119, Issue No. 99, November 2019, pp 105342*

Effect of ZnO nanofiller on Dielectric and Mechanical Properties of PVA/PVP Blend

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ABSTRACT

PVA/PVP (50/50) blends filled with various concentrations of ZnO nanofillers (0, 2,4,8,12,16 wt %) have been prepared using solvent casting technique using an ultrasonicator. The UTM results suggest that the Young's Modulus of the pure blend is 334.34 MPa and that of the blend with 16 wt% ZnO is 1623.80 MPa. The AFM studies indicate that the surface roughness of the films increased upon doping. The dielectric studies carried out using Keithley 4200-SCS

Parameter Analyzer reveals that the dielectric properties of PVA/PVP blends were enhanced upon addition of ZnO nanofillers up to a concentration of 8 wt% ZnO. The dc conductivity studies carried out by Keithley 4200-SCS Parameter. Analyzer reveals that the conductivity of pure blend is 2.92×10^{-11} S/cm and the blend consisting of 8 wt% ZnO nanofiller has a conductivity of 3.04×10^{-9} S/cm. There is a significant enhancement in the dielectric and mechanical properties of the blend upon the addition of ZnO nanofillers. These improvements in the properties of the blend upon the addition of ZnO nanofillers make it a suitable material for device applications.

**Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5130306>, Vol. 2162, Issue No.1, 27 October 2019, pp 020096-1-020096-6*

Third Order Optical Nonlinearity in TPP Incorporated PMMA Composite Thin Film

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ABSTRACT

The third order nonlinear optical properties of TPP incorporated PMMA thin films were probed by means of z-scan technique. The thin films of the order 200-400 nm were fabricated using spin-coating technique. The UV-Visible absorption spectrum shows no variation in the absorption wavelength region with the increase of TPP concentration in PMMA matrix. The developed composite thin films exhibit strong nonlinear absorption (NLA) and nonlinear refraction (NLR) coefficients (β and n_2) in the range 10^{-6} to 10^{-5} m/W and 10^{-13} to 10^{-12} m²/W respectively. The measured third order nonlinear susceptibility, $\chi^{(3)}$ of composite thin films was found to increase with the TPP concentration. The obtained results indicate that the developed spin coated thin films are potential candidates for nonlinear optical device fabrication.

**Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5113126>, Vol. 2115, Issue No.1, July 2019, pp 030287*

Intensity Dependent Third Order Optical Nonlinearity of Zinc-Tetraphenyl Porphyrin Ultrathin Film in Nano-Second Regime

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ABSTRACT

The third order nonlinear optical properties of 5,10,15,20 Tetraphenyl 21H,23H-porphine zinc (II) (ZnTPP) thin films have been investigated by using single beam Z-scan technique with 6 ns laser pulse operating at 532 nm. The ultrathin films of ZnTPP with the thickness of the order of 120 nm were fabricated by means thermal vacuum coating technique. The UV-Visible spectrum depicts signature absorption curve identifying the enhancement in the symmetry of the molecule from D_{2h} symmetry to D_{4h}, due to the presence of central Zn metal ion. The ZnTPP thin film is exhibiting reverse saturation absorption (RSA) and strong self-defocusing effect. The effective two photon nonlinear absorption coefficients (β_{eff}) and nonlinear refractive index (n_2) obtained at different input on-axis peak intensities (I_0) are of the order of 10^{-6} to 10^{-5} m/W and 10^{-13} to 10^{-11} m²/W. The decrease in β_{eff} with the increase in intensity indicates that the observed RSA is due to the excited state absorption (ESA) from T₁ triplet state to higher triplet state (T_n).

**Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.511368>, Vol. 2115, Issue No. 1, July 2019, pp 030329*

Study Of Structural, Optical And Photoluminescence Properties of ZnO Doped PVA/PVP Nanocomposite

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ABSTRACT

We report preparation and characterization of ZnO doped PVA/PVP Polymer nanocomposites using solvent casting technique. The FTIR and XRD studies confirm the formation of polymer nanocomposites through the interaction taking place between the nanoparticles and the polymer. The optical energy gap of the doped polymer decreases with an increase in doping concentration. The photoluminescence studies reveal that the intensity of the peak is maximum for a doping concentration of 8% ZnO. The optical and photoluminescence properties of PVA/PVP blend are enhanced due to doping. This makes ZnO doped PVA/PVP a prominent material for device applications.

**Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5098599>, Vol. 2100, Issue No. 1, April 2019, pp 020045*

Structural, Mechanical and Optical Properties of PVA doped with TiO₂ and ZnO Nanoparticles

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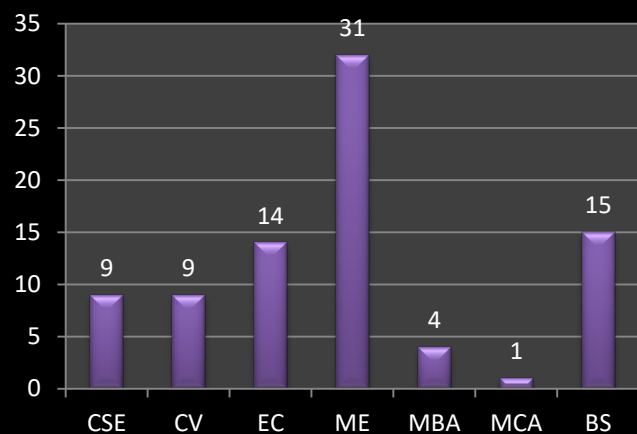
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ABSTRACT

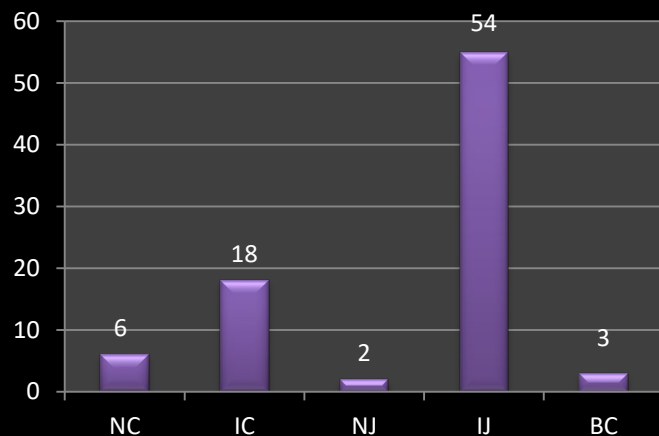
This article emphasizes the preparation of TiO₂, ZnO nanoparticles and PVA/(x)TiO₂(15-x)ZnO nanocomposites for x=0%, 1%, 5%, 7.5%, 10%, 14% and 15% doping concentration via solution casting method. The micro structural studies of prepared nano films were studied using x-ray diffraction (XRD) technique. The UV – Visible spectra reveals the severe decrease in optical energy gap of nanocomposites for x=14% doping concentration. Universal testing machine (UTM) shows high tensile strength, stiffness and Young's modulus for x=14% doping concentration.

**Full paper: AIP Conference Proceedings, <https://doi.org/10.1063/1.5098618>, Vol. 2100, Issue No. 1, April 2019, pp 020064*

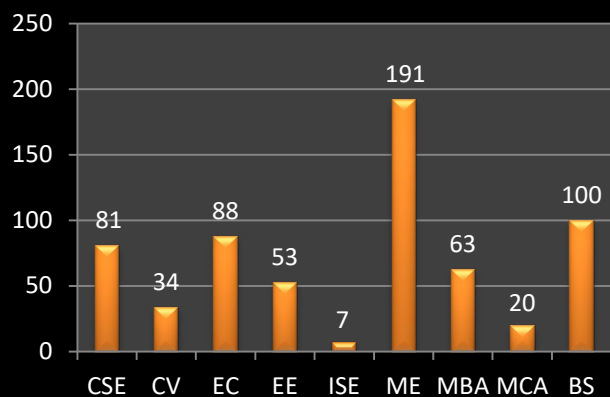
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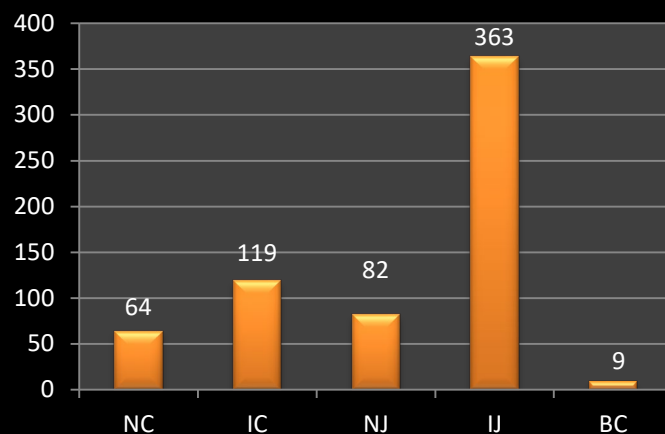
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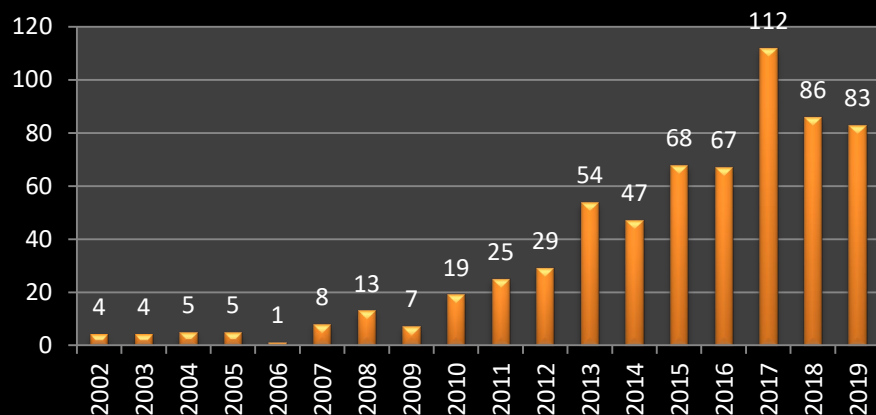
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