IEI Epitome

November 2019, Volume 4, Number 11

Contents

Members in the News

Ms Aruna Devi, MIE

Director for Student Affairs - Information Systems Security Association (ISSA - India), Visiting Faculty, Business Administration Department, University of Mysore

Has been elected as the Chairperson of Computer Society of India, Mysore Chapter for the year 2019-2020. She is also serving as the Women Chair, Indian Society of Heating, Refrigerating and Air Conditioning Engineers (ISHRAE), Mysore Chapter and mentor for E& C, Department, Vidyavardhaka Polytechnic, Mysuru.

Mr Koppuravuri V Pratap, AMIE

Assistant Professor, Department of Civil Engineering, Narasaraopeta Engineering College (Autonomous), Narasaraopet, Guntur, Andhra Pradesh

Awarded 'Best Young Teacher International Award' from IRDP Group of Journals, Chennai.

Mr Ajay Krishna, MIE

Sr Manager (E), Nathpa Jhakri Hydro Power Station, SJVN Limited, Shimla

Received "Professional Engineer (Corporate) Award-2019" by "CTAE Alumni Society" for outstanding contribution and technical advancement in the field of Electrical engineering in the XVII Alumni Meet And Felicitation Programme On 12th October, 2019 at College of Technology and Engineering, Udaipur Rajasthan.

Dr N Sivasubramanian, FIE

Senior Scientist/ Chief General Manager, ISRO (Rtd) Honarary Visiting professor

Awarded 'Doctor of Philosophy' at Bharathidasan University, Trichy, TN on 1 st Oct, 2019 by Hon'ble Governor of Tamilnadu and other diginitaries.

The area of the research carried out was in the field of 'Management' and the topic being" The Knowledge Management in Aerospace Manufacturing Firms" .

Dr L Ramesh, AMIE

Honorary Secretary, Tiruvallur Local Centre, IEI, Founder & Chairman -Energy Efficiency Research Group, and Dean, Dr MGR Educational and Research Institute, Chennai

Received the prestigious The Society of Energy Engineers and Managers (SEEM) National Energy Management Award 2019 for commitment towards energy conservation from Dr Zhu Yi Fu, Director, China Industrial Energy Conservation at India Islamic Cultural Centre New Delhi on 26 Sep, 2019. The award is constituted by SEEM to empower the United Nations's sustainable development goals for affordable and clean energy & climate change.

Mr Pramit Debmallik, AMIE

M.E. Structural Engineering (Persuing), Jadavpur University, Kolkata

Secured 2nd All India Rank in Engineering Services Examination (ESE) 2019 conducted by UPSC in Civil Engineering Stream. Succeeded in securing this rank in the first attempt while completing his Bachelor degree in Construction Engineering from Jadavpur University.

Publication by Members

Dr T Pyne, FIE

Reliability and Asset Strategy Specialist

E-mail: tarapada.pyne@gmail.com

Title of Paper: "Asset Life Assessment : A Strategic Reliability Tool for the Process Industries", *Maintenance and Reliability, August 2019.*

Abstract: Asset Life Assessment (ALA) has become a strategic tool for process plants (e.g., petrochemical, chemical, and oil and gas) to determine the extent of degradation and the ability of assets to bear static and dynamic loads while sustaining the desired production processes. ALA is also commonly referred to as remaining life assessment (RLA), with a slight variation from ALA in the coverage of assets and the depth of analysis features in the testing techniques applied. A balance exists between an ever-increasing demand for plant reliability and availability, and the continuous degradation and aging of machinery influencing direct and indirect costs in every stage of a production process. Due to the presence of inappropriate and obsolete designs, as well as national and international safety and environmental regulations, it has become mandatory to assess and ascertain the current and future health of assets throughout the entire production line. Over the last decades, life assessment of machinery has become a crucial task for industry. Literature concerning ALA/RLA is mainly concentrated on the reports and case studies of consulting firms and original equipment manufacturer (OEM) maintenance and asset-disposal guidelines. The scholarly articles/cases focus mainly on RLA using specific diagnostic techniques. In this article, the relevant tasks, coverage and merits of life assessment are collated with an isolated viewpoint on ALA/RLA to justify the concept of life assessment, and to appreciate this vital task as a unique as- set management activity, unlike prevailing exclusive reliability, diagnostic techniques and proactive approaches

Keywords : *Asset Management; Degradation; Diagnostic Technique; Life Assessment; Reliability*

Mr Abhishek Dwivedi, AMIE

Assistant Professor, Department of Mechanical Engineering, Integral University, Dasauli, Post-Basha, Kursi Road, Lucknow
E-mail: abhishekdwi2003@hotmail.com

Title of Paper: "Interaction of water soluble polyacrylic acid towards mild steel / hydrochloric acid interface", *International Conference on Contemporary Research in Mechanical Engineering with focus on Materials and Manufacturing, 06-07 April 2018, IOP Conf. Series: Materials Science and Engineering 404 (2018) 012044, 5 October 2018.*

DOI:10.1088/1757-899X/404/1/012044
Co-authors : Sudhish Kumar Shukla, P. K Bharti

Abstract: Many of the polymers such as polyanilines, polyanthranilic acids have been reported as one of the efficient corrosion inhibitors for mild steel in acidic media. In view of the major limitation of insolubility of polymers, we have taken water soluble polyacrylic acid for the corrosion inhibition process. The corrosion inhibition property of polyacrylic acid is demonstrated for mild steel in 0.5 M hydrochloric acid using electrochemical impedance spectroscopy, Tafel polarization and weight loss methods. All the results are found to be in well correlation and the inhibition efficiency shows upto 94% in 0.5 M hydrochloric acid for 3hrs duration. Surface studies are also done by scanning electron microscopy.

Keywords : *Polymer; Weight loss; Electrochemical calculation; Inhibition*

Publication by Members

Mr Varun Shukla, MIE
Assistant Professor, Department of Electronics & Communication, Pranveer Singh Institute of Technology (PSIT), Kanpur
E-mail: varun.shuklaa@gmail.com

Title of Paper: "A Secure Stop and Wait Communication Protocol for Disturbed Networks", *Wireless Personal Communications, Springer, September 2019.*

Co-authors: Atul Chaturvedi and Neelam Srivastava

DOI: https://doi.org/10.1007/s11277-019-06760-w

Abstract: Secure data communication is the need of hour today specifically when the wireless communication channel is insecure. We are proposing a protocol which can be customized in variety of situations. We want to use steganography as a complementary tool for cryptography. The protocol utilizes the nature of communication protocol and it is even useful for places where data hiding and cryptography is illegal or can't be performed because of various reasons. We are giving a name to these kinds of networks as disturbed networks. The proposed peer to peer protocol is very useful for insecure channels and disturbed networks and we provide complete analysis to validate its utility. The method is a convenient stop and wait protocol which provides unbeatable security and suitable for mobile phones as well. At the same time, for intruder's perspective, there is no encryption involved which is a very important aspect.

Keywords : *Disturbed networks; Encryption; Man in the middle attack (MITM); Steganography; Wireless*

Mr Naga Eswara Naveen Pasala, AMIE
Department of Mechanical Engineering Sanketika Vidya Parishad Engineeering College, Affiliated to Andhra University, P. M. Palem, Visakhapatnam
E-mail: pne.naveen@gmail.com

Title of Paper: "Evaluation of Mechanical Properties on Tio2/GF Reinforced Nylon66 Composites", *Materials Today Proceedings, available online on July 2019.*

https://doi.org/10.1016/j.matpr.2019.06.758

Co-Authors: Bhanu Kiran Goriparthi and Chaitanya Mayee M

Abstract: The research on Mechanical and Tribological properties using nylon66 composites with TiO_2 at variousvolume fractions are taken into consideration. The tensile strength, compressive strength, Modulusand Flexural strength tests were performed on specimen prepared by twin screw extruder. It wasobserved that there is increase in heat deflection value, wear arte along with increase in the coefficientof friction. For effectiveness in the Tribological properties of nylon66 + TiO_2 it was combined with glassfiber as filler material. Some of the tests were conducted on the pin-on-disc apparatus and analysisthrough SEM to study about the wear behaviour of the material. This resulted in the improvement ofthe Tribological, thermal and mechanical properties of the composites with reduction in wear rate andcoefficient of friction up to 4 wt% of TiO_2 filled with glass fiber. It was also analysed that at 2 wt% of TiO_2 filled with 2 wt% glass fiber there is effective enhancement in Tribological properties along withdecrease in coefficient of friction and wear rate.

Keywords : *Nylon66; Titanium dioxide; Glass fiber; Tribological properties; SEM; Wear rate*

Publication by Members

Dr Punith Kumar M B, AMIE
Associate Professor, Department of Electronics and Communication, PES College of Engineering, Mandya
E-mail: punithpes@gmail.com

Title of Paper: "An ANN Based Real Time System for Classification of Normal and Abnormal Cries of Pre-Term and Neonates" *International Journal of Recent Technology and Engineering TM (IJRTE), 8 (5S3), July, 2019, pp 133-138.*

https://www.ijeat.org/wpcontent/uploads/papers/v8i5S3/E10330785S319.pdf

Co-authors : T Shreekanth,Anupama M1, Sarsawath S

Abstract: Infants communicate with the external world through cry. Most of the problems in the infants can be explored through their cry within first year. Variations in cry can sometimes indicate the neurological disorders, genetic problems and many more. Classification of the infant cry as normal and abnormal at the early stages can reduce the course of action or any casualty. Hence this work proposes a computational approach for the early diagnosis of pre-term and neonates; infant cry. The previous works include various algorithms for classification, however the novelty in this work can be attributed to processing only voiced part of the cry signal. The cry signal is first preprocessed by decomposing it into three levels using db13 wavelet in order to remove any noise that has been inherited during signal acquisition. This signal is further processed to extract only voiced part of the speech by identifying the endpoints through Zero Crossing Rate and Energy. Then the MFCC features are extracted, as this kind of signal envelop is best estimated eventually using these kind of features and are used to train feed forward neural networks based on back propagation algorithm. In order to train the network 100 normal and 100 abnormal samples were used. The database has been obtained from the neonatal ward of JSS Hospital, Mysuru. The algorithm has been tested on the test dataset consisting of 50 samples. The performance of the proposed method has been evaluated on only voiced part of the cry signal using the diagnostic test measures and the efficiency is found to be 98% as compared to 90% efficiency if the same procedure is applied on the entire cry signal.

Keywords : *Back Propagation, DCT, FFT, MFCC, STFT, Neural Network, Pre-term, Neonates, Hamming Window, Wavelet*

Title of Paper: "A Simplified Research for Mathematical Expression Recognition and Its Conversion to Speech" *International Journal of Recent Technology and Engineering TM (IJRTE), 8 (2S8), August 2019, PP 1033-1038.*

https://www.ijrte.org/wpcontent/uploads/papers/v8i2S8/B10080882S819.pdf

Co-authors : T Shreekanth, Shashank N S, Sneha S

Abstract: The number of visually impaired people appearing for various examination is increasing every year while on the other hand, there are several blind aspirants who are willing to enrich their knowledge through higher studies. Mathematics is one of the key language (subject) for those who are willing to pursue higher studies in science stream. There is a lot of advanced Braille techniques and OCR to speech conversion software made available to help visual impaired community to pursue their education but still the number of visually impaired students getting admitted to higher education is less. This is not because most of the data is on paper in the form of books and documents. So, there is a great need to convert information from the physical domain into the digital domain which would help the visually impaired people to read the advanced mathematics text independently. Optical Character Recognition (OCR) systems for mathematics have received considerable attention in recent years due to the tremendous need for the digitization of printed documents. Existing literature reveals that, most of the works concentrated on recognizing handwritten mathematical symbols and some works revolve around complex algorithms. This paper proposes a simple, yet efficient approach to develop an OCR system for mathematics and its conversion to speech. For Mathematical symbol recognition, Skin and Bone algorithm is proposed, which proved its efficiency on a variety of data set. The proposed methodology has been tested on 50 equations comprising various symbols such as integral, differential, square, square root and currently achieving recognition rate of 92%.

Keywords : *Skin and Bone Algorithm, connected component labelling, Projection profile, Segmentation, 2D Correlation*

Publication by Members

Mr C P Kumar, FIE
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Title of Paper: "Purpose Driven Studies under National Hydrology Project, India", *International Journal of Scientific Research in Science, Engineering and Technology (IJSRSET), ISSN (Print): 2395-1990, ISSN (Online): 2394-4099, 6, Issue 5, September-October 2019, pp. 213-229.*

DOI: https://doi.org/10.32628/IJSRSET1196522

Abstract: Considering the peculiarities and large variation in the nature of problems associated with water resources planning, development and management, the issues involved in research related to particular region and specific project, there is a provision under National Hydrology Project (NHP) of India is to take up applied and action-oriented R&D studies by the implementing agencies. This article presents the details of purpose driven studies taken up by various implementing agencies under the National Hydrology Project of India.

Keywords : *Hydrology; Water Resources; Research; NHP; PDS; NIH; World Bank*

Mr N Soundiraraj, AMIE
Assistant Professor, Department of Electronics and Communication Engineering, PSNA College of Engineering and Technology, Dindigul
E-mail: soundar06@gmail.com

Title of Paper: "Resonant converter for Data Center and Super Computer Applications", *International Journal of Recent Technology and Engineering (IJRTE), ISSN: 2277-3878, 8 (3), September 2019, pp 3873 - 3877.*

Co-authers: K Palanivel Rajan; I Sayed Mohammed; K Kaleeswarn; K Aruljeyaraj

Abstract: In this article proposes the load sharing performance of converters in supercomputers. A new control method is proposed for dc to dc switch controlled capacitor (SCC) - LLC converter. The switching frequency is utilized for controlling the regulation of output voltage. It can give the good frequency variation range and peak gain range compared to conventional converters. To attain load sharing the half wave switch controlled capacitor (SCC) is used to control the resonant frequency of each LLC stage. The simulation results are compared with experimental results. A 600w prototype model is developed to prove the feasibility.

Keywords : *resonant converter; Frequency control; Soft switching; Power grid; Super computer; Data center*

Dr C Kayalvizhi, MIE
Professor/Head, Department of Textile Technology, RVS College of Engineering, Dindigul, Tamil Nadu
E-mail: kayalvizhi1009@gmail.com

Title of Paper: "Cyclic Voltammetric and AFM Study of Corrosion Inhibition and Adsorption Behavior of Sodium Dodecyl Sulphate-zn^{2+} on Carbon Steel in Aqueous Medium", *Rasayan Journal of Chemistry, 12(4), pp 1881-1888, October – December / 2019.*

ISSN: 0974-1496 / e-ISSN : 0976-0083/CODEN: RJCABP.

Co-authors : V. R. Nazeera Banu , V Ramesh Babu

Abstract: The corrosion inhibition behavior of Sodium Dodecyl Sulphate (SDS) and the synergistic effect with Zn^{2+} on the corrosion of carbon steel in well water medium were studied using mass reduction technique, cyclic voltammetry (CV), atomic force microscopy (AFM), FTIR and contact angle measurements. The results showed that the protective film formed on the metal surface is stable even in the presence of 3.5% NaCl solution and also there was a formation of self assembled monolayer on the carbon steel surface. There was a synergistic effect exists between SDS and Zn^{2+}.

Keywords : *SDS; Corrosion inhibition; Synergistic effect; Carbon steel*

Publication by Members

Mr Mahadevan Palanichamy, AMIE
Research Scholar, Department of Civil Engineering, School of Environmental and Construction Technology, Kalasalingam Academy of Research and Education (KARE), (A Deemed to be University), Anand Nagar, Krishnankoil Tamil Nadu
E-mail: mahasqr@gmail.com

Title of Paper: "Prediction and Validation of Rainfall Classes for Vaigai River Catchment using El Nino", *International Journal of Recent Technology and Engineering (IJRTE),ISSN: 2277-3878 (Online); 8(2), July 2019, pp1412-1427.*

DOI: 10.35940/ijrte.B2078.078219

Co-authors: Dr.Ramaswamy Sankaralingam Narayanasamy

Abstract: Extraordinary weather patterns are being observed globally during the past 30 years due to climate change resulting in variations in temperature and rainfall. Studies on long-term trend pattern of temperature and rainfall since 1980 distinctly shows a rise in mean temperature and declining rainfall trend. Due to change of climate at global level change, forecasting of rainfall with the conventional statistical analysis could not predict satisfactory results. Among the available processes, the El Niño Southern Oscillation (ENSO) cycle is considered efficient. Statistical analysis was carried out in this study so as to investigate the implication of rainfall data in seven rain gauge stations located in Vaigai River Catchment through the period from 1959 to 2016. ENSO Cycle was used also to predict rainfall for Vaigai River catchment of the Tamil Nadu State, India. Quadratic discrimination analysis (QDA) and Neural Network models are used to identify the class of rainfall classes with reference to ENSO cycle. The patterns recognized on the study area offer constructive information to administrators of water resource management, to implement the same for agriculture, water supply and power generation.

Keywords : *Climate change; Statistical analysis; Trend pattern; Vaigai river catchment; Water resources management*

Mr Atul Garg, MIE
Scientific Officer-D, Institute for Plasma Research, An aided Institute of Deptt. of Atomic Energy, Government of India, Gandhinagar
E-mail: atulgarg2205@gmail.com

Title of Paper: "Comparative Study of Cryogenic NbTi/Cu and MgB_2 /Brass based Current Leads", *26th International Conference on Magnet Technology, Vancouver BC, Canada, September 22-27, 2019.*

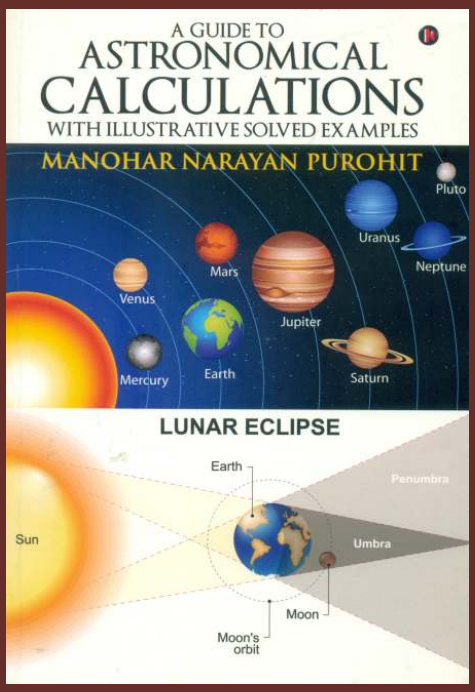
Co-authors: Hiren Nimavat, Dashrath Sonara, Gaurang Mahesuria, Rakesh Patel, Dikens Christian, Nitin Bairagi, Gaurav Purwar, Rajiv Sharma, Pankil Shah, Ketan Patel, Pradip Panchal, Rohit Panchal, Vipul Tanna and Upendra Prasad

Abstract: SST-1 is medium size superconducting (SC) tokomak operational at IPR. It consists TF and PF sc coils. Vapour cooled current leads (VCCLs) at 10 kA consisting of NbTi superconductor and copper heat exchanger used for the TF system. Similarly, 9 PF coils will be energised by individual power supplies requiring total 18 VCCLs under pulse operations up to 9 kA. VCCLs utilize 55% of total cryogenic plant capacity (1.3 kW at 4.5 K). Consequently, it has been envisaged to minimize the liquid helium (LHe) consumption by an innovative solution to save the cryogenic power with alteration of the materials in current lead specific to the pulse operation. This approach adopts two folds savings, i.e. introducing MgB_2 sc in lieu of NbTi and the heat exchanger material as brass instead of copper, which has more specific heat, lower thermal conductivity and higher melting temperature as compared to copper. Moreover, brass can be also overload. MgB_2 provides better temperature margin as compared to NbTi. In temperature range of 20 K – 40 K, cryoplant offers the best exergy efficiency. It has been established that the combination of MgB_2 and brass based current leads have several advantages over the existing VCCLs. To support this statement, we have conducted a prototype experiment using a dedicated test cryostat in which both types of current leads were installed and tested up to 1.5 kA. The test cryostat consists of pair of current leads, feeder link, hydraulic network, 12 kA/16 V switch mode power supply, sensors and data acquisition system. The details of the test cryostat and experimental results will be discussed in this paper. LHe consumption in case of VCCL and MgB_2 based brass current leads will be compared to assess operational cost and also highlight the cryo benefits of the MgB_2 based brass current leads.

Keywords : *Vapour cooled Current lead; Liquid helium; Cryogenic; Thermal conductivity; Operational Cost and heat Exchanger; Superconducting Coils; Exergy*

Book Review

A Guide to Astronomical Calculations with Illustrative Solved Examples

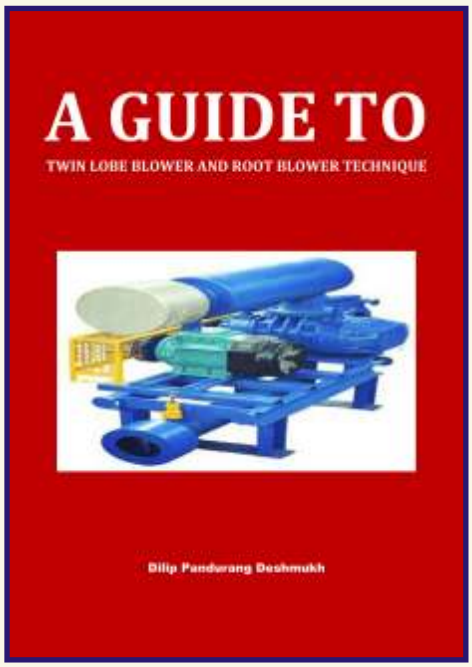


Mr Manohar Narayan Purohit, *MIE*

The book provides the details of Astronomy in three different periods, namely Ancient, Renaissance and Modern containing the first hand information about development of astronomy, which is very useful for scientists, engineers, mathematicians and other practicing professional in the relevant field. The book lucidly explained definitions, explanations of different terminologies in astronomy, mathematical procedures, details of Time scales including Universal time, DeltaT, Terrestrial Time, Gregorian Calendar, Julian Calendar, Epoch J2000 and so on. The further explained complex motions of earth and its' effect on the effect on the position of celestial objects, different computations of planetary motions, orbital elements, Solar and Lunar systems etc. The book will be an useful ready reckoner for the students of Astronomy.

Publisher : Notion Press, McNichols Road, Chetpet, Chennai

Email ID: prof.manoharpurohit@gmail.com



A Guide to Twin Lobe Blower and Root Blower Technique

Mr Dilip Pandurang Deshmukh, *AMIE*

This book presents the technical aspects in the design of Twin lobe Blowers and validates the functional parameters for the efficient operations. Twin lobe blowers; optimised model of pumps, is used in thermal power plant for pumping operation as compared to that of roots blower. Innovations are being expected from the researchers to optimise the design of various blowers being used in pumps in Engineering applications.

This book will be helpful for the students of Engineering, Research Scholars, and Academicians and will prove its worthy in blower and pumps Industries.

Publisher : Empyreal Publishing House, Zoo Road, Tiniali, Guwahati, Assam

Email ID: dilipdeshmukh67@gmail.com

Technical Activities by Institutional Members

The **Future Institute of Engineering & Technology, Bareilly,** the Institutional Member (IM0005425/M-20) of the Institution, celebrated Engineer's Day on September 15. During this occasion a competition for the students was organised in order to enhance their knowledge and to motivate them for future endeavours. A debate was conducted on the topic "Role of Technocrats in Socio-technological development of India" and a technical power point presentation competition was conducted on the topic "Emerging Technologies in Different Branches of Engineering".

Announcement

Contribution for Centenary Celebrations of
The Institution of Engineers (India)

The Institution of Engineers (India) has entered its next Century in September 2019 and we intend to celebrate this significant landmark in a befitting manner. Various International Seminars are being organized in India and Overseas on contemporary and innovative themes culminating in Global Engineering Congress next year. Also, IEI has launched a special outreach programme to induct new members into its' fold along with an image enhancement programme to project the Institution both nationally and globally.

For this purpose, an IEI Centenary Fund has been established and the finances accrued by way of donation/sponsorship would be utilized to organize various events in the Centenary Year.

The contribution made under this section is exempted as per Section 80G of the Income Tax Act 1961, if made by cheque/draft/NEFT.

Details of IEI Centenary Fund are as follows.

Name of the Fund	IEI Centenary Fund
Bank	HDFC Bank
A/c No	50100301303426
IFSC Code	HDFC0000469

The Institution of Engineers (India)

Notification for

R&D Grant-in-Aid (2019-20)

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 2019-2020 for funding 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 proforma 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

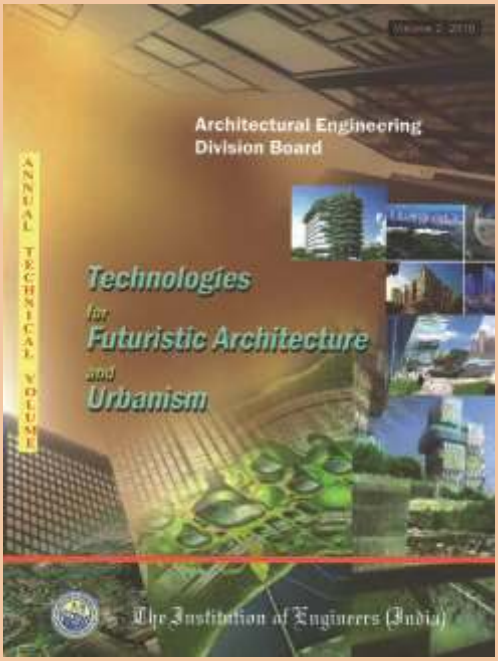
Applications received in format other than that available on our website will not be accepted. Application should be forwarded through the Guide, Head of the Department or Head of the Institution. Please note that preference will be given to project proposals received from Institutions who are members 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.

Annual Technical Volumes of IEI are available online

[https://www.ieindia.org/webui/IEI-Publication.aspx#annual-technical-volume]

Architectural Engineering Division Board



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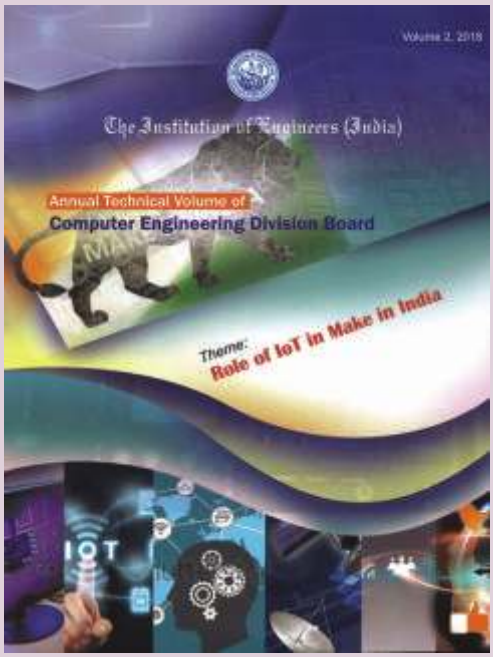
Electronics & Telecommunication Engineering Division Board

Theme : Recent trends in Mechatronics for Sustainable Development in Engineering

ISBN : 978-81-939709-0-4

Computer Engineering Division Board



Theme : Role of IoT in Make in India

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Mechanical Engineering Division Board

Theme : Industry 4.0

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