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# IEI EPITOME

A Century of Service to the Nation



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# Members in the NEWS

**Dr Surinder Mohan Goel**, FIE
*Freelance Individiual*
*Civil Engineer and Astro Consultnat*
*goelsm@yahoo.com*

Arunachal University of Studies (AUS) established the **Dr S M Goel Linguistic Chair** "**for the creation and preservation of tribal language scripts and culture with an annual sponsorship of Rs 10 lakhs by the World Education Mission (WEM)**" on 26 August 2021.

**Dr Rangaraju Visvanathan**, FIE
*Formerly Professor and Head*
*Department of Food and Agricultural Process Engineering*
*Agricultural Engineering College and Research Institute,*
*Tamil Nadu Agricultural University, Coimbatore*
*drrviswanathan@gmail.com*

Awarded **ISAE Gold Medal 2020** by **Indian Society of Agricultural Engineers**, New Delhi for outstanding contributions to the Profession of Agricultural Engineering and the Society on 23 November 2021 during the Inaugural Session of the 55th Annual Convention held at Patna.

**Dr Sarabjeet Singh Sidhu**, FIE
*Associate Professor*
*Department of Mechanical Engineering,*
*Sardar Beant Singh State University, Gurdaspur, Punjab*
*sarabjeetsidhu@yahoo.com*

- One of the **Guest Editors** in **Journal of Materials Research** (JMR) of **Special Issue** on 'Advances in Titanium Bio-Implants: Alloy Design, Surface Engineering and Manufacturing Processes'
- Received **Best Teacher Award 2021** from **Indian Society for Technical Education** (ISTE) for outstanding achievements in the field of technical education and research, held on 3 December 2021 at Chitkara University

**Prof(Dr) Kapileswar Mishra**, FIE
*Director*
*Academics and Research, DRIEMS, Tangi, Cuttack, Odisha*
*kmishraiitkgp@gmail.com, director.ar@driems.ac.in*

Joined as **Director** of **Academic and Research of DRIEMS GROUP** from 1st November, 2021

# Members in the NEWS

**Dr Ravindra Naik**, FIE
*Principal Scientist (AS&PE)*
*ICAR Central Institute of Agricultural Engineering, Regional Centre,*
*Sugarcane Institute Post, Coimbatore*
*naikravindra@gmail.com*

Awarded **ISAE Fellow 2020** by **Indian Society of Agricultural Engineers**, New Delhi for outstanding contributions to the Profession of Agricultural Engineering and the Society on 23 November 2021 during the Inaugural Session of the 55th Annual Convention held at Patna.

**Prof Purushottam Balaso Pawar**, MIE
*Lecturer and ED Cell Coordinator*
*SVPM's Institute of Technology and Engineering , Malegaon BK*
*purushottampawar_07@rediffmail.com*

Awarded **National Level Innovative Teacher Award 2020** by **SIR Foundation Maharashtra**. Event Sponsored by IIM Ahmadabad, Honey Bee Network (submitted thesis on '**Developing Innovation and Entrepreneurial values among Engineering Students through Academic Projects**'). Award declared on 05 September 2020 and delivered on 09 December 2021.

**Er Srikanth Satish Kumar Darapu**, MIE
*Senior Assistant Professor*
*Department of Civil Engineering*
*Certified Behaviour and Mentoring Analyst,*
*GITAM Deemed to be University, Visakhapatnam campus*
*reach.dssk@gmail.com*

- Awarded the certificate by **AICTE, Ministry of Education's Innovation Cell for Exceptional Contribution** as a **Primary Evaluator in Toycathon, 2021** in December 2021
- Achieved **IGBC Accredited Faculty** honour in September 2021
- Served as the **Scientific Member** of **ICASET-2021**.

**Er Logesh Rajendran**, MIE
*Senior Architect*
*L&T Smart World , Chennai*
*srlogesh@gmail.com*

He has won '**India's Future CIOs Next100 Awards 2021**'.

**NEXT100** is an annual awards program instituted by **IT Next magazine and the 9.9 Group** that aims to identify 100 experienced IT managers who have the skills, talent and spirit to become CIOs. His application is selected amongst hundreds of applicant received throughout the nation through rigorous process.

# Members in the NEWS

**Er Chiranjib Sarkar**, MIE
*Senior Structural Engineer*
*AECOM India Pvt Ltd*
*chiranjibjubce@gmail.com*

Finalist in the category of '**Young Tunneller of the Year**' in **ITA Tunnelling Awards 2021** in November 2021.

**Dr Jayasanthi M**, MIE
*Associate Professor*
*Department of Electronics and Communication Engineering,*
*PSG Institute of Technology and Applied Research, Coimbatore, Tamil Nadu*
*jayasanthiranjith@gmail.com*

Her application for DST-SERB sponsored **Post Doc. TARE Fellowship** jointly with IIT Madras for the research project titled '**Development of an Improved Multivariate Machine Learning Solution with Additional Features for Non-Invasive Anemia Detection**' on December 2021 has been approved.

# Publication by Members

**Er Cawas Phiroze Nazir**, FIE
*Consulting Engineer*
*Self Employed*
*cpnazir@gmail.com*

Title of Paper: **Techno- Economics of a Hybrid Photovoltaic Wind Turbine**

SCIREA Journal of Energy, Volume 6, Issue 6, 14 December 2021, pp. 95-112

**DOI**: https://doi.org/10.54647/energy48149

***Abstract***: *To improve the overall energy production from the wind turbine and lower the levelized cost of energy (LCOE), an innovative approach for the design of a hybrid solar-wind turbine (HSWT) is proposed. The present concept is based on installing arrays of solar panels on the south-facing facade of the turbine tower to generate electricity from sunlight. The hybrid offers greater benefits compared to separate systems. An example is given of an offshore WT with a rated capacity of 4.7 MW forming part of a 600 MW wind farm in the North Atlantic. The 100 m high tower is covered with 465 PV panels of 340 W capacity. For evaluation, the gross resource of each renewable is estimated considering the specifications of the available data In the discussion, the LCOE's of wind and the hybrid solar-wind combination are compared. From the results, it is clear that HSWT offers a reduced LCOE, even after allowing for shading losses from the blade, and a much steadier production of energy. The introduction of HSWT would help to make wind farms a more cost-effective and competitive source of clean energy.*

***Keywords***: *Solar, Wind-turbine, Hybrid, Tower, LCOE*

**Er Jai Prakash**, FIE
*Senior Consultant*
*Environment Research & Advisory, BPA Consulting*
*jaypee_snd@yahoo.com*

Title of Paper: **Estimation of Phthalates in Bottled Drinking Water, Manufactured in India, using Liquid Chromatography Mass Spectrometry (LC-MS/MS)**

International Journal of Scientific Research, Environmental Science, Volume 10, Issue 10, October 2021, pp 38-43, ISSN (Print) 2277-8179

**DOI**: 10.36106/ijsr/0930021

***Abstract***: *Phthalate easters are known endocrine disrupter and possible carcinogen. Studies have carried out in different countries to investigate possible migration of phthalate easters into packaged drinking water and beverages and resultant toxic effect on human health. This study aimed to determine the level of phthalate migration into bottled drinking water, manufactured commercially in India and to identify a possible relationship between the amount and type of phthalate migration. Eight phthalate easters were investigated. The analysis included 375 samples (75 sets of 5 bottles each from 5 manufacturers, having same batch numbers and manufacturing dates) of drinking water packed in 1-Litre bottles made from polyethylene terephthalate (PET). The samples were incubated and analyzed at the Centre of Mass Spectrometry (Analytics Department) of the CSIR-Indian Institute of Chemical Technology, Hyderabad on Agilent 6420 QQQ MS/MS system coupled to Agilent 1290 UPLC pump and Thermo TSQ Altis coupled to Thermo RSLC 3000 system at room temperature (27°C) and two temperatures of extreme conditions representing refrigeration temperature (4°C) and summer outdoor temperature (45°C) at the interval of 0, 30, 60, 120 and 180 days, 180 days (6 months) being the projected self-life for bottled drinking water in India. Of eight investigated phthalate esters, Di-butyl Phthalate (DBP) was detected in 94% and Di-isobutyl phthalate (DiBP) in 80% of samples analyzed. The highest migration of 0.0027 mg/l was recorded from PET bottles to drinking water for DBP, followed by 0.0024 mg/l for DiBP. DEHP (Bis(2-ethylhexyl) phthalate) was detected in 40% of sample sets with maximum concentration of 0.0006 mg/l. DPP (Di-pentyl phthalate) was detected in the least number of samples (21.3%) and its maximum concentration observed was 0.0004 mg/l. Migration of all eight investigated esters were detected in drinking water samples stored for 180 days at the three temperature conditions. In other temperature and storage conditions, frequency of detection varied between 0-66%. This study did not account for the factors like source of raw water, manufacturing process, PET types (virgin or recycled), and composition, etcetera. This is probably reflected in widely varied standard deviation. The phthalate levels measured in these samples pose no risk for human health considering reference dose determined by USEPA, EU and FSSAI, for daily oral exposure to the human population. Nevertheless, the accumulation of small individual quantity taken with time may increase the lifelong phthalate exposure and eventually threaten the exposed person's life. Further studies with larger sample size and variants may be desirable. Also, drinking water quality standards needs to be revisited to include all significant phthalate esters.*

***Keywords***: *Bottled drinking water in India, Phthalate esters migration*

# Publication by Members

**Dr Nilaj N Deshmukh** , FIE
*Dean (Faculty) & Head*
*Mechanical Engineering Department, Fr C Rodrigues Institute of Technology, Navi-Mumbai*
*nilaj.deshmukh@fcrit.ac.in*

Title of Paper: **Effect of Position of Radial Air Injection Plane on Control of Thermo-Acoustic Instability using Active Closed-Loop Method**

Journal of Vibration and Control, First Published: 14 October 2021

**DOI**: https://doi.org/10.1177%2F10775463211050175

**Co-authors**: Afzal Ansari, Praseed Kumar, Allen V George, Febin J Thomas & Merick Steve George

***Abstract***: *Thermo-acoustic instability occurs when self-excited oscillations are generated due to the coupling between unsteady heat release and acoustics. This phenomenon can result in an increased rate of vibration, structural damage, and produces unwanted emissions. Thermo-acoustic instability occurs in rocket engines, gas turbines, combustors, and furnaces. When thermo-acoustic instability occurs, many modes are developed naturally at a specific point. Some waves are unstable and some are stable. So, to study this phenomenon the most unstable waves are considered and a technique is developed to suppress these unstable waves. A radial air injector as a closed-loop active control method is used for breaking the coupling between the heat waves and acoustics inside the 1D combustion chamber. The distance between the burner and the air injector is varied for the fixed position of the burner with respect to the Rijke tube, that is, x/L = 0.01125, 0.0075, and 0.00375. This closed-loop method works based on the feedback acquired from a microphone. The control method is built using DAQ and Arduino with the LabVIEW as interface for Arduino (LIFA). An air flow rate controller setup is developed to control and measure air required for suppressing the thermo-acoustic instability. Thermo-acoustic instability is effectively suppressed with the help of radial injection in the form of micro-jets at the downstream of the burner as the closed-loop controlling method. It is concluded that when the radial micro-jet air injection plane is closer to the burner head, the thermo-acoustic instability gets suppressed in a short time and with a lesser quantity of air.*

***Keywords***: *Thermo-acoustic instability, Active control, Closed-loop method, Rijke tube, Radial air injection*

**Er Chiranjib Sarkar**, MIE
*Senior Structural Engineer*
*AECOM India Pvt Ltd*
*chiranjibjubce@gmail.com*

Book Chapter: **Seismic Behaviour of Tunnel Structure under Varying Surrounding Soil, Water Table and Overburden Condition**

Chapter 3, under Geotechnical Vulnerability Assessment, Recent Advances in Earthquake Engineering, Select Proceedings of VCDRR 2021, Part of the Lecture Notes in Civil Engineering book series (LNCE), Springer, Singapore, First Online: 21 September 2021, Volume 175, pp 259-270, ISBN (Print): 978-981-16-4616-4, ISBN (Online): 978-981-16-4617-1

**DOI**: https://doi.org/10.1007/978-981-16-4617-1_21

**Co-author**: Sibapriya Mukherjee

***Abstract***: *The increasing need to expand the urban transportation systems, tunnels and underground structures are playing crucial role in building modernized transportation networks. It has been observed during recent earthquakes that underground structures may undergo severe distress produced by excessive deformation. Hence, it is necessary to have a precise assessment of deformation, force and moment in structures caused by surrounding soil under seismic conditions. The variation of deformation, force and moment with varying characteristics of surrounding soil, water table and overburden pressure due to varying depth of structure need to be assessed properly for different seismic zones. Therefore, with this in view, a parametric study has been conducted for a typical box structure of size 10.0m wide x 6.0m high, having different depths of 8m, 10m and 12m, encountering varying soil layers of loose to medium, medium to dense and very dense non-cohesive soil at different seismic zones. The results of the study reveal that distortion and bending moment reduces by 14-22% and 15-22% respectively, when compactness of subsoil surrounding the structure changes from loose to medium and further to dense under same seismic conditions. Deformation also reduces by 4 to 7% due to increase in tunnel depth from 8m to 10m and then to 12m. On the other hand, deformation becomes almost double when seismic zone changes from III to IV for same soil condition. The outcome of the present study may be useful to the practicing engineers in design of underground structures.*

***Keywords***: *Underground structure, Metro and subways, Seismic effect, Ground deformation*

# Publication by Members

**Er Chandan Kumar**, MIE
*Manager,*
*POSOCO*
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Title of Paper: **Resilience of Electric Utilities during the COVID-19 Pandemic in the Framework of the CIGRE Definition of Power System Resilience**

International Journal of Electrical Power & Energy Systems, Elsevier, Volume 136, March 2022, Article ID 107703

**DOI**: https://doi.org/10.1016/j.ijepes.2021.107703

**Co-authors**: Spyros Skarvelis-Kazakos, Malcolm Van Harte, Mathaios Panteli, Emanuele Ciapessoni, Diego Cirio, Andrea Pitto, Rodrigo Moreno, Chris Mak, Ian Dobson, Christopher Challen, Milorad Papic & Craig Rieger

***Abstract***: *Resilience is a vital concept in engineering, business, and natural sciences, and is a measure of the ability of an entity to withstand High Impact Low Probability (HILP) events. During the COVID-19 pandemic, which started in late 2019/early 2020, power system utilities around the globe have responded in effective and efficient ways to enhance the resilience of their organisations, both in terms of real-time operations and prudent management of its infrastructure, in order to continue their mandate in providing reliable supply to meet customer demands. This paper presents the CIGRE definition for power system resilience, established by the C4.47 Working Group in 2018, and demonstrates the application of resilience-oriented thinking within the electrical sector. The response and recovery efforts are described, with respect to the key actionable measures integral to the power system resilience definition, taken before, during and after the COVID-19 pandemic. A practical conceptual framework is also presented for thinking about resilience in terms of three key components of resilience strategies: organisational, infrastructure and operational resilience. The paper also discusses the different strategies adopted in response to COVID-19, based on the C4.47 members' experiences during the pandemic. Finally, a case study is presented, which proves the effectiveness of a set of response measures, using graph theory and the characteristics of the staff-asset interactions.*

***Keywords***: *COVID-19, Power system resilience, Disaster recovery, Critical infrastructure, Organisational resilience, Graph theory*

**Er Srikanth Satish Kumar Darapu**, MIE
*Senior Assistant Professor*
*Certified Behavior and Mentoring Analyst (CBMA), CII-IGBC Accredited Faculty*
*Department of Civil Engineering, GIT, GITAM (Deemed to be University), Visakhapatnam*
*reach.dssk@gmail.com*

Title of Paper: **A Review on the State of the Development of Alternative Materials for Replacing Plastic Use**

ICTSGS-1 Conference led by Yamagata University Japan, SPAST Abstracts, Volume 1, No. 01, 30 September 2021, Smart Green Connected Societies Issue, Environmental Sciences Section

**DOI**: https://spast.org/techrep/article/view/1320

***Abstract***: *Indiscriminate use and untenable disposal of plastic have led to severe environmental consequences, which have drastically affected many life forms, especially marine animals, and resulted in their extinction. If the usage continues at the same pace, most life forms will become extinct much sooner than expected. Ultimately, the existence of human beings will be endangered. Hence, replacing plastic products with those manufactured from alternative sustainable materials must be given utmost priority and made mandatory by the statutory authorities. In this paper, a critical review of the state of alternative materials for replacing plastic use in alignment with achieving the sustainable development goals (SDGs) is presented, and insights for the way forward are discussed.*

***Keywords***: *Plastic, Plastic pollution, Plastic disaster, Alternative Sustainable materials, Sustainable development goals (SDGs), Environmental conservation, Eco-centric thinking*

# Publication by Members

**Er Rudraprasad Bhattacharyya**, MIE
*Senior Engineer*
*Applied Science, Thornton Tomasetti, Houston, TX, United States of America*
*rudraprasad.civil@gmail.com, RBhattacharyya@thorntontomasetti.com*

Title of Paper: **Multiscale Analysis of Multi-Directional Composite Laminates to Predict Stiffness and Strength in the Presence of Micro-Defects**

Composites Part C: Open Access, Elsevier B.V., Volume 6, October 2021, Published Online: 16 September 2021, Article ID: 100189, ISSN: 2666-6820

**DOI**: https://doi.org/10.1016/j.jcomc.2021.100189

**Co-author**: Douglas Adams

***Abstract***: *A methodology is proposed to incorporate spatial distributions of micro-defects within a three dimensional multiscale modeling framework for Carbon Fiber Reinforced Polymer (CFRP) composites to predict stiffness and strength properties of laminates for use in structural design and in establishing nondestructive inspection protocols. Defects in both the fiber and matrix due to variations in the manufacturing process for fiber reinforced composite laminates are considered. Stochastic sampling of micro-defects based on experimental data using Ripley's K-function is proposed. Three different laminate void volume fractions are used. Spatial statistical analysis is performed for the micro-defects, and then a methodology is presented for predicting stiffness and ultimate strength of three multi-directional composite laminates with distributions of microstructural defects. The results indicate that, in addition to the volume of micro-defects that are present, the spatial distribution of the micro-defects plays a significant role in mechanical properties of laminates, especially the ultimate strength for which a 3.62% reduction is seen in the simulations of laminates containing distributions of micro-defects. Based on these results, it is recommended that the spatial statistics of micro-defects in manufactured composites be incorporated into both design criteria and nondestructive inspection criteria for composite laminates.*

***Keywords***: *Multiscale modeling, Micro-defects, Spatial statistics, Composite laminate*

Title of Paper: **Computationally Efficient Multiscale Modeling for Probabilistic Analysis of CFRP Composites with Micro-Scale Spatial Randomness**

Composite Structures, Volume 280, Elsevier, 15 January 2022, Published Online: 30 October 2021, Article ID: 114884, ISSN: 0263-8223

**DOI**: https://doi.org/10.1016/j.compstruct.2021.114884

**Co-authors**: Sankaran Mahadevan & Prodyot K Basu

***Abstract***: *The physics of spatial material randomness in CFRP composites is incorporated in a concurrent multiscale modeling framework. A sampling based non-intrusive approach is adopted to demonstrate natural variability in the material. The key outcome is the computational efficiency achieved by the proposed numerical model. Improvement in computational cost is achieved by the strategic use of parallel computing tools. Multi-directional fiber composite laminates are numerically modeled to predict progressive damage. The accuracy of the framework is demonstrated by comparing with experimental results of unnotched and open-hole quasi-isotropic laminates.*

***Keywords***: *Multiscale method, Composite laminate, Spatial randomness, Parallel computing*

Title of Paper: **Calibration and Validation of Multiscale Model for Ultimate Strength Prediction of Composite Laminates under Uncertainty**

ASCE-ASME Journal of Risk and Uncertainty in Engineering Systems, Part B: Mechanical Engineering, Volume 8, Issue 2, June 2021, Published Online: 07 January 2022, ISSN: 2332-9017

**DOI**: https://doi.org/10.1115/1.4053060

**Co-author**: Sankaran Mahadevan

***Abstract***: *A methodology to account for the effect of epistemic uncertainty (regarding model parameters) on the strength prediction of carbon fiber reinforced polymer (CFRP) composite laminates is presented. A three-dimensional concurrent multiscale physics modeling framework is considered. A continuum damage mechanics-based constitutive relation is used for multiscale analysis. The parameters for the constitutive model are unknown and need to be calibrated. A least squares-based approach is employed for the calibration of model parameters and a model discrepancy term. The calibrated constitutive model is validated quantitatively using experimental data for both unnotched and open-hole specimens with different composite layups. The quantitative validation results are used to indicate further steps for model improvement.*

***Keywords***: *Multiscale modeling, Model calibration, Surrogate model, Uncertainty quantification*

# Publication by Members

**Er Mukesh Rawal**, MIE
*Senior Manager*
*TCE Ltd*
*mukeshrawalbe@rediffmail.com*

Title of Paper: **Role of Emerging Technologies in Inspection and Quality Control for Sustainable Manufacturing**

35th National Convention of Production Engineers, organized by IEI, Durgapur Local Centre under the aegis of the Production Engineering Division during October 30-31, 2021 in virtual mode/hybrid mode.

***Abstract***: *Emerging technology is the necessity of today's manufacturing industry. Emerging technology corresponds to the growing digitization of industry, which uses advanced technologies to enhance the quality for sustainable manufacturing. Manufacturing industry is worst affected with the time and cost overruns. The major source of time and cost overruns has been identified as inefficiency of resources. In today's competitive world manufacturing industry cannot survive by implementing the traditional inspection and Quality Control methods. Digital technologies in quality paired with more sophisticated methods and smarter processes will allow high-performance teams to provide consumers with high-performance and quality goods reliably. Sensors play an essential role in improving the quality of manufacturing and services. These can improve protection, increased internal productivity and sustainable operations. The coalition of emerging technology with the role of Inspection and Quality Control engineer can satisfy the needs as well as bring added value to the Sustainable Manufacturing.*

***Keywords***: *Emerging technologies, Inspection, Quality control, Sustainable manufacturing*

**Er Logesh Rajendran**, MIE
*Senior Architect*
*L&T Smart World, Chennai*
*srlogesh@gmail.com*

Title of Paper: **Safety for HER: A Systematic Approach with Coalescence of Technology and Citizens**

2021 IEEE International Conference on Electronics, Computing and Communication Technologies (CONECCT), IEEE, Date Added to IEEE Xplore: 07 December 2021, ISBN (Online): 978-1-6654-2849-1, Print on Demand (PoD) ISBN: 978-1-6654-2850-7, ISSN (Online): 2766-2101, Print on Demand (PoD) ISSN: 2334-0940

**DOI**: 10.1109/CONECCT52877.2021.9622587

**Co-author**: Shyam Shankaran R

***Abstract***: *The SOS (Save Our Soul) application software is designed primarily for women in situations of distress. A possible emergency happens without proper intimation hence detecting and reporting those emergencies on-time is a crucial problem in real-lifesituations. The proposed SOS application has unique characteristics that make it different from a predecessor of SOS frameworks and offers swift responsiveness that stands out. For anyone who can be in an uncertain situation, the proposed platform approach is to ensure safety, security, and emergency on nearly on-time. Initially, an application allows citizens to register as "SOS Responder" as these registered volunteers are the instant ones who would act immediately during emergencies. Apart from the SOS responder the application also has the feature of notifying enrolled Emergency contacts, family, friends, Patrol Police and share live GPS location, activated front and back camera video feeds, etc. SOS app has two inputs orange and red category, during a situation woman can press orange if she is unsure of the travel location, this case lives location, video feeds sent to the ICT (Information and communication technology) control centre to keep track of travel and ensuring safety. For emergencies, the red button can be pressed to activate a notification to "SOS Responder/s and enrolled emergency contacts. Since probability is very high for SOS responder/s to acknowledge the notification and track victim based on live map positioning. Based on the emergency notification the ICT command centre could track down the situation by coordinating with Patrol police, SOS responders, etc. The police command centre may also have the facility to GPS live imaging, Access to all the surveillance cameras within the proximity radius, identify the tower signals used by mobiles, analyse the crime database based on any critical pieces of evidence, etc. This framework overcomes the real-life challenges and can be quickly implemented into any security forces and e-government structure.*

***Keywords***: *Embedded systems, Law enforcement, Databases, Surveillance, Cameras, Registers, Information and communication technology*

# Publication by Members

**Dr Ramesh S Sharma**, MIE
*Professor*
*Department of Mechanical Engineering, RV College of Engineering, Bangalore*
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Title of Paper: **A Machine Learning Approach to predict the Stress Results of Quadratictetrahedral Elements**

Proceedings of the Institution of Mechanical Engineers, Part C: Journal of Mechanical Engineering Science, SAGE Journals, First Published Online: 07 December 2021, ISSN: 0954-4062, ISSN (Online): 2041-2983

**DOI**: https://doi.org/10.1177/09544062211010828

**Co-authors**: S Mahesh, Schiffel Marco, M K Praveenkumar, Vishal Wadagavi & Lakshminarasimhan Subbarao

***Abstract***: *Industries are always looking for an effective and efficient way to reduce the computation time of simulation because of the huge expenditure involved. From basics of Finite Element Method (FEM), it is known that, linear order finite elements consume less computation time and are less accurate compared to higher order finite elements say quadratic elements. An approach to get the benefit of less computation cost of linear elements and the good accuracy of quadratic elements can be of a good thought. The methodology to get the accurate results of quadratic elements with the advantage of less simulation run time of linear elements is presented here. Machine Learning (ML) algorithms are found to be effective in making predictions based on some known data set. The present paper discusses a methodology to implement ML model to predict the results equivalent to that of quadratic elements based on the solutions obtained from the linear elements. Here, a ML model is developed using python code, the stress results from Finite Element (FE) model of linear tetrahedral elements is given as the input to it to predict the stress results of quadratic tetrahedral elements. Abaqus is used as the FEM tool to develop the FE models. A python script is used to extract the stresses and the corresponding node numbers. The results showed that the developed ML model is successful in prediction of the accurate stress results for the set of test data. The scatter plots showed that the Z-score method was effective in removing the singularities. The proposed methodology is effective to reduce the computation time for simulation.*

***Keywords***: *Finite element method, Machine learning, Abaqus, Python script, Linear and quadratic tetrahedral elements*

**Dr A K Priya**, MIE
*Associate Professor*
*Department of Civil Engineering, KPR Institute of Engineering and Technology, Coimbatore*
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Paper Title: **Occurrences and Removal of Pharmaceutical and Personal Care Products from Aquatic Systems using Advanced Treatment—A Review**

Environmental Research, Elsevier, Volume 204, Part C, March 2022, Article ID 112298

**DOI**: https://doi.org/10.1016/j.envres.2021.112298

**Co-authors**: Lalitha Gnanasekaran, Saravanan Rajendran, Jiaqian Qin & Yasser Vasseghian

***Abstract***: *Pharmaceuticals, personal care items, steroid hormones, and agrochemicals are among the synthetic and indigenous products that make up micropollutants, also known as emerging contaminants. Pharmaceutical and personal care products (PPPs) are a class of developing micropollutants that can harm living organisms even at low concentrations. Many are detected in surface water and wastewater from the treatment process, with quantities ranging from ng L-1 to gL-1; however, residual PPPs at dangerously high levels have indeed recently been recognized in the ecosystem. Residential sewage treatment plant (STP) dump the largest majority of these pollutants into the environment on a regular basis. As a result of its robust structure, it has a longer life span in the environment. This review article discusses how surface water pollutants such pesticides, petroleum hydrocarbons, and perfluorinated compounds affect water quality, as well as the most cost-effective adsorbents for removing these PPPs. The goal of this study is to provide information about the origins of PPP, as well as diagnostic procedures and treatment options. Research on developing contaminants is also aimed at evaluating the efficacy and affordability of adsorption.*

***Keywords***: *Micropollutants, Pharmaceutical, Personal care products, Sewage treatment plants, Adsorption*

# Publication by Members

**Dr C Kayalvizhi**, AMIE
*Professor/Head*
*Department of Textile Technology, RVS College of Engineering, Dindigul, Tamil Nadu*
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Paper Title: **Evaluation of the Seam Quality in Garments**

International Journal of Research in Engineering and Science (IJRES), ISSN (Online): 2320-9364, ISSN (Print): 2320-9356, Volume 9, Issue 6, 2021, pp. 01-09

**URL**: https://www.ijres.org/papers/Volume-9/Issue-6/Ser-1/A09060109.pdf

**Co-author**: N Gokarneshan

***Abstract***: *In the production of garments, seams are considered as fundamental requirement. The quality of garment is normally considered to be strongly affected by seam performance. Durability and smoothness of the seams are considered important in garment. Based on the kind of fabric and garment, the choice of stitch and seam types and stitch and seam parameters should be done. The types of stitch and seam, their parameters, seam defects and damages determine the appearance and performance of seams. Seam performance of a garment also depends on structural and mechanical properties of the fabric and strength, extensibility, security, durability, appearance and efficiency of the seams. In this study, the importance of the seam performance of garments is investigated. In this context, stitch and seam types used in garments are explained. However, the stitch and seam parameters, sewing needle penetration force, needle damage index, seam defects and damages that are effective at seam performance have been explained and their relations with each other are compared.*

***Keywords***: *Garment, Quality, Seam, Stitch, Performance, Mechanical properties*

**Dr Manikandan Sridharan**, AMIE
*Associate Professor and Head*
*Department of Information Technology, EGS Pillay Engineering College, Nagapattinam, Tamil Nadu*
*profmaninvp@gmail.com*

Title of Paper: **Virtualized Load Balancer for Hybrid Cloud using Genetic Algorithm**

Intelligent Automation & Soft Computing, Tech Science Press, Volume 32, No.3, 09 December 2021, pp.1459-1466, ISSN (Print): 1079-8587, ISSN (Online): 2326-005X

**DOI**: 10.32604/iasc.2022.022527

**Co-author**: M Chinnadurai

***Abstract***: *Load Balancing is an important factor handling resource during running and execution time in real time applications. Virtual machines are used for dynamically access and share the resources. As per current scenario cloud computing is played major for storage, resource accessing, resource pooling and internet based service offering. Usage of cloud computing services is dynamically increased such as online shopping, education, ticketing, etc. Many users can use the cloud resources and load balancing is used for adjusting the virtual machine and balance the node. Our proposed virtualized genetic algorithms are to provide balanced virtual machine services in Hybrid cloud. The proposed algorithm and experiments are implemented by using Cloud simulator. In this paper the experiments are done with cloud computing models, Virtual Machine allocation, load balancing and simulations. Also compare the results using response time, throughput and turnaround time using cloud sim. The accuracy can be compared with existing load balancing techniques.*

***Keywords***: *Load balancing, Hybrid cloud, Virtual machine, Genetic algorithm, Cloud simulator*

# Publication by Members

**Er S Valai Ganesh**, AMIE
*Assistant Professor*
*Department of Mechanical Engineering, Ramco Institute of Technology, Rajapalayam*
*valaiganesh@gmail.com*

Title of Paper: **Role of Modern Technologies and Internet of Things in the Field of Solid Waste Management**

International Journal of Computers, Communications and Control, Oradea, Volume 16, Issue 5, October 2021, ISSN (Online): 1841-9844, ISSN-L: 1841-9836, Article Number: 4239

**DOI**: https://doi.org/10.15837/ijccc.2021.5.4239

**Co-authors**: S Godwin Barnabas, K Arun vasantha Geethan, S Rajakarunakaran & P Sabarish Kuma

***Abstract***: *The process of handling solid waste becomes complex and tedious due to the urbanizationand industrialization of the most developing and developed countries. These solid waste issuesif it is not addressed properly it affects ecosystem and environment. There is a possibility of many health-oriented issues especially during the pandemic period covid-19. Most of the human beings are struggling with respiratory pulmonary diseases, asthma caused by these solid wastes. Most of the governments are also spending huge amount of money for labors, devices and some technologies to tackle these solid waste issues. There is also an opportunity for the government to generate revenue from these solid wastes by properly sorting this waste into recyclable, non-recyclable and bio-degradable wastes. But when humans are involved in sorting these waste it will cause some diseases and hygienic problems. So,in order to address the above said issues in this work the role of modern technologies, algorithms and some Internet of things (IoT) methods are discussed. Implementing these technologies in the future will save huge amount of money spent by the government for the solid waste management activities.*

***Keywords***: *Environment, Pandemic period, Diseases, Technologies, Internet of things*

# Published Articles of IEI Journals


## Journal of The Institution of Engineers (India): Series B

(Electronic ISSN: 2250-2114; Print ISSN: 2250-2106)
[SCOPUS Indexed & UGC-CARE (India) listed]
For download, use Membership ID through: www.ieindia.org

### Volume 103, Issue 1, February 2022

Title: **A Low-Power Digitally Controlled Ring Oscillator Design with IMOS Varactor Tuning Concept**
Authors: **Manoj Kumar**: University School of Information, Communication and Technology, Guru Gobind Singh Indraprastha University, New Delhi, India
DOI: https://doi.org/10.1007/s40031-021-00621-6
Publication date: 05 June 2021
Pages: 1 – 11

Title: **A New Software for Investigating the Function and Modeling the Non-isolated DC–DC Switching Converters**
Authors: **Mohammadreza Modabbernia, Reza Golab, Alireza Akoushideh** & **Kazem Ghorbani**: Department of Electrical Engineering, Guilan Branch, Technical and Vocational University, Rasht, Iran
DOI: https://doi.org/10.1007/s40031-021-00628-z
Publication date: 24 June 2021
Pages: 13–28

Title: **A Study on the Effect of Thresholding Enhancement for the Classification of Texture Images**
Authors: **Osheima Sony, T Palanisamy** & **P Paramanathan**: Amrita Vishwa Vidyapeetham, Coimbatore, India
DOI: https://doi.org/10.1007/s40031-021-00610-9
Publication date: 09 June 2021
Pages: 29–37

Title: **Analysis of Cross T-Type MLI using Different Modulation Schemes**
Authors: **Sumit Raj, Rajib Kumar Mandal** & **Mala De**: Department of Electrical Engineering, National Institute of Technology, Patna, India
DOI: https://doi.org/10.1007/s40031-021-00646-x
Publication date: 12 July 2021
Pages: 39–50

Title: **Cost-based Unit Commitment in a Stand-Alone Hybrid Microgrid with Demand Response Flexibility**
Authors: **Sunil Kumar**: Department of Electrical Engineering, National Institute of Technology, Kurukshetra, India
DOI: https://doi.org/10.1007/s40031-021-00634-1
Publication date: 23 June 2021
Pages: 51–61

Title: **Demand-Side Management in an Indian Village**
Authors: **Sandeep Bhongade, R S Dawar** & **S L Sisodiya**: Shri Govindram Seksaria Institute of Technology and Science, Indore, Madhya Pradesh, India
DOI: https://doi.org/10.1007/s40031-021-00639-w
Publication date: 08 July 2021
Pages: 63–71

Title: **Distributed Big Data Clustering using MapReduce-based Fuzzy C-Medoids**
Authors: **Tanvir H Sardar**: School of Computer Science & Engineering, Jain University, Bangalore, India
**Zahid Ansari**: Electrical Engineering Section, University Polytechnic, Aligarh Muslim University, Aligarh,India
DOI: https://doi.org/10.1007/s40031-021-00647-w
Publication date: 27 July 2021
Pages: 73–82

Title: **Extended Applications of Compressed Sensing Algorithm in Biomedical Signal and Image Compression**
Authors: **Parnasree Chakraborty** & **Tharini Chandrapragasam**: BSA Crescent Institute of Science &

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Technology, Chennai, India
DOI: https://doi.org/10.1007/s40031-021-00592-8
Publication date: 09 June 2021
Pages: 83–91

Title: **High-Impedance Restricted Earth Fault Relay Settings: Impact of using Auxiliary Current Transformers on Phase Side for Ratio Matching**
Authors: **Subramanian Vanchier Payyalore** & **Sridhar Palanisamy**: Independent Print Ltd., Pune, India
DOI: https://doi.org/10.1007/s40031-021-00609-2
Publication date: 09 June 2021
Pages: 93–99

Title: **Improvement of Drive Currents of FinFET using Strained Si Technology**
Authors: **Supratim Subhra Das**: Department of Electronics and Communication Engineering, Mallabhum Institute of Technology Bishnupur, Bankura, West Bengal, India
DOI: https://doi.org/10.1007/s40031-021-00641-2
Publication date: 20 July 2021
Pages: 101–105

Title: **Improved based Differential Evolution Algorithm using New Environment Adaption Operator**
Authors: **Shailendra Pratap Singh**: Department of Computer Science and Engineering, Bundelkhand Institute of Engineering and Technology, Jhansi, Uttar Pradesh, India
DOI: https://doi.org/10.1007/s40031-021-00645-y
Publication date: 23 July 2021
Pages: 107–117

Title: **Improving the Test Time of M-Distance based Recommendation System**
Authors: **Narges Hasanzadeh** & **Yahya Forghani**: Mashhad branch, Islamic Azad University, Mashhad, Iran
DOI: https://doi.org/10.1007/s40031-021-00626-1
Publication date: 09 June 2021
Pages: 119–129

Title: **Map Reduce-based Fuzzy C-means Algorithm for Distributed Document Clustering**
Authors: **Tanvir H Sardar**: School of Computer Science & Engineering, Jain University, Bangalore, India
**Zahid Ansari**: Electrical Engineering Section, University Polytechnic, Aligarh Muslim University, Aligarh, India
DOI: https://doi.org/10.1007/s40031-021-00651-0
Publication date: 19 July 2021
Pages: 131–142

Title: **Mitigating Environmental Impact by Optimizing Base Load Generation in Energy Mix**
Authors: **Maneesha Naresh** & **Manoj Kumar Nigam**: Department of Electrical Engineering, MATS University, Raipur, India
**Shashwati Ray**: Department of Electrical Engineering, Bhilai Institute of Technology, Durg, Madhya Pradesh, India
**Anirban Guha**: Kolkata, India
DOI: https://doi.org/10.1007/s40031-021-00612-7
Publication date: 22 June 2021
Pages: 143–151

Title: **Multi-objective Control of Solar PV-BES Microgrid**
Authors: **Tripurari Nath Gupta**, **Bhim Singh** & **Syed Bilal Qaiser Naqvi**: Department of Electrical Engineering, Indian Institute of Technology Delhi, New Delhi, India
DOI: https://doi.org/10.1007/s40031-021-00598-2
Publication date: 09 June 2021
Pages: 153–161

Title: **Parallel Inverters Control in Standalone Microgrid using different Droop Control Methodologies and Virtual Oscillator Control**
Authors: **Gurugubelli Vikash** & **Arnab Ghosh**: Department of Electrical Engineering, National Institute of Technology, Rourkela, India
DOI: https://doi.org/10.1007/s40031-021-00613-6
Publication date: 08 June 2021
Pages: 163–171

Title: **Planning and Optimization of Hybrid Microgrid for Reliable Electrification of Rural Region**
Authors: **Md Mustafa Kamal** & **Imtiaz Ashraf**: Department of Electrical Engineering, Aligarh Muslim University,

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Aligarh 202002, India
DOI: https://doi.org/10.1007/s40031-021-00631-4
Publication date: 07 July 2021
Pages: 173–188

Title: **Statistical Switching Overvoltages of 1200 kV UHV AC Transmission Line**
Authors: **Ramchandra Reddy Annadi** & **Chandra Sekhar Patsa**: Department of Electrical & Electronics Engineering, Mahatma Gandhi Institute of Technology, Hyderabad, India
DOI: https://doi.org/10.1007/s40031-021-00643-0
Publication date: 08 July 2021
Pages: 189–195

Title: **Transmission Line Fault Classification under High Noise in Signal: A Direct PCA -Threshold-Based Approach**
Authors: **Alok Mukherjee**: Government College of Engineering and Ceramic Technology, Kolkata, India
**Palash Kumar Kundu** & **Arabinda Das**: Department of Electrical Engineering, Jadavpur University, Kolkata, India
DOI: https://doi.org/10.1007/s40031-021-00601-w
Publication date: 15 June 2021
Pages: 197–211

Title: **Ultra-miniaturized DGS-based Meander Line Multi-band Filters with/without Resonators for Satellite Band Applications**
Authors: **S Oudaya Coumar**: Department of Electronics and Communication Engineering, Vel Tech Rangarajan Dr. Sakunthala R&D Institute of Science and Technology, Chennai, India
DOI: https://doi.org/10.1007/s40031-021-00625-2
Publication date: 08 June 2021
Pages: 213–223

Title: **Comparison of Anti-islanding Protection in Single- and Three-Phase Solar Grid Connected String Inverters**
Authors: **K Jeykishan Kumar**: ERED Division, Central Power Research Institute, Bengaluru, India
DOI: https://doi.org/10.1007/s40031-021-00635-0
Publication date: 23 June 2021
Pages: 225–235

Title: **Sterilization of Dry-Type Transformer Winding by Conducting Short-Circuit Test in Nuclear Power Plant: A Case Study**
Authors: **Kudiyarasan Swamynathan**, **A Singadurai** & **P Sivakumar**: Department of Atomic Energy, Bharatiya Nabhikiya Vidyut Nigam Limited, Kalpakkam, Tamil Nadu, India
DOI: https://doi.org/10.1007/s40031-021-00640-3
Publication date: 30 June 2021
Pages: 237–244

Title: **A Review on Existing IoT Architecture and Communication Protocols used in Healthcare Monitoring System**
Authors: **Navneet Verma** & **Sukhdip Singh**: Computer Science and Engineering Department, Deenbandhu Chhotu Ram University of Science & Technology, Sonipat, Haryana, India
**Devendra Prasad**: Institute of Engineering and Technology, Chitkara University, Punjab, India
DOI: https://doi.org/10.1007/s40031-021-00632-3
Publication date: 09 June 2021
Pages: 245–257

Title: **Exploiting Emojis in Sentiment Analysis: A Survey**
Authors: **Vandita Grover**: Department of Computer Science, Acharya Narendra Dev College, University of Delhi, New Delhi , India
DOI: https://doi.org/10.1007/s40031-021-00620-7
Publication date: 12 June 2021
Pages: 259–272

Title: **TCP/IP Layerwise Taxonomy of Attacks and Defence Mechanisms in Mobile Ad Hoc Networks**
Authors: **Ankita A Mahamune** & **M M Chandane**: Department of Computer Engineering and Information Technology, Veermata Jijabai Technological Institute, Mumbai, India
DOI: https://doi.org/10.1007/s40031-021-00627-0
Publication date: 15 June 2021
Pages: 273–291

# Call for Papers

Full-length papers for the **Annual Technical Volumes** (**ISBN numbered**) of different Engineering Divisions are invited by The Institution of Engineers (India) from eminent engineers, technologists, professionals, and researchers on identified themes as appended below.

These volumes intend to accommodate original Research articles; Review articles, Brief communications, Case studies and Articles of Professional Interest. Submitted manuscripts should not have been published previously, nor be under consideration for publication elsewhere. All manuscripts will be subjected to a suitable review process and thereafter accommodated in the Technical Volumes if found suitable. The release of the Annual Technical Volumes will be communicated to the authors once it is finalized.

The paper (full length) should be submitted to respective email ids as indicated against each engineering disciplines on or before **15 March 2022**. The paper should be prepared following our standard paper template and must be accompanied by the duly filled-in 'Declaration Form' both of which are available on our website
**(URL: *https://www.ieindia.org/webui/IEI-Publication.aspx#annual-technical-volume*)**.

## Aerospace Engineering Division

Volume No 5

### *Theme* : Small Satellites Initiatives in India

***On the Theme*** :

The small satellite is envisaged to provide platform for stand-alone payloads, which facilitate earth imaging and science missions within a quick turnaround time. Small satellites are miniaturized satellites with wider range of users, all over the world. Small satellites have several advantages over large satellites namely cost effective ways to test newer technologies, opportunities for local industry, bigger basket of potential users and thus a large variety of mission possibilities. Small satellites are transforming the dynamics and economics of space industry and ensure that space technology is no longer monopolized by nations, but is accessible to smaller and newer entities. As a space-faring nation for over last five decades, India is set to become the hub for the small satellite launch market, which is projected to be valued a substantial amount in near future. Start-ups will be the key drivers in this space, with a few among them on the final stages of developing low-cost solutions that conform to global standards. The recent reforms by the Government of India will further accelerate private sector participation in the sector. Although small spacecraft have existed for decades, in recent years, small satellites have gained considerable importance, particularly in defense sectors, which have recently gained prominence owing to technological advances in their development and integration into the armed services of the major space faring countries across the world.

***Sub-themes*** :

* Technological Innovations, Business Opportunities and Commercialization of Indian Space Industry
* Role of MSMEs and Start Ups in Small Satellite initiatives and development
* Cryogenic Engine Technology and Indian Space Market
* Design and Advancement in Satellite Launch Vehicle
* Business Initiatives for Components, Sub-assemblies and Spare Manufacturing in Aerospace Startups
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# Call for Papers

## Electronics and Telecommunication Engineering Division

Volume No 5

*Theme :*

## Recent Trends in Antenna Technology for Modern Wireless Communication

### *On the Theme:*

Antenna design is an integral part of the communication system and plays a vital role in maintaining the quality of communication. Efficient antennas are employed as they are potentially responsible for the enhancement in system performance. These antennas have to perform critical activities that are required for efficient communication. The antennas have been successfully utilized in various sectors that include cellular communication systems, satellite communication links, military, defense, and health care services, and so on.

### *Sub-themes:*

- Antenna Theory and Design
- Planar Antennas
- Broadband and Multiband Antennas
- Antenna Arrays
- Optical Antennas
- Smart Antennas and RF Sensors
- Wireless and Mobile communication
- Wireless Sensor Networks
- Wireless Security
- MIMO Systems Internet of Things
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- 5G mobile Networking
- Any other related topics

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# Call for Papers

## Marine Engineering Division

Volume No 5

*Theme* :

## Advancements in Ship Building Technology — Way Ahead towards New Normal

### *On the Theme* :

The COVID-19 pandemic has underscored the global interdependency of nations and set in motion new trends, which is reshaping the maritime transport landscape. The Indian maritime sector is at a pivotal moment facing not only immediate concerns resulting from the pandemic but also longer-term considerations, ranging from shifts in supply-chain design and globalization patterns to changes in consumption and spending habits, a growing focus on risk assessment and resilience-building, as well as a heightened global sustainability and low-carbon agenda. The sector is also dealing with the knock-on effects of growing trade protectionism and inward-looking policies. The shipbuilding industry is now witnessing an unparalleled transformation with growing demand to build new vessels and expand geographic routes, tight budgetary measures, and most importantly, the need to deliver reliable designs at affordable costs. The shipbuilding industry is now characterized with complex value chain, which involves construction of large structures. Moreover, rising demand for flexible ships poses a challenge due to the traditional construction approach prevalent in the industry. In the presence of these demanding market requirements, advanced technologies such as Industrial Internet of Things (IIoT) plays a crucial role in modernizing fleets in a cost-effective manner and also within a shorter time span. IIoT addresses various constraints pertaining to capital allocation, design, and build, and more importantly, supports optimal utilization of vessels during the commissioning and decommissioning phase of new and existing ships.

### *Sub-themes* :

* Technological Advancement in Shipping Industry in New Normal
* Global Recovery in Shipping in New Normal: The Way forward
* Maritime Industry 4.0
* Digital Transformation of Ship Building Industry – The Way Ahead
* Advancements in Shipbuilding Value Chain
* Reorientation of post pandemic marine workforce and Seafarers

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# Call for Papers

## Mechanical Engineering Division

Volume No 6

*Theme* :

### Applications of Artificial Intelligence and Machine Learning in Mechanical Engineering — The Post Pandemic Pathway

*On the Theme* :

Amidst the ongoing global crisis, the engineers, scientists, and professionals have so far played a stellar role and have constantly scaling up their efforts and have been responsive to the challenges posed by the COVID-19 pandemic. The application of Machine Learning (ML) and Artificial Intelligence (AI) during the first wave of pandemic encouraged the researchers to outline new angles to explore different fields of mechanical engineering contributing to uninterrupted industrial growth of the country. The rapid advancements in the field of fluid mechanics leads to, unprecedented volumes of data driven experiments, field measurements, and large-scale simulations at multiple spatiotemporal scales. Moreover, Machine Learning algorithms can augment domain knowledge and automate tasks related to flow control and optimization. Tribology is another area which has been empowered with AI, ML, Big Data tools and led to evolution of '**Tribo-informatics / Intelligent Tribology**'. As we embrace the new normal, most of the facets of mechanical engineering will be data driven and AI and ML need to be vectored in to optimize workspace, product and services.

*Sub-themes* :

* Study of IC Engine in light of Artificial Intelligence (AI) and Machine Learning (ML)
* Design, Operation and Maintenance of Turbine: A Machine Learning Approach
* Advancement in Boiler Design, Operation & Maintenance through AI and ML Approach
* Advancement in Machine Design through AI and ML Approach
* Advances in Thermodynamics and Heat Transfer: The Machine Learning Approach
* Neural Network in Kinematics: Challenges and Opportunities
* Predictive Maintenance and Failure Analysis: AI and ML Approach
* Tribology and Condition Monitoring: Supervised and Unsupervised Learning Approach
* Fluid Mechanics and Heat Transfer: A Data Driven Approach
* Application of Machine Learning in Mechanical System Modeling and Simulation
* Assessment of Behaviours of Mechanical Systems through AI and ML
* Machine Installation and Commissioning through Machine Learning Approach
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# Call for Papers

## Metallurgical & Materials Engineering Division

Volume No 5

*Theme* :

## Integrated Computational Materials Engineering

***On the Theme*** :

Integrated computational materials engineering (ICME) is an emergent field that aims to integrate computational materials science tools into a holistic system that can accelerate materials development, transform the engineering design optimization process, and unify design and manufacturing. Even though in its nascent state, ICME presents a grand challenge laden with prospects of achieving significant economic benefit and accelerate innovation in the engineering of materials and manufactured products. Papers from eminent engineers and technologists on contemporary issues having technical relevance to the theme shall be included in this volume. It is expected that the articles will be of academic values, and reflect experience of professional engineers.

***Sub-themes*** :

* Computer Simulations at Different Time Scales,
* Multi scale Aspects of Materials,
* Creating Newer Materials,
* Thermodynamics of Materials Engineering,
* Principles of Engineering Practice,
* Fundamentals of Materials Science and Engineering,
* Electronic Structure Theory and Methods,
* Applications of First-Principles Methods,
* Molecular Dynamics (MD),
* Material Structures using Finite Element Methods (FEM);
* Crystal Plasticity Theory etc.

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# Call for Papers

## Mining Engineering Division

Volume No 4

*Theme* :

## Future of Mining

*On the Theme :*

The evolution of technology, from advanced data analytics to artificial intelligence (AI), has always had the potential to transform the mining industry by realizing operational efficiency improvements, enhancing productivity, improving safety performance, empowering employees to do more meaningful work, and allowing communities to be more prosperous. The COVID-19 crisis has exposed the siloed nature of mining companies and highlighted the need for integrated operations. This is likely to accelerate the adoption of digital technologies, artificial intelligence, and analytics in the mining industry. This volume will discuss what future has in store for the mining sector and the likelihood of vectoring in the intelligent, integrated operations in mining in a comprehensive manner. Papers from eminent engineers, technologists, professionals and researchers on contemporary issues having technical relevance to the theme shall be included in this volume.

*Sub-themes :*

* Climate-Smart Mining
* Responsible Sourcing (Decrease environmental footprint, Increase social footprint)
* Adoption of low carbon product strategies
* Collaboration to set new mining standards based on environmental, social and governance (ESG) principles
* Digitalization for more sustainable use of resources & lowering input cost
* Automation for enhancing productivity
* Smart mine power distribution and energy management
* New frontiers: deep sea, space exploration
* Resilient Mining Practices

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# Call for Papers

## Production Engineering Division

Volume No 6

*Theme* :

### Applications of Machine Learning, Deep Learning and Artificial Intelligence in Manufacturing — The Way Forward

*On the Theme :*

The advent of fourth industrial revolution ushered in huge industrial reforms and a paradigm shift in manufacturing from conventional product oriented labour intensive approach to a customer oriented data driven one and reinstated that promoting digital innovations coupled with intelligent decision making is the way forward. With the introduction of IIoT, Digital Twins, Smart Factories, Cyber-Physical Systems, Indian manufacturing sector has created a niche for itself in terms of productivity, efficiency and overall growth. Smart manufacturing revolution has enabled the manufacturing units to achieve timeless manufacturing goal with the objective to produce products with stated degree of precision and accuracy in a cost effective manner. In this context, Artificial Intelligence and Machine Learning are the core technologies which have provided stimulus for this transformation. These technologies, leveraged by Industry 4.0, namely Internet of Things, Advanced Embedded Systems, Cloud Computing, Big Data, Cognitive Systems, Virtual and Augmented Reality needs to be leveraged further as we prepare ourselves for adopting a newer, resilient and a self-reliant manufacturing eco-system.

*Sub-themes :*

* Data Driven Decision Making in Production Planning and Control
* Advances in Machine Tools: Artificial Intelligence and Deep Learning Approach
* Assessment of Industrial Automation in Machine Learning Environment
* Deep Learning and Smart Manufacturing – The Way forward
* Application of Big Data Analytics in Manufacturing
* Smart Warehousing, Warehouse Optimization and Inventory Management
* Artificial Intelligence and Robotics in Welding Industry
* Lean and Agile Supply Chain: Machine Learning Approach
* Digital Fabrication and 3D Printing
* Industry 4.0 and Project Management: The Way Forward
* Business Analytics and Knowledge Management
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# Call for Papers

## Textile Engineering Division

Volume No 5

***Theme*** :

## Development and Application of Functional Textiles

***On the Theme*** :

Functional textiles, as we all know, are textiles with integrated functions of controlling or adjusting according to its application area. Functional textiles, over the years, have developed a niche for itself in textile industry and the associated fraternity. This range includes breathable, heat and cold-resistant materials, ultra-strong fabrics (e.g. as reinforcement for composites), new flame retardant fabrics (e.g. intumescent materials), optimized textile fabrics for acoustic properties, etc. Functional textiles became more and more important materials for various applications and interest in them grew year by year. Papers from eminent engineers, technologists, professionals and researchers on contemporary issues having technical relevance to the theme shall be included in this volume. It is expected that the articles will be of academic values, and will provide a comprehensive coverage of the subject.

***Sub-themes*** :

The said volume will cover major sectors of Development and Application of Functional Textile, and will accommodate manuscripts on the following genre:

* Based on the type of garment
  - Active wear
  - Performance wear
  - Ready to wear
  - Seamless wear
* Based on the type of fiber
  - Polyester and advancements
  - Viscose
* Based on the type of functions
  - Anti-bacterial
  - UV-protection
  - Temperature regulating
  - Water and oil repellent
* Based on the application area
  - Geotextiles
  - Personal Protection
  - Medical
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| (vi) Designation | |
| (vii) Organization of affiliation | |
| (viii) Membership No (please use the prefix F/M/AM as the case may be) | |
| (ix) Title of Paper | |
| (x) Name of Journal/Proceeding/Technical Volume | |
| (xi) Volume No (Not required for Indian Engineering Congress) | |
| (xii) Issue No (Not required for Indian Engineering Congress/Annual Technical Volumes of IEI) | |
| (xiii) Theme (Only for Technical Volumes of IEI) | |
| (xiv) DOI: (Not required for Indian Engineering Congress/Annual Technical Volumes of IEI) | |
| (xv) ISSN | |
| (xvi) Date of Publication (Date-Month-Year) | |
| (xvii) Co-authors (if any) | |
| (xviii) Abstract in full | |
| (xix) 5/6 Keywords | |
| (xx) Supporting Documents/links [which are clearly indicative of the incumbent's achievement(s)] | |
| # *Publications in local seminar, conference and symposia will not be accounted* | |

# FORMAT FOR PUBLICATION(S) BY MEMBERS — BOOKS

A passport size color photograph (scanned image)

| | |
|---|---|
| (i) Prefix (Er/Dr/Prof) | |
| (ii) First Name | |
| (iii) Middle Name (if any) | |
| (iv) Surname (Last Name) | |
| (v) Email and Mobile Number | |
| (vi) Designation | |
| (vii) Organization of affiliation | |
| (viii) Membership No (please use the prefix F/M/AM as the case may be) | |
| (ix) Title of Book/Book Chapter | |
| (x) Publisher Details | |
| (xi) ISBN | |
| (xii) Date of Publication (Date-Month-Year) | |
| (xiii) Co-authors (if any) | |
| (xiv) About the book (100-150 words) | |
| (xv) Supporting Documents (complimentary copies for IEI Headquarters)/links [which are clearly indicative of the incumbent's achievement(s)] | |

# Advertisement in IEI Epitome

The Institution of Engineers (India) reserves a coveted privilege in being the largest multi-disciplinary professional body of engineers encompassing 15 engineering disciplines with a Corporate membership of over 2 lakhs maintaining a national/international presence through hundred twenty five Centres and six Overseas Chapters, Fora's and Organ (Engineering Staff College of India). The Institution has been disseminating the various information through IEI-Epitome and other publications.

We would like to share with you that we are now providing the facility to advertise engineering / technical products/services, information brochure, recruitment notices etc. in our official publication portal IEI Epitome (12 issues-140000 reach online). Besides, IEI Epitome is also uploaded on our website (www.ieindia.org) on a monthly basis and is accessible to all free of cost. Given its immense footprint in the engineering and technical diaspora spanning the globe, IEI with its distinguished heritage of a century provides you the ideal portal to connect with the National and International Engineering and Technical Community at very competitive rates. We invite you to take this unique and privileged opportunity to advertise and communicate your service and product portfolios under our prestigious banner and make us your brand emissaries in your promotional campaigns.

The booking form containing details of each publication, rates for the advertisements and the advertisement form are appended below.

## BOOKING FORM

| Publication | Description | Type | Rate (Rs.) including GST | Number of Issues / Volumes | Total (Rs.) including GST |
|---|---|---|---|---|---|
| IEI Epitome | Inside Full Page | Colour | 30,000 | | |
| | Inside Half Page | Colour | 15,000 | | |
| | Inside Quarter Page | Colour | 8,000 | | |

Less discount* @ .....%

Total Cost of Advertisement

*5% discount for advertisement in 6 consecutive issues of IEI Epitome
*10% discount for advertisement in 12 consecutive issues of IEI Epitome

Payments to be made by cheques / drafts drawn in favour of "The Institution of Engineers (India)". Transfer through NEFT/RTGS will be also accepted.

Cheque / Draft No. ..... Drawn on .....

NEFT/RTGS/IMPS/Online Net Banking Transfer to IEI Account (please enclose the transaction slip generated):

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Transaction ID/UTR No./Payment Reference No. : .....

Date: .....

Mobile No.

Email: .....

GSTIN: ..... Signature with seal

# Advertisement in IEI Epitome

## Details required for Payment to IEI -- NEFT/RTGS

| Sr No | Particulars | Details |
|---|---|---|
| 1 | Name and address of the Beneficiary | The Institution of Engineers (India)<br>8 Gokhale Road, Kolkata 700 020 |
| 2 | Account Number of Beneficiary | 005010100002704 |
| 3 | Account Classification | SB |
| 4 | Name and address of the Bank Branch (where payments are to be sent by Applicant) | Axis Bank Ltd, Kolkata<br>Main Branch,<br>7 Shakespeare Sarani,<br>Kolkata 700 071 |
| 5 | Branch Code | 005 |
| 6 | The 9 Digit MICR code of the Branch (as appearing on the MICR cheque) | 700 211 002 |
| 7 | IFSC Code of the Bank Branch for RTGS mode | UTIB0000005 |
| 8 | IFSC Code of the Bank Branch for NEFT mode | UTIB0000005 |
| 9 | Email ID of Beneficiary for advice of payment by Bank | technical@ieindia.org |
| 10 | PAN | AAATT3439Q |
| 11 | Name in PAN | The Institution of Engineers (India) |
| 12 | GSTIN | 19AAATT3439Q1ZR |
| 13 | Service Tax Registration Number | AAATT3439QSD027 |

# Notification for R&D Grant-in-Aid (2022-23)

To promote appropriate technology, assist in building up design & research talents and, most importantly, to help in nurturing potential R&D venture amongst engineering students pursuing Diploma/UG/PG/PhD courses, The Institution of Engineers (India) had instituted the R&D Grant-in-Aid program way back in 2001.

Like every year, the Institution invites applications for the session 2022-2023 for funding industry-oriented R&D projects and research initiatives aimed at improving the life-style of common people from engineering students pursuing full time Diploma/UG/PG/PhD engineering program in AICTE/UGC/NAAC approved Institutions/Colleges/Universities. The application form and guidelines are available in our website **https://www.ieindia.org**. The projects should be carried out under the guidance of faculty members who are Corporate Members of IEI. Membership criteria for student(s), guide(s) and Institution(s) are as follows:

| Project Category | Student/Applicant Membership | Guide(s) Membership | Institutional Membership |
|---|---|---|---|
| 1. Diploma | Exempted [Membership of Student Chapter is desirable] | AMIE/MIE/FIE | Not Mandatory |
| 2. UG (BE/BTech/ AMIE/Equivalent) | 'Student Member' (SMIE) | AMIE/MIE/FIE | Applicant's Institute should preferably be an Institutional Member with NBA / NAAC Accreditation or valid NIRF Rank |
| 3. PG (ME/MTech/ Equivalent) | AMIE/MIE/FIE | MIE/FIE | Applicant's Institute should preferably be an Institutional Member with NBA / NAAC Accreditation or valid NIRF Rank |
| 4. PhD | AMIE/MIE/FIE | MIE/FIE | Applicant's Institute should preferably be an Institutional Member with NBA / NAAC Accreditation or valid NIRF Rank |

The soft copy of the duly filled-up applications (in editable format), as per the pro-forma available in our website www.ieindia.org, should be sent through email to research@ieindia.org and one printed copy of the same should reach the following address:

**Director (Technical)**
**The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700 020**

Applications received in format other than that available on our website will not be accepted. Application should be forwarded through the Guide, Head of the Department or Head of the Institution. Please note that preference will be given to project proposals received from Institutions who are members of The Institution of Engineers (India) and with NBA / NAAC Accreditation or valid NIRF Rank. Kindly go through the guidelines (visit link https://www.ieindia.org/webui/IEI-Activities.aspx#RnD-Initiative) carefully before filling up the application.

The grant is not intended for the faculty members who have access to other avenues of research funding. Proposals received will be scrutinized and the recipients of R&D Grant will be informed accordingly.