

*Abstracts of*  
*International Conference on*  
**Smart Materials & Emerging Technologies For Industry 4.0**

**SMETI - 2020**

October 16<sup>th</sup> & 17<sup>th</sup> 2020

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**Exchange of technological advances in the field of Smart Materials & exploring the innovation paths & challenges towards Industry 4.0**

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*(Autonomous & Affiliated to Anna University)*

*Pennalur, Sriperumbudur (TK), Tamil Nadu – 602 117, India.*

# Proceedings of International Conference on Smart Materials and Emerging Technologies for Industry 4.0

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**Sri Venkateswara College of Engineering,**  
(Autonomous Institution & Affiliated to Anna University)  
**Pennalur, Sriperumbudur, Tamil Nadu, India.**

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## **Proceedings of International Conference on Smart Materials and Emerging Technologies in Industry 4.0**

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# Preface

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International Conference on Automobile, Marine and Mechanical Engineering - 2018 focuses on the theme “Preparing to meet manufacturing challenges to achieve Eco-Efficiency for Make in India”. The concept of eco-efficiency in design, manufacturing and disposal is given higher importance in order to tackle pollution, energy scarcity and global warming issues and to sustain consistent growth in the long term. The conference shall be providing a great opportunity where the researchers, academicians and professionals from industry will share their thoughts and experiences on their related domains. The uniqueness of this conference is that it attempts to provide a platform for the research fraternity in the fields of mechanical, automobile and marine engineering to interact and define critical crosscutting barriers that, if successfully addressed, could enable step change impact beyond the current state-of-the-art.

In response to the call for papers, 275 manuscripts were submitted by authors from home and abroad, out of which 100 manuscripts are short-listed by our highly qualified review committee members. The selected manuscripts are of high quality and will be published as special issue in International Journals.

The conference witnessed ten keynote speakers from distinguished institutions and industry across the world. There were 10 industrial exhibition stalls of different leading industries and organizations to exhibit their latest products and services. It helped the academicians and industrialists to share their views and exchange knowledge of the latest research findings in the fields of Mechanical, Automobile and Marine Engineering.

We would like to take this opportunity to express our deepest gratitude to the members of the Program Committee and all reviewers for their professional review of the papers. We would also like to thank our technical sponsors and other organizations for their support, which went well beyond our expectations.

It is strongly believed that these proceedings will play the role as a valuable resource for mechanical engineering and allied branches of people.

*Editors*

**SMETI 2020**

# Message from the Chairman

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It is with great contentment and happiness that I write this message to the Proceedings of the Online International Conference on Smart Materials & Emerging Technologies for Industry 4.0 (SMETI 2020) organised by Sri Venkateswara College of Engineering, Sriperumbudur, TN, India. By organising this Conference the College continues to maintain its tradition of bringing together researchers, people from academia and industry professionals from all over the globe for intellectual interactions, scholarly discussions and creative collaborations. The Conference's multidisciplinary approach is more relevant now than ever before because it is now that the borders between the disciplines are not distinct. Hence, it is the right time to unify disciplines and ideate, innovate and elucidate all the possibilities and challenges to ensure a sustainable but exciting future. Certainly, that is what the Conference aims at. Also, I trust that this Conference will be an impulsion to inspire and enthuse further study and research in all these fields of science and technology. I am sure that this Conference is an ideal platform for networking, renewing old bonds, making new friends and creating new plans to serve our society better. As said by Isaac Asimov, "Any increase in knowledge anywhere helps pave the way for an increase in knowledge everywhere".

***Dr.A.C. Muthiah***

***Chairman***

***Sri Venkateswara Educational and Health Trust***

# Message from the Secretary

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I am delighted to welcome researchers and academicians to the “International Conference on Smart Materials & Emerging Technologies for Industry 4.0 – SMETI 2020”.

Development of civilization depends on materials and, the materials have become smart and smarter, and will achieve smartest one. These developments in materials will lead to set standards in the industries. It is indeed a timely call to Engineering and Scientific communities to scholastically as well as practically explore Industry 4.0 standards, including the above materials to achieve higher productivity which will lead to economic upliftment of society and keep the environment better. I am sure that the participants of this conference would bring more insight into the objectives of this conference.

I wish the organizers a grand success of this conference.

***Prof. Muthukumaran Sivanandham***

***Secretary***

***Sri Venkateswara Educational and Health Trust***

# Message from the Principal

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First of all, I would like to congratulate the organizers of International Conference on Smart Materials & Emerging Technologies for Industry 4.0 for bringing together in an online mode, the industry experts, researchers, postgraduate students and also freelance professionals while norms still do not approve them coming together at this point of time, on account of the currently ongoing pandemic.

It gives me great pleasure to know that 151 papers are presented from various universities and institutions across the country. I am sure that the conference will serve as a platform for researchers, professionals and academicians to get ample exposure in knowing the cutting-edge technologies and create new opportunities for creation of innovative ideas and their implementation aspects.

The challenges in the implementation of Industry 4.0 Standard necessitates the forum of scientists and researchers to come together and share their knowledge on solutions adopted in Engineering and Technology across the globe. The proceedings of this conference will serve as a repository of information that will inspire and make the participants ready for the next level in their digital transformation journey.

I wish the conference a great success.

***Dr. S. Ganesh Vaidyanathan***

***Principal***

***Sri Venkateswara College of Engineering***

# Message from Coordinator

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We are very glad that the International Conference on Smart Materials and Emerging Technologies for Industry 4.0 - SMETI 2020 is a two-day technical event that aims to provide an outstanding opportunity for both academic and industrial communities to address innovative ideas along with challenges to overcome, which will be critical for enabling smart manufacturing in the form of the Internet of Things (IoT), cyber-physical systems (CPS), human-robot interaction, augmented and virtual realities, cloud computing, cognitive computing and many more emerging technologies.. SMETI 2020 will lay the platform that ensures the successful merging and blending of various ideas of the researchers, academicians and professionals from industries for the Smart India.

On behalf of the organizing departments, we take great pleasure in welcoming all the innovative ideas and the great minds to the SMETI 2020 on 16th and 17th October 2020. We assure that the impact of the discussions on the research papers presented in this conference would offer new insights and kindle innovative thoughts and solutions for the challenges ahead of us in the ever-growing industrial automation and the resulting effects on the mankind.

We would like to thank all the members of the organizing committee for making this event a grandeur and successful. We wish all the participants a beneficial, fulfilling and enlightening conference.

***Dr.S. Ramesh Babu***

***Coordinator – SMETI 2020***

***Professor & Head***

***Department of Mechanical Engineering***



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# INDEX

## STREAM I

Ref. No.	Title	Page No.
14650	THE INFLUENCE OF POST WELD HEAT TREATMENT ON VARIOUS PROPERTIES OF STAINLESS STEEL 316 <i>Sirisha Bhadrakali Ainapurapu, Sai Kumar EEDUPALLI, Lakshmi Narayana Kavuluru, Sai Surya Narayana Raju Pericherla</i>	1
14655	OPTIMIZATION OF PERFORMANCE AND EMISSION CHARACTERISTICS OF DIESEL ENGINE FOR BIODIESEL AND BLENDS <i>Ranjith G, Nikesh M, Vignesh Raveendran, Raghu P</i>	1
14672	APPLICATION OF 3D PRINTING IN CONSTRUCTION: SOME CASE STUDIES <i>Deepak Sundrani</i>	2
14677	A STUDY ON SOLAR CHIMNEY POWER PLANT WITH SEMI CONVERGENT COLLECTOR AND DIVERGENT CHIMNEY <i>rajamurugu natarajan, venkatesan jeyaraman</i>	2
14690	MEASUREMENT OF OVERALL EQUIPMENT EFFECTIVENESS (OEE) OF A SPRING MANUFACTURER <i>BALAKUMAR M, KIRAN R, AKSHAY G</i>	3
14711	EXPERIMENTAL AND COMPUTATIONAL INVESTIGATION OF FLOW THROUGH THE CONVERGENT NOZZLE BY USING CORRUGATED TABS <i>Irish angelin s, Nazeera sulthana Siva kumar, Sanjana Jambu, Kavitha Loganathan, Sangeetha Mahalingam</i>	4
14723	CHARACTERIZATION AND OPTIMIZATION OF THE ALKALI TREATMENT ON ARIAL ROOTS OF BANYAN FIBER FOR BIO COMPOSITES <i>RAMESHKANNAN G, RAMESH BABU S, NIVASH R, NITHISHKUMAR A, PRAVEEN JAYARAM V.N.S</i>	4
14725	COMPARISON OF MECHANICAL AND CORROSION BEHAVIOR OF FRICTION STIR WELDED AND TIG WELDED AA5083 <i>Nishal Murali, Ram Prasad K, Bhavesh B, Lakshmi Kanthan M</i>	5
14726	INVESTIGATION OF MECHANICAL PROPERTIES OF ALOE-VERA FIBER REINFORCED EPOXY AND POLYLACTIC ACID BASED BIO-COMPOSITES <i>kirubakaran G, SENTHAMARAIKANNAN C, ATHIBAN V, AMUDHAN S, GOPI KRISHNAN V</i>	5

14727	FREE VIBRATION CHARACTERISTICS OF BANANA FIBER REINFORCED EPOXY AND PLA BASED BIO-COMPOSITES <i>kirubakaran G, <u>SENTHAMARAIKANNAN C</u>, HARISHKUMAR S R, KALAIVANAN K, MADANKUMAR C</i>	6
14732	DESIGN OF AUTONOMOUS TRANSPORTATION SYSTEM USING COLOR BASED TRAIN CONTROL <i>Ashwin T, <u>Barath Kumar</u>, Ajay E, Raghu P</i>	6
14737	DYNAMIC CHARACTERISTICS AND SUITABILITY OF MAGNETO-RHEOLOGICAL GELS FOR SEISMIC ISOLATION APPLICATION <i><u>Venkateswara Rao P</u></i>	7
14745	DATA SECURITY IN AUTONOMOUS VEHICLE BY CLOUD COMPUTING <i><u>Tilak Ramesh Babu</u>, Anobhama V, Anitha R, Venkatesan Jeyaraman</i>	7
14752	MECHANICAL CHARACTERIZATION OF NATURAL BASED PLASTICIZERS AND POLYMER COMPOSITES <i><u>THAMIZH SELVAN S</u>, MOHANDASS Muthukrishnan, SHYAM SUNDAR K, SHRIRAM V</i>	8
14754	ANALYSIS OF MECHANICAL PROPERTIES FOR PVC, NYLON AND PLA <i><u>THAMIZH SELVAN S</u>, MOHANDASS Muthukrishnan, SHANMUGAGOUTHAMAN K R, SHARAN ANANTH M</i>	8
14755	THERMAL ANALYSIS OF THE DISC BRAKE DURING BRAKING IN A TWO WHEELER FOR VARIOUS MATERIALS <i><u>Ramanjaneyulu Kolla</u>, Ganesh V, Kamalesh D</i>	9
14757	INFLUENCE OF STACKING SEQUENCE ON MECHANICAL PROPERTIES AND WEAR CHARACTERISTICS OF EPOXY BASED FLAX/SISAL COMPOSITE LAMINATES <i><u>Murugan Ramasamy</u>, Rupesh G, Stephen Paul Samson, Paul Theophilus Rajakumar</i>	9
14761	PREDICTING THE ISO-ELECTRIC POINT OF AQUA-ANTIFREEZE FLUID DISPERSED WITH COMBUSTION DERIVED MAGNESIUM OXIDE NANOPARTICLES <i>Suseel Jai Krishnan, <u>P K Nagarajan</u>, Venkatesan Jeyaraman</i>	10
14762	EXPERIMENTAL INVESTIGATION, OPTIMIZATION OF FACE TURNING PROCESS IN INCOLOY AND EVALUATION OF MACHINING PERFORMANCE OF COATED CARBIDE TOOL BASED ON SPECIFIC CUTTING ENERGY <i><u>RAMANAN K V</u></i>	10
14767	COMBUSTION ANALYSIS OF HCV ENGINE FUELLED WITH DIESEL AND BIODIESEL. <i><u>Ravi gG</u>, Ramakrishnan L, Dr. Saravanan S</i>	11

14775	MATERIAL TESTING AND CHARACTERIZATION OF COLD METAL TRANSFER(CMT) WELDING - INCONEL625 NICKEL BASE ALLOYS AND SS (304L) LOW CARBON STEEL USING V-SHAPED GROOVE BUTT JOINT <i>Nithyanand Damotharan, MOHANDASS Muthukrishnan</i>	11
14792	AUTONOMOUS BLINDSPOT DETECTION SYSTEM. <i>Gopinath S, Nareshkumar G</i>	12
14817	DESIGN AND IMPLEMENTATION OF ENERGY STORAGE SYSTEM FOR ELECTRIC VEHICLES USING SUPERCAPACITORS <i>SAKTHI VEL, SUDHARSAN ANANTH, SHAAHIDH IRFAAN SHA, ANISH PRABU R R</i>	12
14830	EMERGENCY RESPONSE SYSTEM FOR TWO WHEELERS <i>Gopinath S, Suren kumar U, Ram kannan L, Rukaia A, Saravana kumaran A, Vijayan V</i>	13
14841	DYNAMIC AND MECHANICAL BEHAVIOR OF 3D CARBON NANO FIBER COMPOSITES <i>Senthamaraikannan C, Mithul Kiruthik S R, Charukhash G S, Nirthick Kumar S</i>	13
14842	EFFECT OF VARYING MATERIALS FOR INTAKE MANIFOLD OF FORMULA STUDENT RACE CAR <i>Paul Durai K, Balaji R, Vignesh P, Suriya Prakash A</i>	14
14846	A COMPARATIVE STUDY AND ANALYSIS OF CORROSION BEHAVIOR OF MAGNESIUM ALLOY AZ31B AND AZ 91 D <i>Sivaramapandian J, Prem Ananth M</i>	14
14849	PERFORMANCE EVALUATION OF A DUAL FUEL ENGINE USING ALTERNATIVE BIO FUELS <i>Kumaraswamy A, Dr Durga Prasad B</i>	15
14870	DESIGN OF BELL-SHAPED LIFT DISTRIBUTION OVER MODIFIED B737 WING <i>Sanjana Rao, Supriya Gopalan, Dr.Yogesh Kumar Sinha</i>	15
14903	SVCE, CNT THERMOSTATIC WAX <i>Vignesh R, GAJENDIRAN M, Vikram Kumar Parthiban, Aravind Kumaresan</i>	16
15190	EXPERIMENTAL STUDIES ON THE COMBUSTION DERIVED ZINC OXIDE NANOPARTICLES AS FUEL ADDITIVES TO EVALUATE THE EMISSION CHARACTERISTICS OF A DIESEL ENGINE <i>Dhanesh C, Venkatesan J, Suseel Jaikrishnan</i>	17
15202	STUDY OF WEAR BEHAVIOR OF POLYMER NANO MATERIAL COMPOSITE MATERIALS <i>naveen e</i>	17
15203	MECHANICAL AND CORROSION RESISTANT PROPERTIES OF NITRIDED LOW CARBON STEEL <i>naveen e</i>	18
15204	DEVELOPMENT AND EXPERIMENTAL CHARACTERIZATION OF FIBRE METAL LAMINATES <i>naveen e</i>	18

15212	3D PRINTING IN FDM PROCESS <i>THAMIZH SELVAN S, MOHANDASS Muthukrishnan</i>	19
15215	DEVELOPMENT OF AIR BRAKE SYSTEM USING ENGINE EXHAUST GAS <i>SAKTHIVEL R, GOPALAKRISHNAN E, SETHURAMAN BL, SHREE RAM VISHAAL S, POOVARASAN T</i>	20
15219	STUDY ON MECHANICAL PROPERTIES OF SUSTAINABLE BIO COMPOSITE PANELS USING JUTE-PLA AND SISAL-PLA <i>Aakash T, Aadithya Madava krishnan, Aushwin S, Senthamaraikannan C</i>	20
15224	AUTOMATIC TYRE PRESSURE SENSING AND INFLATION SYSTEM <i>Ajay Govindarajan G J, Premnath S, Prasanth P, Raghunath Sriram K R</i>	21
15233	TRIBOLOGICAL BEHAVIOR OF THIN FILM TIN COATING ON TI ALLOY SUBSTRATES WITH VARIOUS SURFACE ROUGHNESS CONDITIONS. <i>Muhammad Zishan P.R, Rahul S, Varun V.V, Prabu S, Dr R.Ramesh.</i>	21
15241	MECHANICAL AND VIBRATION BEHAVIOR OF ZIRCONIUM OXIDE REINFORCED HEMP EPOXY COMPOSITE. <i>Charukhash G S, mithul kiruthik S R, Ramesh R</i>	22
15243	DEVELOPMENT OF VEHICLE STABILITY CONTROL <i>Sai Ajay Sankar, Abhilash Venkat, Kiran K K, Ganesh Vinayagam</i>	22
15244	WORKING MODEL OF POWER GENERATION THROUGH DIFFERENT SOURCES IN HYBRID VECHILE. <i>THANIGACHALAM R RAMU</i>	23
15246	DESIGNING AND ANALYSIS OF ELECTRONIC LEVERAGE ADJUSTMENT BRAKING SYSTEM <i>RAGHURAMAN V, MANOJ KUMAR A, GOKUL S, Ramanjaneyulu Kolla</i>	23
15250	SUSPENSION ANALYSIS OF ELECTRONICALLY OPERATED BRAKING SYSTEM ON A TWO-WHEELER <i>Vinith M, Dinesh Krishnan G, Ramanjaneyulu Kolla, Ganesh V</i>	24
15251	INVESTIGATION ON EMISSION TESTING AND ENGINE PERFORMANCE USING JOJOBA OIL AS BIOFUEL <i>Thirumalai kannan K</i>	24
15253	ASSESSMENT OF TRIBOLOGICAL PROPERTIES OF DIFFERENT VEGETABLE OILS EMULSIONS USING PIN ON DISC TRIBOMETER <i>Ruthuraraj R, Thirumalai kannan K</i>	25
15255	STUDIES ON MECHANICAL PROPERTIES OF COLD METAL TRANSFER WELDING OF LASER SURFACE TEXTURED MARINE GRADE ALUMINIUM ALLOYS <i>Narendraraja Palanikumar, Ashish Singh, Gurusamy V, Krishnan S, Pitchandi K</i>	26

15256	MANUFACTURING OF MICROWELL USING PHOTOCHEMICAL MACHINING PROCESS FOR BIOLOGICAL STUDIES <i>DEVENDRA AGRAWAL, Dinesh Kamble</i>	26
15257	INVESTIGATION OF MECHANICAL PROPERTIES OF ALUMINIUM ALLOY PROCESSED BY ADDITIVE MANUFACTURING <i>Senthil Velan Veerasamy, RAMESH BABU S, Gurusamy V</i>	27
15259	MARITIME INDUSTRY 4.0: OPPORTUNITIES AND CHALLENGES <i>Anandan M</i>	27
15260	INVESTIGATION ON MWCNTS FILLED EPOXY/GLASS FIBER COMPOSITES FOR MULTIPLE DRILLED HOLE QUALITY CHARACTERISTICS <i>Hariharan P, Ponnuvel S, Moorthy T V</i>	28
15262	EXPERIMENTAL INVESTIGATIONS OF THE SUPERPLASTIC FORMING OF FRICTION STIR PROCESSED AZ31B ALLOY <i>RAMESH BABU S, Krithik Jhawahar R</i>	28
15266	EXPERIMENTAL INVESTIGATION OF STATIC MECHANICAL PROPERTIES OF EPOXY BASED GLASS, CARBON & SISAL WOVEN FABRIC HYBRID COMPOSITES <i>ARULKUMAR MUNIYAPPAN</i>	29
15269	REDESIGN AND ANALYSIS OF A THERMOSTAT VALVE USING CFD <i>Jeyaraman P, Rohith Renish, Niruban Projoth</i>	30
15270	DESIGN MODIFICATION IN HONING TOOL GUIDING SYSTEM TO REDUCE THE MACHINE DOWNTIME <i>Niruban Projoth, Rohith Renish, Karnam Dileep</i>	30
15274	WEAR PERFORMANCE ON RED MUD FILLED NATURAL FIBRE REINFORCED POLYESTER COMPOSITES <i>Balamurali B, Sivakumar P</i>	31
15277	CALIBRATION OF AGGREGATE ACCIDENT MODEL USING LINEAR REGRESSION TECHNIQUE <i>Sri Akshai R</i>	31
15305	EFFECT OF CYCLIC LOADING ON FREE VIBRATION CHARACTERISTICS OF GLASS/JUTE HYBRID COMPOSITE BEAMS <i>Murugan Ramasamy, Ramesh .Rajagopal, Rajakarthykeyan K, Santhosh Kumar B</i>	32
15308	DESIGNING AND ANALYSIS OF ELECTRONIC LEVERAGE ADJUSTMENT BRAKING SYSTEM <i>RAGHURAMAN V, GOKUL S, MANOJ KUMAR A, Ramanjaneyulu Kolla</i>	32
15311	AMALGAMATION OF DESALINATED SHORE SAND IN CONCRETE <i>Arun Raja P, Anubama S, Dineshkumar G, Arun G</i>	33

15314	A STATE-OF-THE-ART REVIEW : STEEL BEAM-COLUMN JOINTS WITH VISCOUS FLUID DAMPERS <i>Ruby Freya, <u>Abinaya S</u>, Senthil R</i>	33
15315	ANALYSIS OF ENHANCEMENT IN THE STRENGTH OF COLUMNS WRAPPED WITH GLASS FIBER REINFORCED POLYMER <i>Ughi Shipram, Vijay Viswesh, Sathish T, Arun G</i>	34
15323	INFLUENCE OF RICE HUSK ASH AND LIME ON SHEAR STRENGTH OF HIGH PLASTICITY CLAY <i>Dheepika Ravindran, Divya S.S., Arun Gunasekaran</i>	34
15328	OBSERVATION OF MICROBIAL CORROSION AND BIO FOULING EFFECT ON STEEL BASED COMPOSITE REINFORCED WITH TITANIUM DIBORIDE, COATED WITH COPPER UNDER BRINE MEDIUM AT CRYOGENIC CONDITION <i>Mohan Ayyappan, Mr Deepanesh k, Mr Shakti S, Mr.Venkateshwaran S</i>	35
15342	COMPLIANT MECHANISM AND IT'S APPLICATION <i><u>KARTHIC KUMAR R</u></i>	35

## STREAM II

Ref. No.	Title	Page No.
14814	COMPARATIVE STUDY OF MASK RCNN WITH ATROUS CONVOLUTION AND RETINANET FOR PEDESTRIAN DETECTION <i>Sindhura K.S, Shiwani Rajagopalan, Ms. Senthamizh Selvi S</i>	36
14819	EMOT <i>Sreenidhi M.J, Surabi Sri Dhanya S, Sahithi R, Ms. Sharon Femi P</i>	36
14821	SVCE-CHATBOT <i>YUGESH S, VENGATESH KUMAR C, SHRI GAAYATHRI K, SIVAKUMAR E</i>	37
14822	ELECTRICITY CONSUMPTION INTREPRETER <i>Suresh krishnamoorthy, Kumaratharan N, <u>PREMKUMAR KUMAR R.M</u>, vigneshvaran R</i>	37
14826	A CROSS LAYER APPROACH FOR IMPROVING PERFORMANCE IN HETEROGENEOUS WIRELESS NETWORKS <i>Suresh Kumar M, Sathish Kumar G A</i>	38
14835	HITCHHIKE - TOURIST SPOT DETECTION USING CONVOLUTION NEURAL NETWORKS <i>B.Harini Shree, Janani M, Poorani Sankaran</i>	38
14855	INTRUSION DETECTION SMART SURVEILLANCE SYSTEM <i>Kishore S, Karthi kumar R, JAYANTH KRISHNAMOORTHY , Guru Gokul A R</i>	39
14871	SMART HOME INTEGRATED SYSTEM <i>Rajaram V, Balasubramanian S R, Kumaratharan N</i>	39
14890	REMOVAL OF IRRELEVANT DATA IN IOT USING DELTA STREAMING. <i><u>Poorani Sankaran</u></i>	40

14929	SMART TRAFFIC MANAGEMENT SYSTEM BY VEHICLE DENISTY DISSOLVING METHOD <i>MAHESH G K, BALAMURUGAN N M, MALAISHREE G, MADHUMITHA B</i>	40
15026	DYNAMIC GREEN CLUSTERING FOR LIFETIME MAXIMIZATION OF WIRELESS VISUAL SENSOR NETWORKS <i>Usama Abdur Rahman, JAYAKUMAR C</i>	41
15200	ROLE OF INTERNET OF THINGS IN SMART GRID APPLICATIONS AND ITS CHALLENGES <i>Muthulakshmi S, Dr.Chitra R</i>	41
15247	A COLLABORATIVE MACHINE LEARNING APPROACH FOR SENTENCE LEVEL SENTIMENT ANALYSIS <i>Senthil Kumar, Malarvizhi N</i>	42
15249	AUTOMATED HEART DISEASE DETECTION USING CHI- SQUARE STATISTICAL MODEL AND DEEP LEARNING TECHNIQUES <i>Aishwarya A, Adela Florence C, Aparajita S, Gayathri K S</i>	43
15258	CREATION OF BILINGUAL DICTIONARY USING BOOLEAN MODEL OF INFORMATION RETRIEVAL METHOD <i>Senthamizh Selvi S, Anitha R</i>	43
15279	SECURING THE IOT DATA USING IMPROVED CIPHER BLOCKCHAIN TECHNOLOGY <i>Muthunagai S U, Anitha R</i>	44
14664	A SURVEY ON IMAGE SEGMENTATION ALGORITHMS <i>PRABU S, Gnanasekar J M</i>	45
14689	A NOVEL CONCEPT DRIFT DETECTION FRAMEWORK FOR TIME-EVOLVING STREAM DATA <i>Muralikrishnan Ramane, Gnanasekar J M</i>	45
14733	EFFICIENT RESOURCE ALLOCATION USING COMBINATIVE DOUBLE AUCTION IN CLOUD COMPUTING <i>Vinothiyalakshmi P, Anitha R</i>	46
14740	TRAFFIC CHARACTERIZATION AND ANALYSIS IN SDN ENVIRONMENT IN FINDING OPTIMAL PATH OF ROUTING <i>Padmavathy T, Anitha R</i>	46
14751	A COMPARATIVE STUDY ON MACHINE LEARNING ALGORITHMS FOR TRAFFIC FLOW FORECASTING <i>Rajalakshmi V, Ganesh Vaidyanathan S</i>	47
14753	EDGE PREDICTION USING NEURAL NETWORK ALGORITHM <i>Uma N, Anitha R</i>	47
14763	WEATHER FORECASTING USING MACHINE LEARNING ALGORITHMS <i>Kala A, Ganesh Vaidyanathan S</i>	48



14786	TRANSGENDER FACE RECOGNITION USING A VARIANT OF CONVOLUTIONAL NEURAL NETWORK (CNN) <i>R. Bhuvaneshwari, S. Ganesh Vaidyanathan</i>	48
14795	CREDIT CARD FRAUD DETECTION USING UNSUPERVISED LEARNING <i>Sharon Femi, S. Ganesh Vaidyanathan</i>	49
14805	ACHIEVING DATA SECURITY ON CLOUD THROUGH BIO-INSPIRED COMPUTING TECHNIQUES <i>Indumathi A, Dr.Sumathi G, Sangeetha G</i>	50
14806	CARDIOVASCULAR DISEASE PREDICTION USING MACHINE LEARNING MODELS <i>Leela Rani P, Shoundarya P, Raashika V, Subaguru prabakaran G</i>	50
14810	DETECTING MALWARE INFECTED MACHINES WITH DIGITAL FORENSIC ANALYSIS <i>Sangeetha Ganesan, Sumathi Ganesan, Indumathi Angamuthu Mohan</i>	51
14811	COMPARISON OF LONG SHORT TERM MEMORY(LSTM) AND MULTI-INPUT LSTM MODELS FOR AGRICULTURAL ENVIRONMENT PREDICTION <i>Jayanthi Devaraj, Vaishali Murugavel</i>	51
14812	COURSE SCHEDULING SYSTEM USING GRAPH COLORING <i>Hemavathi Umapathi, Rajasri Naresh, Nithin Krishnan, Rajalakshmi Sankaran</i>	52
14813	OCULAR DISEASE PERCEPTION USING AR <i>Delphi Rajakumar, Monisha Sukumar, Jenifer Ramesh, Devi N</i>	52

### STREAM III

Ref. No.	Title	Page No.
15271	COMPUTER-AIDED DOCKING STUDIES OF PIPERIDIN-4-ONE DERIVATIVES AS INHIBITORS OF TYROSINE KINASE (2HCK) OF ANTIOXIDANT ACTIVITY <i>Dr. Stanly S, Reeta Carolin</i>	53
15303	A STUDY ON PROTON EXCHANGE MEMBRANE FUEL CELL TECHNOLOGY <i>Dr. Nachiappan N, Sanjaiy N, Arsath Kader K A, Nannapuraju Pranava sai Raju</i>	54
15304	STUDIES ON COAGULATION EFFECT OF MORINGA OLEIFERA AS A BIO-COAGULANT FOR TREATING GROUND AND SURFACE WATER <i>Harish Kumar N N, VIJAYA LAKSHMI A C</i>	54
15306	A REVIEW ON NOVEL ENERGY-PRODUCTION METHODS FROM WASTE <i>Saraswathi G, Kamalakanth R V, Vignesh P</i>	55

15307	PREDICTION OF KINETICS FOR ADSORPTION OF CONGO RED BY GRAPHENE OXIDE SYNTHESIZED FROM GLUCOSE <i>BHARATH SURESH, Palaniappan S, Priyanka M A</i>	55
15309	DESIGN AND VERIFICATION OF HIGH EFFICIENCY CYCLONE SEPERATOR <i>Shibu M, Sivaneswaran K, Vikash S, Jai Ganesh S</i>	56
15310	ROBUSTNESS OF MEMBRANE BIOREACTOR (MBR) UNDER VARIOUS HYDRAULIC RETENTION TIME (HRT) IN INDUSTRIAL PHARMACEUTICAL WASTEWATER TREATMENT <i>SIVAKUMAR DURAISAMY, M.Nambi Raj, Harish Kumar N N, Krishna S Atherya</i>	56
15312	COLORIMETRIC GAS SENSORS BASED ON CHOLESTERIC LIQUID CRYSTALS <i>Yogesh Kumar M, Ajith Kumar N, Prakashbabu R, Shruti Krishna R</i>	57
15318	RECYCLE AND RECOVERY OF STAINLESS STEEL (SS) PICKLING ACIDS USING ULTRA-FILTRATION (UF) AND ION-EXCHANGE (IX) PROCESSES – AN EXPERIMENTAL STUDY. <i>Bhadrinarayanan L.S., Anand Babu C, Meyyappan N</i>	57
15319	EVALUATION OF COMPOSITE MADE OF POLYLACTIC ACID AND ALOE VERA FOR BONE TISSUE ENGINEERING <i>Sushmitha P, Nalinkanth V Ghone</i>	58
15320	PREFERENTIAL KILLING OF BREAST CANCER CELLS USING ZINC OXIDE THIN FILM <i>Pooja shree Rangaraj, Nalinkanth V Ghone</i>	58
15321	EFFECT OF NANOTUBULAR DELIVERY OF DEXAMETHASONE ON OSTEOGENIC DIFFERENTIATION OF MESENCHYMAL STEM CELLS (MSCS) <i>Jayashree B, Nalinkanth V Ghone</i>	59
15322	MODELLING OF STEM CELL PELLET GROWTH IN A SUSPENSION CULTURE <i>HAARINI RAMESH, Hariharan T P, Nalinkanth V Ghone</i>	59
15326	INFLUENCE OF BORON POTENTIAL ON THE FORMATION OF FEB/FE2B PHASES IN SURFACE NANOCRYSTALLIZED MEDIUM CARBON STEEL <i>Balusamyl T, Ravichandran K, Prof. T.S.N. Sankara Narayanan</i>	60
15327	STUDY ON PROCESS OPTIMIZATION OF BIOACTIVE ENRICHED TOFU WHEY <i>SWETHA G, NANDHINI G, Meyyappan N</i>	60
14649	QUANTUM CHEMICAL VIBRATIONAL STUDY, FTIR AND FT RAMAN SPECTRA OF 1,3-DIPHENYL PROPENONE <i>Revathi Haldoraj, Thirumalaikumar M</i>	61
15341	CELL TO CELL COMMUNICATION STUDIES BETWEEN BREAST CANCER CELLS AND MESENCHYMAL STEM CELLS <i>HARIHARAN JAYARAMAN, Nalinkanth V Ghone</i>	61
14658	IN SILICO BINDING ANALYSIS OF BOERAVINONES WITH THE VEGF AND CASPASE 3 RECEPTORS OF MICE <i>Priyadharshini A, PRAVEEN KUMAR P K</i>	62

14670	MOLECULAR DOCKING, QUANTUM COMPUTATIONAL, SPECTROSCOPIC STUDIES OF 4-PHENYLBUTYROPHENONE <i>SHEELA N R, Rajaaraman BR</i>	62
14688	SYNTHESIS, SPECTROSCOPIC (FT- IR, FT – RAMAN) STUDY, FMO'S, NBO ANALYSIS FIRST ORDER HYPERPOLARIZABILITY AND THERMODYNAMIC PROPERTIES OF ADAMANTAN- 1- AMINE BY DENSITY FUNCTIONAL METHOD <i>Sakthisri K S, Thirumalakumar M, Sampath Krishnan S, Santhanakrishnan V</i>	63
14695	DEVELOPMENT OF A HYDROPHILIC, TRANSPARENT AND SELF-HEALABLE ANTIFOG COATING FOR AUTOMOTIVE GLASS <i>Govindarasu R, Harini I, Abdul Hakeem E H, Gokul Bharathi S, Ashwin Ramachandran</i>	63
14735	EPITOPE BASED VACCINE DEVELOPMENT AGAINST ZIKA VIRUS BY REVERSE VACCINOLOGY APPROACH <i>Varshini Jayakanth, Praveen kumar PK</i>	64
14776	THIN LAYER MODELING OF LIMABEAN (PHASEOLUS LUNATUS) SEEDS IN A TRAY DRIER AND EVALUATION OF MOISTURE DIFFUSIVITY DURING DRYING PROCESS <i>Rajasekar Subramanyam, Meyyappan Narayanan</i>	64
14790	ENHANCED THERMOELECTRIC PROPERTIES OF MG3SB2 UNDER UNI-AXIAL STRAIN: A FIRST-PRINCIPLES METHOD <i>Anandavadivel Annamalai</i>	65
14844	SYNTHESIS AND CYCLIC VOLTAMMETRIC STUDY OF 2,4-BIS(O-CHLOROPHENYL)-3-AZABICYCLO[3.3.1]NONAN-9-ONE. <i>Baskar Ganesan, Anusha G, Lavanya T, Apoorva Ravi</i>	65
14856	DOSE DEPENDENT EFFECT OF CITRULLINE ON IMMUNOMODULATION IN SRBC ANTIGEN INDUCED EXPERIMENTAL MICE <i>Sandhya V, Prabhu Sukumaran</i>	66
14899	CHARACTERIZATION OF POLYPHENOLS AND ITS ANTI-OXIDANT ACTIVITY IN ALLIUM FISTULOSUM, CYNADON DACTYLON AND HIBISCUS SABDIFFERA <i>Karthikeyan M, Nacchiappan Annamalai, sudha ganesh, Meyyappan N</i>	66
15222	DETECTION OF SLUDGE IN CRITICAL REGION OF OIL TRANSPORTATION PIPELINES USING ROBOT <i>DURAIMURUGAN P, VELMURUGAN N, RANJITH KUMAR R, VIGNESH M</i>	67
15223	PROBIOTIC LACTOBACILLUS AS A PROPHYLACTIC TREATMENT FOR CADMIUM AND LEAD TOXICITY IN HUMANS <i>NAGARAJAN SATHISH, Nalinkanth V Ghone</i>	67
15245	PHYCOREMEDIATION OF DAIRY EFFLUENT AND THE POTENTIAL APPLICATION OF RESIDUAL ALGAL BIOMASS IN AGRICULTURE <i>kanagam nachiappan</i>	68
15248	FORMULATION AND EVALUATION OF NOVEL FERMENTED ALMOND MILK TEA (FAMT)- AN ANTIDIABETIC DRINK IN	68

	STZ INDUCED DIABETIC RAT MODEL. <i>Deepak Kannan, Sanjay Venkatesan, AKASH KUMARAN, Prabhu S</i>	
15267	DETECTION OF MICROBES FROM STREET FOODS FROM CHENNAI CITY USING MOLECULAR CHARACTERIZATION STUDY <i>Indira Nachammai, timothy victor, Prabhu Sukumaran</i>	69

#### STREAM IV

Ref. No.	Title	Page No.
14840	A SURVEY ON DEEP LEARNING ALGORITHMS FOR HUMAN ACTIVITY RECOGNITION USING WEARABLE SENSORS <i>subhashini srinivasan, S. Ganesh Vaidyanathan</i>	70
14847	ECG ANALYSIS ALGORITHMS: AN OVERVIEW AND COMPARATIVE STUDY <i>Pooja V Rajan, Umayal R, PAVITHRA K S, SANTHA KR, MAADHURI M</i>	71
14853	DISEASE DETECTION AND CROP MONITORING USING IMAGE PROCESSING TECHNIQUE <i>Sathish Kumar G A, Kiruthika Devi K, AjayKumar Ravikumar, Ganesh G</i>	71
14862	A HIGH PERFORMANCE HANDWRITTEN CHARACTER RECOGNITION SYSTEM USING ALEX-NET BASED ON CNN FOR TAMIL LANGUAGE <i>Babitha Lincy R, Gayathri R.</i>	72
14892	SPEED AND MOTION CONTROL OF SERVO MOTOR FOR STEERING INDUSTRY <i>Rajaram R, Arulmozhi Subramanian, KR Santha, Rakshick srinivas</i>	72
15210	SCENE CLASSIFICATION OF REMOTELY SENSED IMAGERY USING CNN <i>Akila G, Dr. R.Gayathri</i>	73
15211	INTEGRATED SINGLE INPUT DUAL OUTPUT DC-DC CONVERTER FOR ELECTRIC VEHICLE APPLICATIONS <i>Bharadwaj S, Santha KR, Arulmozhi S</i>	73
15213	DEPOSITION AND OPTIMIZATION OF CUO ABSORPTION LAYER USING RF SPUTTERING FOR PV APPLICATION <i>Sinthamani Sivaprakasam, SUDHAKAR K BHARATAN, RANJITH KUMAR M</i>	74
15214	A FUZZY LOGIC CONTROLLER BASED MODIFIED SEPIC CONVERTER AS A MAXIMUM POWER POINT TRACKER WITH IMPROVED GAIN IN REAL TIME APPLICATIONS <i>Rajeswari V, Mohanty N.K, Amudhavalli D</i>	74
15217	MODELING OF MOS2 BASED THIN FILM TRANSISTOR USING COMSOL MULTIPHYSICS <i>SUDHARSANAM S, Dr.Sudhakar K Bharatan, SASIKALA M</i>	75

15218	INTRODUCTION OF SOFT MAGNETIC COMPOSITES AS ALTERNATIVE FOR THE SWITCHED RELUCTANCE MOTOR TORQUE RIPPLE AND VIBRATION MITIGATION <i>Karthikeyan R, Vijayakumar K, Joseph Basanth A, Kannan S</i>	75
15220	INTEGRATING RENEWABLE ENERGY SOURCES AND ENERGY EFFICIENT TECHNOLOGY INTO ELECTRIC POWER SYSTEMS: CHALLENGES AND SOLUTIONS <i>s nanda kumar</i>	76
15221	FABRICATION OF ZNO BASED PHOTODETECTOR USING RF MAGNETRON SPUTTERING <i>Anitha S, Sudhakar K Bharatan</i>	76
15240	ELIMINATION OF LOWER ORDER HARMONICS IN SHEPWM BASED CASCADED H-BRIDGE MULTILEVEL INVERTER <i>SIVAGAMA SUNDARI M S, PERIYASAMY D</i>	77
15261	HYPERSPECTRAL IMAGE CLASSIFICATION WITH SVM AND EDGE-PRESERVING SMOOTHING TECHNIQUE FILTER <i>kavitha m, Dr. Gayathri R.Gayathri</i>	77
14651	PIPELINED SMS4 CIPHER DESIGN FOR FAST ENCRYPTION USING TWISTED BDD S-BOX ARCHITECTURE <i>Babu M, Sathish Kumar G A</i>	78
14750	DESIGN AND ANALYSIS OF DIGITAL FIR FILTER USING RLNS FIXED-WIDTH MULTIPLIER <i>JENCY RUBIA J, Sathish Kumar G A</i>	78
14756	HIGH SPEED AND LOW POWER CARRY SELECT ADDER USING OPTIMIZED CARRY SELECT UNIT <i>Athappan M, KR Santha</i>	79
14758	FLOOD INUNDATION MAPPING EXTENT USING SATELLITE IMAGES :A REVIEW <i>Mehzabeen S M, Dr. R.Gayathri</i>	79
14769	ANALYSIS OF SUPERPIXEL SEGMENTATION TECHNIQUES IN HYPERSPECTRAL IMAGERY <i>Sherin Shibi, Dr. R.Gayathri</i>	80
14777	A LITERATURE SURVEY ON VARIOUS HANDWRITTEN CHARACTER RECOGNITION TECHNIQUES <i>Kalyani S, Ganesh Vaidyanathan S</i>	80
14779	A SURVEY ON AUTOMATED ANALYSIS OF MULTISPECTRAL HUMAN CHROMOSOME IMAGES <i>Menaka Dinesh, Ganesh Vaidyanathan S</i>	81
14782	A REVIEW ON SPN BASED LIGHT-WEIGHT CRYPTOGRAPHIC ALGORITHMS <i>Kousalya Ramachandran, Sathish Kumar G A</i>	82
14783	SPEECH RECOGNITION TECHNIQUES: A SURVEY <i>Vidya M, Ganesh Vaidyanathan S</i>	82

14789	DESIGN OF AN AREA EFFICIENT AND LOW POWER COMPOSITE S-BOX USING REVERSIBLE LOGIC CRYPTOGRAPHIC DESIGN <i>Sarala B, Sathish Kumar G A</i>	83
14796	DESIGN OF SINGLE LAYER KU-BAND REFLECTARRAY ANTENNA FOR SATELLITE APPLICATIONS <i>Venkatraman S, Umma Habiba H</i>	83
14798	DESIGN OF SECURE BANKING SYSTEM <i>T J Jeyaprabha</i>	84
14802	COAXIAL-PIN FED NOTCHED CIRCULAR PATCH ANTENNA FOR X-BAND APPLICATIONS <i>yarnikha N, Jothilakshmi P</i>	84
14804	REAL-TIME EMBEDDED TRAFFIC SIGN RECOGNITION FOR INTELLIGENT TRANSPORTATION SYSTEMS: A SURVEY <i>SIVAGNANA SUBRAMANIAN S P, S. Ganesh Vaidyanathan</i>	85
14823	DESIGN AND IMPLEMENTATION OF A RECONFIGURABLE ANTENNA FOR WIRELESS APPLICATION <i>Hemalatha Balakrishnan, Jothilakshmi P</i>	85



\* Presenting Author

### STREAM-I

Paper ID 14650

## THE INFLUENCE OF POST WELD HEAT TREATMENT ON VARIOUS PROPERTIES OF STAINLESS STEEL 316

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### Abstract:

In this paper, effect of post weld heat treatment on stainless steel 316 and the changes that occurs in their mechanical properties were studied in the temperature ranging from 9000c – 12000c. In this work austenitic steel ss316 is chosen. Ss316 has high strength and better creep resistance at higher temperatures and found its applications in many sectors of industry. The samples were butt welded by using arc welding process and these samples were subjected to different heat treatment processes like hardening annealing, normalizing, quenching with oil and water. Both asm and astm standards were used to test various properties of this austenitic steel. The result indicates there is a change in the tensile strength and hardness in the specimens after the post weld heat treatment processes

**Keywords :** Post Welding, heat Treatment, austenitic Stainless Steel, mechanical Properties

Paper ID 14655

## OPTIMIZATION OF PERFORMANCE AND EMISSION CHARACTERISTICS OF DIESEL ENGINE FOR BIODIESEL AND BLENDS

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### Abstract:

There is a demand to diagnose environment-friendly fuels and performance for the diesel engine due to increasing intake of fossil fuel which is conducive in exploding the pollution levels of the atmosphere. The intent of the study is to optimize the factors which are accountable for the performance and emission analysis di diesel engine by (multi response optimization technique) mrsn technique. The injection



pressure, injection timing, and fuel blends are the chosen factor to optimize diesel engine performance and emission characteristics. The best combination of input parameters is recorded at 190 btdc injection timing, 220 bar injection pressure, fuel blends (rubber seed oil methyl ester) rsme 20 which results in maximum brake thermal efficiency and minimum unburned hydrocarbon(uhc) and nox emissions of the engine.

**Keywords :** Mrsn, Biodiesel, Diesel Engine, Injection Timing

**Paper ID 14672**

### APPLICATION OF 3D PRINTING IN CONSTRUCTION: SOME CASE STUDIES

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#### **Abstract:**

In 3d printing (also known as additive manufacturing) sequential layering of materials is done with the help of a computer. In the beginning, with the help of cad a 3d digital model of the item is created. The printer then reads the drawing and lays down successive layers of printing medium (which can be a liquid, semi-solid or even sheet metal) which are then fused to create the item. Construction is perfectly suitable for 3d printing as nowadays the architects commonly use cad and bim, which are the basic inputs required for application of this technology. in this paper, some case studies relating to construction are described, such as a pedestrian bridge in madrid; a house; world's first 3d printed office building in dubai (of 250 square metre) and world's biggest 3d printed building (640 square metre) in dubai. this technology can reduce both time and cost.

**Keywords :** 3d Printing, Construction, Cad

**Paper ID 14677**

### A STUDY ON SOLAR CHIMNEY POWER PLANT WITH SEMI CONVERGENT COLLECTOR AND DIVERGENT CHIMNEY

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#### **Abstract:**

:a solar chimney power plant (scpp) with a semi convergent collector fitted with a divergent chimney is carried out by cfd and experimental methods. A test on a small-scaled model is carried out with inclined collector to a divergent chimney. The cfd result indicates that the updraft effect increases because of the convergent collector with mean temperature rise of 18k. The experiment conducted in a 2m tall tower with a semi convergent collector of 1.6m diameter with collector inlet height as 0.2m produces a theoretical power output of 33w. Experiment and simulation results are in good agreement. Developing a larger size model helps in achieving larger power output. It is recommended that the semi





convergent collector with a divergent chimney adopts for construction of large size scpp for generating greener energy.

**Keywords :** Solar Chimney; Cfd; Divergent Chimney

**Paper ID 14690**

## **MEASUREMENT OF OVERALL EQUIPMENT EFFECTIVENESS (OEE) OF A SPRING MANUFACTURER**

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### **Abstract:**

In today's competitive world's business environment, the key to success for many manufacturing companies is by increasing productivity. The exploration for improving productivity in the current competitive global environment since customers are becoming more and more quality centered and demands among customers are increased. To meet customer demand industries must work with efficiency oriented. One of the ways to increase efficiency and productivity is to increase the oee (overall equipment effectiveness) of the plant or the critical machines. This paper discusses identifying potential problems in a cnc machine which can affect oee. Overall equipment effectiveness (oee) plays an important factor in industry 4.0 which's a primitive aim is to develop a defect free industry with more accurate with digital systems connected through cloud technology. Oee is one of the most important performance measurements in tpm for modern manufacturing facilities for improving three parameters such as availability, productivity, and quality.

**Keywords :** Overall Equipment Effectiveness(oee), Total Productive Management(tpm), Availability, Performance, Quality.



Paper ID 14711

### EXPERIMENTAL AND COMPUTATIONAL INVESTIGATION OF FLOW THROUGH THE CONVERGENT NOZZLE BY USING CORRUGATED TABS

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#### Abstract:

Experimental and computational investigations of flow through the convergent nozzle were carried out using rectangular corrugated tabs. The aim of our project is to manipulate the result of the exit jet from the convergent nozzle without tabs with a nozzle using corrugated tabs which is positioned downstream of the exit nozzle located diagonally opposite to each other. The study is carried out at a subsonic flow conditions due to which a basic type of convergent nozzle is used. Axial pressure differences were studied for both the cases downstream the nozzle exits at a distance of 5d. The blockage of the tabs with corrugation is found to be 4.2%. The pressure variation is identified and the result is described. It is found there is an increase in pressure drop when tested using a corrugated tabs. The experimental analyses were carried out with and without tabs at various pressure conditions were validating it from the computational results obtained.

**Keywords :** Convergent Nozzle, Corrugated Tabs, Thrust, Pressure Distribution

Paper ID 14723

### CHARACTERIZATION AND OPTIMIZATION OF THE ALKALI TREATMENT ON ARIAL ROOTS OF BANYAN FIBER FOR BIO COMPOSITES

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#### Abstract:

Today environmental conditions and laws are driving the researchers to develop light weight applications using natural fiber composites as they are eco friendly. But the problem with the natural fiber is hydrophilicity which affects the bonding strength of composites. Hence it is essential to modify the surface of the fiber before fabricating the composites in order to improve the bonding strength



effectively. The effectiveness of the surface treatments depends on different parameters and it varies fiber to fiber. Therefore it is necessary to optimize the parameters before fabricating composites. there is no evidence on optimized chemical treatment on banyan fiber in the literatures. For the very first time the concentration of na-oh for the treatment will be optimized based on maximum degradation temperature which will be the result of tg analysis. Then the ftir, xrd, afm will be conducted on optimally selected fiber to find functional group,crystal size,surface roughness respectively.

**Keywords :** Arial Roots Of Banyan Fiber,characterization, Alkali Treatment

**Paper ID 14725**

### COMPARISON OF MECHANICAL AND CORROSION BEHAVIOR OF FRICTION STIR WELDED AND TIG WELDED AA5083

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#### **Abstract:**

In a heavy industry like marine industries, materials like aa5083 has a greater influence on its mechanical properties and corrosion behavior by tungsten inert gas welding and friction stir welding. Aa5083 is preferred compared to other materials due to its high resistance towards salt water and exceptional strength after welding. The joining of the aa5083 is limited to traditional methods like gmaw, gtaw. However, the major problems in conventional welding are loss of alloying elements, presence of segregation, porosities, blowholes and crack formation in welding joint. With the development of new modern techniques like friction stir welding (fsw), these problems have been effectively rectified. This study primarily focuses on understanding the effect of corrosion on materials welded with fsw technique and to defeat the existing challenges in fusion arc welding. Additionally, this study also intends to analyze the critical points of various mechanical tests carried out for testing the strength

**Keywords :** Aluminum Alloys, Tungsten Inert Gas Welding, Friction Stir Welding, Properties.

**Paper ID 14726**

### INVESTIGATION OF MECHANICAL PROPERTIES OF ALOE-VERA FIBER REINFORCED EPOXY AND POLYLACTIC ACID BASED BIO-COMPOSITES

**Kirubakaran G<sup>1</sup>, Senthamarai<sup>2</sup>, Athiban V<sup>2</sup>, Amudhan S<sup>3</sup>, Gopi Krishnan V<sup>4</sup>**

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#### **Abstract:**



The need for seeking alternative materials with increased performance in the field of composites revived this research to prepare and study the mechanical properties of aloe-vera fiber reinforced with epoxy resin and polylactic acid composites. The composites are prepared by hand layup method followed by the compression molding technique using aloe-vera fiber. The resin used in the preparation of composites was epoxy resin and polylactic acid. Fiber reinforced composites were synthesized at 40:60 resin-fiber volume percentage. Samples were prepared as per ASTM standard to study its mechanical properties such as tensile strength, flexural strength, hardness and scanning electron microscope (SEM). SEM analysis revealed the morphological feature. Aloe-vera reinforced epoxy composite exhibited better mechanical properties than other composite samples. This research work enlists the properties of the same aloe-vera fiber lamina reinforced with epoxy resin and polylactic acid which has not been attempted so far.

**Keywords :** Aloevera Fiber, Epoxy, PLA, Tensile Strength, Compressive Strength, Flexural Strength And Biocomposites.

**Paper ID 14727**

### **FREE VIBRATION CHARACTERISTICS OF BANANA FIBER REINFORCED EPOXY AND PLA BASED BIO-COMPOSITES**

**Kirubakaran G<sup>1</sup>, Senthamarai C<sup>2</sup>, Harishkumar S R<sup>2</sup>, Kalaivanan K<sup>3</sup>, Madankumar C<sup>4</sup>**

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#### **Abstract:**

The concern for the environmental pollution and prevention of non-biodegradable resources had attracted to develop eco-friendly increased performance materials in the field of composites revived this research to prepare and evaluate the free vibration characteristics of banana fiber reinforced with epoxy and polylactic (PLA) acid. In the present experiment, banana fiber undergoes alkalization and reinforced with epoxy and PLA composites with 40:60 fiber-matrix volume percentages using hand lay-up process. This research enlists the free vibration characteristics of the same banana fiber lamina reinforced with epoxy and PLA resin matrices which has not been attempted so far.

**Keywords :** Banana Fiber, Epoxy, PLA, Vibration Characteristics Of Epoxide Composites And Biocomposites.

**Paper ID 14732**

### **DESIGN OF AUTONOMOUS TRANSPORTATION SYSTEM USING COLOR BASED TRAIN CONTROL**

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### Abstract:

The world is moving towards automation in every field of engineering, and transportation field is not an exception from it. Autonomous transportation is starting to hit the roads with new features. Many industry are facing trouble with implementing an efficient and reliable transportation from one place to another. Hence we propose a method to automate the systems of transportation in a closed environment using a special color scheme, so that it will take minimum time and makes the environment a more safer place for the workers to work. This can be achieved by using a variety of sensors and iot for maintaining safety and to get real time data of the transportation being made.

**Keywords :** Safety, Autonomous Transportation.

**Paper ID 14737**

### DYNAMIC CHARACTERISTICS AND SUITABILITY OF MAGNETO-RHEOLOGICAL GELS FOR SEISMIC ISOLATION APPLICATION

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### Abstract:

Magnetorheological (mr) gels are a new class of smart soft polymers whose stiffness can be tuneable under the magnetic control. One of the possible functional dynamic applications of mr gels taking advantage of the tuneable stiffness is seismic isolation. Seismic isolation can be achieved by decoupling a structure from damaging effects of earthquake ground motion by introducing a material with frequency shift capability to a system placed between the structure and its foundation. The frequency shift capability of a material depends on its dynamic characteristics. If the dynamic characteristics of the supports are tuneable, it will be possible to isolate a large range of vibrations to the superstructure. And hence, in this work a constant gel matrix of 1:8 with 50% of carbonyl iron particles is prepared with various sizes of iron particles of 1.4, 3.4 and 6 microns and studied the dynamic characteristics experimentally by conducting dynamic shear tests.

**Keywords :** Magnetorheological Gels, Shear Modulus, Mr Effects, Seismic Isolation

**Paper ID 14745**

### DATA SECURITY IN AUTONOMOUS VEHICLE BY CLOUD COMPUTING

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### Abstract:



Due to the hybrid performance of exclusive automated driven vehicle (adv's) vehicles that works on open streets, the cloud computing model is used for storing the data. These data from the vehicle can be collected through the sensors that are available in different parts of the adv's. Since the adv uses the connected vehicle network model, the telematics and infotainments that are used inside the vehicle may be hacked by other connected vehicle around it. Hence the data that happens inside and outside the vehicle has to be secured from the data stealer that may cause serious threat to the user. This paper develops a model for protecting the sensitive data of the user that is processed via in-vehicle infotainment and telematics. It differentiates the mode of data and secures the user as well as vehicle sensitive data.

**Keywords :** Automated Driven Vehicle, Information Security, Connected Vehicles, Data Security

**Paper ID 14752**

### MECHANICAL CHARACTERIZATION OF NATURAL BASED PLASTICIZERS AND POLYMER COMPOSITES

**Thamizh Selvan S<sup>\*1</sup>, Mohandass Muthukrishnan<sup>2</sup>, Shyam Sundar K<sup>3</sup>, Shriram V<sup>4</sup>**

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#### **Abstract:**

The polymers have been playing a vital role in the industries, have its own advantages and it have application in manufacturing, aerospace, automobile industries. The polymer could be manufactured by various process by using natural and artificial ingredients. Even though the polymer have its own properties like mechanical, chemical, electrical properties, non-degradable and pollute our environment, but it has similar strength compare with metals materials. Using some natural ingredients like vegetable oil (i.E., neem oil, groundnut oil), starch, h<sub>2</sub>o, glycerin, and fiber elements to process the polymer composite and while analysis the properties it has strength, degradable, high resistance.

**Keywords :** Polymers, Vegetable Oil, Environment Pollution, Degradable

**Paper ID 14754**

### ANALYSIS OF MECHANICAL PROPERTIES FOR PVC, NYLON AND PLA

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#### **Abstract:**

Now a day's plastics (polymer) are most required materials in our society, pvc and nylon has been used in automobile, electrical, manufacturing, but it is formed the pollution in the air, water and land. While



making the various polymer (pla) use of natural ingredients with various temperature and period of time, it observed the changes in properties of materials. In this study, 3mm to 10mm thick plate have been choose in pvc, nylon and polymer (pla) materials has been analyzed and compared with various testing process like corrosion, strength, hardness, stress, elasticity. While observing the three materials, polymer have similar properties with pvc but compared with nylon it has lesser but it does not pollute the environment.

**Keywords :** Polymers, Pvc, Environment Pollution, Degradable, Materials

**Paper ID 14755**

### **THERMAL ANALYSIS OF THE DISC BRAKE DURING BRAKING IN A TWO WHEELER FOR VARIOUS MATERIALS**

**Ramanjaneyulu Kolla<sup>1</sup>, Ganesh V<sup>2</sup>, Kamalesh D<sup>1</sup>**

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#### **Abstract:**

The key factor which determines the safety of the automobile is its handling. The handling of the system depends on the braking and steering ability of the vehicle. During normal driving conditions, steering and braking systems are not so essential. But, the braking system plays a vital role when driving at high speeds of the vehicle. To handle these situations without accidents better braking system is to design. When the brake is applied in the disc brake, it induces the different stresses on the brake rotor surface, thus it may endure structurally. The main objective of this paper is to design the rotor and also selects the best material for better handling of thermal stresses during braking. Hence for improving the performance of the disc brake, a structural and thermal analysis is carried out for different selective materials using creo and ansys software.

**Keywords :** Disc Brake Rotor Design And Material, Structural And Thermal Analysis

**Paper ID 14757**

### **INFLUENCE OF STACKING SEQUENCE ON MECHANICAL PROPERTIES AND WEAR CHARACTERISTICS OF EPOXY BASED FLAX/SISAL COMPOSITE LAMINATES**

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#### **Abstract:**

Increase in demand for environmental friendly materials for engineering structures makes the natural fiber as best alternative material to synthetic fibers without much compromise in the mechanical properties. In the present investigation, the two natural fibers having different elastic modulus such as



sisal and flax are preferred to study the effect of stacking sequence on mechanical properties and wear characteristics. The composite laminates for the study were fabricated by hand layup technique using low density epoxy resin. Mechanical properties like tensile strength, flexural strength, hardness and wear characteristics such as wear rate and coefficient of friction were evaluated according to astm standards and reported. This study reveals that the hybridization of natural fibers having two different elastic modulus values could be considered as viable solution for augmenting the mechanical properties and wear characteristics of composite structure used in automobile and aircraft applications.

**Keywords :** Natural Composites, Mechanical Properties, Wear Characteristics

**Paper ID 14761**

### **PREDICTING THE ISO-ELECTRIC POINT OF AQUA-ANTIFREEZE FLUID DISPERSED WITH COMBUSTION DERIVED MAGNESIUM OXIDE NANOPARTICLES**

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#### **Abstract:**

Experimental investigations were carried on the mgo nanoparticles (17 nm) synthesized by the solution combustion route, which was dispersed in the aqua-antifreeze fluid to prepare stable nanofluids by identifying the iso-electric point through optimized ultrasonication and varied ph. Nanofluids were prepared at different nanoparticle concentrations (0.05, 0.2 and 0.6 vol%) under different ph (5 to 13). The zeta potential values are measured using the zetasizer and the obtained results indicate that the iso-electric point (iep) of the nanofluid samples is approximately 10.9. Moreover, the stability of all the nanofluid samples was excellent below ph 7 and beyond ph 13. The hydrodynamic size of the nanoparticles measured at the iep is found to be larger due to agglomeration effects and is found to be 37, 42 and 60 nm for the 0.05, 0.2 and 0.6% particle concentration, respectively.

**Keywords :** Nanofluid, Magnesium Oxide, Ethylene Glycol, Zeta Potential, Combustion Synthesis, Iso-electric Point

**Paper ID 14762**

### **EXPERIMENTAL INVESTIGATION, OPTIMIZATION OF FACE TURNING PROCESS IN INCOLOY AND EVALUATION OF MACHINING PERFORMANCE OF COATED CARBIDE TOOL BASED ON SPECIFIC CUTTING ENERGY**

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#### **Abstract:**





Incoloy800 is iron based nickel alloy widely used in chemical and petrochemical industries due to its superior strength and corrosion resistance at higher temperatures. This paper presents experimental investigation, measurement and evaluation of machining performance of coated carbide tool while face turning incoloy 800, based on specific cutting energy. Feed rate, cutting speed, depth of cut and tool nose radius are the input factors and surface quality (ra and rz), material removal rate (mrr) and specific cutting energy (u) are the responses measured. Response surface regression equations developed to predict ra, rz, mrr and u. Multi response optimization carried out using desirability function and its performances compared with uncoated tool. Main cutting force drops by 15%, productivity (mrr) increases by 39% and specific cutting energy reduces by 20% in coated carbide tool, compared to uncoated carbide tool. 25% higher cutting speed can be used to increase productivity in coated tool.

**Paper ID 14767**

### **COMBUSTION ANALYSIS OF HCV ENGINE FUELLED WITH DIESEL AND BIODIESEL.**

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#### **Abstract:**

Compression-ignition engines are the widely used engines nowadays because of their higher efficiency compared to other engines. This is because these engines can operated at very high compression ratios. Generally, diesel engines are heavier compared as they have very high brake mean effective pressure. Also, they have the ability to operate at any kind of extreme load conditions and this is the reason for the use of diesel engines in heavy commercial vehicles (hcv). The only parameter that can be improved to improve the efficiency of hcv is by altering the combustion parameters. But, there is severe demand and the price of fossil fuels rise up every day. Hence it is necessary to investigate on alternative fuels for the sustainability in the near future. The physical and chemical property that suits the properties of diesel fuel is biodiesel. Biodiesel fuel is the best substitute for diesel with a great

**Keywords :** Hcv, Diesel, Bio-diesel

**Paper ID 14775**

### **MATERIAL TESTING AND CHARACTERIZATION OF COLD METAL TRANSFER(CMT) WELDING - INCONEL625 NICKEL BASE ALLOYS AND SS (304L) LOW CARBON STEEL USING V-SHAPED GROOVE BUTT JOINT**

**Nithyanand Damotharan<sup>1</sup>, Mohandass Muthukrishnan<sup>2</sup>**

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#### **Abstract:**



This research work reports the effect of heat input and torch position, torch angle and torch gap on intermetallic compounds (imc) formations and mechanical properties of cold metal transfer (cmt) welding on inconel 625 nickel base alloys and ss (304l) extra low carbon stainless steel was performed in a v-butt joint configuration using ernicrmo-3 filler wire testing of weldments and microstructure characterization is done using an opical spectroscopy and tensile strength is conducted using universal testing machine for various parameters such as wire feed speed in 'm/min', torch position, torch angle, torch gap, mean voltage in 'v', mean current in 'a' and heat input in 'j/mm' are used in the samples for conducting the experiment and further investigation is carried out.

**Keywords :** Inconel 625, Extra Low Carbon Stainless Steel, Ss (304l), Cold Metal Transfer Welding, Ernicrmo-3 Filler Wire, Edax Analysis, Tensile Test

**Paper ID 14792**

### **AUTONOMOUS BLINDSPOT DETECTION SYSTEM.**

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#### **Abstract:**

The vision of this paper is to provide an advanced driver assistance system(adas) to reduce the number of road fatalities caused by sidesweep accidents and so we proposed a new compact and low cost autonomous blindspot detection system to eliminate the blindspot region with the use of machine learning k-means algorithm and ultrasonic sensors to make meticulous detection and decision.This paper delivers an overview of safety technology for transportation system.

**Keywords :** Adas, Autonomous Blindspot Detection, K-means Algorithm.

**Paper ID 14817**

### **DESIGN AND IMPLEMENTATION OF ENERGY STORAGE SYSTEM FOR ELECTRIC VEHICLES USING SUPERCAPACITORS**

**Sudharsan Ananth<sup>\*1</sup>, Shaahidh Irfaan Sha<sup>\*1</sup>, Anish Prabu R R<sup>\*1</sup>, Sakthi Vel<sup>1</sup>**

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#### **Abstract:**

Batteries have played a major role in electrification of vehicles, but due to some disadvantages and cost, it is not suitable for developing and underdeveloped countries. For automotive applications electric vehicle have many constraints like start up, acceleration, braking and recharging and weight of the batteries. To reduce the weight of the storage system, the battery can be associated with high power super capacitor. This research deals with development of super capacitor and related circuits such as boost converter in electric vehicles in place of batteries in a scale prototype. Performance like speed, acceleration, charging and discharging time of a car were compared with batteries. It has been seen that



introduction of super capacitor reduces charging time and increases performance of the car. The ease of manufacturing and cost of super capacitor makes this as an ideal choice to be used as energy storage device in electric vehicle

**Keywords :** Batteries, Super Capacitor, Electric Vehicle, Boost Converter

**Paper ID 14830**

### EMERGENCY RESPONSE SYSTEM FOR TWO WHEELERS

**Gopinath S<sup>1</sup>, Suren Kumar U<sup>2</sup>, Ram Kannan L<sup>2</sup>, Rukaia A<sup>2</sup>, Saravana Kumaran A<sup>1</sup>, Vijayan V<sup>1</sup>**

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#### Abstract:

The motorcycle safety is a serious concern that needs to be addressed all over the world. The accident reports suggest that the motorcycle accidents are increasing day by day. The indian government is taking many steps to reduce the risk of accidents, but still accidents tends to happen. The response time for ambulances to come to the spot is considerably slower in rural areas and in highways. Therefore, through this system we tend to reduce the response time in those areas. The electrical system consists of a microcontroller which gets input from vibration sensor and gyroscopic sensor. The gsm and gps module is integrated with the microcontroller to send alert messages for the close relations of their family. The messages are triggered by microcontroller following a sequence of instructions. This system is available in four wheelers but is still not implemented in two wheelers due to cost and other factors.

**Keywords :** Gsm,gps,microcontroller,gyroscope

**Paper ID 14841**

### DYNAMIC AND MECHANICAL BEHAVIOR OF 3D CARBON NANO FIBER COMPOSITES

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#### Abstract:

Additive manufacturing technologies provide new opportunities for the manufacturing of components with customisable geometries and mechanical properties. In particular, fused deposition modelling (fdm) allows for customisable mechanical properties by controlling the void density and filament orientation. The mechanical and vibration behavior of 3d printed polyethylene terephthalate glycol (petg) and nylon reinforced with 20% carbon nano fibers(cnf) is presented in this paper using several experimental tests. Tensile and flexural test were conducted as per astm standarts. The results reveal that the addition of carbon fibers increases the tensile and flexural considerably. Free vibration test conducted to analyse the dynamic behaviour of nylon and petg and results are discussed.



**Keywords :** Nylon, Petg, Carbon Nano Fiber,damping, Tensile Modulus

**Paper ID 14842**

### **EFFECT OF VARYING MATERIALS FOR INTAKE MANIFOLD OF FORMULA STUDENT RACE CAR**

**Paul Durai K<sup>1</sup>, Balaji R<sup>1</sup>, Vignesh P<sup>1</sup>, Suriya Prakash A<sup>1</sup>**

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#### **Abstract:**

This work focused on design and analyze of an intake manifold for fsae competition with an air restrictor of 20 mm circular cross section for different materials. The air restrictor must be placed between the throttle body and engine inlet in order to limit the mass flow rate which had a great impact on maximum power as it strongly influences the volumetric efficiency. It also focus on design of intake system by varying the geometric aspects of restrictor, plenum chamber and runner length for single cylinder, four stroke si engine. Taking advantage of cfd and calibrated 1d model of the engine, simulation and design of restrictor, plenum and runner can be carried out easily by validating the results with calculated values. By selecting appropriate material for intake manifold the pressure loss can be minimized, which increases mass flow rate. Maximum performance for the selected speed range can also be achieved.

**Keywords :** Intake Manifold, Air Restrictor, Plenum, Runner, Mass Flow Rate

**Paper ID 14846**

### **A COMPARATIVE STUDY AND ANALYSIS OF CORROSION BEHAVIOR OF MAGNESIUM ALLOY AZ31B AND AZ 91 D**

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#### **Abstract:**

Magnesium (mg) alloys are receiving increasing attention due to their abundance, light weight, formability, mechanical properties and corrosion performance. Magnesium has specific high strength to weight ratio, and it is 35% lighter than aluminium and 75% lighter than iron. Mg alloy used as a structural material in aerospace components, automobile and computer parts, mobile phones and sporting goods. The limitation of mg alloy is easily corrosive in nature and low melting temperature also. Hence we focused our research work towards to improve the corrosive property of the mg alloy by coating. We identify the three different coatings tin, crn, aln in order to increase the corrosion resistance specifically. We are going to analyse the corrosion behaviour of the az 91 d and az 31 b samples with different coatings using coating method as per astm standards and also to study the surface changes of mg alloys using scanning electron microscope.



**Keywords :** Mg Alloy, Az 91d, Az 31b, Sem

**Paper ID 14849**

### **PERFORMANCE EVALUATION OF A DUAL FUEL ENGINE USING ALTERNATIVE BIO FUELS**

**Kumaraswamy A<sup>\*1</sup>, Dr Durga Prasad B<sup>2</sup>**

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#### **Abstract:**

The performance evaluation on a of dual fuel stationary engine using cotton seed oil is investigated in the literature. Hence, a technology of dual fuelling concept which shows highly promising combustion and exhibit low emissions leads to reduction in emissions like hc and co, since compression ignition has increased hydrocarbon (hc) and carbon monoxide (co) emissions. Duel fuelling offers less pollutant emissions like nox and pm. Duel fuel technology is the most adequate technology for next generation engines to reduce emissions for cleaner environment. This study investigates the effects of the bio fuels, ignition improvers and operating conditions on the dual fuel combustion and emissions from it. Dual fuel combines the characteristics of spark-ignition (si) and compression ignition (ci). Dual fuel engines can operate on gasoline, diesel fuel, and most alternative fuels. This paper reviews the parameters involved in dual fuel engine technology.

**Keywords :** Dual Fuel Engine, Alternate Fuel, Bio Diesel

**Paper ID 14870**

### **DESIGN OF BELL-SHAPED LIFT DISTRIBUTION OVER MODIFIED B737 WING**

**Sanjana Rao<sup>\*1</sup>, Supriya Gopalan<sup>1</sup>, Dr.yogesh Kumar Sinha<sup>1</sup>**

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#### **Abstract:**

The elliptic lift distribution over a wing span has been believed to be the solution for least induced drag and is implemented over all aircraft wings. Ongoing research shows that a bell-shaped lift distribution produces up to 14% lesser induced drag over the same profile. A reduction in induced drag also results in a reduction in fuel consumption. This project aims to design a wing with reference to the boeing 737-800 wing and modify it such that bell-shaped lift distribution is achieved. We implement an optimum washout distribution to achieve this. We have obtained a theoretical expression for washout and bell lift distribution over a wing. The effect of washout on lift distribution is studied and comparison of various distributions is done. Theoretical, experimental and simulation results are analysed. A change in aerodynamic forces and reduction in induced drag over the modified wing is achieved.

**Keywords :** Aerodynamics, Wing, Drag, Lift Distribution, Efficiency



Paper ID 14903

### SVCE, CNT THERMOSTATIC WAX

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#### Abstract:

Wax thermostatic elements transform heat energy into mechanical energy using the thermal expansion of waxes when they melt. At present copper powder mixed with wax is being used in thermostat elements. At prolonged exposure to high temperature, copper powder in these elements tend to settle down due to gravity. To avoid this problem carbon nanotubes (cnt) is selected as dispersion material. Generally, cnt improves thermal conductivity in matrix region where they are reinforced because they stretch uniformly and effectively throughout the matrix region. Here we report that the combination of wax and carbon nanotubes samples are taken in the ratio of 100:1 and mixed the accurate proportions to obtain the cnt wax thermostatic element. The range of thermal conductivity at room temperature is always greater than 200w/m k. So, the cnt dispersed in the wax element has the capability of attaining melting state around a temperature of 353k.



Paper ID 15190

### EXPERIMENTAL STUDIES ON THE COMBUSTION DERIVED ZINC OXIDE NANOPARTICLES AS FUEL ADDITIVES TO EVALUATE THE EMISSION CHARACTERISTICS OF A DIESEL ENGINE

**Dhanesh C<sup>1</sup>, Venkatesan J<sup>2</sup>, Suseel Jaikrishnan<sup>3</sup>**

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#### Abstract:

This research evaluates the emission characteristics of a diesel engine susceptible to a diesel fuel dispersed with modified zinc oxide nanoparticles. The zinc oxide nanoparticles were synthesized by combustion en-route and appears to be modified based on the particle morphology. Zinc oxide nanoparticles were weighed equivalent to 25 and 50 ppm by a sensitive weigh balance (0.0001 g). Nanofuel samples were prepared by dispersing these nanoparticles within the diesel with the aid of a magnetic stirring and ultrasonicator. Single cylinder, water cooled direct injection tv1 engine running at 1500 rpm constant speed was used for study at varying load conditions. The obtained experimental data is compared with those of pure conventional diesel. Although we found only a marginal improvement in the thermal efficiency and brake specific fuel consumption (bsfc) in the case of engine running with nanofuels, the nox and smoke emissions were appreciably lesser.

**Keywords :** Nanofuels, Diesel Engine, Zinc Oxide, Nanoparticles, Fuel Additives, Emission

Paper ID 15202

### STUDY OF WEAR BEHAVIOR OF POLYMER NANO MATERIAL COMPOSITE MATERIALS

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#### Abstract:

For the past few year, almost every manufacturing industry facing a heavy competition due to globalization to achieve greater success than other firms they implement various management philosophies, but the material properties finds such a important role in making the components for industrial application. In the automobile industry they are using the material not only stronger even the less weight also. To achieve this the pmc plays as an important part of the industry. A polymer matrix composite is composed of variety of short or conditions fibers bound together by an organic polymer matrix. Pmcs are designed to transfer loads between fibers through the matrix. Some of the advantages with pmc include their light weight, high through the matrix. Some of the advantages with pmcs include their light weight ,high stiffness and their high strength along the direction of their reinforcements. Other advantages are good abrasion resistance and good corrosion



### MECHANICAL AND CORROSION RESISTANT PROPERTIES OF NITRIDED LOW CARBON STEEL

**Naveen E**<sup>\*1</sup>

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#### **Abstract:**

The aim of the work is to study and analyze the effects of salt bath nitriding of en-24 low carbon steel. The nitriding process was implemented in the salt bath component for 30 min and temperature was constant at 570°C. The coated sample is characterized using x-ray diffraction, pin on disc and microvicker hardness tester to study the structural, wear, mechanical and corrosion properties. Before coating, the material is thoroughly cleaned and etched. A typical salt bath nitriding thickness for our sample is ~5 µm. The results obtained are then compared for before and after the nitriding. Xrd results showed that formation of the nitrides  $\epsilon$  phase in the sample. En 24 low carbon steel showed the hardness of 231 hv before nitriding and it increased to 371 hv. The wear studies indicated that the coefficient friction is 0.80 and wear is ~ 150 µm. The hardness is increased 1.5

**Paper ID 15204**

### DEVELOPMENT AND EXPERIMENTAL CHARACTERIZATION OF FIBRE METAL LAMINATES

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#### **Abstract:**

Fiber metal laminates have a stagnation of the laminated material. They have used for the light weight application in industrial. Current days fml's are used in a break pad application also. In this work, basalt fibres with aluminium 6061 material are used in the laminate material and epoxy resin are acting as binding materials. The laminates were prepared by the hand lay up or compression moulding method. The 5-3/2 laminates of size 300x300 mm<sup>2</sup> with thickness 3mm were prepared by using hand lay-up method. The specimen was prepared by the water jet cutting machine. The different test will take as like tensile, flexural impact and hardness. The fracture surface will study using scanning electron microscope. The fracture surface also evaluated.





Paper ID 15212

### 3D PRINTING IN FDM PROCESS

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#### Abstract:

Recently, additive manufacturing has a large development in this industrial era. This advanced additive process allows fabricating the parts with complex geometry parts directly from cad models, without the necessity to use any tooling. The main advantages of am are its capability of producing parts with high geometrical complexity at almost no added cost, short lead times, weight reduction, less efforts for assembly and appropriateness for customization as for as low volume production parts is concern. In addition, some areas may need materials with extraordinary combinations of properties, which are not fulfilled only by metals, polymers or ceramics. For such applications, composite materials combining two or more materials let to having the preferred properties combined in a single material. Thus, am, which can be defined as a process of adding materials to produce objects directly from its cad model in successive layers in contrast to subtractive processes, is gaining significance

**Keywords :** 3d Print, Polymer, Fdm

Paper ID 15215

### DEVELOPMENT OF AIR BRAKE SYSTEM USING ENGINE EXHAUST GAS

**Gopalakrishnan E<sup>1</sup>, Sakthivel R<sup>1</sup>, Sethuraman B<sup>1</sup>, Poovarasam T<sup>1</sup>, Shree Ram Vishaal S<sup>1</sup>**

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#### Abstract:

The exhaust gas from automobile vehicles is the product of the combustion process of an internal combustion engine and also it is considered as harmful emission due to its chemical nature. The latest



development and technologies on waste heat recovery of exhaust gas is utilized for performing the braking mechanism. In the proposed model turbine is placed in the path of exhaust from the engine, so that the kinetic energy is converted into electrical energy by a dynamo which is coupled to the turbine. The generated power is stored in the battery and then this electric power has to be loaded to the dc compressor. The air compressor compresses the atmospheric air and it is stored in the air tank and it supplies the compressed pneumatic power for the braking system. In conclusion, the air braking system is operated with the recovered exhaust gas instead of the engine workload.

**Keywords :** Exhaust Gas, Turbine, Dynamo, Dc Compressor

**Paper ID 15219**

### STUDY ON MECHANICAL PROPERTIES OF SUSTAINABLE BIO COMPOSITE PANELS USING JUTE-PLA AND SISAL-PLA

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#### Abstract:

The main objective of this investigation is to reduce and replace the use of non-biodegradable synthetic fiber. Many types of natural fibers have been investigated to produce composite materials that are competitive with synthetic fiber composites. Jute and sisal are natural fibers which are available in abundance. Their properties include high tensile strength and low extensibility. Polylactic acid, abbreviated as pla is a thermoplastic polyester, produced by converting starch or sugar, it is 100% biodegradable and recyclable making it environmentally friendly and sustainable. . The flexural and tensile tests have been done according to the astm standards to find the maximum strength and bending properties. Free vibration analysis was conducted to find resonant frequency, damping and amplitude of bio composite. Bio-composite have shown growth and used in the domestic sectors and various fields. The increasing awareness of global and social concerns has propelled the search for new bio-composites.

**Paper ID 15224**

### AUTOMATIC TYRE PRESSURE SENSING AND INFLATION SYSTEM

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#### Abstract:

Running a vehicle with low or higher tyre pressure than the manufacturer's recommended value may lead to accidents. Hence, as a preventive measure (active safety), we have come up with an idea of automatic tyre pressure sensing and inflation system which will maintain the manufacturer's recommended tyre pressure. This will help in avoiding uneven tyre wear, avoid accidents, increases



fuel efficiency, improves traction between the tyre and road and it also provides better handling characteristics of the vehicle. This system will sense the air pressure present inside the tyre and if it is lower than the recommended value, air will be inflated into the tyre using a compressor. This system ensures that the vehicle is safer to use and also reduces the miscellaneous expenses of a customer.

**Keywords :** Tyre Pressure, Inflation, Automotive, Safety

**Paper ID 15233**

### TRIBOLOGICAL BEHAVIOR OF THIN FILM TIN COATING ON TI ALLOY SUBSTRATES WITH VARIOUS SURFACE ROUGHNESS CONDITIONS.

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#### Abstract:

The high strength and low weight possessed by ti alloys is preferred as an engineering material for various machine elements applications. However it also exhibits poor wear resistance. Improving its wear resisting performance is important in various aspects of engineering applications. In the present work three surface modifications have been attempted such as milled, grounded and polished ti alloy substrates. These modified surfaces were then coated with tin by pvd technique. The adhesive wear behavior was evaluated by using the pin on disc and the abrasive wear behavior was studied by conducting the dry sand abrasion test. Various parameters like cof, wear volume, wear mechanisms, wear rate and related depth features of the damaged surfaces were evaluated, critically analyzed and compared. This was done to study the influence of different surface roughness conditions on friction and wear behavior and also to enhance the wear resistance properties. The trends and deterioration mechanisms were drawn from experimental tribology.

**Keywords :** Ti Alloys, Tin, milled, Grounded, Polished, Pvd, adhesive Wear Behavior, Abrasive Wear Behavior, Surface Roughness, Cof, Wear Mechanisms, Wear Volume, Wear Rate, Friction, Wear, Tribology.

**Paper ID 15241**

### MECHANICAL AND VIBRATION BEHAVIOR OF ZIRCONIUM OXIDE REINFORCED HEMP EPOXY COMPOSITE.

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#### Abstract:

Natural fiber plays an important role in the industrial revolution, which is cost efficient and abundantly available. In this study, mechanical and vibration behavior of the zirconium oxide reinforced epoxy



based natural fiber hybrid composite was tailored. Firstly, nano -sized zirconium oxide particles of average size 45nm was reinforced into the epoxy matrix and fabricated the hemp /epoxy composite laminate using hand lay-up method. The hemp epoxy composite laminate is fabricated with 0%, 3% and 6% of zirconium oxide by weight fraction for the clear understanding and analysis of the composite and its influence of nano particulates reinforcement. The mechanical and vibration behavior of the composite is investigated. The result shows that the reinforcement of zirconium oxide in the natural fiber increases the mechanical and the bulk property of the composite and beneficial for lighter structural engineering applications.

**Keywords :** Zirconium Oxide Reinforced Fiber, Hemp Epoxy Composite, Mechanical And Vibration Behavior

**Paper ID 15243**

### DEVELOPMENT OF VEHICLE STABILITY CONTROL

**Sai Ajay Sankar<sup>\*1</sup>, Abhilash Venkat<sup>2</sup>, Kiran K K<sup>\*2</sup>, Ganesh Vinayagam<sup>2</sup>**

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#### Abstract:

An optimal control strategy for a vehicle is proposed to improve vehicle dynamics stability and handling performance. If the coefficient of friction were small or if the vehicle speed were too high, then the vehicle would not follow the nominal motion expected by the driver it would instead travel on a trajectory of larger radius (smaller curvature). The function of the yaw control system is to restore the yaw velocity of the vehicle as much as possible to the nominal motion expected by the driver. The desired longitudinal and lateral forces and yaw moment are determined based on the sliding-mode control (smc) scheme in the upper controller, which takes the longitudinal and lateral velocity and the yaw rate as control variables. In the lower controller, an optimization algorithm is adopted to allocate the brake pressure. by sai ajay sankar dr v ganesh abhilash venkat kiran kk

**Paper ID 15244**

### WORKING MODEL OF POWER GENERATION THROUGH DIFFERENT SOURCES IN HYBRID VECHILE.

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#### Abstract:

In this project proposes to implement new concept of power production in hybrid vehicle. The hybrid vehicle conditions are motor drive the vehicle at some minimum speed in city range and traffic conditions only, then the engine will take over the propulsion system for highways and hill climbing at this time the motor is in rest condition. In that time the bevel gear arrangement to connect the one end of the engine shaft and another end of the motor shaft that tends to rotate the shaft reversing the direction of the motor. Now the motor act as a generator to produce dc (direct current) power to charge the battery



and car accessories in the time of the drive power comes from the ic (internal combustion) engine.  
ganesh.V,sathis kumar.B,sumant.A,thanigachalam.R,

### Paper ID 15246

## DESIGNING AND ANALYSIS OF ELECTRONIC LEVERAGE ADJUSTMENT BRAKING SYSTEM

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### Abstract:

The proposal idea seeks to create a pattern and design of electromechanically adjusted lever that multiplies the applied braking force depending on the inputs given by the sensors. The system is categorized into two parts, the first part deals with the detection of load acting on the vehicle and to identify the required braking force to be applied. The second part deals with the adjustment of the leverage adjustment rod using the programmed stepper motor. It uses two actively movable wedges. These designs can be employed to further reduce the required actuator forces beyond what is possible with the conventional design. So, a proposed design system required less braking effort. The matlab simulation work was carried out for various load conditions in the two-wheeler. The results show that the normal dynamic reaction on the rear wheel is decreased and that of for front-wheel during maximum deceleration.

**Keywords :** Variable Braking Force, Matlab Simulation, Load Transfer Effect, Minimal Stopping Distance

### Paper ID 15250

## SUSPENSION ANALYSIS OF ELECTRONICALLY OPERATED BRAKING SYSTEM ON A TWO-WHEELER

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### Abstract:

In this paper, the suspension system for a new type of electronic load adaptive braking system on a two-wheeler is investigated. It is an idea of adjusting the leverage ratio in a two-wheeler with the help of microcontrollers, dc motors, and various sensors, to effectively control the braking system in a two-wheeler. The project is categorized to two parts: the first part deals with the detection of load acting on the vehicle, to identify the required braking force to be applied and adjustment of leverage rod using an arduino-programmed stepper motor. The second part deals with simulating the actuation of the suspension system in simulink and evaluating the spring compression values. This design is used to optimize the required actuator forces beyond what is possible with the conventional design.



**Keywords :** Electronically Operated Braking System, Suspension Analysis, Simulink.

**Paper ID 15251**

### INVESTIGATION ON EMISSION TESTING AND ENGINE PERFORMANCE USING JOJOBA OIL AS BIOFUEL

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#### **Abstract:**

An investigation on emission and performance testing using the blends of jojoba oil is carried out in this work. Jojoba oil is blended with diesel in order to reduce its high viscosity property. Various blend ratios such as b0, b20, b30 are used for carrying out performance and emission test in single cylinder water cooled variable compression ratio (vcr) engine. Graphene nano particle is added for the blends b20 and b30 in the ratio of 0.025% by weight. Compression ratios are maintained at 13, 15, and 17.5 for all the blends. Performance characteristics such as brake power, brake thermal efficiency, mechanical efficiency, sfc, friction power, indicated power are measured using ic engine software. The readings of b0, b20, and b30 are compared with one another using the plotted graph. From the results it seen that the nox and hc emissions are reduced considerably because of jojoba oil's oxidation property.

**Keywords :** Exhaust Gases, Gas Analyser, Jojoba, Variable Compression Ratio

**Paper ID 15253**

### ASSESSMENT OF TRIBOLOGICAL PROPERTIES OF DIFFERENT VEGETABLE OILS EMULSIONS USING PIN ON DISC TRIBOMETER

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#### **Abstract:**

In the present study lubricants from vegetable oil based emulsions were formulated with food grade emulsifier polysorbate 80. The tribological properties of these vegetable oil emulsions were investigated using pin on disc tribometer. The pin material used was en 8 steel while the disc material was en 31 steel. Four different oils were used namely palm oil, castor oil, mahua oil and mineral oil which were mixed with water. The experiments were performed with two different sliding speeds and four different loads. Coefficient of friction, friction force, wear rate and surface roughness were recorded and analyzed. The wear rate of the pins while lubricating with castor oil and mahua oil emulsions was low as compared to palm oil emulsion. From the experimental results it was concluded that castor oil emulsion gave better lubrication properties as compare to other emulsions.

**Keywords :** Polysorbate 80, Pin On Disc Tribometer, Vegetable Oil Emulsions, Castor Oil, Mahua Oil, Palm Oil, Mineral Oil



Paper ID 15255

### STUDIES ON MECHANICAL PROPERTIES OF COLD METAL TRANSFER WELDING OF LASER SURFACE TEXTURED MARINE GRADE ALUMINIUM ALLOYS

**Narendraraja Palanikumar<sup>\*1</sup>, Ashish Singh<sup>\*2</sup>, Gurusamy V<sup>2</sup>, Krishnan S<sup>2</sup>, Pitchandi K<sup>3</sup>**

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#### Abstract:

This work aims to study the effects of edge modification at nano-level on the mechanical properties of cold metal transfer welded aluminium alloy joints. The 4mm thick 5083 aluminum alloy plate was used for the study. The cmtw machine was used to make the welded joints before and after laser surface texturing with filler wire of diameter of 1.2mm and wire grade of er5556. The parameters like current, welding speed, and npd were chosen as the process parameters. With the different parameters, there were eight trials were conducted using the 4mm thick al alloy sheets. Further, the al alloy sheet's top edges of 5mm were textured with four different texturing patterns. Both joints with and without texturing were subjected to tensile test and micro-hardness were also computed. From the results, it was observed that the textured specimen exhibited about a 20% increase in ultimate tensile strength and micro-hardness.



**Keywords :** Additive Manufacturing, Laser Surface Texturing, Tensile Strength

**Paper ID 15256**

### MANUFACTURING OF MICROWELL USING PHOTOCHEMICAL MACHINING PROCESS FOR BIOLOGICAL STUDIES

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#### **Abstract:**

The behavior of individual cell needs to be get analyzed to understand the root cause of diseases and necessary medical treatment. The advanced micro well manufacturing systems are emerging with capability of trapping and handling the individual cell and tissues. In the present study, an attempt is made to review the work done by researchers to manufacture the low cost array of micro well on different substrate materials as well as manufacturing of the array of micro well on high class hardened epoxy resin by molding micro projections developed by optimized process parameters in photochemical machining through ss-304 as a substrate the dimensions of micro well manufactured are verified using video measuring system (vms) and counter tracer. Microwell is showing applications in concern to cell-heterogeneity, tissue engineering and embryonic development.

**Keywords :** Pcm; Photoresist, Etching, Microwell, Cell-analysis

**Paper ID 15257**

### INVESTIGATION OF MECHANICAL PROPERTIES OF ALUMINIUM ALLOY PROCESSED BY ADDITIVE MANUFACTURING

**Senthil Velan Veerasamy<sup>\*1</sup>, Ramesh Babu S<sup>2</sup>, Gurusamy V<sup>3</sup>**

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#### **Abstract:**

Additive manufacturing (am) is a modern manufacturing method (alternatively called 3d printing) which directly fabricates prototype or mechanical parts through deposition of material layer upon layer. In this method, raw material will be either in the form of liquid or solid (powder or wire). This method enables the researchers, engineers, industrialists to build the near net-shape components by using arc welding technology. The equipment used for this research work is fronius tps 4000 cmt r machine. The materials selected are aluminium alloy er5356 wire with 1.2mm of diameter as feedstock and aa5754 plate as substrate material. This research aims to analyse the mechanical properties of specimen, built up in cmt. The input process parameters are table speed, feed rate, current, stand-off distance. The specimens were analysed for its mechanical properties. The tensile strength of the samples are observed as higher than the substrate material tensile strength.





**Keywords :** Additive Manufacturing, Cmt, Aluminium Alloy, Wire Feed Stock, Substrate

**Paper ID 15259**

### **MARITIME INDUSTRY 4.0: OPPORTUNITIES AND CHALLENGES**

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#### **Abstract:**

Maritime industry is no exception to the industrial revolution 4.0, with advancements in communication technologies integrated with high speed data transfer capabilities. Maritime industry which includes, shipbuilding, shipboard management and logistics sectors gain numerous advantages adopting to the industry 4.0. In ship building industry it is possible to build cost effective and reliable ships to meet the ship owner's dynamic requirements till the point of delivery of ships, using the state of the art technologies like virtual modelling, intelligent simulation, 3d printing, intelligent robotics, internet of things, augmented realities etc. Intelligent navigation of ships enables cost and capacity optimization of ship's operations. Real time tracking of the ships on voyage provides highest satisfaction to all the stakeholders by enabling voyage route optimization, shipboard maintenance of machinery, collision avoidance, equipment and hull condition monitoring. Minimizing cyber exposure of ship's critical data and continuous training of crew will make sailing safe.

**Keywords :** Maritime Industry, Cost Effective, Internet Of Things

**Paper ID 15260**

### **INVESTIGATION ON MWCNTS FILLED EPOXY/GLASS FIBER COMPOSITES FOR MULTIPLE DRILLED HOLE QUALITY CHARACTERISTICS**

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#### **Abstract:**

Polymer nanocomposites are emerging as important engineering materials. This research work aimed to investigate the effect of multi walled carbon nanotubes (mwcnts) on drilled hole quality characteristics. Delamination factor, circularity, surface roughness and material removal rate are the drilled hole quality characteristics investigated in this study. Two types of mwcnts were used for the fabrication of polymer nanocomposites with epoxy resin and glass fiber as matrix and reinforcement respectively. The observations from the drilling experiments on the fabricated nanocomposites were compared with a reference polymer composite fabricated without mwcnts. Drilling tests were carried out on these materials with high speed drill (hss) twist drill of diameter 6 mm. Analysis of variance (anova) is applied to study the significance of the effect of mwcnts on the hole quality characteristics. Grey relational analysis based multi-objective optimization study showed that the mwcnts had significantly improved the overall grey relational grade.



**Keywords :** Carbon Nano Tubes, Drilling, Anova, Grey Relational Analysis, Optimization

**Paper ID 15262**

## **EXPERIMENTAL INVESTIGATIONS OF THE SUPERPLASTIC FORMING OF FRICTION STIR PROCESSED AZ31B ALLOY**

**Ramesh Babu S<sup>1</sup>, Krithik Jhawahar R<sup>2</sup>**

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### **Abstract:**

The microstructural properties of 1.5mm thick az31b magnesium alloy subjected to friction stir processing were examined to select the process parameters such as tool rotational speed and tool traversing speed that could produce equiaxed grains in the stirred zone, with the average grain size being less than 10 $\mu$ m. Using the optimal parameters, friction stir processing was carried out to obtain sheets of the magnesium alloy az31b, which was then superplastically formed into a hemispherical die. Superplastic forming under biaxial stressing into a hemispherical dome was carried out at a constant temperature of 350 $^{\circ}$ c and varying pressures on the as-received az31b alloy also. The results reveal that friction stir processing can be used as an effective technique for microstructure refinement needed for superplastic forming at higher strain rates, lower temperatures and at lower flow stresses.

**Keywords :** Friction Stir Processing, Superplastic Forming, Numerical Modeling, High Strain Rate Forming



Paper ID 15266

### EXPERIMENTAL INVESTIGATION OF STATIC MECHANICAL PROPERTIES OF EPOXY BASED GLASS, CARBON & SISAL WOVEN FABRIC HYBRID COMPOSITES

Arulkumar Munivappan<sup>\*1</sup>

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#### Abstract:

In recent years, composite materials widely involved replacing the metals to increase the strength at minimal weight. Synthetic fibre reinforced polymer composites are widely used many applications like aircraft, automobile etc. Due to increasing demand for synthetic fibre, because of its lightweight and easily biodegradable, natural fibre are involved in achieving good strength to weight ratio. In present work sisal fibre-reinforced polymer composite sfrp was used to replacing the two synthetic composite such as carbon fibre reinforced polymer composite cfrp and glass-reinforced polymer composite gfrp. All laminates are fabricated by using hand layup method. The static mechanical properties of epoxy-based sfrp, gfrp, cfrp and their hybrids laminates are experimentally evaluated as per astm standards and reported.

**Keywords :** Synthetic Fiber, Natural Fiber, Epoxy, Biodegradable.

Paper ID 15269

### REDESIGN AND ANALYSIS OF A THERMOSTAT VALVE USING CFD

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#### Abstract:

Design and manufacturing aspects for computer-aided design (cad) with reverse engineering concept, illustrated by a real time working component of a maruthi alto vehicle's thermostat valve which is made up of aluminium alloy. The main objective of this study is to redesign a thermostat valve to improve engines' life. This process involves reconstruction of thermostat valve whose dimensions were initially measured using the coordinate measuring machine (cmm). The dimensions were remodified using 123 design software and then analysed by cfd. This modified design of the component was converted to stl format which was then made to a prototype using a 3d printer. The final prototype of the thermostat valve was redesigned and set to 300k which was found to be lesser than that of the existing model that is 325k.

**Keywords :** 3d Scan, 3d-printing, Cad Data, Cfd.



Paper ID 15270

### DESIGN MODIFICATION IN HONING TOOL GUIDING SYSTEM TO REDUCE THE MACHINE DOWNTIME

**Niruban Projoth<sup>1</sup>, Rohith Renish<sup>1</sup>, Karnam Dileep<sup>2</sup>**

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#### Abstract:

Honing is the surface finishing process in which the precision smooth surface of hollow cylindrical engine bore is achieved by scrubbing an abrasive stone against it along a controlled path. This paper focusses on reducing the downtime of a honing machine through design modifications in honing tool guiding system. Out of several other reasons contributing to the increased downtime, guiding system failure (clamping failure) influences the major part. So a suitable design modification in the honing tool guiding system was suggested to avoid clamping failure and thereby reducing the downtime of the machine. The proposed design, under the action of applied hydraulic pressure creates symmetric bending in the clamping plate which avoids mismatch of clamping plate with engine bore and thereby prevents the tool breakage while feeding honing tool inside the engine cylinder. The result majorly eliminates downtime due to clamping failure.

**Keywords :** Honing, Downtime, Honing Tool Guiding System, Clamping Plate.

Paper ID 15274

### WEAR PERFORMANCE ON RED MUD FILLED NATURAL FIBRE REINFORCED POLYESTER COMPOSITES

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#### Abstract:

The present work describes the wear studies on banana fibre reinforced polyesters composites and its effect on wear by the addition of red mud (rm) an industrial waste as a filler material. Banana fibres treated with naoh, and untreated were taken for wear studies. Wear studies were carried out for treated and untreated fibres of different varying loads (10n,20n,30n) and for a constant sliding distances (3000m) at sliding velocity (2m/s,3m/s,4m/s) scanning electron microscope studies were carried out to analyze the wear behavior of the composites

**Keywords :** Banana Fibre, Red Mud, Naoh, Silane, Dry Sliding Wear Test

Paper ID 15277

### CALIBRATION OF AGGREGATE ACCIDENT MODEL USING LINEAR REGRESSION TECHNIQUE



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### Abstract:

Development of accident model is complex involving many factors. Factors causing accidents can be grouped as aggregate and disaggregate in nature. Some of the major aggregate level factors are speed, age of the driver, road geometry etc. And disaggregate level factors such as psychological, social & economical data. In this background, an attempt was made to develop an aggregate accident model for million plus cities in India using linear regression analysis. For this, a set of 50 million plus cities were identified as per 2011 population census records. Aggregate level data such as number of road accidents (dependent), population, and number of registered motor vehicles were collected from reliable sources. A dummy variable was used to account intangible factors for tier-i cities. The developed model was validated using hold-out sample technique. Thus, calibrated and validated model was used to predict the number of accidents for the year 2025.

**Keywords :** Road Accidents; Million Plus Cities; Regression; India; Causal Model

**Paper ID 15305**

## EFFECT OF CYCLIC LOADING ON FREE VIBRATION CHARACTERISTICS OF GLASS/JUTE HYBRID COMPOSITE BEAMS

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### Abstract:

In dynamic service conditions, composite structures are subjected to both vibration and fatigue. An attempt is made here to understand the effect of cyclic loading on FRP composite laminates in terms of free vibration characteristics. Hybrid composite laminates made of natural jute fiber and synthetic glass fiber are considered. Epoxy resin is used as matrix. Four layered glass/jute hybrid composite laminates with two different stacking sequences were prepared by hand layup technique. The fabricated laminates were tested for mechanical properties like tensile and flexural strength. A completely reversed bending fatigue test rig is developed indigenously to apply cyclic load with required amplitude and frequency to the glass/jute hybrid composite specimen. Free vibration characteristics of glass/jute hybrid composite specimen are measured by impulse excitation technique for various stages of cyclic loading. Based on mechanical properties and vibration characteristics of glass/jute hybrid composite laminates, the effective stacking sequence is established.

**Keywords :** Natural Fibre, Hybrid Composites, Stacking Sequence, Mechanical Properties, Vibration Characteristics, Effect Of Cyclic Loading

**Paper ID 15308**



### DESIGNING AND ANALYSIS OF ELECTRONIC LEVERAGE ADJUSTMENT BRAKING SYSTEM

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#### Abstract:

To reduce the effort required while braking and to provide optimum braking torque, an electronic load-adaptive braking system on a two-wheeler is proposed. It will actuate the braking system based on the load on the motorcycle. It has an inherent self-reinforcing capability that translates into reduced actuation forces and subsequently into reduced energy requirements. By studying the braking system, innovatively we used microcontrollers, a new idea of braking for small-scale applications directly involving the working of sensors and stepper motor was evolved. The present project work seeks to create a pattern and design of electromechanically adjusted lever that multiplies the applied braking force depending on the inputs given by the sensors. The matlab simulation was carried out for various load conditions in the two-wheeler. Simulation results show that the normal dynamic reaction on the rear wheel is decreased and that of for rear wheel is increased for the maximum deceleration.

#### Keywords :

Paper ID 15311

### AMALGAMATION OF DESALINATED SHORE SAND IN CONCRETE

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#### Abstract:

To get the most economic material that can be replaced for fine aggregate in construction instead of river sand. For expelling the chloride content from the shore sand there was no particular strategy of treatment for shore sand. Primarily shore sand can be washed with an artificial washing technique as an essential treatment yet it is adequate that water wash can't expel the 100% chloride ion substance from shore sand. So, it ought to be incorporated by adding cl- agents such as zeolite, calcium aluminate hydrate, copper slag as a mineral admixture to reduce the chloride ion content in the shore sand as a secondary treatment. Cubes were cast for m20 and tested for compressive strength at 7th day, 14th day, 28th day. The sea sand is replaced in percentages of 0%, 20%, 40%, 60%, 80%, 100%. Test outcomes will be obtained from the compressive strength test.

**Keywords :** Offshore Sand, Artificial Washing, Chloride Ion, Zeolite, Copper Slag, Calcium Aluminate Hydrate, Compressive Strength

Paper ID 15314



### **A STATE-OF-THE-ART REVIEW : STEEL BEAM-COLUMN JOINTS WITH VISCOUS FLUID DAMPERS**

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#### **Abstract:**

The most severe damage due to the earthquakes appear to be brittle fractures at beam to-column connections in steel frameworks. The causes of damage, parameters that affect the cyclic behavior of moment connections, and the reparability of the damaged structures have to be studied. For this, a damage-controlled structure with passive energy dissipation devices like the metallic hysteric damper, the auxetic damper, the buckling- restrained brace, the slit damper, dual pipe dampers, visco-elastic rubber, elasto-plastic bolts, electrorheological and magneto-rheological fluid dampers. Compared to linear dampers, nonlinear viscous dampers improve the vibration isolation performance in a wider frequency range in the beam column joint. This study concludes with a proposal of a new steel structural system with viscous fluid dampers that achieves structural performance and how it can be treated as semi active damping device.

**Keywords :** Viscous Fluid Damper, Steel Connection, Beam-column Joint

**Paper ID 15315**

### **ANALYSIS OF ENHANCEMENT IN THE STRENGTH OF COLUMNS WRAPPED WITH GLASS FIBER REINFORCED POLYMER**

**Ughi Shipram<sup>\*1</sup>, Vijay Viswesh<sup>1</sup>, Sathish T<sup>1</sup>, Arun G<sup>1</sup>**

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#### **Abstract:**

Wrapping of reinforced concrete columns using fiber reinforced polymer (frp) layer is one of the effective methods to significantly enhances the strength of reinforced concrete columns. The analysis is based on the comparative study of the behavior of chopped strand mat (csm), woven roving (wr) and uni- directional cloth (udc) wrapped concrete circular columns of diameter of 150mm and length of 1200mm with 3mm and 5mm thickness of gfrp mats under uni-axial compression by means of a uni-axial compression testing machine. The effectiveness of gfrp wrapping is studied by comparison of the wrapped specimen with the conventional specimen.

**Paper ID 15323**

### **INFLUENCE OF RICE HUSK ASH AND LIME ON SHEAR STRENGTH OF HIGH PLASTICITY CLAY**



**Dheepika Ravindran<sup>\*1</sup>, Divya S.s.<sup>1</sup>, Arun Gunasekaran<sup>1</sup>**

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### Abstract:

The main objective of this study is to find out the effect of rice husk ash and quick lime in the soil. The effect of rice husk ash on soil stabilized with 5% quicklime is studied. The soil sample blended with 5% quicklime are treated by mixing rice husk ash in 5%, 10%, 15%, 20% and 25% ratio by weight of dry soil as per relevant is code of practice and tests for index properties are carried out. The focus point of this study is strength parameter. To determine strength, unconfined compressive strength test was carried out on samples with various percentages of rice husk ash and quicklime that were cured for one, three, seven days. The strength of the samples considerably increased when tested after curing them compared to uncured sample. The improvement in strength of soil reveals that rice husk ash is the best material to stabilize soil.

**Keywords :** Rice Husk Ash, Strength Parameter Soil Stabilization, Unconfined Compressive Strength

**Paper ID 15326**

## INFLUENCE OF BORON POTENTIAL ON THE FORMATION OF FEB/FE2B PHASES IN SURFACE NANOCRYSTALLIZED MEDIUM CARBON STEEL

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### Abstract:

Boronizing is a well-known surface treatment process that involves diffusion of boron atoms into the surface of metals/alloys to produce a layer of borides. During the diffusion process, the properties of the resultant boride layer are primarily determined by the surface reactions and the diffusion kinetics of atoms. Improving the surface reactivity and accelerating the diffusion of atoms is a challenging issue at lower temperatures that warrants a suitable surface modification. Surface mechanical attrition treatment (smat) is well known surface severe plastic deformation method that enables the formation of a nanostructured surface layer and improves the overall properties of engineering materials. The presence of large number of grain boundaries and triple junctions in nanocrystalline and ultra-fine-grained materials could act as fast atomic diffusion channels. The present work aims to explore smat as a pretreatment for boronizing. The study suggests that smat can be effectively used as a pretreatment for boronizing.

**Keywords :** Carbon Steel, Smat, Diffusion, Boron Concentration

**Paper ID 15328**





### **OBSERVATION OF MICROBIAL CORROSION AND BIO FOULING EFFECT ON STEEL BASED COMPOSITE REINFORCED WITH TITANIUM DIBORIDE, COATED WITH COPPER UNDER BRINE MEDIUM AT CRYOGENIC CONDITION**

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#### **Abstract:**

Abstract corrosion, microbial growth was the major problem faced by the shipping industries for many decades. This biological and chemical behavior of the metal was found on floating platforms, sea going vessels, floating docks etc. This cannot be evaded but can be minimized by various techniques. These techniques include coating, painting and apply impressed current system on the hull. Our study on a composite material which would increase the corrosion resistant, hardness of the material. Advanced copper coating technology on the material would provide both corrosion inhibition and anti fouling property to the composite material. Microbial corrosion testing will provide the rate of corrosion by weight comparison method and gives a clear idea to analyses of corrosion resistance of copper coated composite material coated with various wt. % of tib2. . Since the metallic copper reveals anti-microbial and antifungal metal property; the metallic coating would sustain on the composite.

**Keywords :** Ms Casting- - Electrolytic Coating – Mechanical And Microbial Corrosion Testing – Microbial Growth-- Surface Observation—composite Behaviour At Cryogenic Condition

**Paper ID 15342**

### **COMPLIANT MECHANISM AND IT'S APPLICATION**

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#### **Abstract:**

Compliant mechanisms are single-piece flexible structures that deliver the desired motion by undergoing elastic deformation as opposed to jointed rigid body motions of conventional mechanisms. Compliance in design leads to jointless, no-assembly (Fig. 1), monolithic mechanical devices and is particularly suited for applications with small range of motions. The designs of these compliant mechanisms are often based on experience and intuition, and can be a frustrating experience during the design phase. Hence, this paper proposes an algorithm that aids users in designing compliant mechanisms for torsional applications in a systematic manner.



## STREAM-II

Paper ID 14664

### A SURVEY ON IMAGE SEGMENTATION ALGORITHMS

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#### Abstract:

The important process of image processing is image segmentation. Image segmentation is the process of splitting the images into various tiny parts called segments. Image processing makes to simplify the image representation in order to analyze the images. It plays vital role in various applications like medical field, object detection, video surveillance system, computer vision etc.. So many algorithms are developed for segmenting images, based on the certain feature of the pixel. In this paper different algorithms of segmentation can be reviewed, analyzed and finally list out the comparison for all the algorithms.

**Keywords :** Image Processing, Segmentation, Compression, Binary Images, Color Images



Paper ID 14689

### A NOVEL CONCEPT DRIFT DETECTION FRAMEWORK FOR TIME-EVOLVING STREAM DATA

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#### Abstract:

In predictive analytics, concept drift is defined as an alteration in relationship between input data and target variable over a time period. It is a hidden phenomenon, unknown to the underlying machine learner and occurs due to evolving and uncertain data. Typically observed as a change point problem, needs data stream to be monitored in real time to detect drift occurrence which is a complex yet achievable task. Concept drift detection has long been a data-driven approach and has its limitations for analysing time evolving data. This work introduces an event-driven approach for drift detection and proposes a novel framework that utilizes unique drift detection and understanding methods. This paper investigates past approaches and discusses on necessary adaptations required for incorporating event-driven stream processing methods. This research direction is capable of making significant contribution towards intelligent and early drift detection capabilities.

**Keywords :** Concept Drift, Event Stream Processing, Machine Learning

Paper ID 14733

### EFFICIENT RESOURCE ALLOCATION USING COMBINATIVE DOUBLE AUCTION IN CLOUD COMPUTING

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#### Abstract:

Cloud computing is a growing technology where the resources are provided as a service. There are huge amount of different types of resources available in cloud environment. So it is difficult to match the customer's request with available resources based on the expectations of customers and providers in cloud environment. This paper proposes the resource provisioning using auction based technique to fulfill the expectations of both customers and providers in an efficient way in cloud environment. In the proposed work the multi-attribute combinative double auction (cda) resource allocation algorithm is used for auction to the customer's bids with the provider's bids by the cloud auctioneer for finding the best request-resource pairs in the cloud computing environment. The experimental result demonstrates that the proposed multi-attribute combinative double auction (cda) resource allocation algorithm performs efficiently than the existing combinatorial double auction resource allocation (cdara) model.

**Keywords :** Cloud Computing, Multi-attribute, Combinative, Double Auction, Resource Allocation,sla



Paper ID 14740

### TRAFFIC CHARACTERIZATION AND ANALYSIS IN SDN ENVIRONMENT IN FINDING OPTIMAL PATH OF ROUTING

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#### Abstract:

Sdn is an emerging paradigm that provides decoupling of the data plane and the control plane by shifting the control logic to a centralized controller. The controller makes decisions on routing and forwarding in and out of the switches. With the zetabyte era, handling of wide variety and huge mass of data has led to the invention of various methods to characterize and analyze the traffic. Sdn has a great contribution towards management of the traffic, namely traffic engineering(te). This paper mainly focuses on predicting the characteristics of the traffic such as the number and type of users, available bandwidth, payload size, packet loss which are analyzed to find the optimal route for forwarding packet over the network.

**Keywords :** Sdn,traffic Characterization,traffic Engineering

Paper ID 14751

### A COMPARATIVE STUDY ON MACHINE LEARNING ALGORITHMS FOR TRAFFIC FLOW FORECASTING

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#### Abstract:

Traffic flow forecasting is estimating the number of vehicles that may use a particular road in future based on its past experience. It is essential which will reduce the traffic congestion on roads. In this work, forecasting traffic flow is carried out on time series dataset. Time series traffic flow data consists of flow of vehicles through the specified path at every equal time intervals. Machine learning algorithms are used for forecasting the traffic flow. Auto regressive integrated moving average (arima) model and extreme learning machine (elm) model are implemented and the results are compared. Arima is a linear regression model whereas elm is a feedforward neural network where the hidden node parameters are randomly tuned. Both works well with time series data. It has been identified that extreme learning machine produces less error rate compared to arima model.

**Keywords :** Auto Regressive Integrated Moving Average (arima) Model, Extreme Learning Machine, Traffic Flow Forecasting, Time Series Data



**Paper ID 14753**

### **EDGE PREDICTION USING NEURAL NETWORK ALGORITHM**

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#### **Abstract:**

The technological advances in smart phones and their widespread use has resulted in the big volume and varied types of mobile data which we have today. Location prediction through mobile data mining leverages such big data in applications such as traffic planning, location-based advertising, and intelligent resource allocation. With the use of the mobile phone, the detection of the user's past and current location is possible. This paper presents a novel approach that goes beyond predicting users' next location and is able to predict their entire mobility patterns. Using gps location data and the arrival time to that location, the future location of the user can be predicted. These predictions can be done based on neural networks and machine learning concepts. This location prediction will be used in offloading to edges in the mobile edge computing. The paper also shows the performance analysis of mobility prediction done with various concepts

**Keywords :** Recurrent Neural Networks, Cloudlet

**Paper ID 14763**

### **WEATHER FORECASTING USING MACHINE LEARNING ALGORITHMS**

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#### **Abstract:**

Forecasts of meteorological time series data is very paramount and it can be auxiliary in many ways for countries like india in which their economy highly relies on agriculture. Weather forecasts especially precipitation forecast, pose intricate tasks because they depend very much on sundry parameters like humidity, wind speed and direction which dynamically changes according to the climate. Hence, precise forecasting of rainfall is highly desirable and it is made possible by utilizing machine learning algorithms. To obtain the precise forecasting of rainfall, this paper attempts to use two models like auto regressive integrated moving average (arima) model and long short term memory (lstm) model. The root mean square error (rmse) is applied to measure the performance of these algorithms. While evaluating the performances of these algorithms, lstm algorithm provides a good model for forecasting of rainfall.

**Keywords :** Arima, Lstm, Rmse

**Paper ID 14786**



### TRANSGENDER FACE RECOGNITION USING A VARIANT OF CONVOLUTIONAL NEURAL NETWORK (CNN)

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#### Abstract:

The ability for face recognition stands a big challenge in handling the images / video frames of transgender people. Usually the gender transformation causes severe alterations in the physical appearance of the face as well as in the body of a transgender person. As a result, it introduces additional complexity in handling the accuracy in terms of transgender face recognition. Hence, there is a need for face recognition system to consistently identify the persons after they undergo gender change. As convolutional neural network (cnn) has proven to be one of a powerful tool in handling images, we present a new framework using a variant of cnn to increase the performance of recognition. The transgender's face components such as left eye, right eye, both eyes, nose and mouth have been used for training the variant of cnn. The experiments were carried out on hrt transgender database.

**Paper ID 14795**

### CREDIT CARD FRAUD DETECTION USING UNSUPERVISED LEARNING

**Sharon Femi<sup>\*1</sup>, S. Ganesh Vaidyanathan<sup>2</sup>**

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#### Abstract:

An overview of credit card usage in the recent past reveals large number of fraudulent transactions. The early detection of credit card frauds helps to prevent the issuers from huge loss. This paper attempts to consider the credit card fraud detection as an outlier detection problem and the fraudulent transactions are treated as outliers. The unsupervised outlier detection approaches such as, one class support vector machine (ocsvm) and autoencoders are used for identifying the frauds. Unsupervised learning is a machine learning technique that allows the model to work by itself to identify information. The ocsvm is an unsupervised learning algorithm that is trained only on non-fraudulent data. It learns the boundaries of these points and classifies any point that lie outside the boundary as fraud. Whereas, autoencoders are unsupervised neural networks that learn to encode data efficiently for outlier identification. The experimental results and interpretations show that ocsvm outperforms autoencoders.

**Keywords :** Outlier Detection, One Class Svm, Autoencoders

**Paper ID 14805**

### ACHIEVING DATA SECURITY ON CLOUD THROUGH BIO-INSPIRED COMPUTING TECHNIQUES



**Indumathi A<sup>\*1</sup>, Dr.sumathi G<sup>1</sup>, Sangeetha G<sup>\*2</sup>**

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### Abstract:

Nowadays cloud computing is an emerging technology. It offers service to the users based on their requirements on a rental basis. The size of the data is increasing day by day. It requires more storage space and also high maintenance. Most of the business organizations, hospitals, educational institutions started using the cloud to store their data. Data owners can access the data from anywhere, at any time with internet access. It allows data owners to store their information. In order to protect the data from unauthorized users, encrypted data can be stored in the cloud. This paper focuses on the above-said issue and presents a modified dna technique with a traditional cryptosystem to preserve confidentiality and also proves that security can be achieved with minimum computational cost.

**Keywords :** Cloud Computing, Modified Dna, Confidentiality

**Paper ID 14806**

## CARDIOVASCULAR DISEASE PREDICTION USING MACHINE LEARNING MODELS

**Leela Rani P<sup>1</sup>, Shoundarya P<sup>2</sup>, Raashika V<sup>2</sup>, Subaguru Prabakaran G<sup>1</sup>**

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### Abstract:

Heart disease is one of the most pressing problems of the health care industry. The patient's reports have to be carefully scrutinized by doctors to make a diagnosis of a heart failure. This research study is an attempt to reduce the efforts and time put in by the doctor by automating the risk prediction with the help of supervised learning algorithms. The system attempts to solve this issue by building a prototype of an interactive prediction system that gives the vulnerability of an individual to heart disease, measured as a risk factor. The best fitting algorithm for the given dataset and six algorithms including naive bayes, decision trees, k-nearest neighbor, logistic regression, support vector machine and random forest were compared by building their processes.

**Keywords :** Heart Disease, Machine Learning

**Paper ID 14810**

## DETECTING MALWARE INFECTED MACHINES WITH DIGITAL FORENSIC ANALYSIS

**Sangeetha Ganesan<sup>\*1</sup>, Sumathi Ganesan<sup>1</sup>, Indumathi Angamuthu Mohan<sup>\*2</sup>**

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### Abstract:

The most significant intimidation on the internet is malware which means malicious software. The third-party (or attacker) will install the malware software program on the machine without the awareness of the owner to steal their private data. Day-by-day the third party launches new malware, which leads a great challenge to the malware detectors. Man-in-the-browser(mb) attack is one of the special attacks in man-in-the-middle(mm), which targets the internet banking customers. In this paper, we examined about forensic analysis of random access memory(ram) and volatile data infected machine. We identified the origin of the attack, time-stamps, and the activities of the malware by using open source tools.

**Keywords :** Digital Forensic Analysis, Ram, Volatile Data ,man-in-the-browser

### Paper ID 14811

## COMPARISON OF LONG SHORT TERM MEMORY(LSTM) AND MULTI-INPUT LSTM MODELS FOR AGRICULTURAL ENVIRONMENT PREDICTION

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### Abstract:

Deep learning represents high-level feature representation for efficient data analysis and image processing techniques and achieves promising results. Deep learning performs high compute intensive tasks in many domains and plays the major role in the domain of agriculture. This paper focuses on analyzing the agricultural environment data which has an major impact on yield of agricultural products. A deep long short term memory(lstm) model is built which captures the non-linear relationship between time series agricultural environmental data. Also, the data is trained using attention based multi-input lstm which extracts the valuable information by considering multiple input features. The performance evaluation of both the models are analyzed using various metrics and the accuracy achieved is compared.

**Keywords :** Deep Learning, Long Short Term Memory(lstm), Agricultural Environment

### Paper ID 14812

## COURSE SCHEDULING SYSTEM USING GRAPH COLORING

**Hemavathi Umapathi<sup>\*1</sup>, Rajasri Naresh<sup>1</sup>, Nithin Krishnan<sup>1</sup>, Rajalakshmi Sankaran<sup>\*2</sup>**

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### Abstract:





Every academy system's routine is to schedule a course timetable for the every new semester. Many of the campus does this manually and the drawback in manual approach is that there is a high chance for committing errors. In order to avoid such situation and to make scheduling easy, we use graph coloring concept to implement a timetable generation system. This system works by coloring the edges between the nodes of the bipartite graph such that there is no clash between more than one subject being assigned for a class in a particular timeslot. In the bipartite graph the vertex set is split two sets one resembling the faculties and the other indicating the courses handled by the former. By including the constraints (set differently by different colleges), we get a table where we take different colors to show different hours in a week.

**Paper ID 14813**

### OCULAR DISEASE PERCEPTION USING AR

**Delphi Rajakumar<sup>\*1</sup>, Monisha Sukumar<sup>\*2</sup>, Jenifer Ramesh<sup>\*2</sup>, Devi N<sup>2</sup>**

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#### **Abstract:**

Retinal image registration is commonly required in order to combine the complementary information in different retinal modalities. In manual diagnosis, image registration is done through retinal scan. In proposed method, segmentation is based on the multi-scale ridge detection. Dijkstra's algorithm is used to get a fully connected vascular tree. Generally, surgeons have the angiographic data nearby and attempt mentally register the images to help localize the abnormality. By using augmented reality visualization, it is easy to localize the leaky blood vessels or eye defects. The superposition of the angiographic edges onto the patient's retinal image clearly illustrates the position of the treatment area. After super positioning it is easy to detect the eye defects such as glaucoma, diabetic retinopathy etc. The registered image is visually precise and accuracy is high.

**Keywords :** Multi-scale Ridge Detection, Image Registration, Augmented Reality

**Paper ID 14814**

### COMPARATIVE STUDY OF MASK RCNN WITH ATROUS CONVOLUTION AND RETINANET FOR PEDESTRIAN DETECTION

**Sindhura K S<sup>\*1</sup>, Shiwani Rajagopalan<sup>1</sup>, Ms. Senthamizh Selvi S<sup>1</sup>**

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#### **Abstract:**

Vehicular accidents claim millions around the world every year most of which are caused due to human-error. The autonomous vehicles are believed to bring solution to the problem by automating the use of vehicles. The autonomous vehicles have a very important feature called pedestrian detection to detect pedestrians on the road and stop in the appropriate places. Many multi-person trackers have been proposed for real-time detection of pedestrians but due to inaccurate predictions and long training time they have not been efficient. The proposed multi-person tracker makes use of the concept of mask rcnn



with atrous convolution which increases the field of view of the kernel by preserving the spatial dimensions of the image and one of the applications of this is in image segmentation. The accuracy and the false positives for the proposed model and retinanet with the use of same backbone network are compared.

**Paper ID 14819**

**EMOT**

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**Abstract:**

The world is facing the dawn of artificial intelligence and its potential should be analyzed to solve the real time problems faced by humans. Using ai to help humans with handling their emotions and identifying their stress levels in the current stressful lifestyle will greatly help them manage their lifestyle. Using the deep learning techniques, it can be made possible by creating a virtual bot to observe and understand human emotions. The virtual chatbot helps to understand the behavior of people suffering from depression, stress and any other mental disorders. In this project, the comments from reddit are used, preprocessed and trained using deep neural network to learn the emotions of the user. The inference engine module, which is a hybrid network consisting of convolutional neural network and recurrent neural network, is also interfaced.

**Keywords :** Deep Learning, Machine Learning, Artificial Intelligence, Neural Network, Chatbot

**Paper ID 14821**

**SVCE-CHATBOT**

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**Abstract:**

When people wants to know information about any particular college, they involve in searching the needed datum in n layers of data available in the website. People believe that they can get the entire detail only by visiting the college. Both are time consuming process. Creation of chat-bot will be an effective solution for the above mentioned problem. Here, the machine has been embedded with sufficient knowledge to identify the sentence, makes decision by its own with provided data and respond with appropriate answer for college related queries. On execution, input query will flow across several embedded functions and according to it, answer will be fetched to user from database. The text based user interface allows user to make conversation easily. It is helpful for students to know more information about any particular college and in making their choice on higher studies. It provides details about the curriculum, staff, department.

**Keywords :** Chat-bot, Data-set, Web Ui, College Query



Paper ID 14822

### ELECTRICITY CONSUMPTION INTREPRETER

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#### Abstract:

People are not aware of their electricity consumption which may lead to excess electricity usage and also higher electricity bill. This project lets people know about their day-to-day usage and also calculate accurate cost, so that they can analyse their usage. This paves way towards reduction in the consumption of electricity and reduced electricity bill. This will be implemented using the concept of internet of things. Here live feed from the digital energy meter will be acquired and further transferred to the database every minute. In the database, certain manipulations will be done and based on the request from the user in the app, the output will be displayed. Technically, a pulse generated by the energy meter will be captured which is required for manipulating the usage, these pulses are transferred to the database and recorded periodically for and it can be further retrieved when the user demands it from the mobile.

**Keywords :** Iot, electricity

Paper ID 14826

### A CROSS LAYER APPROACH FOR IMPROVING PERFORMANCE IN HETEROGENEOUS WIRELESS NETWORKS

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#### Abstract:

Temporal link disconnection during handoff introduces consecutive packet losses in wireless networks. This leads to degradation of throughput for the transmission control protocol (tcp) and forces the tcp to aggravate the bandwidth utilization of wireless networks. In the existing work, tcp path recovery notification [tcp prn] mechanism is used to prevent performance degradation during disconnection period. Prn executes immediate recovery of lost packets during a handoff and keeps congestion window and slow start threshold to maintain its throughput. Losses due to handoff and losses due to congestion cannot be distinguished in tcp-prn. The proposed protocol is used for classifying the packet losses into congestion loss and link error loss using superior path recovery notification [sprn]. The result of sprn shows that it outperforms both tcp prn and tcp-sack in terms of throughput.

Paper ID 14835



### HITCHHIKE - TOURIST SPOT DETECTION USING CONVOLUTION NEURAL NETWORKS

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#### Abstract:

Tourism is important for the country's economy and is growing rapidly. But pain points of tourists coming to india from many parts of the world, is the lack of the necessary guidance. The combination of increasing global smartphone penetration and recent advances in computer vision made possible by deep learning has paved the way for smartphone-assisted travel guides. Using a public data set of more than 2,000,000 images of tourist attractions we train a deep convolutional neural network to identify the tourist spot, get its location and information about those places along with requirements recommendations and restrictions. Overall, the approach of training deep learning models on increasingly large and publicly available image data sets and gps based voice navigators, presents a clear path toward smartphone-assisted travel guides on a massive global scale.

**Keywords :** Cnn, Image Dataset, Gps Navigator.

**Paper ID 14855**

### INTRUSION DETECTION SMART SURVEILLANCE SYSTEM

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#### Abstract:

Video surveillance has been used in many applications including elderly care and home nursing etc. There are situations in which ordinary video surveillance systems are incapable of preventing some intrusion. This happens predominantly in areas close to protected areas that are often prone to animal intrusion. Smart video surveillance systems are capable of enhancing situational awareness across multiple scales of space and time. It describes mobile based remote control and surveillance architecture. Objective of this project is to develop a smart surveillance system using computer vision (deployed in cloud), which detects the animal intrusion in estates near protected areas through the cctv cameras deployed and alerts the admin. The proposed model makes use of some library to capture camera images and detect intrusion using image comparison technique. Once the comparison is done and an intrusion is found, it sends the streamed video from server to remote administrator over android phone.

**Paper ID 14871**

### SMART HOME INTEGRATED SYSTEM



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### Abstract:

With the appearance of innovation, the utilization of keen gadgets, workstations, is expanding broadly additionally individuals are getting increasingly familiar with these mechanically propelling devices. Ar noteworthy job in building up the idea of brilliant city. We can control and deal with various sorts of machines utilizing different applications. One of them is ar which has as of late developed for the automation of different electrical machines. Enlarged reality (ar) is utilized to permit virtual pop ups when the camera of the pda is pointed towards the component the spring up empowers us to kill on or the supply by basic touch choice therefore improving methods for automation. Ar utilizes the idea of picture following, preparing and imparting to control applications. The remote web control highlight is utilized to upgrade the task of apparatuses over cell phones. The control information is sent to the input output pins of micro-controller which triggers the apparatus

**Keywords :** Iot, Raspberry Pi, Arduino

**Paper ID 14890**

## REMOVAL OF IRRELEVANT DATA IN IOT USING DELTA STREAMING.

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### Abstract:

In modern era, the adoration of iot is rising rampantly with the proliferation in its exciting application prospects and practical usage. In addition, handling such iot data and extracting the value out of it, is a great challenge in today real time environment. Data integration is a process in which heterogeneous data is retrieved and combined. It allows different types of data to be merged from various sources. The amount of data being generated and collected by various nodes leads to challenge in data integration. In existing integration system, the integration is carried out by means of bandwidth reduction in modern networks. The proposed work aims to provide solution for the data integration issues using delta streaming technique by removing unnecessary, redundant data from the stream between the endpoints. The adoption of delta streaming technique in data integration, leads to increase in reliability and scalability on the network.

**Keywords :** Internet Of Things, Data Integration, Delta Streaming

**Paper ID 14929**

## SMART TRAFFIC MANAGEMENT SYSTEM BY VEHICLE DENISTY DISSOLVING METHOD



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### Abstract:

Traffic management is an important issue which impacts our daily life routine. The common reason for traffic congestion is poor traffic prioritization. As the number of vehicles is increasing in a very fast phase, the cities infrastructure should also get upgraded simultaneously. But, this does not happen in real-time and hence leads to traffic jams, especially during rush hours. So during rush hours, people had to wait for long hours by wasting their valuable time. Improper regularization of traffic may also lead to more carbon emissions, leading to an unhealthy environment for the people. We have designed a customised algorithm which will give dynamic controlling over the traffic signals based on live monitoring of each lane utilizing surveillance cameras. Based on the vehicular density on the lane, the system controls the traffic signals to eradicate the traffic jams and allow easy passage to vehicles on the road.

**Keywords :** Traffic Management, live Monitoring, Vehicle Density

**Paper ID 15026**

## DYNAMIC GREEN CLUSTERING FOR LIFETIME MAXIMIZATION OF WIRELESS VISUAL SENSOR NETWORKS

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### Abstract:

Wireless visual sensor networks (wvsns) are achieving a great deal of attention for many applications, such as health monitoring, industrial surveillance, environmental tracking, border security, and infrastructures. In wvsns, energy conservation is very essential because, the sensors are usually battery-operated and each sensor node needs to process the voluminous data prior to transmission, which depletes more energy compared to conventional wireless sensor networks. Efficient energy utilization is critically vital in order to preserve a fully operational network for the longest time. A green (energy-aware) clustering technique (dgc) for dynamic cluster formation and cluster head selection is proposed to facilitate a better efficacy of energy in the network. Further, the stability of the sensor network is maintained by merger based re-clustering after the death of the sensor node. The results exhibit the successfulness of the proposed method to reduce energy consumption and increase network life.

**Keywords :** Green Clustering, Energy Efficient, Dynamic Cluster Formation, And Merger Based Re-clustering

**Paper ID 15200**



### ROLE OF INTERNET OF THINGS IN SMART GRID APPLICATIONS AND ITS CHALLENGES

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#### Abstract:

Internet of things (iot) is that the next step evolution of our today internet, where any physical object or thing having or equipped with computation and communication capabilities might be seamlessly integrated, at different levels, to the web. The smart grid which is taken into account together of the foremost critical infrastructures, is defined because the classical power system augmented with a large-scale ict and renewable energy integration, are often seen together of the most important iot network. The smart grid consists of billions of smart objects or things such as smart meters, smart appliances, sensors, actuators-cars, etc. Additionally to many communication infrastructures whether public or private. However, security is seen together of the main factors hampering the rapid and enormous scale adoption and deployment of both the iot vision and therefore the smart grid. This paper explains the safety issues and challenges on the iot-based smart grid.

**Keywords :** Internet Of Things, Smart Grid, Security Issues, Challenges

**Paper ID 15247**

### A COLLABORATIVE MACHINE LEARNING APPROACH FOR SENTENCE LEVEL SENTIMENT ANALYSIS

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#### Abstract:

Sentiment analysis is area of natural language processing which addresses sentiment classification problem, that focus on extracting sentiments from text and predict their polarity to classify them into positive or negative sentiment. Sentiment analysis is classified into two approaches lexicon-based and machine learning based approach. Lexicon-based includes vader which is valence based sentiment analyser and machine learning includes naïve bayes(nb), decision tree(dt), random forest(rf), support vector machine (svm) and rnn classifier. The paper, uses “sentiment140” dataset from stanford university which is organized according to sentiment expressed in them. Vader, nb, dt, rf, svm and rnn classifiers are analysed using this dataset and comparison is carried out among the classifiers to classify either as positive or negative and perform sentiment prediction. Moreover, with machine learning approaches a collaborative method of classifiers nb, svm and rnn is combined to compare the results.

**Keywords :** Sentiment Analysis, Text Classification, Vader, Naive Bayes(mnb), Decision Tree(dt), Random Forest(rf), Support Vector Machine (svm), Rnn Classifier, Twitter



Paper ID 15249

### **AUTOMATED HEART DISEASE DETECTION USING CHI-SQUARE STATISTICAL MODEL AND DEEP LEARNING TECHNIQUES**

**Aishwarya A<sup>\*1</sup>, Adela Florence C<sup>1</sup>, Aparajita S<sup>1</sup>, Gayathri K S<sup>1</sup>**

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#### **Abstract:**

Heart disease is a major cause of morbidity and mortality across the globe. The variety of contributory risk factors involved makes it difficult to manually analyze all these factors. Hence, there is a need to automate the detection of heart diseases. Heart disease detection using various ANN based automated decision support systems have been proposed recently. However, these techniques focus only on the pre-processing of features. This paper focuses on the refinement of features and the elimination of underfitting and overfitting. To ensure data sufficiency and prevent underfitting, clinical data from the UCI machine learning repository is used. To prevent overfitting, chi-square statistical model is used to eliminate irrelevant features. Meanwhile, exhaustive search strategy is used to search the deep neural network that has been optimally configured. The proposed model achieves a prediction accuracy of 96.73% which indicates that it can be used to automate the detection of heart diseases.

**Keywords :** Heart Disease, Chi-square, Exhaustive Search





**Paper ID 15258**

**CREATION OF BILINGUAL DICTIONARY USING BOOLEAN MODEL OF  
INFORMATION RETRIEVAL METHOD**



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### Abstract:

Machine translation is a process of translating the document in source language into target language. Bilingual dictionary is an essential component for translating process in word level rule based machine translation system where word by word translation is done with the help of dictionary. The manual creation of dictionary requires more time and is subjected to correctness of data. As some of the web documents have meaning of words from one language to other language, it shall be used. Hence it is proposed to create a bilingual dictionary for english-tamil language using boolean model of information retrieval(bir) method to extract it from structured web documents. The proposed bir method uses regular expression to generate combination of all three letter pattern of alphabets in english for making query to get meaning of the word in tamil. The accuracy of the created dictionary depends on the correctness of content of web documents.

**Keywords :** Natural Language Processing, Information Retrieval, Bilingual Dictionary

**Paper ID 15279**

## SECURING THE IOT DATA USING IMPROVED CIPHER BLOCKCHAIN TECHNOLOGY

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### Abstract:

The internet of things is a unique paradigm in information technology field. Iot performs a key function in everyone's life by carrying the physical objects and living things into the scope of the cyber world. Various tagging technologies makes the physical objects to hook up with network to communicate and share information. Since, current iot ecosystems rely on centralized, brokered communication model, the communication carried out in the iot must be secured with confidentiality, integrity and authentication services. In brokered communication model, all the devices connected with network for iot applications are identified, authenticated and connected to the cloud servers via various intermediate server consequences in the abuse of iot data from intermediate servers. The existing system provides a solution to this issue by applying cipher block cryptographic techniques in data transmission, results in unrecoverable ciphertext at the other end. The corrupted ciphertext leads to difficulty in tracking of iot

**Keywords :** Internet Of Things, Cryptography, Block Chain, Cipher Block Chain, Cloud Computing.



### STREAM-III

Paper ID 14649

#### QUANTUM CHEMICAL VIBRATIONAL STUDY, FTIR AND FT RAMAN SPECTRA OF 1,3-DIPHENYL PROPENONE

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#### Abstract:

The fourier transform infrared (ftir) and fourier transform raman (ft-raman) spectra of 1,3-diphenyl propenone were recorded in the regions 4000-400 and 4000-100 cm inverse, respectively, in the solid phase. Molecular electronic energy, geometrical structure, harmonic vibrational spectra was computed at the dft/6-31a(dp) and three parameter hybrid functional lee-yang-parr/6-31a(dp) levels of theory. The vibrational studies were interpreted in terms of potential energy distribution (ped). The results were compared with experimental values with the help of scaling procedures. Most of the modes have wavenumbers in the expected range and are in good agreement with computed values and also the molecular properties of mulliken population analysis have been calculated. Besides, thermodynamic properties were performed.

**Keywords :** Ftir, Ft-raman, Vibrational Spectra, Ped

Paper ID 14658

#### IN SILICO BINDING ANALYSIS OF BOERAVINONES WITH THE VEGF AND CASPASE 3 RECEPTORS OF MICE

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#### Abstract:

Experimental analysis of boeravinones compounds present in the roots of boerhaavia diffusa linn plant has shown a wide range of anti-cancer activity against colon and breast cancer cells. Hepatocellular carcinoma (hcc) is the second deadly cancer with incidence rate of approximately 1.6% per year in india. The present study is about the virtual screening of widely available boeravinone a-e compounds using lipinski's rule five to analyse the drug likeness with the hcc marker receptors, vegf and caspase3. Boeravinone b was finally screened based on maximum drug likeness score and the anti-hcc activity of the boeravinone b compound was compared with the anti-hcc standard drug sorafenib by molecular docking analysis with the vegf and caspase 3 receptors of mice. Boeravinone b has shown least



maximum internal energy score of -8.04 and -8.23 kcal/mol when compared to sorafenib internal energy score of -6.55 and -5.48 kcal/mol for vegf and caspase 3 receptors.

**Keywords :** Boeravinone B, boerhaavia Diffusa Linn, hepatocellular Carcinoma, Vegf, Caspase 3, sorafenib

**Paper ID 14688**

### SYNTHESIS, SPECTROSCOPIC (FT- IR, FT – RAMAN) STUDY, FMO'S, NBO ANALYSIS FIRST ORDER HYPERPOLARIZABILITY AND THERMODYNAMIC PROPERTIES OF ADAMANTAN-1- AMINE BY DENSITY FUNCTIONAL METHOD

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#### Abstract:

Fourier transform infrared and fourier transform raman spectra of adamantan-1- amine (admla) have been recorded in the region 4000-400 cm<sup>-1</sup> and 4000-100cm<sup>-1</sup> respectively. A detailed interpretation of the vibrational spectra of this compound has been made on the basis of the calculated potential energy distribution (ped). Quantum chemical calculation of geometrical structure parameters, vibrational frequencies and bonding features were carried out by density functional theory (dft/b3lyp/6-311++g(d,p) and b3lyp/aug-cc-pvdz methods. The assignment of each normal mode has been made using the observed and calculated frequencies. The harmonic vibrational frequencies were calculated and the scaled values have been compared with experimental ft-ir and ft-raman spectra. Most of the computed frequencies were found to be in good agreement with the experimental observation. The calculated homo and lumo energies confirm that charge transfer occurs within the molecule. Stability of the molecule arising from hyper conjugative interactions, charge delocalization has been analyzed using nbo analysis.

**Keywords :** Ft-ir, Ft-raman, Fmo

**Paper ID 14695**

### DEVELOPMENT OF A HYDROPHILIC, TRANSPARENT AND SELF-HEALABLE ANTIFOG COATING FOR AUTOMOTIVE GLASS

**Govindarasu R<sup>1</sup>, Harini I<sup>1</sup>, Abdul Hakeem E H<sup>\*2</sup>, Gokul Bharathi S<sup>2</sup>, Ashwin Ramachandran<sup>3</sup>**

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#### Abstract:



The objective of this study is to develop an environment friendly antifog coating that is highly transparent and durable which can be used for industrial applications. The various antifog coatings that are presently available for automotive windshield use complex mix of chemicals to achieve hydrophilic surface which may have an impact on the environment. This has encouraged us to explore a more sustainable way for developing a hydrophilic surface for the application of antifog coating in automotive windshields. In this study we have used bioderived pectin and tannic acid for creating a hydrophilic surface that has high light transmission, durability, self-healable property and also requires lesser time for processing. We conducted series of experimentation involving various combinations of pectin and tannic acid in different volume ratios for obtaining optimal results. Various tests were conducted to check for key properties such as light transmission, hydrophilicity and durability. Test results obtained based on the

**Keywords :** Hydrophilic, Environment, Self-healable, Pectin, Tannic Acid, Light Transmission, Durability

**Paper ID 14735**

### **EPITOPE BASED VACCINE DEVELOPMENT AGAINST ZIKA VIRUS BY REVERSE VACCINOLOGY APPROACH**

**Varshini Jayakanth<sup>\*1</sup>, Praveen Kumar Pk<sup>2</sup>**

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#### **Abstract:**

Zika virus is a zoonotic virus that belongs to the flaviviridae family, which is responsible for neurological disorders. However, therapeutic vaccination holds promise in targeting major zikv pathogenic proteins, ns4a and partial capsid proteins which are pivotal for viral eradication. In the present study, prediction and modelling of t cell epitopes in the above proteins were performed. Immunogenicity, conservation, toxicity analysis and population coverage of indian ethnicity mhc class i and class ii alleles of human of predicted epitopes were evaluated through in silico studies. Twelve epitopes from india- asian origin were screened in order to develop a t-cell epitope based vaccine against zikv. Based on the allergenicity analysis, each epitope of non-allergenic nature in partial capsid and ns4a were further chosen for molecular docking studies. The results will be discussed in the paper that follows.

**Keywords :** Flaviviridae, Zikv, Mhc, Epitopes, ns4a, Partial Capsid

**Paper ID 14776**

### **THIN LAYER MODELING OF LIMABEAN (PHASEOLUS LUNATUS) SEEDS IN A TRAY DRIER AND EVALUATION OF MOISTURE DIFFUSIVITY DURING DRYING PROCESS**

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### Abstract:

Evaluation of thin layer drying characteristics of bed drying systems is an established practice. Such studies were reported in the present work on the thin layer drying of limabean (*Phaseolus lunatus*) with initial moisture content (imc) of 68% on dry basis (db). In the present study the drying experiments were carried out in a conventional tray dryer at different temperatures of (313-353k). Ten different types of thin layer drying models were fitted to experimental data to come out with the best fit. Effective moisture diffusivity of limabean seeds was measured experimentally at above temperatures using fick's law of diffusion equation which varied from  $4.85 \times 10^{-10}$  to  $8.82 \times 10^{-10}$  m<sup>2</sup>/s. The effect of temperature on the diffusivity coefficient was described by the arrhenius type of relationship. Activation energy for moisture diffusion in limabean seeds was calculated to be 13.51 kJ/gmol.

**Keywords :** Moisture Diffusion, Effective Diffusivity, Drying Characteristics, Activation Energy

### Paper ID 14844

## **SYNTHESIS AND CYCLIC VOLTAMMETRIC STUDY OF 2,4-BIS(O-CHLOROPHENYL)-3-AZABICYCLO[3.3.1]NONAN-9-ONE.**

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### Abstract:

The azabicyclo compounds containing keto group are usually converted to secondary alcohol by catalytic reduction. However the reaction consumes quite an amount of solvent and the catalyst. Also it requires prolonged heating. Our study involves the electroorganic method of reduction in which very less current is utilized with minimal usage of solvent. The reaction time is also significantly less. The title compound is synthesized by the reaction of o-chlorobenzaldehyde, cyclohexanone and ammonium acetate using ethanol as solvent. Then it is subjected to cyclic voltammetric reduction. Different scan rates are applied and the resulting peaks are analyzed pattern of peak determines the reduction process. The number and position of the peak predicts the electron transfer. The product 2,4-bis(o-chlorophenyl)-3-azabicyclo[3.3.1]nonan-9-ol is confirmed by uv, ir and nmr spectroscopy.

**Keywords :** Azabicyclo Compounds, Cyclic Voltammetry, Uv,ir, Nmr, Antibacterial Study.

### Paper ID 14856

## **DOSE DEPENDENT EFFECT OF CITRULLINE ON IMMUNO-MODULATION IN SRBC ANTIGEN INDUCED EXPERIMENTAL MICE**

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### Abstract:



Immuno-therapies derived from natural products tend to be safe and can alter the immune response in certain immune disorders and against pathogens. One such natural compound is citrulline, mainly present in cucurbitaceae family of fruits have been reported to possess various biological activities. The current study has been evaluated the dose dependent immuno-modulatory effect of citrulline in both in vitro and in vivo assays. In in vitro, human peripheral blood mononuclear cells (hpbmc) proliferation assay for different concentrations of citrulline (5, 10, 15, 20, 25, 30, 35, 40, 45, 50 mg/ml) showed a significant increase in cell concentrations at 5, 15 and 45 mg/ml of citrulline concentrations ( $p \leq 0.05$ ,  $p \leq 0.01$  and  $p \leq 0.01$  respectively), compared with the unstimulated cells. Similarly, in in vivo assays, the biochemical, hematological and serological assays showed a significant difference between test groups (group-ii, iii, iv) and control group (group-i).

**Keywords :** Citrulline, Sheep Red Blood Cells, In Vitro Assay, In Vivo Assays

**Paper ID 14899**

### CHARACTERIZATION OF POLYPHENOLS AND ITS ANTI-OXIDANT ACTIVITY IN ALLIUM FISTULOSUM, CYNADON DACTYLON AND HIBISCUS SABDIFFERA

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#### Abstract:

The extracts of many herbs, spices and plant species have been used in an extensive manner on a global scale in order to characterize on their bio-active property. The aim of the present paper was to extract and analyse the total polyphenol, total flavonoid content and the antioxidant activity in cynadon dactylon, hibiscus sabdiffera, and allium fistulosum using soxhlet and ultrasound methods of extraction. Solvents like ethanol and water were used in different ratios and their extraction efficiency was compared. The total phenolic content and total flavonoid content were determined by established methods. The invitro antioxidant activity of the extract was performed by 2, 2-diphenyl-1-picrylhydrazyl radical scavenging method. It was observed that plant parts of c. Dactylon, a. Fistulosum, h. Sabdiffera have a high antioxidant activity and a positive correlation was obtained between the phenolic and flavanoid content of their extracts with the free radical scavenging activities.

**Keywords :** 2,2-diphenyl-1-picrylhydrazyl Radical, Antioxidant, Total Phenolic Content, Total Flavonoid Content, Soxhlet, Ultrasound.

**Paper ID 15222**

### DETECTION OF SLUDGE IN CRITICAL REGION OF OIL TRANSPORTATION PIPELINES USING ROBOT

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### Abstract:

The major problem in oil transportation pipelines is the maintenance of pipelines, especially sludge detection and removal. Pigging involves a lot of downtime in oil flow and it requires a lot of energy. Also entire oil flow in that pipeline should be stopped and also high pressure pumps should be used to operate the pipeline inspection gauge. If the profile of the wax sludge is predetermined with a robot so that a critical value of sludge formation can be set, and pigging can be done only if the critical value is reached. This helps in proper monitoring of the oil pipeline as well can save wastage due to frequent unnecessary pigging operations. This can be achieved through a robot, having sensors that can detect the profile of sludge and interpret it, so that the critical regions can be identified for sludge removal process.

**Keywords :** Sludge Detection Robot, Pipeline Inspection ,linear Potentiometer Sensor , Crude Oil Transport Pipeline

**Paper ID 15223**

## PROBIOTIC LACTOBACILLUS AS A PROPHYLACTIC TREATMENT FOR CADMIUM AND LEAD TOXICITY IN HUMANS

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### Abstract:

Cadmium and lead are metals with extreme toxicity to human and animal life. Living system accumulates these toxic heavy metals, which leads to bioaccumulation and biomagnification. Removal of cadmium and lead using microbial biomass has been introduced as an inexpensive new promising method on top of conventional methods. Probiotic bacteria such as lactobacillus can be administered directly to the living system by oral means and based on the competency to reduce toxicity, the effects of heavy metals can be avoided or reduced by the symbiotic activity of lactobacillus. This work uses lactobacillus strains (lactobacillus plantarum nc1m2084, lactobacillus casei nc1m2125, lactobacillus delbrueckii nc1m2025) that will carry out reduction of cadmium and lead which will keep away the living system from several harmful effects of cadmium and lead. Standard strains was exposed to 10% of mic concentration so that resistance is raised and strain gets modified genetically and will carry out reduction.

**Keywords :** Biomagnification, Toxicity, Lactobacillus, Metal Resistance

**Paper ID 15245**

## PHYCOREMEDIATION OF DAIRY EFFLUENT AND THE POTENTIAL APPLICATION OF RESIDUAL ALGAL BIOMASS IN AGRICULTURE

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### Abstract:

Phytoremediation is the process of removing contaminants such as suspended solids, oil grease and heavy metals using plants and associated microflora like algae. In this study, dairy effluent was treated using the following species *Desmococcus* spp., *Scenedesmus* spp., *Chlorella* spp., and mixed culture (composition of all three in same ratio). The objective of the study is to focus on eco-friendly treatment process in dairy and food industry. After the sustainable growth of algal species, treated effluent was tested for water quality parameters like pH, TDS, TSS, BOD, COD, phosphate, sulphate, chloride, micronutrients, oil and grease. Results obtained show that BOD is reduced from 1332.8 to 1142.4 in sample i and 104.7 to 64.7 in sample iii after incubation period of 10 days under controlled conditions. COD reduced from 6048 to 5644.8 in sample i and 524.2 to 323 in sample iii. All the species showed a sustainable growth and improved water quality.

**Keywords :** Phytoremediation, Dairy Effluent, Microalgae

**Paper ID 15248**

### FORMULATION AND EVALUATION OF NOVEL FERMENTED ALMOND MILK TEA (FAMT)- AN ANTIDIABETIC DRINK IN STZ INDUCED DIABETIC RAT MODEL.

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### Abstract:

The current study focuses on probiotic fermented food that possess antidiabetic activity in the prevention of this chronic disorder. Almond and green tea were reported to possess antidiabetic effect. The novelty of this project is to study the effect of the - fermented almond milk tea (famt). Pasteurised and homogenised almond milk and green tea extract (8:2) were mixed and fermented with *Lactobacillus casei* for 24 hr to develop famt. It was characterized positively for the presence of phenols, flavonoids, saponins and tanins which are some of the active antidiabetic bio compounds. This novel product was tested in streptozotocin induced diabetic rats in preventive regime for 28 days to know its antidiabetic activity. The test animal's blood analysis was found to have reduced serum glucose, insulin, triglyceride and cholesterol when compared to STZ induced control groups. Thus, famt proved to be a potent antidiabetic drink.

**Keywords :** Almond Milk, Tea, Antidiabetic Drink

**Paper ID 15271**

### COMPUTER-AIDED DOCKING STUDIES OF PIPERIDIN-4-ONE DERIVATIVES AS INHIBITORS OF TYROSINE KINASE (2HCK) OF ANTIOXIDANT ACTIVITY

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### Abstract:

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### Abstract:

Piperidin-4-one have been reported to showing anti-oxidant activity and were screened for in-silico toxicity using swissadme and protox-ii servers, and the six 4-piperidinone derivatives were docked with the tyrosine kinase (2hck) receptor protein. The 4-piperidinone derivatives were docked using the software autodock vina to validate the docking results. Compound 2 gave better binding affinity, full fitness, and estimated  $\Delta g$  values by autodock vina and swissadme than other derivatives and also formed conventional hydrogen bonds with the target protein; thus, the important active binding residues were also obtained from the results. Hence, ligand compound 2 is a potential synthetic inhibitor of antioxidant drug.

### Paper ID 15303

## A STUDY ON PROTON EXCHANGE MEMBRANE FUEL CELL TECHNOLOGY

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Energy is a key element of the interactions between nature and society and is considered a key input for sustainable development. Many environmental issues are caused by or related to the production, transformation, and use of energy, for example, acid rain, ozone depletion, and climate change. Recently, a variety of potential solutions to the current environmental problems associated with the harmful pollutant emissions has evolved. Hydrogen energy systems appear to be one of the most effective solutions and can play a significant role in providing a better environment. Many studies indicate that hydrogen-powered pem fuel cell technology in both its high and low-temperature ranges are effective and cleaner than conventional energy technologies, and can be considered one of the pillars of a future sustainable energy system. This talk aims to provide an overview of pem fuel cell technology development and highlights the existing technological challenges in this area.

**Keywords :** Fuel Cell, Hydrogen, Proton Exchange Membrane Fuel Cell (pemfc), Electrolyte, Cathode, Anode, Electrochemistry



**Abstract:**

**Paper ID 15304**

### **STUDIES ON COAGULATION EFFECT OF MORINGA OLEIFERA AS A BIO-COAGULANT FOR TREATING GROUND AND SURFACE WATER**

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**Abstract:**

Water is an essential element of life. It is a matter of great concern that surface water is getting polluted by different human activities and natural processes. Even the groundwater source has an average value of total dissolved solids (tds) between 2500-3500 ppm. Hence proper purification of ground and surface water is vital. Coagulation has a major role in the process of purification of water. It is one of the most common ways to reduce the pollutant contents in the water body that are present as turbidity, color, and organic matter. Moringa seed is a naturally occurring coagulant. The review was done on the coagulation effect of moringa oleifera on surface and groundwater. The required parameters like ph, turbidity, total dissolved solids (tds), total suspended solids, hardness, color, acidity, and conductivity of the purified water were reviewed and were interpreted.

**Keywords :** Bio Coagulant, Moringa Oleifera, Coagulation, Purification

**Paper ID 15306**

### **A REVIEW ON NOVEL ENERGY-PRODUCTION METHODS FROM WASTE**

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### Abstract:

Energy production is one of the greatest commodities that serve a vital role in country's development. Since conventional energy involves in exploiting the natural resources and compromising the environmental security, now we are in a situation to find alternatives. On the other hand, several million tons of wastes are produced. As environmentalists it is our responsibility to maintain "demand and supply equilibrium" of energy and minimize waste. The novel studies in chemical engineering and synthetic-biotechnology are striving to maximize waste conversion. The process of waste to energy conversion can be broadly classified as pyro-chemical process (involving high temperature and pressure) and bio-chemical process (involving microbial entities). To sum up our objective is to convert the carbonaceous material into source of energy.

**Keywords :** Demand And Supply Equilibrium, Pyro-chemical Process Bio-chemical Process Carbonaceous Material

**Paper ID 15307**

### **PREDICTION OF KINETICS FOR ADSORPTION OF CONGO RED BY GRAPHENE OXIDE SYNTHESIZED FROM GLUCOSE**

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### Abstract:

Nanotechnology holds great potential in advancing water and wastewater treatment to improve treatment efficiency as well as to augment water supply through safe use of unconventional water sources. Graphene oxide is a nano-compound which is attaining focus in various applications in recent trends. Graphene oxide can be synthesized by different methods such as mechanical, chemical and electrochemical methods. In this paper, graphene oxide was synthesized by improved hummers' method and tang lau method and characterised using xrd, sem and ftir analyses. The analyses show that the oxidation of graphene oxide synthesized by improved hummers' method is found to be highly oxidised and the lateral thickness of the graphene oxide grown by tang lau method is around 1990nm. Further, batch adsorption of congo red by the as grown graphene oxide by improved hummers' method was carried out and analysed.

**Keywords :** Kinetics, Graphene Oxide, Nanotechnology

**Paper ID 15309**

### **DESIGN AND VERIFICATION OF HIGH EFFICIENCY CYCLONE SEPERATOR**

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### Abstract:

Cyclone separator is one of the important industrial equipment finds its application in various chemical process industries such as removal of catalyst from off gases, removal of dust from product stream, removal product solid particles from fluidised air, removal of particulate matters from flue gases. In cement industry cyclone separators are connected in series to recover the particulate matter from rotary kiln exhaust. The project aims to design a cyclone separator with high efficiency by following lapple method. The process simulation studies using aspen plus will help to verify the geometric dimensions of modelled cyclone separator, using this verified cyclone separator attempt has made to increase the efficiency by varying geometry of inner pipe, density of the feed and moisture content in the feed. This simulation also aims to establish collection efficiency of cyclone separator. This project helps to understand the design and working of a cyclone separator completely.

### Paper ID 15310

## ROBUSTNESS OF MEMBRANE BIOREACTOR (MBR) UNDER VARIOUS HYDRAULIC RETENTION TIME (HRT) IN INDUSTRIAL PHARMACEUTICAL WASTEWATER TREATMENT

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### Abstract:

The membrane bioreactor (mbr) robustness was analyzed under various hydraulic retention time (hrt). Mbr robustness was analyzed by chemical oxygen demand (cod), biological oxygen demand (bod), total suspended solids (tss), total kzheldal nitrogen (tkn) and phosphate removal. The removal efficiency was above 86% tss, cod and bod of above 86% and 83% of tkn and 55% of phosphate. Robustness of also analyzed by different hydraulic shock loads for 18 h at the flow rate of 1.5, 3, 4.5 lph with the hrt of 4, 2 and 1.3h. The results inferred that lower shock loads increase the removal efficiency of organic and inorganic pollutants. The seepage of biomass was prevented at lower shock loads with higher retention time favors the mbr efficiency led to decrease in scale formation which is good accordance with scanning electron microscopic results.

**Keywords :** Robustness; Membrane Bioreactor: Phosphate Removal, Mixed Liquor Suspended Solids; Hydraulic Retention Time

### Paper ID 15312

## COLORIMETRIC GAS SENSORS BASED ON CHOLESTERIC LIQUID CRYSTALS



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### Abstract:

Monitoring of vapors and gases is of great importance in different laboratories, industries, congested public places, agricultural areas and smart packaging. Colorimetric vapor sensing devices based on cholesteric liquid crystals (clcs) have gained considerable research interest in recent years owing to their advantages such as photostability, reversibility, sensitivity, power free, naked-eye detection and the possibility of making microarrays with multiple sensing elements particularly for substances that possess low reactivity for chemical interactions. In this review, the working principle and development of clc based gas sensors and the key challenges associated with their design and operation are presented.

**Keywords :** Gas Sensors, Cholesteric Liquid Crystals

### Paper ID 15318

## RECYCLE AND RECOVERY OF STAINLESS STEEL (SS) PICKLING ACIDS USING ULTRA-FILTRATION (UF) AND ION-EXCHANGE (IX) PROCESSES – AN EXPERIMENTAL STUDY.

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### Abstract:

Uf and ix process for recycling of ss pickling acids are discussed in this study. Experiments were conducted using synthetic and original effluents from industry. The real challenge of overcoming the difficulty in maximum utilization of the ix resin using an efficient regeneration process is presented. Uf is used to capture tss. Cation resin in na<sup>+</sup> form was used to capture metal ions. Anion resin in no<sub>3</sub><sup>-</sup> form was used to remove toxic cr<sub>6</sub><sup>+</sup> and recycle hno<sub>3</sub>, hf, na<sup>+</sup> ions. Regeneration of cation resin using addition of naoh to metals ions and are precipitated by ca(oh)<sub>2</sub> and naoh. The filtered liquid is used for regeneration of cationic resin with addition of nacl. In anionic bed partial crystallization was performed for na<sub>2</sub>cr<sub>2</sub>o<sub>7</sub>. The no<sub>3</sub><sup>-</sup> is converted into nano<sub>3</sub> and to be used for the regeneration of the anionic resin. Fluorides in the effluent are treated using ca (oh)<sub>2</sub> followed by zrc<sub>4</sub>.

**Keywords :** Steel Pickling, Ultra-filtration, Ion-exchange Resins, Recycling Acids, Regeneration, Effective Disposal

### Paper ID 15319

## EVALUATION OF COMPOSITE MADE OF POLYLACTIC ACID AND ALOE VERA FOR BONE TISSUE ENGINEERING

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### Abstract:

Bone defect is one of the major problems in india, caused by many reasons like trauma, tumour, infection, etc. Repair of bones in these cases might be limited due to insufficient self-regeneration potential of bone stem cells. The use of autografts, allograft and xenograft can cure this, but are limited to donor site morbidity, infections, transmission of disease and immunological rejection. Hence, currently the use of a biocompatible scaffold is being sought after which is less invasive, biocompatible and avoids the risk of infections. This work focuses on the fabrication of a composite scaffold made of polylactic acid (pla) and aloe vera which could support cell growth and tissue regeneration. The complex bone structure (zygomatic bone) was first modeled and 3d printed using the pla. The composite filament formation by blending pla and aloe vera was optimized and tested by making a successful print of a standard geometric model (cylinder).

**Keywords :** Scaffold, Tissue Engineering, Pla, Aloe Vera, 3d Printing.

**Paper ID 15320**

## PREFERENTIAL KILLING OF BREAST CANCER CELLS USING ZINC OXIDE THIN FILM

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### Abstract:

Breast cancer, the most frequently diagnosed malignancy in women, represents the second most common cause of cancer death worldwide. Despite many surgeries and therapies available, there is a chance of recurrence in patients post-therapy. Besides, mastectomy patients opting for breast augmentation surgery are prone to have bacterial infections leading to rejection of implants. Zinc oxide (zno) possesses an antibacterial and anticancer property by killing the cancerous cells in the tumor environment. The present study hypothesizes the ability of zinc oxide thin film generated by radiofrequency magnetron sputtering for killing mcf-7 breast cancer cells in the presence of mesenchymal stem cells. Films were characterized by uv-visible spectrophotometer and atomic force microscopy which suggests that the film deposited above 20 mins have high transmittance ( 70-80% ) and high values of roughness ( $>29 \pm 4$ ). The future work is to study the cytotoxicity of the zno films towards cancer and stem cells.

**Keywords :** Radiofrequency Magnetron Sputtering , Breast Cancer Recurrence.

**Paper ID 15321**

## EFFECT OF NANOTUBULAR DELIVERY OF DEXAMETHASONE ON OSTEOGENIC DIFFERENTIATION OF MESENCHYMAL STEM CELLS (MSCS)



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### Abstract:

Bone regeneration is a process in which injured bones can regain full functionality without scar formation. In few cases were the bones failed to heal for prolonged time impacting the brittleness in bones leading to fracture. Mscs, a promising choice of cytotherapy for treating bone disorders was differentiated into osteogenic lineage in vitro using dexamethasone. The study was examined by standardizing in different concentrations of dexamethasone and control release studies was observed. The structural morphology of halloysite clay nanotubes was visualized in scanning electron microscope and energy dispersive x-ray analysis. The results obtained showed that as loading concentration increased higher release rates were observed. The release kinetics indicated an initial burst followed by a sustained release over a long period of time, making halloysite a suitable template for controlled drug release. Future studies will be carried out with the controlled release of dexamethasone for enhancing the osteogenic differentiation of mscs.

**Keywords :** Halloysite Clay Nanotubes, Dexamethasone, Osteogenic Differentiation, Drug Delivery Host

**Paper ID 15322**

## MODELLING OF STEM CELL PELLET GROWTH IN A SUSPENSION CULTURE

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### Abstract:

Differentiation and self-renewal of stem cells is an essential process for the maintenance of tissue composition in the human body. The promise of novel medical therapies involving these unique cells encourage us to employ mathematical methods to predict the cell growth. The objective of this study is to identify an accurate mathematical model to predict the growth of stem cells in a suspension culture. The mathematical models prevalently used to represent stem cell proliferation do not have the level of accuracy that might be desired. Hyperbolic growth models promise a greater degree of precision in representing stem cell proliferation. The model is applied to experimental stem cell growth data and a comparison of the predicted and observed number of cells is made to obtain an absolute relative error of  $\pm 0.008$ , proving the hyperbolic growth model as an accurate and effective means of representing the dynamics of stem cell growth.

**Keywords :** Stem Cells, Modelling, Hyperbolic Growth Model

**Paper ID 15326**

## INFLUENCE OF BORON POTENTIAL ON THE FORMATION OF FEB/FE2B PHASES IN SURFACE NANOCRYSTALLIZED MEDIUM CARBON STEEL





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### Abstract:

Boronizing is a well-known surface treatment process that involves diffusion of boron atoms into the surface of metals/alloys to produce a layer of borides. During the diffusion process, the properties of the resultant boride layer are primarily determined by the surface reactions and the diffusion kinetics of atoms. Improving the surface reactivity and accelerating the diffusion of atoms is a challenging issue at lower temperatures that warrants a suitable surface modification. Surface mechanical attrition treatment (smat) is well known surface severe plastic deformation method that enables the formation of a nanostructured surface layer and improves the overall properties of engineering materials. The presence of large number of grain boundaries and triple junctions in nanocrystalline and ultra-fine-grained materials could act as fast atomic diffusion channels. The present work aims to explore smat as a pre-treatment for boronizing. The study suggests that smat can be effectively used as a pretreatment for boronizing.

**Keywords :** Carbon Steel, Smat, Diffusion, Boron Concentration

**Paper ID 15327**

## STUDY ON PROCESS OPTIMIZATION OF BIOACTIVE ENRICHED TOFU WHEY

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### Abstract:

Industrial waste entangles numerous benefits. By products of food industries contain functional benefits that can be re-introduced in food, as substrate for bioprocessing industries. One byproduct generated in soy product processing industry is tofu whey. It encompasses wide range of nutrients, phytochemicals and various non-starchy oligosaccharides. This study is to valorize whey by evaluating the feasibility of enhancing the bio-active content of whey into bioavailable aglycone forms for various therapeutic benefits. This bioconversion trail can be done using lactobacillus fermentum, lactobacillus acidophilus. The proximate analysis revealed the nutritional quantity of whey. It has been found in the fermentation study that the growth of bacteria is accelerated when the media of growth is altered with whey. Tss, ph, od at 600nm, of the sample were determined. For detection, ftir analysis was done. Phytochemical analysis and antioxidant assays helped differentiate the enhancement functional benefits and quenching abilities of the fermented tofu whey from unfermented whey



**Keywords :** Keywords- Food Waste, Tofu Whey, Bio-active Components, Bacteria, Proximate Analysis, Ftir, Ph

**Paper ID 15341**

## **CELL TO CELL COMMUNICATION STUDIES BETWEEN BREAST CANCER CELLS AND MESENCHYMAL STEM CELLS**

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### **Abstract:**

In tumor microenvironment (tme), which contains heterogeneous cell population, it has been recently shown that naïve mscs (n-mscs) are transformed to tumor mscs (t-mscs) by the cancer cells. To understand the cell to cell communication between mscs and bccs indirect 2d and direct 3d cocultures were performed. In the indirect bidirectional study, mcf-7 conditioned media at 50% transfer ratio and at 48-hour time interval was used to culture mscs and msc conditioned media at 50% transfer ratio and at 48-hour time interval was used to culture mcf-7. The il-6 inhibitory assay indicated the role of il-6 in the tumor cell proliferation as assessed by mtt assay. Similar results were observed in the 3d culture without contact. Additionally, 3d spheroidal co-culture in core shell pattern showed a strong interaction with respect to decrease in diameter of the sphere during 2 weeks of culture.

**Keywords :** Tumor Microenvironment, Spheroids, Co-cultures, Cell-cell Communication



### STREAM-IV

Paper ID 14651

#### PIPELINED SMS4 CIPHER DESIGN FOR FAST ENCRYPTION USING TWISTED BDD S-BOX ARCHITECTURE

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#### Abstract:

In this current fast moving world, getting the information faster is more important. My project makes it happen. Sms4 cipher based on pipelined twisted bdd (binary decision diagram) s-box architecture can convert the plain text into cipher text as fast as other s-box architecture. Sms4 is a 128-bit block cipher used in the wapi standard for protecting data packets in wlan. In this project s-box architecture using look-up table (lut), twisted bdd and pipelined twisted bdd were compared and proved that encryption using s-box pipelined twisted bdd architecture is about 3.5 – 4 times faster than other s-box architectures. Sms4 is a symmetric key cipher, in which both the sender and the receiver use a single key for encryption and decryption. The decryption procedure of sms4 can be done in the same way as the encryption procedure by reversing the order of the round keys.

**Keywords :** Sms4 Cipher; S-box; Twisted Bdd Architecture; Pipelined Twisted Bdd Architecture

Paper ID 14750

#### DESIGN AND ANALYSIS OF DIGITAL FIR FILTER USING RLNS FIXED-WIDTH MULTIPLIER

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#### Abstract:

The residue logarithmic number system is a novel technique which provides fast operation and more precision than any other number systems. The fixed-width multiplier is designed and analyzed the performance using rlms algorithm in our previous work. The fixed-width multiplier has used because of its unique features of the area and power compactness. Besides, the taylor series expansion used for the error approximation and reduced the truncation error by 89% compared with the direct truncated multiplier. This paper presents the extension of the previous work, which implements the recommended fixed-width multiplier in the digital fir filter for signal processing applications. The accuracy of the proposed fir filter characterized by the snr ratio. The desirable snr value of the better filter performance



is above 25 db, and in this work, we obtained the snr ratio of 35db. The output response of the proposed filter response has been simulated by matlab software.

**Keywords :** Rlns, Fixed-width Multiplier, Fir Filter, Fft, Snr

**Paper ID 14756**

### **HIGH SPEED AND LOW POWER CARRY SELECT ADDER USING OPTIMIZED CARRY SELECT UNIT**

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#### **Abstract:**

Carry select adder (csla) is one of the fastest adders having good compromise between area and speed. In this paper, the structure of optimized carry select (ocs) based square root (sqrt) csla is analysed in terms of area, delay, and power. From the analysis, it can be seen that the structure of ocs based sqrt csla reduces delay and power. The proposed csla uses sum of product (sop) form for the generation of carry in ocs based sqrt csla. The use of sop makes the ocs based sqrt csla to have reduced delay and power consumption with an increase of one or gate for each bit. Proposed csla has been designed for 8, 16, 32, 64, and 128-bit and it is compared with existing cslas. Application specific integrated circuit (asic) synthesis is done using tsmc 180 nm technology.

**Keywords :** Sqrt Csla, Sum Of Product, Application Specific Integrated Circuits

**Paper ID 14758**

### **FLOOD INUNDATION MAPPING EXTENT USING SATELLITE IMAGES :A REVIEW**

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#### **Abstract:**

Among so many natural disasters flooding is one of the most leading threat of disaster. It may cause a severe damage to both the urban and rural areas. During such catastrophic effect precise and rapid extraction of inundated areas is a key support for the emergency response team to act pro-active and providing damage assessment in a very efficient manner. For flood inundation extent mapping we highly depend on the remotely sensed data from satellite images. Satellite data aid in the near real time mapping of flood inundation extent. The main focus of this paper deals with the challenges and issues based on so many algorithms developed for flood inundation mapping. In recent years, there is a significant research going on with deep neural networks for remote sensing applications. Convolution neural network (cnn) outperforms the traditional machine learning algorithms which require (hand



crafted features) and it shows better performance on various task including image classification, feature extraction and segmentation.

**Keywords :** Deep Learning, convolution Neural Network, geo Spatial Data Processing, flood Inundation, supervised Learning Techniques

**Paper ID 14769**

## ANALYSIS OF SUPERPIXEL SEGMENTATION TECHNIQUES IN HYPERSPECTRAL IMAGERY

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### Abstract:

Hyperspectral imaging is an emerging research area in remote sensing applications. It is a challenging task to process the hyperspectral image due to its huge dimension, large number of noise pixels, complex spatial structure of objects and spectral similarity between different objects. Superpixel segmentation is an effective approach to extract the spatial and spectral information in hyperspectral image classification. Superpixels are the collection of pixels with the similar spectral property. Superpixels has well defined boundaries between the segments which reduces the spectral mixing and noise. The superpixel segmentation techniques are classified into three categories such as graph based, gradient ascent based and cluster based. In this paper, we analyzed the widely used superpixel segmentation algorithms used in hyperspectral imaging. Experiments on two real hyperspectral datasets are carried out and the performance of the various superpixel segmentation algorithms are analyzed.

**Keywords :** Superpixel Segmentation, Hyperspectral Image, Spatial-spectral Classification, Spectral Similarity, Entropy Rate Superpixel, Simple Linear Iterative Clustering

**Paper ID 14777**

## A LITERATURE SURVEY ON VARIOUS HANDWRITTEN CHARACTER RECOGNITION TECHNIQUES

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### Abstract:

Handwriting differs from person to person due to font style, shape and size. Thus understanding handwritten character is more challenging compared to printed document. Although many techniques for automatic recognition have already been introduced, challenges are there in the areas of overlapping character retrieval etc. A recognition process involves four main steps: preprocessing, segmentation, feature extraction, classification. Preprocessing includes normalization, skew correction and smoothing.



It is followed by segmentation to separate individual characters from words. Features that are prominent for classification are then extracted and the characters are recognized using trained classifiers. The widely used classifiers are bpn, knn and svm. Due to the advancement of deep learning, the recent research is focused on classification using convolutional neural network. This paper presents an overview of various feature extraction and classification algorithms for automatic handwritten character recognition. Finally, the comparative analysis in terms of classification accuracy is represented for various techniques.

**Keywords :** Handwriting, Feature Extraction, Classification

**Paper ID 14779**

### **A SURVEY ON AUTOMATED ANALYSIS OF MULTISPECTRAL HUMAN CHROMOSOME IMAGES**

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#### **Abstract:**

Chromosome analysis is highly essential for diagnosis of genetic disorders and tumor detection. Multicolor fluorescence in-situ hybridization (m-fish) is a technology in which chromosomes can be easily analyzed by using intensity information for karyotyping. Various techniques are identified in automating this process as manual karyotyping is a time consuming and challenging task. This paper presents a comprehensive survey of the advancements and current trends in the automated analysis which involves preprocessing, segmentation, classification and pseudo coloring of chromosome images .An effective review of pre-processing techniques for color compensation, feature normalization and background flattening was done. Segmentation of overlapped chromosome images was carried out using active contours, expectation maximization, crowd sourcing and convolutional semantic segmentation. Since the major challenge is to improve the segmentation and classification accuracy, a comparative analysis of classifiers like bayes, hidden markov model, support vector machines , fuzzy inference engine and deep neural network was carried out.

**Keywords :** Mfish,karyotyping,deep Neural Network



**Paper ID 14782**

### **A REVIEW ON SPN BASED LIGHT-WEIGHT CRYPTOGRAPHIC ALGORITHMS**

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#### **Abstract:**

Cryptography is that apply and study of techniques for secured communication system in the presence of trusted third parties (called adversaries). Traditional cryptography algorithms are slow, complex and energy-consuming for handling resource constrained devices. Some of the resource constrained devices are radio frequency identification (rfid) tags, health care devices and environment with smart objects which have restricted storage device, limited power and fewer data processing capabilities. Light-weight cryptography is a branch of modern cryptography which covers cryptographic algorithms intended for use in devices with low or extremely low resources. In this paper, comparative evaluation of security against various attacks which affect the data confidentiality, data integrity and availability are reviewed. Some of the attacks considered for analysis include related-key attack, side-channel attack, slide attack, key recovery attack, differential attack etc. Security analysis of various light-weight cryptographic algorithm based on substitution permutation network (spn) are reviewed.

**Keywords :** Light-weight Cryptography, Block Cipher, Attacks, Security

**Paper ID 14783**

### **SPEECH RECOGNITION TECHNIQUES: A SURVEY**

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#### **Abstract:**

Speech is one of the best way of expressing ideas and thoughts among people. An effective communication is achieved only when the spoken words are perceived correctly. The prerequisites are that the listener should be familiar with that language model and the received speech signal should be free from noise. The above mentioned constraints are also applicable for any voice based applications as well as speech recognition systems. In general, speech recognition involves preprocessing, feature extraction and recognition. Preprocessing methods such as endpoint detection, silence and unvoiced sound removal, time alignment and normalization are done in time domain. Filtering in frequency domain is also performed in preprocessing. Features such as mfcc, lpc and plp are commonly used. Recognition is done using neural network approach and pattern recognition approach. In recent days, deep learning approach is gaining importance. This paper presents a survey of various speech recognition approaches and techniques.

**Keywords :** Language Model, preprocessing, feature Extraction, Recognition, deep Learning, Pattern Recognition, neural Network



**Paper ID 14789**

### **DESIGN OF AN AREA EFFICIENT AND LOW POWER COMPOSITE S-BOX USING REVERSIBLE LOGIC CRYPTOGRAPHIC DESIGN**

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#### **Abstract:**

Aes is the most important technique for reliable data transmission in the field of satellite communication, net banking etc. S-box is the heart of aes technique which has linearity and non-linearity technique. It uses lut to store the corresponding substitute value for given input which consumes more area and power with low security. To overcome this, 8-bit composite s-box is used with gf(24) composite s-box unit consists of inverse affine/affine matrix, isomorphic mapping, multiplier and multiplicative inverse units. The architecture uses reversible logic as s-box is implemented on same hardware reduces the area and gate count. Low power consumption is possible due to resource sharing. In present days, the applications need security algorithm to keep information securely. The power and area analysis are one of the major challenges to mathematically secure cryptography protocols. To overcome this, reversible logic cryptographic design (rlcd) technique is introduced. More than 7% asic performance is improved in rlcd method compared to conventional method.

**Keywords :** Reversible Logic, aes, S-box

**Paper ID 14802**

### **COAXIAL-PIN FED NOTCHED CIRCULAR PATCH ANTENNA FOR X-BAND APPLICATIONS**

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### Abstract:

A circularly polarized antenna for x band satellite application is presented in this paper. The patch consists of a circular disc with rectangular cuts on opposite edges. The notched patch described here has the advantage of using a single coaxial feed, orientated at  $45^\circ$  to the position of the notches to achieve circular polarization. The antenna is designed on a ro3003 substrate with dielectric constant 3 and thickness 1.52mm. Hfss software is used for the design and simulation of the antenna and the performance parameters are determined in terms of vswr, return loss, gain and radiation patterns. This antenna has 10 db impedance bandwidth (return loss  $< -10$  db) ranging from (9.4 to 11)ghz and 3 db axial ratio (ar  $< 3$  db) bandwidth ranging from (9.95 to 10.13)ghz. The gain of the antenna ranges between 5.76db to 6.5db throughout the band

**Keywords :** Circular Polarization, axial Ratio

**Paper ID 14804**

## REAL-TIME EMBEDDED TRAFFIC SIGN RECOGNITION FOR INTELLIGENT TRANSPORTATION SYSTEMS: A SURVEY

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### Abstract:

Traffic signs recognition (tsr) is a significant part of advanced driver-assistance systems and autonomous driving systems. Tsr is a challenging problem because of bad weather conditions, partial occlusion etc. Recognition of small traffic signs is a research problem in computer vision to improve accuracy. The challenge of tsr is to ensure its efficiency that includes accuracy, generalization, and speed in real-time with a computationally limited platform. In recent years, many traffic sign detection (tsd) algorithms are based on machine vision and lidar-based methods. Deep learning based tsr utilizes efficient cnn architectures and algorithms such as squeezeNet, alexnet, googlenet, mobilenet, yolo, ssd, rpn, r-cnn for traffic sign detection and classification. Hence, the aim of the survey paper is to provide the overview, issues, challenges and various technologies for the tsr and also the hardware requirements for the intelligent transportation systems.

**Keywords :** Traffic Signs Recognition (tsr), Traffic Sign Detection (tsd), Yolo (you Only Look Once), Ssd(single Shot Detector), Rpn(region Proposal Network), R-cnn (region-based Convolutional Neural Network)



**Abstract:**

**Paper ID 14823**

### **DESIGN AND IMPLEMENTATION OF A RECONFIGURABLE ANTENNA FOR WIRELESS APPLICATION**

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**Abstract:**

A novel microstrip reconfigurable antenna is proposed in this paper. To design a patch antenna for multiband and create a slot in the radiating element in order to obtain wider bandwidth. Quarter wave transformer is used to match the microstrip feed impedance with patch antenna impedance. Pin diodes are integrated with the main radiating element to achieve the reconfiguration in frequency of the proposed antenna. The various states of the switches (pin diodes) change the radiating element operating frequencies. The simulated antenna parameters can be validated with the measured results.

**Keywords :** Microstrip Antenna, Pin Diode

**Paper ID 14840**

### **A SURVEY ON DEEP LEARNING ALGORITHMS FOR HUMAN ACTIVITY RECOGNITION USING WEARABLE SENSORS**

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Human activity recognition (har) involves data collection from sensors installed in wearable devices, pre-processing, data segmentation, and extraction of salient features and finally classification of activity. Feature extraction from sensor data is the most challenging part in the recognition pipeline. Conventional techniques rely on hand crafted features, use time-frequency transformation and statistical approaches and are unable to model and support the dynamic nature of the ubiquitous sensor streams. Deep learning is widely adopted owing to its automated feature learning that enhances performance of the recognition system. This survey will present the description, advantages and disadvantages of generative feature extraction techniques such as deep belief network (dbn), deep boltzmann machine (dbm), sparse coding, and discriminative feature extraction with convolutional neural network (cnn), recurrent neural network (rnn) and hybrid methods that combine generative and discriminative deep learning methods.

**Keywords :** Har, sensors, deep Learning



### Abstract:

Paper ID 14847

### ECG ANALYSIS ALGORITHMS: AN OVERVIEW AND COMPARATIVE STUDY

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### Abstract:

Cardiovascular diseases (cvds) remains the leading cause of death globally, as estimated by who, 17.9 million lives each year. The accurate and real-time heartbeat detection of the ecg signal plays a fundamental role in monitoring cvds. Arrhythmia is a condition which is caused by an electrical malfunction in the cardiac signal of the heart. This paper reviews various adaptive and time-efficient algorithms proposed for electrocardiogram (ecg) signal analysis. The novel methods to diagnose arrhythmia include recognition of st segment detection and qrs complex detection or r peak detection from the ecg signal. The noise cancellation and the different transformation stages employed in the ecg analysis algorithms are studied and compared. The performance, time of response, detection accuracies and the utility of the algorithms in different application conditions are discussed and compared.

**Keywords :** Cvd, Arrhythmia, Analysis

Paper ID 14853

### DISEASE DETECTION AND CROP MONITORING USING IMAGE PROCESSING TECHNIQUE

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### Abstract:

Agriculture is a primary source of livelihood. This paper consists of diagnosis of plant leaf diseases and crop monitoring using machine learning algorithms. The process involves two steps feature extraction followed by disease classification. The process of feature extraction uses texture feature and concurrence matrix equations. The proposed system can be applied to the diagnosis of plant diseases with good accuracy level.

### Paper ID 14862

## A HIGH PERFORMANCE HANDWRITTEN CHARACTER RECOGNITION SYSTEM USING ALEX-NET BASED ON CNN FOR TAMIL LANGUAGE

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### Abstract:

Just like its great achievement in solving many computer vision problems, the convolutional neural networks (cnn) provided new end-to-end approach to many handwritten character recognition (hcr) with very optimistic outcomes for many languages in recent years. Convolutional neural networks is one of the popular methods used in image and language recognition with automatic feature extraction technique. This research article proposes a new handwritten tamil character recognition model based on alex-net architecture. The tamil language contains of a multiplicity of characters having alike features, therefore differentiating characters is a challenging task. We show in this paper that, this deeper architecture can assistance for tamil handwritten character recognition (thcr) a lot to attain greater performance, in the meantime can be designed with less parameter. 12 primary, 18 consonants and 20 compound characters of tamil language are recognized with better accuracy and achieved minimal time consumption using this model.

**Keywords :** Thcr, Deep Learning, Convolutional Neural Networks, Alex-net, Feature Extraction.

### Paper ID 14892

## SPEED AND MOTION CONTROL OF SERVO MOTOR FOR STEERING INDUSTRY

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### Abstract:

The steering industry has a new requirement, as to test the steering lever of its sustainability and durability, for that it requires an automation system with which the strength of the steering lever can be



tested. The test is carried out by continuously turning the steering in either direction up to a specified angle for a certain time so as to test the strength of the steering lever. For this, the best suitable motor would be servo motor so as to perform angular and precise movement. Though this is based on motion control, the industry also requires the testing of it under various speeds, hence a combined motion and speed control of the servo motor is done for the steering lever's testing by using the respective programming software. In addition, predetection and diagnosis of faults in servo motors will be carried out in future.

**Keywords :** Servo Motor, Speed Control, Motion Control

**Paper ID 15210**

### SCENE CLASSIFICATION OF REMOTELY SENSED IMAGERY USING CNN

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#### **Abstract:**

Scene classification of remotely sensed high resolution images has gained a significant role in remote-sensing due to its high range of applications. It is the base and an important technology for ground-object-detection, geographic-analysis, urban-planning and management of land-use. The deep-learning method using convolutional-neural-network has become an efficient and powerful tool for rs image classification, but it takes in larger amount of data images, in order of thousands or more images, to acquire higher accuracy by training them from scratch. Also, it is slow despite using a fast-processor and high storage. These limitations can be overcome by using transfer learning concept for rs image scene classification-(rsisc) while using a smaller dataset. The results show that we are able to attain higher accuracy with minimum epochs and also within short span of time. We also perform transfer learning analysis using the best pretrained keras cnn model such as vgg19, inceptionv3 and xception.

**Keywords :** Deep Learning; Convolutional Neural Networks; Scene Classification; Transfer Learning

**Paper ID 15211**

### INTEGRATED SINGLE INPUT DUAL OUTPUT DC-DC CONVERTER FOR ELECTRIC VEHICLE APPLICATIONS

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#### **Abstract:**

Optimization of power electronic converters used in an electric vehicle (ev) system is necessary for efficient and reliable operation of electric vehicles. This paper presents an integrated single-input dual-output (sido) dc-dc converter topology applied to electric vehicle (ev) environment. The proposed converter has two output terminals, each of which is independently controlled and is capable of



simultaneously powering two or more ev loads, each with different voltage level requirements. The number of output terminals is extendable as per the number of ev loads. This converter replaces several conventional dc-dc converters used in an ev. Due to its reduced component count, this converter has reduced size, cost and complexity and improved overall system efficiency. Also the proposed converter has low switching stress that improves the reliability of the system. Simulation of the proposed converter circuit has been carried out using matlab-simulink and the results are validated.

**Keywords :** Dc-dc Converters, Single-input Dual-output (sido), Electric Vehicle (ev)

**Paper ID 15213**

### DEPOSITION AND OPTIMIZATION OF CUO ABSORPTION LAYER USING RF SPUTTERING FOR PV APPLICATION

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#### Abstract:

Oxide semiconductors are one of the alternatives to silicon solar cells. Features of oxide semiconductors are high optical absorption and low cost of raw materials. Copper oxides (cuo and cu<sub>2</sub>o) are well-known p-type oxide semiconductors for high-efficiency solar cells because of direct bandgap transitions (1.5 ev and 2.0 ev). Cuo is used as a hole transfer layer and a barrier layer for dye-sensitized solar cells and as a p-type semiconductor active layer in few solar cells. In this work, deposition and optimization of 150 nm thick cuo thin films on fto coated glass substrate using rf magnetron sputtering was carried out. In-situ annealing was also carried out to investigate the influence of annealing on structural, optical and electrical characteristics. Annealed thin films resulted in the formation of monoclinic phase of cuo as evident from x-ray diffraction spectrum. Bandgap of cuo was determined from uv-visible spectrophotometer ranging between 1.7-2.0 ev.

**Keywords :** Thinfilms, Rf Sputtering, Cuo, Xrd

**Paper ID 15214**

### A FUZZY LOGIC CONTROLLER BASED MODIFIED SEPIC CONVERTER AS A MAXIMUM POWER POINT TRACKER WITH IMPROVED GAIN IN REAL TIME APPLICATIONS

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#### Abstract:



In this paper to overcome the problems of low voltage gain, tracking of maximum power under unpredictable weather conditions, a new topology of modified sepic converter along with fuzzy logic mppt control (flc) is proposed. In sepic converter the output is controlled by duty cycle and it can be either greater or smaller than the input voltage. Whereas in modified sepic converter the output voltage gain can be increased more than conventional by adding voltage multiplier or voltage booster circuit across the switch which was basically by adding diodes and capacitors in it to transfer more energy from input to output with maximum duty cycle. A flc with mppt is proposed in this paper which can accurately track the reference signal to achieve optimum power under varying solar irradiances gives the output of controlled duty cycle. On accounting fast response time, system stability and reduced oscillations flc plays important role in realtime applications.

**Keywords :** Sepic, mppt, flc

**Paper ID 15217**

### MODELING OF MOS2 BASED THIN FILM TRANSISTOR USING COMSOL MULTIPHYSICS

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#### **Abstract:**

Two dimensional molybdenum disulfide (mos2) when thinned down to atomic layer thicknesses exhibit non-zero bandgap and optical transparency, which makes it suitable material for low power switching devices in display applications. With the display size extending beyond the limits of conventional display devices, the transition towards active matrix backplane with individual pixel control, which integrates display technology and switching device, becomes important. Mos2 based tft switches can be used in such active matrix organic light-emitting diodes (amoled) flexible displays applications. These 2d semiconductors have been reported to exhibit high carrier mobility, excellent optical transmittance, even at low bending. This work will focus on physical structure modeling and simulation of mos2 thin film transistor using comsol multiphysics software. In this simulation work, effect of gate oxide thickness, active material concentration, dielectric material and metal contacts on the threshold voltages were modeled.

**Paper ID 15218**

### INTRODUCTION OF SOFT MAGNETIC COMPOSITES AS ALTERNATIVE FOR THE SWITCHED RELUCTANCE MOTOR TORQUE RIPPLE AND VIBRATION MITIGATION

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### Abstract:

This paper presents a contemporary direction on the reduction of torque ripple, vibrations, and acoustic noise in switched reluctance motors (srm) using soft magnetic composite (smc). Soft magnetic composite materials consist of iron powder particles where the surface of every particle is insulated using a continuous oxide layer. The particles are compacted, together with a lubricant and possibly a binder, at high pressure into a bulk material. Soft magnetic composite materials are characterized by three dimensional isotropic ferromagnetic behavior and very low eddy current loss. The capability of soft magnetic composite material in switched reluctance motor has been investigated through finite element analysis (fea). Fea has been carried out to study essential motor characteristics like electromagnetic, vibration and acoustic noise on two configurations viz m-19-srm and smc-srm motor and validation of smc-srm's superiority in torque ripple and vibration mitigation.

**Keywords :** Soft Magnetic Composite (smc), Switched Reluctance Motor (srm), Finite Element Analysis (fea), Torque Ripple, Vibration

### Paper ID 15220

## INTEGRATING RENEWABLE ENERGY SOURCES AND ENERGY EFFICIENT TECHNOLOGY INTO ELECTRIC POWER SYSTEMS: CHALLENGES AND SOLUTIONS

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### Abstract:

Abstract - a modernization of electric power is necessary to limit co2 emissions, safeguard the greenhouse and boost energy security. Consequently, renewable energy development is a valid investigation for designers in the power system. This initiative has made considerable progress toward the modernization of the grid and aims to integrate renewable energy sources (ress). As more renewable energy such as wind and photovoltaic are incorporated into the grid, technical problems arise from the requirement to maintain and balance the load and generation in the power system network. This paper presents several challenges come across during grid integration of different renewable energy sources with some possible solutions. Also, suggestions are provided for integration energy efficient technology into the future power grid. This paper explores ress integration challenges and mitigation strategies such as forecasting ress, power quality issues, location of res, bess.

**Keywords :** Electric Power Systems: Challenges And Solutions

### Paper ID 15221

## FABRICATION OF ZNO BASED PHOTODETECTOR USING RF MAGNETRON SPUTTERING

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### Abstract:

The objective of this paper is to fabricate a zno based photodetector on n-si substrate using rf magnetron sputtering, to achieve high photo responses, fast response times and broadband photo detection. The effect of lattice mismatch will be addressed through introduction of interfacial layers which would pave way for the future advanced photodetectors that enable a broadband detection. Two different photodetectors were fabricated and characterized, namely, heterojunctions of zno and n-si and the sample with a cuo interfacial layer between zno and n-si substrate, with two different metal contacts such as al and au. The samples were characterized using x-ray diffraction, surface profilometer, i-v characteristics and photo response measurement. X-ray diffraction was performed to investigate the quality of the cuo and zno thin films. Thick zno results showed a strong 002 peak with a 2 theta value of 34.115° corresponding to zno.

**Keywords :** Rf Sputtering, Zno

**Paper ID 15240**

## ELIMINATION OF LOWER ORDER HARMONICS IN SHEPWM BASED CASCADED H-BRIDGE MULTILEVEL INVERTER

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### Abstract:

Selective harmonic elimination pulse width modulation (shepwm) technique based on particle swarm optimization (pso) algorithm is proposed in this paper for harmonic elimination in a single phase cascaded h-bridge eleven level inverter fed by confined dc sources. This procedure is utilized to eliminate 5th, 7th, 11th and 13th lower order harmonics by solving non-linear equations, while the amplitude of the required fundamental voltage is fulfilled. Particle swarm optimization calculation is utilized for solving the non-linear objective function and computing the switching angles for the switches. The novelty in this paper uses an automatic sequential scheme such that the total energy conveyed the condition of charge of the batteries and the terminal voltages are on the whole equivalent in all the dc sources. Matlab programming is utilized for enhancement and the outcomes show the adequacy of the proposed calculation.

**Keywords :** Multilevel Inverter, Cascaded H-bridge Multilevel Inverter, Total Harmonic Distortion, She-pwm, Particle Swarm Optimization

**Paper ID 15261**

## HYPERSPECTRAL IMAGE CLASSIFICATION WITH SVM AND EDGE-PRESERVING SMOOTHING TECHNIQUE FILTER



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### **Abstract:**

Hyperspectral image (hsi) classification has become a great interest of research in the field of remote sensing. There are different techniques involved in classification of hsi. The spectral feature and spatial feature mixing has achieved a great performance rate among others. With the challenges of feature extraction in spectral-spatial hsi classification, we proposed a novel edge-smoothing filter based method which is applied on support vector machine (svm) for hsi classification. In order to optimize the results, we have included guidance filter to achieve high classification rate. The evaluation results obtained summarizes better results than other state-of-art methods on the dataset. The fast and easy implementation of the proposed method enhances the performance and accuracy of the hsi classification.

**Keywords :** : Guidance Filter, Support Vector Machine, Hyperspectral Image, Edge-preserving, Spatial-spectral Feature.

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