



I.E.I NEWS

February 2022

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A CENTURY OF SERVICE TO THE NATION

Volume 28

Number 11

Thirty-sixth National Convention of Electronics and Telecommunication Engineers and National Seminar

Antenna Design for Efficient Communication and Networking



Thirty-sixth National Convention of Electronics and Telecommunication Engineers was organized by **Bathinda Local Centre** of the Institution during 04-05 December 2021 in hybrid mode under the aegis of Electronics and Telecommunication Engineering Division Board [ETDB]. A National Seminar was also organized on the occasion on the theme **Antenna Design for Efficient Communication and Networking**. Mr Pawan Kumar Garg, Former Wireless Advisor to the Government of India and Former Chairman, Radio Regulation Board

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Thirty-fourth National Convention of Computer Engineers and National Seminar

Industrial and Medical Applications of Artificial Intelligence

Jabalpur Local Centre, IEI organized Thirty-fourth National Convention of Computer Engineers in hybrid mode during 20-21 November 2021 under the aegis of Computer Engineering Division Board [CPDB] of the Institution on the theme **Industrial and Medical Applications of Artificial Intelligence**. The Inaugural Function of the National Convention was held at physical mode with live telecast and the Technical Sessions were organized in online mode. The function was inaugurated by Shri Om Prakash Sakhlecha, Hon'ble Minister, Department of Science and Technology, Government of Madhya Pradesh in the gracious



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From the President's Desk.....



The concept of design thinking and innovation is a driving force in business organizations for their continual development. Design thinking is a non-linear, systematic, human-centered, iterative thought process that helps in exploring problems, adheres to the customers' continuous demand for value addition to the products and services, and providing meaningful innovative solutions leading to development of prototype and its testing. In other words, design thinking is an ideology that seeks to solve complex problems in a user-centric manner. It focuses on achieving practical results and solutions that are technically feasible and economically viable. Design thinking approach encourages the teams and task forces to generate ground-breaking solutions. It enhances and strengthens the innovative capabilities, ability to conceive ideas and transforming them to appropriate line of actions. In this concept, the focus of innovation has shifted from engineering driven to design driven, from product centric to customer centric and from marketing focused to user feedback focused. Thus the design thinking approach looks to minimize the uncertainty and risk of innovation by using collective intelligence to increase the understanding of customer needs. By engaging with customers actively throughout the process using a series of prototypes to learn, test, obtain feedback and refine concepts; it leads to closer customer understanding to determine their needs. Design thinkers rely on customer insights gained from real-world experiments and direct engagement instead of conventional market research data.

In line with such innovative thinking, the enthusiastic and dynamic entrepreneurs are inherent design thinkers. They analyse the problems, solve them and look for more improved solutions from time to time. They are empathetic to customers' needs and their rational mind allows them to visualize things unconventionally. With this unique thought process, they are able to come up with business ideas and incubate them through startups. Design thinking helps

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Antenna Design for Efficient Communication and Networking

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(RRB) of International Telecommunication Union (ITU) Geneva graced the Inaugural Function as Chief Guest and inaugurated the National Convention. On the occasion, Mr R L Dube, Chief Engineer, Military Engineer Services, Bathinda, Dr Harinder Pal Singh, Additional Director of Technical Education, Punjab and Mr Anil Kumar Vij, Deputy General Manager, BSNL were the Guests of Honour. Er Narendra Singh, President, IEI graced the occasion with his kind virtual presence and addressed the august gathering. Prof (Dr) T S Kamal, Chairman, Electronics & Telecommunication Engineering Division Board, IEI, chaired over the function and in his address, highlighted the contribution of the country in the field of telecommunication engineering. On the occasion, Dr Savina Bansal, Dean (Academic Affairs), Maharaja Ranjit Singh Punjab Technical University, Bathinda ; Dr Harpreet Singh, Former Professor, Wayne State University, Detroit, Michigan and Mr Pawan Kumar Garg, Former Wireless Adviser to the Government of India and Former Member, RRB of ITU, Geneva were felicitated in recognition of their outstanding achievements and contributions in the field of Electronics & Telecommunication Engineering. A Conference Proceedings was released on the occasion in the august presence of the dignitaries on the dais.

Earlier, Mr Jagtar Singh, Chairman, Bathinda Local Centre, IEI and Mr Sukhvir Singh Mundi, Chairman, Punjab & Chandigarh State Centre, IEI welcomed the dignitaries and participants. Mr Janta Singh, Honorary Secretary, Bathinda Local Centre, IEI proposed the vote of thanks.

Followed by the Inaugural Function, the Prof S K Mitra Memorial Lecture was delivered by Dr Jagpal Singh Ubhi, Professor, Department of Electronics & Communication Engineering, Sant Longowal Institute of Engineering & Technology, Punjab on the topic '5G: The Catalyst to Digital Revolution'. Dr Balwinder Singh Dhaliwal, Associate Professor, ECE Department, NITTTT Chandigarh delivered the Keynote Lecture on the topic 'Recent Trends and Issues in Antenna Design'. Invited Lectures were delivered by eminent speakers during the technical sessions of the National Conference on different types of Wireless Communications, Optical Transmission Systems and Networks and Role of Antenna in 5G communication.

During the technical sessions held in virtual mode, Papers were presented on diverse topics in the field of communication and networking, namely Flexible Wearable Fractal Antennas; Efficiency Enhancement of Wireless

Sensor Network using Markov Modeling Approach; First Principle Approach to Investigate the Li Based Quaternary Heusler Compound LiTiCoSn; Different types of Fractal Antennas; H and Inverted U shaped Compact Multiband Antenna for Mobile Communication, WiMAX and Satellite Communication Applications; Energy Efficient Virtual Machine Migration Approach with SLA Conservation in Cloud Computing; Nonlinear PID (N-PID) Controller Based Voltage Reference Control of DC-DC Converter; Performance Enhancement of NOMA - A 5G Candidate; A Comprehensive Review of Green Computing based DevOps Process in Agile Delivery Model; Bandwidth Enhancement of Fractal Antenna with Defected Ground Structure; Compact Wearable Fractal Patch Antenna and its Performance Analysis for BAN; Theoretical Basis of Antenna's Significant Place in Information Communication Systems; Design of E Shape Single Element Patch Antenna with High Gain for Wireless 5G Communication Application; Pentagon Shaped Sierpinski Carpet Defected Ground Plane Wearable Fractal Antenna For Wireless Applications; Design of Meander Curve Based Low Profile Multiband Microstrip Patch Antenna; Performance Analysis of Four Layered Clustering Network using Fault Tolerance Protocol in Wireless Sensor Network and so on.

During the Valedictory Function, Prof (Dr) T S Kamal, Chairman ETDB, IEI graced the function as the Chief Guest and Er Vijay Kant Goyal, General Manager, National Fertilizers Limited, Bathinda, the Guest of Honour.

Recommendations that emanated from the two-day deliberations are as follows:

Different types of antennas like microstrip patch antenna, Fractal Antennas and wearable fractal antennas are designed by the researchers but these designed antennas are based on empirical studies. Most of the authors have done only simulations but measured results should be included in the studies; Involvement of telecommunication industries during the National Conventions need to be enhanced; Papers on contemporary topics with real time data should be encouraged; Mathematical models in the papers need to be elaborated more to understand the mathematical aspects in the papers; It is recommended to have more research in the field of design of Antennas for 5G Communications, Visible Light Communication, Quantum Communication, Tera Hertz Communication etc; It is recommended to motivate and create awareness among the people in rural areas about digital communication and digital India schemes so that they can derive the benefit of recent technology.

From the President's Desk.....

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translate ideas into realities by integrating a full spectrum of inputs that originates through interaction with incubators. As design thinking is adaptable and iterative, it's incredibly useful at startups during all stages of development, starting from inception stage of business upto a successful product and business model. For a sustainable startup ecosystem, sound design thinking frameworks provide a strong customer focus. Moreover, the

relationship between innovation, design thinking and startup incubators rests on imbibing co-creation as a mode of new product development.

With the growing number of unicorn technology start-ups, we are confident that engineers of this century are capable enough to address the challenges ahead in this post pandemic times with their innovative mindsets that will lead India to be the startup hub of the world.

Smart Distribution Grid

The Institution of Engineers (India) organized the Technical Webinar on the topic **Smart Distribution Grid** under the aegis of Electrical Engineering Division Board [ELDB], IEI on 17 September 2021. Prof S N Singh, Professor (HAG), Department of Electrical Engineering, Indian Institute of Technology Kanpur and Prof Saifur Rahman, Life Fellow, IEEE, Director, Virginia Tech Advanced Research Institute, USA & President, IEEE Power & Energy Society, 2018 and 2019 graced the function as Panelists and shared their thoughts and views. Prof (Dr) Natarajan Kumaresan, Professor, Department of Electrical & Electronics Engineering, NIT Tiruchirappalli, Chairman, Tiruchirappalli Local Centre and Council Member, IEI was the Moderator of the event.

Prof S N Singh, in his address highlighted the technological changes in the field of Power Engineering, The speaker, during his lecture presented an overview of Indian power sector, generation capacity, recent issues of concerns across the globe in the field of power engineering, present and future scenario of power sector, development of new materials, development of new technologies and devices, regulatory changes in power sector, future grid, digital transformation of the grid and the challenges in implementing the digital transformation. In his deliberation, Prof Singh highlighted the increasing contribution of hydroelectric and renewable in Indian power sector. He further added that within renewable, the maximum contribution is from the solar sector. He stated the major concerns of power system, which include limited expansion of transmission network, increased transmission and distribution losses, vulnerability and resilience of the system under natural and man-made disaster, growing



Prof S N Singh

environment concern and global warming, poor power quality and the increasing demand. He highlighted that in future power system, the load will follow the generation and there will be more use of ICT & digital technology. The speaker opined that the technological changes in future will be obtained by means of development of new materials like polymer, composites, nano and superconductors which will decrease the size of insulator and machine, with subsequent improvement in the rating and capacity of the machines. Development of new technologies and devices will take the centre stage, which include Power Electronics Devices, Digital Signal Processing (DSP), Sensors, Smart Meters, Intelligent controller using Artificial Intelligence/ Machine Learning (AI/ML) technologies, application of IoT and Block Chain, maintaining security, reliability and resilience of large interconnected systems by use of Wide Area Monitoring System (WAMS), Supervisory Control and Data Acquisition (SCADA), Distribution Automation (DA), which will help in addressing the concerns related to power system, Prof Singh added. He stated that the transformation is driven by 3Ds : Digitization, Decentralization and Decarbonization. At the end of his lecture, the speaker summarized the challenges in implementing the Digital Energy System which include, increase in system operational complexity, more business oriented attitude, large data handling, information and cyber security, cost-effective implementation of ICT, requirement of accurate forecasting approaches, utilization of demand response, redesigning of electricity market structure, fast analysis tools, integration of renewable energy sources, low inertia system and power quality.

Prof Saifur Rahman, Director, Virginia Tech Advanced Research Institute, USA discussed on the role of smart distribution grid in facilitating integration of more renewable, smart grid ecosystem, smart buildings, smart grid and micro grids, distributed energy resources, roof top solar-wind energy, new paradigm in power system, namely demand driven supply to supply driven demand, intelligent interconnected micro grid, evolution of grid, integrated communication etc. He elaborated the concept of smart grid ecosystem starting with smart building. Smart grid is made up of number of distribution systems, which in turn comprises of



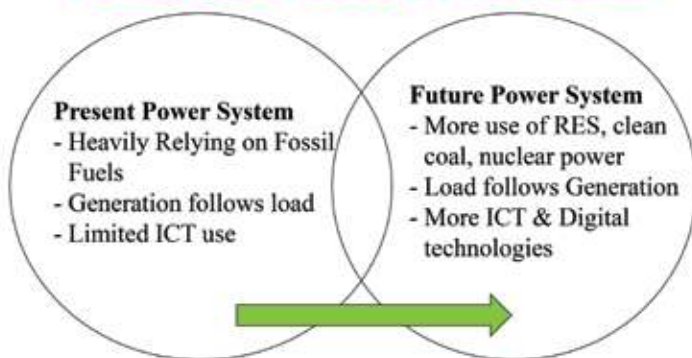
Prof Saifur Rahman

number of micro grids. Moreover, a smart building has productive users and connect to micro grid where the energy can flow bi-directional; If there is roof top solar system and the energy produced is more than the requirement of the user, then the surplus power can be forwarded to the grid for sell, he explained. He further highlighted that any building can be transformed into a smart building with certain fundamental requirement; It should have a single platform for monitoring and control of HVAC, lighting, water supply, sensor network, cameras and fire emergency. While deliberating on the advantages of smart grid to accommodate energy from renewable, he pointed out that resources may be free but it is not always usable due to the fluctuation in the production capacity of solar and wind, depending on the weather condition. He opined that these are the problems to be solved by the engineers. He further recommended the new paradigm of power system, which implies that the future demand for power needs to be adjusted with the fluctuating supply from the storage unlike the conventional system where the supply is adjusted as per the demand. He further stated that a smart system can't be implemented at a time. He spoke on the need to focus on a part of the system, where smart methodologies are deployed, hardware, software and operating principles of the system be developed and implemented; followed by development of specialized smart skills and validate the process by make the system operational. In this context, Prof Rahman termed smart distribution grid as intelligent interconnected micro grid. While deliberating over the functional evolution of grid, he stated that the future grid will be bi-directional, which will be able to interconnect multiple sources like thermal, hydro, rooftop solar, wind, gas turbine and



Indian Institute of Technology Kanpur

Present and Future Power System

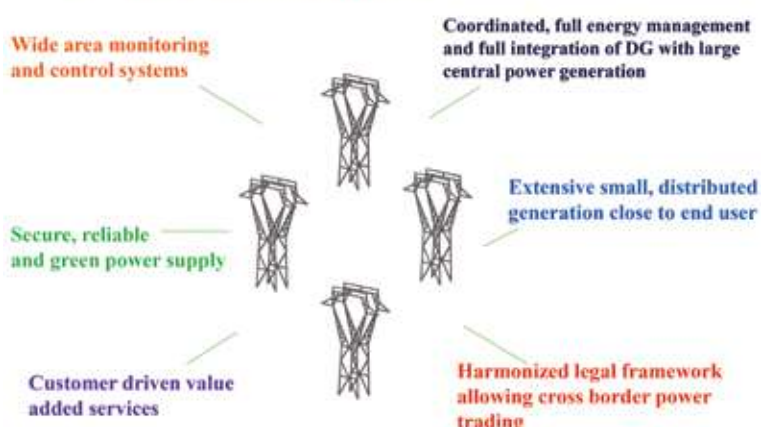


Courtesy Prof S N Singh



Indian Institute of Technology Kanpur

Future Grid – Smart(er) Grid



Courtesy Prof S N Singh

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AI/ML in Industrial Automation

West Bengal State Centre, IEI organized IEI Technical Webinar on the theme **AI/ML in Industrial Automation** on 24 December 2021 under the aegis of Electronics and Telecommunication Engineering Division Board [ETDB]. Panelists of the session, Mr Chanchal Chakraborty, Vice President (Technology), Reliance Jio and Mr Nilanjan Nath, Technology Architect, Lexmark shared their thoughts and views with the virtual audience. The session was moderated by Mr Ram Chandra Chakraborty, Managing Director, PSI Metals India Private Limited.



Mr Chanchal Chakraborty

Mr Chanchal Chakraborty, Vice President (Technology), Reliance Jio made a presentation on Artificial Intelligence and Machine Learning. He started his presentation with the basics of the history of Artificial Intelligence (AI), demand of AI for more computational power, more data, better algorithms & broad investment by blue chip companies, startups, financial houses and Government. He then explained application of AI in finance, healthcare, social media, automated car driving, chatbot, spam filtering etc. He further narrated basic facets of Artificial Intelligence, the theory and development of computer systems, which are able to perform tasks normally requiring human intelligence like visual perception, speech recognition, decision making and translation between languages. This was followed by explanation of three types of AI, namely Artificial Narrow Intelligence, Artificial General Intelligence and Artificial Super Intelligence. He then touched upon the basics of Machine Learning (ML) and Supervised Learning, Unsupervised Learning and Reinforcement Learning. He further explained the limitations of ML and explained the application of Deep Learning. He further explained the basic traits of Deep Learning and the process flow thereof. He explained the Forward and Back Propagation Neural Network and discussed on training datasets. He discussed in detail the Deep



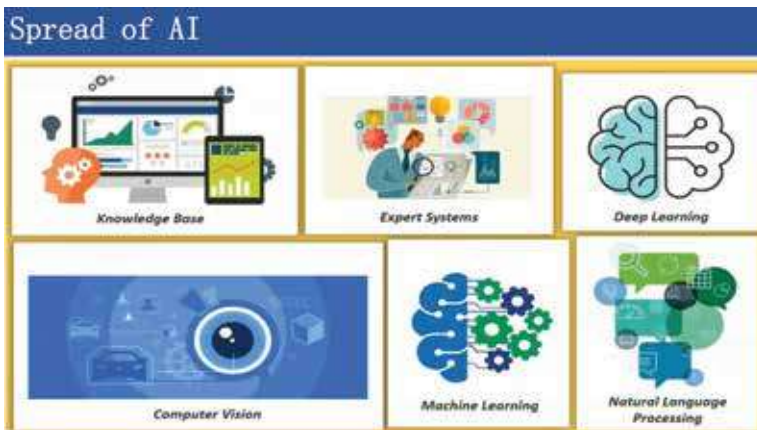
Mr Nilanjan Nath

Neural Network (DNN) model and Convolutional Neural Network (CNN) for image identification and classification with examples. Mr Nilanjan Nath, Technology Architect, Lexmark deliberated on application of Machine Learning on Industrial Automation. He started his presentation with application of Supervised Learning and Regression Analysis on process Industries. He narrated Visual inspection using ML classifier for quality control and the application of Deep Learning in gas and oil industries, explosions and conflagrations. He further discussed on advanced pattern recognition like condition monitoring of drive trains by data fusion of Acoustic Emission and Vibration Sensors. He then explained TensorFlow Lite which is an open-source deep learning framework to run TensorFlow models on-device such as microcontrollers which perform Training, Distillation, Quantization, Encoding and Compilation in different stages. He explained it's use for device lifecycle management, model management using cloud integration. He further described Machine Learning in terms of design, model development and operations and subsequent validation. Moderator of the session, Mr Ram Chandra Chakraborty, Managing Director, PSI Metals India Private Limited summed up the proceedings.

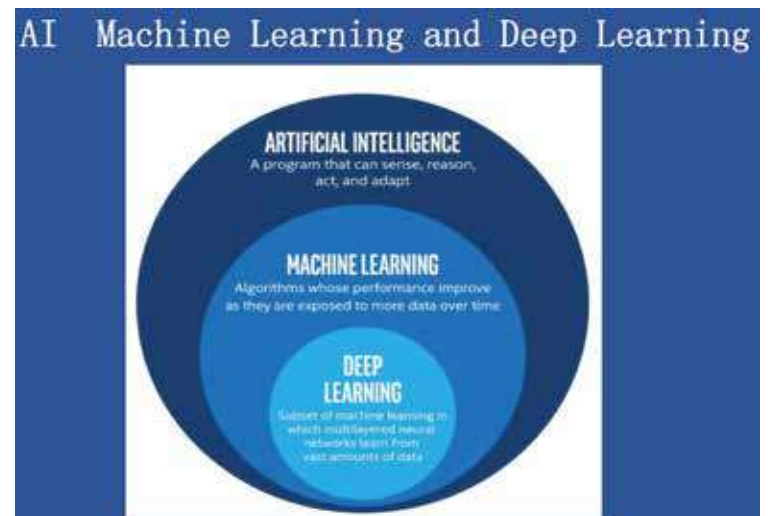


Mr Ram Chandra Chakraborty

Earlier, Mr Chakraborty, Convenor, Electronics & Telecommunication Engineering Divisional Subcommittee, West Bengal State Centre delivered the opening remarks. The programme concluded with a vote of thanks by Prof Nitosh Kumar Brahma, Honorary Secretary, West Bengal State Centre, IEI.



Courtesy Mr Chanchal Chakraborty



Courtesy Mr Chanchal Chakraborty

Smart Distribution Grid

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others and the information infrastructure will superimposed on it, that leads to two-way communication between the service providers and end users. Mr P Rajamani, Chairman, Electrical Engineering Division Board and Council Member, IEI appreciated the Panelists and Moderator for the informative session and thoughtful deliberations. A brief question-answer session was held at the end of the session.



Prof (Dr) Natarajan Kumaresan

Earlier, Prof (Dr) Natarajan Kumaresan, Chairman, Tiruchirappalli Local Centre and Council Member, IEI delivered the welcome address. Dr Nilanjan Sengupta, Director (Technical), IEI proposed the vote of thanks.

Convergence of IoT and AI

West Bengal State Centre, IEI organized Technical Webinar on the theme **Convergence of IoT and AI** under the aegis of Electronics and Telecommunication Engineering Division Board [ETDB], IEI on 27 January 2022. Dr Nabarun Bhattacharyya, Senior Director & Centre Head, C-DAC Kolkata and Mr Alokesh Ghosh, Associate Director, C-DAC Kolkata graced the function as Panelists and shared their expertise and views with the attendees. The session was moderated by Mr Ram Chandra Chakraborty, Managing Director, PSI Metals India Private Limited.

The webinar commenced with the welcome speech delivered by Mr Sandip Kumar Deb, Vice President, IEI and Chairman, West Bengal State Centre, IEI. Dr H O Thakare, President, IEI graced the occasion with his august presence and presided over the function. Prof (Dr) Girish Shrikisan Mundada, Chairman, ETDB, IEI; Dr Alok Nath De, Member, ETDB, IEI; and Mr Santosh Kumar Surajmal Mutha, Member, ETDB, IEI were present on the occasion.



Dr Nabarun Bhattacharyya

Dr Nabarun Bhattacharyya, Senior Director & Centre Head, C-DAC Kolkata spoke on the topic 'Convergence of IoT & AI for Society & Masses'. He started his presentation with a brief review on the intersecting areas of science, engineering & technology and discussed about their impact on societal verticals like Agriculture, Health, Education, Governance and Environment. He then elaborated on the salient features of emerging technologies like

IoT, Artificial Intelligence (AI), Machine Learning (ML), Robotics, Big Data on Cloud, Augmented Reality / Virtual Reality (AR/VR), Radio Frequency Identification (RFID), Block Chain Technology, High Performance Computing (HPC), Grid and Cloud Computing, Nano Technology, Communication Technologies-5G/6G/7G, their relationship with each other & different applications. He defined IoT as a system of interrelated computing devices, mechanical & digital machines, objects, animals or people that are provided with Unique Identifiers (UIDs) and possess the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. He illustrated the concept of IoT with an example of a smart home having interconnected devices like refrigerator, television, washing machine, fan, temperature sensor & air conditioner etc. Dr Bhattacharyya further deliberated on Sensors & Sensing System, Wireless Sensor Network (WSN) / IoT Technologies, Instrumentation & Automation, Web & Mobile Technologies, Biosensors & Biotechnologies & their application domains in Agri-Climatic, Soil, Water and Air; Food Safety and Quality Check, Tracking & Traceability. He also discussed Integrated Electronic Nose & Vision (ENV) System with its application in tea industry.

Mr Alokesh Ghosh, Associate Director, C-DAC Kolkata in his lecture, stated that the Integrated Electronic Nose & Vision (ENV) System developed was bulky in nature; To combat this issue handheld E-Nose system got developed, which is used for reliable prediction of tea-taster like score of finished tea, online plot of fermentation profile for end-point detection, quality analysis of floral extracts like jasmine, rose, etc and quality estimation of spices. He then described Ion-Selective Polymer Membrane Sensors based Portable E-Tongue, able to distinguishes tea samples



Mr Alokesh Ghosh

having different astringency values with an accuracy of more than 85%, completes tea testing operation in a single mouse click, mimicking Tea Taster Scores by electronic means, does auto cleaning of electrodes by clean water & utilises user-friendly software. 5 E-Tongue systems have been installed in the tea industries, tea gardens, research organizations in India, Mr Ghosh added. He further narrated about rapid, real time & non-invasive means of assessment of physical quality parameters for a number of food grains & pulses produced in India, benefitting farmers, agricultural traders,

commercial agriculturists, Government authorities and stakeholders of agri-marketing at all levels. Mr Ghosh further explained Machine Vision Solution for Quality Analysis of Tur Dal, PULSE-VIEU, that provides benefits of fast & reliable Image processing based non-invasive technique such that buyers become aware of quality before buying and farmers get better prices. This machine generates instant quality analysis report with count based and correlation with weight, supports PC based image processing solution for online quality analysis, uniform illumination for easy image analysis, camera connected with PC through USB, digital camera based image acquisition and customized sample holding tray, he mentioned. He then described tea factory automation system with sensors in Withering, Rotorvane & CTC, Fermentation, & Drier areas of the Process Floor, connected to a PC in the Central Control Room. He also discussed Bio-Sensing Systems 'PestSCAN' & 'BioSCAN' for finding pesticide residue in Tea (Organophosphorus group) and pesticide detection in fruits and vegetables. The speaker discussed at a length the convergence of IoT & AI in Agriculture to meet challenges like population explosion, climate change and enhancing farmer's income. He focussed on the basic facets of Indian agriculture like small and fragmented land holdings, soil degradation due to excessive use of fertilizers, outputs depend upon external factors - weather, water resource, pest & disease attack, etc., lack of mechanisation, very slow adoption of technology,



Internet of Things (IoT)

IoT is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with Unique Identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.



EXAMPLES OF IOT DEVICES IN SMART HOME



Courtesy Dr Nabarun Bhattacharyya



Virtual Reality (VR) and Augmented Reality (AR)

Virtual Reality and Augmented Reality are new exciting areas in which the real and virtual worlds are brought together.

Using this technology, one can see, hear, smell and feel sensations as though one were in a real life situation, but actually the experience is via a computer simulation.



With the help of special headsets, glasses and joysticks, one can get a 3D look and feel and enjoy an immersive experience.

Flight Simulator that helps aspiring pilots with how to navigate a plane in real time and with simulations that help them learn how to handle an aircraft during times such as turbulence, engine failure or other emergencies.

Courtesy Dr Nabarun Bhattacharyya

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Industrial and Medical Applications of Artificial Intelligence

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presence of Shri Rakesh Singh, Hon'ble Member of Parliament. Hon'ble Minister, Department of Science and Technology, Government of Madhya Pradesh in his address mentioned that Artificial Intelligence has changed the world as a whole and plays a vital role in the field of healthcare sector. He strongly advocated for the application of Electronic Health Records (EHR) as one of the crucial inputs for digitization to facilitate the ease of information flow in the healthcare industry. A major percentage of medical practitioners use EHR, which leads to using AI to interpret the records and provide meaningful diagnostic and clinical information to the doctors, he added. Shri Rakesh Singh, Hon'ble Member of Parliament in his address highlighted on the ethical concerns of applications of AI in healthcare industry including data privacy.

Er Narendra Singh, President, IEI graced the occasion with his august presence and addressed the audience. In his address, President, IEI mentioned that Artificial Intelligence has attracted the attention of researchers, physicians, technology and program developers, and consumers in various fields in terms of its potential for transformative innovations in treating human diseases and public health. As AI-supported technologies learn and diagnose from a large volume of medical research and patients' treatment records, they play a significant role in augmenting doctors' decision-making process for diagnoses and treatment, he added.

Mr Bharat Patel, Chairman, Computer Engineering Division Board, IEI presided over the function. Mr Rakesh Rathore, Council Member, IEI was also present on the occasion.

On the occasion, Dr Sanjeev Jain, Director, Indian Institute of Information Technology, Design and Manufacturing, Jabalpur; Mr Manjeet Singh, Managing Director, Madhya Pradesh Power Generation Company Limited, Jabalpur and Mr Anant Gijare, Director, SUVACH Technologies Limited were felicitated as eminent engineering personalities for their meritorious contribution in the field of Computer Engineering.

The prestigious M S Ramanujam Memorial Lecture was delivered by Mr Prashant Pole, Member, IT Task Force, Ministry of Transport and Shipping, Government of India. Mr Pole, in his lecture explained the application of Artificial intelligence in healthcare to mimic human cognition in the analysis, presentation, and comprehension of complex medical issues and preservation of health care data. The speaker deliberated at a length

the role of different Machine Learning models to gain useful insights and predictions.

Earlier, Mr Tarun Kumar Anand, Chairman, Jabalpur Local Centre, IEI welcomed the guests, dignitaries, participants and members present in the function. Dr Mukta Bhatele, Convener of the National Convention apprised the audience regarding the theme of the National Seminar. Mr Prakash Chandra Dubey, Honorary Secretary, Jabalpur Local Centre proposed vote of thanks.

During the Technical Sessions, number of Papers were presented on different topics, which include Quality Control Using AI for Digital Pathology; Demonstration of Real World use Cases of AI in Augmenting Radiology Workflow ; Estimation of the Mechanical State of the Aortic Wall from 4D Flow MRI; Detection & Classification of Plant Leaf Disease Using Recent Techniques; Use of Artificial Intelligence in Civil Engineering; Intelligent Surveillance Model Using Convolution Neural Network (CNN) and Unscented Kalman Filter (UKF) ; Detection & Classification of Plant Leaf Disease Using Recent Techniques ; Study of VGG-16 & Inception-V3 Classification Models for segregation of Machine Harvested Tea-leaves; Visual Explanation using Grad-CAM for Deep Learning based Classification of Tea-leaves ; IoT enabled e-nose Network for Deep Learning based Detection of Obnoxious Odor Gases in Environment etc.

During the Valedictory Function, Brigadier Vipin Trivedi graced the function as Chief Guest.

Recommendations which emanated from the two-day deliberation are as follows.

The use of AI in healthcare need to be increased, to bring in accuracy in diagnosis and better predictions in the treatment plan as well as prevention of diseases.

More exploration is required in the application of Brain-computer Interfaces, (BCI) which is applicable for the patients with trouble in moving, speaking or with a spinal cord injury.

Healthcare is a complicated science that is bound by legal, ethical, regulatory, economical, and social constraints. In order to fully implement AI within healthcare, there must be parallel changes in the global environment, with numerous stakeholders, including citizen and society.

Since AI makes decisions solely on the data it receives as input, it is important that this data represents accurate patient demographics.

Convergence of IoT and AI

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environment pollution / climate change and inadequate and improper storage facility. In his lecture, Mr Ghosh stressed upon the adoption of precision farming by deployment of technologies like IoT, Robotics, GIS Map / GPS, Weather Information, and Artificial Intelligence. He narrated the application of IoT in agriculture in the areas of irrigation systems, fertilization systems, early disease detection and pest control leading to Sustainable Irrigation Systems. He also spoke on the application of IoT in Dairy, Poultry, & Fishery. He also talked about deployment of Mechanical / Robotic Solutions like Tractor, Transplanter, Drum Seeder, Mechanical Harvester, Unmanned Aerial Vehicle and Autonomous Tractor in agriculture. He concluded saying that we need to deploy our indigenously developed affordable technologies, as only Indians would understand Indian agriculture in a better manner. He further emphasised on Community Farming to overcome problems of small

landholdings. More so he stressed upon eco-system to be developed for support and maintenance, attracting educated rural youths into agriculture with friendly policies & Government initiatives. Moderator of the session, Mr Ram Chandra Chakraborty, Managing Director, PSI Metals India Private Limited summed up the proceedings.



Mr Ram Chandra Chakraborty

Earlier, Mr Chakraborty, delivered the opening remarks. The programme concluded with the vote of thanks delivered by Prof Nitosh Kumar Brahma, Honorary Secretary, West Bengal State Centre, IEI.

Application of Embedded Controllers and Sensors for Smart Environment

Kanchepuram Local Centre of the Institution, in association with the Department of Electronics and Communication Engineering, Sathyabama Institute of Science and Technology, Chennai organized One Day Seminar on the topic **Application of Embedded Controllers and Sensors for Smart Environment** on 23 October 2021 under the aegis of Electronics



and Telecommunication Engineering Division Board [ETDB], IEI. The main objective of the Seminar was to explore the application domain and significance of embedded controllers and sensors and provide an in-depth knowledge about sensors and embedded controllers for smart environment in real time applications. Dr R M Joany, Associate Professor, Department of

Electronics & Communication Engineering, Sathyabama Institute of Science and Technology, Chennai graced the function as Chief Guest and delivered the Keynote Lecture. Followed by the inaugural session, Dr R M Joany delivered lecture on the topic 'Application of Embedded Controllers and Sensors for Smart Environment'. In his lecture, Dr Joany focused on the future of imaging in smart cities for real time applications of embedded systems in day to day applications. Dr E Anna Devi, Associate Professor, Department of Electronics & Communication Engineering, Sathyabama Institute of Science and Technology delivered lecture on the topic 'Internet of Things' and focused on new perspectives about various approaches, importance of sensors and IoT in real time applications. Ms S Yogalakshmi, Assistant Professor, Department of Electronics and Communication Engineering, Sathyabama Institute of Science and Technology delivered lecture on the topic 'Communication in Embedded Controllers'. Dr S Karthikeyan, Associate Professor, Department of Electronics and Communication Engineering, Sathyabama Institute of Science and Technology, Chennai delivered lecture on the topic 'Communication Protocols'. This session also had a demo on application using Arduino Controller. Earlier, Prof (Dr) K Palani Kumar, Chairman, Kanchepuram Local Centre and Council Member, IEI presided over the function.

and Telecommunication Engineering Division Board [ETDB], IEI. The main objective of the Seminar was to explore the application domain and significance of embedded controllers and sensors and provide an in-depth knowledge about sensors and embedded controllers for smart environment in real time applications. Dr R M Joany, Associate Professor, Department of



Engineering Staff College of India

Autonomous Organ of The Institution of Engineers (India)
(An ISO 9001: 2015 Certified Institution)
Old Bombay Road, Gachi Bowli, Hyderabad – 500 032

Continuing Professional Development Programmes (CPDPs) for the Month of March 2022

Sl. No.	Name of the Course	Scheduled Dates
1	Reactive Power Management (Concepts of SIL, FACTS devices)	02 – 04 Mar, 22
2	NAAC Accreditation	03 – 05 Mar, 22
3	Analysis of Castings, Forgings and Weldments	07 – 10 Mar, 22
4	Machine Learning & Artificial Intelligence	07 – 11 Mar, 22
5	Automation in Micro Irrigation Systems for improving Irrigation Efficiency	07 – 11 Mar, 22
6	Online Monitoring Industrial Emission Effluent (Technical Guidelines and Demonstration).	08 – 10 Mar, 22
7	Testing of High Voltage Power Equipment	08 – 10 Mar, 22
8	Asset Management for highway projects including HDM	14 – 16 Mar, 22
9	Best Practices in Distribution System Operation & Management	14 – 17 Mar, 22
10	Desalination Process – Planning, Design & Operation	15 – 17 Mar, 22
11	Total Quality in Power Plants	16 – 18 Mar, 22
12	Geo-Synthetics & Reinforced Soil Structures	21 – 23 Mar, 22
13	Planning, Design, Construction and O&M of Lift Irrigation Schemes	21 – 24 Mar, 22
14	Preparation of DPR and Tender Documents for Sewage Treatment Plant	22 – 24 Mar, 22
15	Tariff Policy Including Basics of Tariff Calculation & Procedure / Information Required for Preparation of Tariff Petition & Energy Scheduling	22 – 24 Mar, 22
16	CMM – Co-ordinate Measuring Machine	23 – 26 Mar, 22
17	Customer Relationship Management - Modernization of Metering, Billing, Collections in Distribution System	28 – 31 Mar, 22

For detail information please contact:

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IEI Celebrates Energy Conservation Day

The Institution of Engineers (India) celebrated Energy Conservation Day all over the country on 14 December 2021. Brief account of the celebration as received from various Centres are reported hereunder.

STATE CENTRES

Assam



Assam State Centre, IEI observed Energy Conservation Day at Guwahati on 14 December 2021. Mr Mrinal Choudhury, Additional Director, Assam Energy Development Agency spoke on the occasion. During deliberation,

he stressed on inculcation of energy conservation habits right from the childhood. He further stressed on plugging of all leaks in water conduit, fuel conduit, power lines to conserve the significant sources of energy. Earlier, Mr Nirpendra Nath Patwari, Chairman, Assam State Centre and Council Member, IEI welcomed the gathering. Mr Pulak Sarmah, Honorary Secretary, Assam State Centre felicitated the speaker. At the end, Dr Milanjit Bhattacharyya, Jt. Honorary Secretary of the host Centre proposed the vote of thanks.

Gujarat

Gujarat State Centre, IEI observed Energy Conservation Day on 14 December 2021 at Ahmedabad on the topic 'Importance of Energy Conservation'. On the occasion, Mr Dineshchandra Odhavjibhai Nakrani, Honorary Secretary-Elect, Gujarat State Centre, IEI was the Keynote speaker. During his lecture, he explained about energy conservation, energy efficiency, energy audit, importance of energy conservation and about Energy Conservation Act 2021 in detail. At the end of the session, Mr Vijay B Solanki, on behalf of Water Management Forum, IEI offered his concluding remarks and proposed the vote of thanks.



Kerala

Kerala State Centre, IEI observed Energy Conservation Day on 14 December 2021 and a technical webinar was organised on the occasion. Dr Shaji James P, Former Professor of Farm Power, Machinery & Energy, Kerala Agricultural University delivered lecture on the topic 'Renewable Energy Options for Climate Change Mitigation' and shared his expertise and knowledge. Earlier, Mr Asok Kumar K, Chairman Kerala State Centre and Council Member, IEI delivered the welcome address and introduced the speaker. At the end, Mr Roy Mathew, Honorary Secretary, Kerala State Centre, proposed the vote of thanks.



Tamil Nadu

Tamil Nadu State Centre, IEI observed Energy Conservation Day on the topic 'Green Hydrogen' in virtual mode on 14 December 2021. Dr Mayilvelnathan



Vivekananthan, Professor, Mohamed Sathak Engineering College, Chennai was the speaker of the session. At the outset, Mr S Kannan, Chairman, Tamilnadu State Centre and Council Member, IEI welcomed the gathering. Mr D Gokul, Joint Honorary Secretary

of the Centre introduced the guest speaker. At the end, Mr K N Sivaraju, Honorary Secretary, Tamil Nadu State Centre, IEI proposed the vote of thanks.

Telangana

Telangana State Centre, IEI observed Energy Conservation Week during 14-20 December 2021 at Hyderabad. On 14 December 2021 Telangana State Centre, in association with Telangana State Renewable Energy Development Corporation Limited (TSREDCO) organised the inaugural function.



Mr Sunil Sharma, IAS, Special Chief Secretary to Energy, Government of Telangana was the Chief Guest. Dr Shanta Thoutam, Chief Innovation Officer, Telangana State Innovation Cell, Government of Telangana and Mr N Janaiah, Vice Chairman and Managing Director, Telangana State Renewable Energy Development Corporation Limited (TSREDCO), the Guest of Honours. Speaker of the event, Mr Pavan Kumar, Consultant, TSREDCO deliberated lecture on the topic 'Energy Efficient BEE Star Rating Appliances'. A Souvenir was released on the occasion in the august presence of the dignitaries on the dais. On 15 December 2021, Mr Gulshan Kumar Anand, Energy Management professional was the Chief Guest and delivered the Keynote address. On 16 December 2021 a technical talk was organised on the topic 'Strategical Suggestions for Better Energy Conservation – A Vision' through cloud mode. Prof C Ramanujacharyulu, Vice-Chairman, ECM, Telangana State Centre was the speaker. On 17 December 2021, a technical talk was organised on the topic 'Energy Conservation by Efficient Utilization of Steam in Industries' in online mode. Mr G K Anand, Committee Member of the host Centre spoke on the topic. On 18 December 2021 a technical talk was organised on the topic 'Energy Conservation Awareness Walk'. On 19 December 2021, Mr S Ashok, BEE Accredited Energy Auditor delivered lecture through virtual mode on 'Practice Energy Modesty in Residential & Commercial Buildings at least Now'. Mr T Muthukumar, Research Scholar, Department of Electrical & Electronics Engineering, Puducherry Technological University delivered lecture on 'Feasibility Analysis of Solar Plant for EV Charging Application in Residential Apartment using Software'. On 20 December 2021, during the valedictory session, Ms Surabhi Vani Devi, MLC, Telangana addressed the gathering as Chief Guest. Mr Adhar Sinha, IAS, Special Chief Secretary to Government & Director General, Environment Protection Training & Research Institute addressed the gathering as Chief Guest and deliberated on the topic 'The Reasons for Seasons'. Mr N Janaiah, Vice Chancellor & Managing Director, TSREDCO addressed the gathering as Special Guest. Dr P G Sastry, Director, Ramky, Hyderabad delivered the technical talk on the topic 'Earned Value Project Management System'. Mr B Brahma Reddy, Chairman, Telangana State

Centre, IEI presided over the functions. Dr G Venkata Subbaiah, Honorary Secretary, Telangana State Centre was also present in the programme.

Uttar Pradesh



Uttar Pradesh State Centre, IEI observed Energy Conservation Day on 14 December 2021 in association with Rotary International Club, Rajdhani Lucknow, M/s Neelance Theme Park, Resort & Water Park Lucknow and M/s Elegent Outfit, Lucknow dealing with Solar Power at Lucknow. Chief Guest

of the function, Dr R C Goyal, Former Head and Principal, MMM Engineering College, Gorakhpur spoke on energy conservation. In the beginning, Mr Masarrat Noor Khan, Chairman, Uttar Pradesh State Centre and Council Member, IEI welcomed all guests. On the occasion, Mr V B Singh, Council Member, IEI; Mr R K Trivedi, Former Chairman, Uttar Pradesh State Centre, IEI, Mr Satya Prakash, Managing Director, UP Rajkiya Nirman Nigam were also present. The programme concluded with vote of thanks presented by Dr Jaswant Singh, Honorary Secretary, Uttar Pradesh State Centre, IEI.

West Bengal

West Bengal State Centre, IEI observed Energy Conservation Day on 14 December 2021 and a webinar was organised on the occasion. Speaker of the event, Prof Ashoke Kumar Paul, Associate Professor, Department of Electrical Engineering, Techno India University, Kolkata delivered lecture on the topic 'Energy Saving Schemes on Metals, Mining, Transportation and Food processing Industries'. Prof Paul discussed on dry quenching of coke, waste heat recovery from sinter, role of top pressure recovery turbine in blast furnace, function of walking beam reheating furnace in rolling mills and so on. Speaker of the event, Dr Marta Zurek-Mortka, Researcher, Lukasiewicz Research Network, Department of Control Systems, Institute for Sustainable Technologies, Poland deliberated on the topic 'Energy Potentials and Crisis Scenarios in Electromobility'. She highlighted the increasing demand of electricity and emphasized on introduction of renewable energy sources into the energy system. In the beginning, Mr Sandip Kumar Deb, Chairman, West Bengal State Centre and Council Member, IEI welcomed the participants of the webinar. Dr Raju Basak, Joint Honorary Secretary of the host Centre, introduced the speakers and at the end, Prof Nitosh Kumar Brahma, Honorary Secretary, West Bengal State Centre proposed the vote of thanks.

LOCAL CENTRES

Alwar

Alwar Local Centre, IEI, in collaboration with Government Polytechnic College, Alwar observed Energy Conservation Day on 14 December 2021 and organised a technical talk on the topic 'Energy Conservation & Solar Power' at Alwar. The Keynote speaker of the programme, Mr C L Yogi, HoD,



Electrical Engineering Department, Government Polytechnic College, Alwar spoke on the useful applications of solar power for industry and domestic use. The Command Speaker of the programme, Mr Ajit Kumar Jain, Retired General Manager, ONGC

focused on the present condition of energy crisis and spoke about government scheme for efficient use of energy. Earlier, Mr Subhash Chandra Joshi, Chairman, Alwar Local Centre, IEI welcomed the guests and dignitaries. At the end, Mr Raj Deep Sharma, Honorary Secretary, Alwar Local Centre proposed the vote of thanks.

Dhanbad

Dhanbad Local Centre, IEI observed Energy Conservation Day on 14 December 2021 at Mining Engineering Department, IIT-ISM Dhanbad. Prof



Tanmay Maity, Associate Professor, Department of Mining Machinery Engineering, IIT-ISM Dhanbad delivered Keynote address on the topic 'Scope of Energy Management in Mining Industry'. On the occasion, Dr Satyendra K Singh, Chairman, Dhanbad Local Centre, IEI welcomed all and delivered the theme address. At the end, Dr K K Singh, Past Honorary Secretary, Dhanbad Local Centre, IEI proposed the vote of thanks.

Durgapur

Durgapur Local Centre, IEI observed Energy Conservation Day on 14 December 2021 at Durgapur Local Centre, IEI. On the occasion, Dr D V Rajan, Deputy Chief Engineer, DVC, DSTPS, Andal was the Guest of Honour and Mr Kamal Nasir, Deputy Director, NPTI(ER), Durgapur, the



Guest Speaker. Dr D V Rajan deliberated on the topic 'Energy Transition towards Sustainable Development – Opportunities & Challenges'; while Mr Kamal Nasir spoke on the topic 'Energy Management'. Earlier, Mr Safikul Islam, Chairman, Durgapur Local Centre, IEI delivered the welcome address and highlighted the objectives of Energy Conservation Day. Mr Manas Majumder, Honorary Secretary, Durgapur Local Centre, IEI delivered the introductory address and at the end of the session, proposed the vote of thanks.

Goa

Goa Local Centre, IEI observed Energy Conservation Day on 14 December 2021 at International Centre, Donapaula, Goa. Mr Nilesh Cabral, Hon'ble Minister for Power, Environment, New and Renewable Energy, Government of Goa was the Chief Guest of the function. During his address, Mr Cabral stressed on the importance of various steps taken up



by Government of Goa in conservation of energy. The Keynote speakers of the event were Mr Anish Souza, Founder & CEO, Sun360 and Dr C Thangaraj, Director NITTTR, Bhopal. The speakers shared their knowledge and experience with the august audience and explained the need of energy conservation. In the beginning, Mr Gajanan Harihar Karkare, Chairman, Goa State Centre, IEI welcomed the participants. At the end of the session, Austin Socorro Rodrigues, Honorary Secretary, Goa State Centre, IEI proposed the vote of thanks.

Gorakhpur

Gorakhpur Local Centre, IEI observed Energy Conservation Day on 23 December 2021 at Government Polytechnic, Gorakhpur. Mr A K Mishra, Principal, Government Polytechnic, Gorakhpur inaugurated the function. Mr Jay Shankar Dubey explained the forms of energy including mechanical energy, heat energy, light energy, chemical energy, electrical energy and



nuclear energy, renewable and non-renewable energy and different aspects of energy savings. Earlier, Mr Dharendra Chaturvedi, Chairman, Gorakhpur Local Centre, IEI welcomed the Keynote speaker and audience. Mr Ved Prakash Gupta, Honorary Secretary, Gorakhpur Local Centre introduced the Keynote speaker and at the end of the event, proposed the vote of thanks.

Gwalior

Gwalior Local Centre, IEI observed Energy Conservation Day on 14 December 2021 at Gwalior. Mr Virender Singh Tomar, Retired Chief Engineer (Electrical), M P PGCO, Government of Madhya Pradesh delivered lecture on the occasion. Mr R K Gupta, Retired MPEB Senior Executive, Government of Madhya Pradesh & Consultant, HCE Limited explained about the energy conservation in detail. Dr S K Agarwal, MNNIT, Allahabad, Uttar Pradesh, spoke on energy conservation and urged that efforts to be made to ensure that energy is used efficiently. Mr R S Bhadoriya, Retired Chief Engineer, PHE, Government of Madhya Pradesh stressed on creating awareness amongst people on global warming and climate change and promote efforts towards saving energy resources. Mr U S Pandey, Retired S.E., PHE, Government of Madhya Pradesh also spoke on the topic and lastly Mr P Y Khanwilkar, Retired Chief Engineer, NHPC, MOP-GOI and Honorary Secretary, Gwalior Local Centre, IEI shortly spoke on Perform Achieve and Trade Scheme (PAT) on a market based mechanism to enhance the cost effectiveness to improve the energy efficiency in energy intensive industries through certification of energy saving which can be traded. Earlier, Mr Prabhat Kumar Bhargava, Chairman, Gwalior Local Centre, IEI delivered the welcome address and briefed the audience on the topic. At the end, Mr P Y Khanwilkar, Honorary Secretary, Gwalior Local Centre proposed the vote of thanks.



Indore Local Centre, IEI observed Energy Conservation Day held on 18 December 2021 at Indore and a one day conference on the topic 'Net Zero 2070' was organised on the occasion. Mr Hardeep Singh Dang, Minister, New & Renewable Energy & Environment, Government of Madhya Pradesh graced the occasion as Chief Guest and Mr Shankar Lalwani, Member of Parliament, Indore, Mr Abhay Bakre, Director General, Bureau of Energy Efficiency, New Delhi and Mr S N Goyal, President, Maral Overseas Limited as Guests of Honour. Ms Mohua Mukherjee, Energy and Climate Finance Expert, New Delhi was the Keynote speaker. The speakers of the technical session were Ms Janak Palta McGilligan, Mr Jitendra Vyas, Consultant, Mr Shailesh Harani, Managing Director, ARMEC Cooling Towers, Mumbai; Mr Sapan Shah, Director, Shah Marketing, Indore and Mr Hariom Jha, General Manager, Energy Management Systems; Dr Surendra P Bajpai, Project In-Charge, EMC, Madhya Pradesh Urja Vikash Nigam Limited. Earlier, Mr Rajendra Prasad Gautam, Chairman, Indore Local Centre, IEI welcomed all dignitaries. At the end, Mr Dharmendra Singh Parihar, Honorary Secretary, Indore Local Centre, IEI proposed the vote of thanks.

Indore

Kalpakkam Local Centre, IEI observed Energy Conservation Day on 15 December 2021 in virtual mode. On the occasion, Mr S Pothiraj, Scientific Officer, Electrical & Mechanical Maintenance Division, GSO, ESG Kalpakkam addressed the audience on the topic 'Energy Conservation in Electrical Components'. He stated the Energy Conservation Act and mentioned its' goal to reduce energy intensity of Indian economy. He further discussed about energy conservation. Mr M Shanmuga Sundaram, Chairman, Kalpakkam Local Centre, IEI presided over the programme and welcomed the participants. Mr S K Rajesh, Honorary Secretary, Kalpakkam Local Centre introduced the speaker to the audience. The programme concluded with vote of thanks proposed by Mr M Shanmuga Sundaram, Chairman, Kalpakkam Local Centre, IEI.



Palghat Local Centre, IEI observed Energy Conservation Day on 14 December 2021 by organising a webinar. Mr Ajith Gopi, Joint Chief Technical Manager, Heading Technical Consultancy in Solar PV Projects and Wind Energy Programme, Department of Power, Government of Kerala, State Nodal Agency of Ministry of New and Renewable Energy, Government of India delivered Keynote lecture on the topic 'Solar Energy and its Future Trends in Supporting Sustainable Development'. Earlier, Mr K Madhana Mohan, Chairman, Palghat Local Centre, IEI welcomed the Keynote speaker and attendees of the webinar. At the end, Prof (Dr) C Pradip, Honorary Secretary, Palghat Local Centre, IEI proposed the vote of thanks.

Kalpakkam

Pune Local Centre, IEI observed Energy Conservation Day on 23 December 2021 in virtual mode. On the occasion, Mr Mohan Satpute, General Manager, Factory Maintenance, SKF India Limited and Country Energy Coordinator spoke on energy conservation and emphasized the importance of energy conservation for the future. In the beginning, Dr Sanjay Bhaskar Zope, Chairman, Pune Local Centre, IEI welcomed the dignitaries and participants. At the end of the session, Mr Munot Vipin Vasantlal, Honorary Secretary, Pune Local Centre proposed the vote of thanks.



Kota

Nagpur Local Centre, IEI observed Energy Conservation Day on 21 December 2021 at Nagpur and a workshop was organised on this occasion. Mr Hemant Patil, Superintending Engineer, PWD, Nagpur was the Chief Guest of the programme. Mr Nishikant Kelkar, Senior General Manager, PGCIL was present on the occasion. Mr Piyush Kokate, Senior Scientist, CSIR, NEERI, Mr Satish Kumar, General Manager, MOIL; Mr Manish Itankar and Mr Dipak Sharma presented case studies during the workshop. In the beginning, Milind Anant Pathak, Chairman, Nagpur Local Centre, IEI welcomed the Chief Guest and other participants.



Pune Local Centre, IEI observed Energy Conservation Day on 23 December 2021 in virtual mode. On the occasion, Mr Mohan Satpute, General Manager, Factory Maintenance, SKF India Limited and Country Energy Coordinator spoke on energy conservation and emphasized the importance of energy conservation for the future. In the beginning, Dr Sanjay Bhaskar Zope, Chairman, Pune Local Centre, IEI welcomed the dignitaries and participants. At the end of the session, Mr Munot Vipin Vasantlal, Honorary Secretary, Pune Local Centre proposed the vote of thanks.

Nagpur

Palghat Local Centre, IEI observed Energy Conservation Day on 14 December 2021 by organising a webinar. Mr Ajith Gopi, Joint Chief Technical Manager, Heading Technical Consultancy in Solar PV Projects and Wind Energy Programme, Department of Power, Government of Kerala, State Nodal Agency of Ministry of New and Renewable Energy, Government of India delivered Keynote lecture on the topic 'Solar Energy and its Future Trends in Supporting Sustainable Development'. Earlier, Mr K Madhana Mohan, Chairman, Palghat Local Centre, IEI welcomed the Keynote speaker and attendees of the webinar. At the end, Prof (Dr) C Pradip, Honorary Secretary, Palghat Local Centre, IEI proposed the vote of thanks.



Pune Local Centre, IEI observed Energy Conservation Day on 23 December 2021 in virtual mode. On the occasion, Mr Mohan Satpute, General Manager, Factory Maintenance, SKF India Limited and Country Energy Coordinator spoke on energy conservation and emphasized the importance of energy conservation for the future. In the beginning, Dr Sanjay Bhaskar Zope, Chairman, Pune Local Centre, IEI welcomed the dignitaries and participants. At the end of the session, Mr Munot Vipin Vasantlal, Honorary Secretary, Pune Local Centre proposed the vote of thanks.

Palghat

Pune Local Centre, IEI observed Energy Conservation Day on 23 December 2021 in virtual mode. On the occasion, Mr Mohan Satpute, General Manager, Factory Maintenance, SKF India Limited and Country Energy Coordinator spoke on energy conservation and emphasized the importance of energy conservation for the future. In the beginning, Dr Sanjay Bhaskar Zope, Chairman, Pune Local Centre, IEI welcomed the dignitaries and participants. At the end of the session, Mr Munot Vipin Vasantlal, Honorary Secretary, Pune Local Centre proposed the vote of thanks.

Pune

Pune Local Centre, IEI observed Energy Conservation Day on 23 December 2021 in virtual mode. On the occasion, Mr Mohan Satpute, General Manager, Factory Maintenance, SKF India Limited and Country Energy Coordinator spoke on energy conservation and emphasized the importance of energy conservation for the future. In the beginning, Dr Sanjay Bhaskar Zope, Chairman, Pune Local Centre, IEI welcomed the dignitaries and participants. At the end of the session, Mr Munot Vipin Vasantlal, Honorary Secretary, Pune Local Centre proposed the vote of thanks.

Roorkee

Roorkee Local Centre, IEI observed Energy Conservation Day on 14 December 2021 through online platform. Keynote speaker of the session, Prof Rajeshwar Prasad Saini, Hydro and Renewable Energy Department, Indian Institute of Technology Roorkee delivered lecture on the topic 'Importance and Benefits of Energy Conservation'. The event started with the welcome address delivered by Dr Ashish Pandey, Chairman, Roorkee Local Centre, IEI. Mr Vineet Kumar Saini, Honorary Secretary, Roorkee Local Centre, IEI proposed the vote of thanks at the end of the session.

Rourkela

Rourkela Local Centre, IEI observed Energy Conservation Day on 14 December 2021 in hybrid mode and organized seminar on the topic 'Sustainable Energy Conservation Technology and Management'. Dr Anil Kumar, Associate Professor, Department of Mechanical Engineering, Delhi Technological University, Delhi was the speaker of the event. His lecture introduced the concept of energy efficiency with associated approaches and technologies to achieve higher energy efficiency to mitigate energy demand. In the beginning, Mr Ajay Kumar Goswami, Chairman, Rourkela Local Centre, IEI delivered the welcome address. Dr Rama Chandra Pradhan, Honorary Secretary, Rourkela Local Centre, IEI briefed about the Energy Conservation Day and at the end, proposed the vote of thanks.

Saurashtra

Saurashtra Local Centre, IEI, in association with Marwadi University, Rajkot observed Energy Conservation Day by organizing technical webinar on the theme 'Approach and Attitude towards the Energy Conservation Practices' on 14 December 2021. Dr Bharat Kumar Maganbhai Ramani, Professor & Principal, Shri Labhubhai Trivedi Institute Engineering & Technology, Rajkot was the speaker on the occasion and delivered lecture on the topic. Earlier, Prof (Dr) Sarang Sadashiv Rao Pande, Chairman, Saurashtra Local Centre, IEI welcomed the speaker, dignitaries and participants. At the end, Mr B V Harsoda, Honorary Secretary, Saurashtra Local Centre, IEI proposed the vote of thanks.

Tiruchirappalli

Tiruchirappalli Local Centre, IEI observed Energy Conservation Day through online mode on 14 December 2021 and a lecture programme was organized on the topic 'Conserve Energy, Save the Future'. Dr J Sathiyarayan, Senior Section Engineer, Golden Rock Railway Workshop, Tiruchirappalli, was the speaker of the event. During his lecture, Dr Sathiyarayan explained energy efficiency, which is measured in terms of Tonne of Oil Equivalent (TOE), which is the unit of energy defined as the amount of energy released by burning one tonne of crude oil. He further discussed the energy loss due to idle run and keeping the gadgets in operational condition, when not in use. Earlier, Mr N Rajasekaran, Chairman, Tiruchirappalli Local Centre delivered the welcome address.

Tirunelveli

Tirunelveli Local Centre observed Energy Conservation Day on 17 December 2021 through online mode and organised a seminar on the topic 'Electrical Energy Conservation'. Prof K Kasirajan, Senior Lecturer, Faculty of Engineering and Built Environment, MAHSA University, Kuala Lumpur, Malaysia was the speaker of the day. Prof (Dr) R Velayutham, Chairman, Tirunelveli Local Centre, IEI delivered the welcome address. Mr M Jimmi Carten, Honorary Secretary, Tirunelveli Local Centre proposed the vote of thanks.

Trichur

Trichur Local Centre, IEI observed Energy Conservation Day and organised a webinar on the topic 'Current Voltage Responses in Solar PV Modules' on 14 December 2021. Dr Nikhil P G, Assistant Director (Technical),

National Institute of Solar Energy, Gurgaon, Haryana was the speaker of the day. The speaker presented the responses of current and voltage in Solar Photovoltaic Modules in the context of technology, measurement, losses and cost concerns. Earlier, Prof C P Sunil Kumar, Chairman, Trichur Local Centre, IEI delivered the welcome address. Dr E K Kurien, Honorary Secretary, Trichur Local Centre, IEI proposed the vote of thanks.

Tuticorin

Tuticorin Local Centre, IEI observed Energy Conservation Day on 14 December 2021 at Tuticorin. On the occasion, Mr Rakesh Shandilya, Senior Scientific Officer, Heavy Water Plant, Tuticorin delivered the Keynote address. In his deliberation, he mentioned that energy conservation



can be achieved by optimizing the consumption. Energy conservation measure in buildings reduces the need for energy services and can result in increased environmental quality, national security, financial security and higher energy savings, he added. Mr I Maria Michael Raj, Past Chairman of Tuticorin Local Centre, IEI presided over the function and welcomed the participants.

Upper Assam

Upper Assam Local Centre, IEI observed Energy Conservation Day on 14 December 2021 through online mode. On the occasion, Mr Dibakar Bhattacharjee, Ex-Deputy General Manager, IOCL – AOD and Mr Bibhuti Kumar Sarma, Ex-Deputy General Manager, AGCL delivered speech as Guest Speakers. During the technical session, Mr Sushant Kumar Gupta, Superintending Engineer (Logistics), Oil India Limited, Duliajan presented paper on the topic 'Strategizing Energy Conservation in Transport Sector' and Mr Rakesh Kalita, Manager (Excavation), North Eastern Coal Fields, Margherita presented paper on the topic 'Energy Conservation in Agriculture'. At the end of the session, vote of thanks was proposed by Mr Debajeet Sarma, Honorary Secretary, Upper Assam Local Centre, IEI.

Varanasi

Varanasi Local Centre, IEI observed Energy Conservation Day on 21 December 2021 in association with Saraswati Higher Education and Technical (SHEAT) Group of Institutions, Varanasi through online platform. On the occasion, Dr Vijay Kumar Upadhyay, Associate Professor & Registrar, SHEAT College of Engineering and Management, Varanasi and Mr Akash Agrawal, Director, Tulsipumps and Power Private Limited, Maldahiya, Varanasi delivered lecture as resource persons. Dr Vijay Kumar Upadhyay deliberated on energy conservation and mentioned the importance of energy conservation, policy framework, Energy Conservation Act, energy savings during transportation etc. Mr Akash Agrawal deliberated on the topic 'Solar Power and its Development'. In the beginning, Mr Ramashanker Prasad Gupta, Chairman, Varanasi Local Centre, IEI welcomed the learned speakers and other participants of the webinar and highlighted the importance of energy saving. Mr Santosh Kumar, Immediate Past Honorary Secretary, Varanasi Local Centre, IEI conducted the proceedings of the programme and at the end, proposed the vote of thanks.

Warangal

Warangal Local Centre, IEI observed Energy Conservation Day on 14 December 2021 at Warangal. Mr V Pradeepkumar, graced the occasion as Chief Guest. Earlier, Mr M Sambaiah, Chairman, Warangal Local Centre, IEI delivered the welcome address and highlighted the importance and application of Energy Conservation & Energy Audit. He also emphasized upon the urgent need for judicious use of energy and conserving it as the most precious commodity. Mr M Mallaiyah, Honorary Secretary, Warangal Local Centre, IEI proposed the vote of thanks.

News-in-Brief

The following are the brief account of Technical Activities organised by various Centres

STATE CENTRES

Gujarat

Organised webinar on the topic 'Energy Conservation & Energy Audit' jointly with Electrical Engineering Department, Government Polytechnic, Himatnagar on 2 September 2021 through online mode. Dr R K Gajjar, Principal, L D College of Engineering, Ahmedabad graced the function as Chief Guest and Prof (Dr) D J Shah, Director, Technical Courses, & Principal, Sankalchand Patel University, Visnagar as Guest of Honour. Keynote Speaker, Mr Dinesh O Nakrani, Executive Engineer (Electrical), R&B Department, Government of Gujarat also addressed the gathering on the subject 'Energy Conservation & Energy Audit'.

Jointly with Water Management Forum, IEI and Civil Engineering Department, Government Polytechnic, Himatnagar organised webinar on the topic 'Water Resources Management in Gujarat' on 6 September 2021 through online platform. Chief Guest of the event, Prof (Dr) Ing Anupam Kumar Singh, Director, IITE, Indus University, Ahmedabad delivered presentation on the topic with case studies and statistical analysis. Mr J H Gabra, Head, Civil and Applied Mechanics Department, Government Polytechnic, Himatnagar explained the objective of the theme. Mr N B Patel, Retired Superintending Engineer & Consultant, Water Resources Department, Government of Gujarat delivered the Keynote lecture.

Punjab & Chandigarh

Observed World Habitat Day on 4 October 2021 through online mode. Chief Guest of the function, Mr Daljit Singh, Chief Engineer, Punjab Water Supply and Sewerage Board delivered lecture on the occasion. Dr Manjeet Bansal, Consultancy & Industry Linkage, Department of Civil Engineering, Maharaja Ranjit Singh Punjab Technical University, Bathinda was the Keynote speaker on the session.

Telangana

In association with Hyderabad Clean Air Network organized webinar on the topic 'Role of Eco-friendly Firecrackers in Preventing Air Pollution' on 23 October 2021 through online mode. Dr Veeranna Potipally, Joint Chief Environmental Scientist (Retd), Telangana State Pollution Control Board and Dr Vijaybhasker M S, Chairman, Ethical Committee Clinical Trials and Research, Hyderabad delivered lecture on the occasion. The speakers stressed on exercising control over the use of firecrackers.

In association with Hyderabad Clean Air Network organized webinar on the topic 'Role of Eco-friendly Firecrackers in Preventing Air Pollution' on 23 October 2021 through online mode. Dr Veeranna Potipally, Joint Chief Environmental Scientist (Retd), Telangana State Pollution Control Board and Dr Vijaybhasker M S, Chairman, Ethical Committee Clinical Trials and Research, Hyderabad delivered lecture on the occasion. The speakers stressed on control to use firecrackers.

LOCAL CENTRES

Bareilly

In association with Rajshree Institute of Management & Technology, Bareilly organised webinar on the topic 'Challenges and Opportunities for Mechanical Engineer in Space Science and Technology' on 26 August 2021. On the occasion, Mr A C Mathur, Group Director (Retd), Mechanical

Engineering Systems Area Space Application Centre, ISRO, Ahmedabad & Ex-Secretary and President, Space Society of Mechanical Engineers and Mr Sudhir Kumar Gupta, Chairman, Bareilly Local Centre, IEI deliberated on the topic.

Organised technical webinar on 27 August 2021 on the topic 'Ecosystem Preservation - Smart City'. Keynote Speaker of the function, Mr R N Bhargava, Ex-CMD, Ecomen Laboratories Private Limited spoke on the topic and Mr J C Singhal, Founder President, Institution of Water & Environment (India) also delivered lecture.

Organised 'Faculty Development Programme' in virtual mode on Recent Innovations and Challenges in Mechanical Engineering' on 30 July 2021. Panellists, Prof (Dr) Sanjay Upadhyay, Department of Mechanical Engineering, Indian Institute of Technology Roorkee; Dr Varun Sharma, Department of Mechanical Engineering, Indian Institute of Technology Roorkee and Dr Pankaj Sharma, Director, Rajshree Institute, Bareilly delivered lecture on the topic.

Indore

Observed World Telecommunication and Information Society Day on 10 December 2021 via online mode. Speaker, Dr Bhupesh Kumar Lad, Associate Professor, Department of Mechanical Engineering, Indian Institute of Technology Indore delivered lecture on 'Accelerating Digital Transformation in Challenging Times'. During lecture, he reinforced the importance of automation and smart manufacturing in the industrial sector through number of case studies of the industrial area, Indore.

Kalaburagi

In association with Karnataka State Council for Science and Technology, Bengaluru organised seminar on 28 October 2021 on the topic 'Rain Water Harvesting' at Kalaburagi. Speakers, Dr U T Vijay, Chief Scientific Officer & Principal Investigator, RWH & KDH, Karnataka State Council for Science & Technology (KSCST) Indian Institute of Science, Bengaluru deliberated on the topic.

Kalpakkam

Celebrated International Civil Aviation Day on 28 December 2021 through virtual mode. Dr A Anderson, Professor, School of Mechanical Engineering, Sathyabhama Institute of Science and Technology, Chennai presented on the topic 'Thermal Barrier Coatings' and explained how thermal barrier coatings are designed to protect metal structural components from extreme elevated temperatures, thereby reducing stress and fatigue and thus increasing the component life span.

Observed World Habitat Day on 7 January 2022 through virtual mode. On the occasion, Dr R Gandhimathi, Professor, National Institute of Technology Tiruchirappalli delivered presentation on the theme 'Accelerating Urban Action for a Carbon-free World'. In her lecture, she explained the methodology and line of actions to reduce carbon monoxide emission in various applications.

Jointly with New Prince Shri Bhavani College of Engineering and Technology, Santhosapuram, Chennai celebrated Technology Day on 16 December 2021 through virtual mode. Mr M Shanmuga Sundaram, Chairman, Kalpakkam Local Centre, IEI delivered lecture on the topic 'Basic Nuclear Engineering' and deliberated on nuclear reactors, nuclear fuel basics, nuclear fission, chain reaction, breeding, fuel enrichment and so on.

Kanpur

Organised Lecture on the topic 'Reforms-oriented and Results-inked Revamped Distribution Sector Scheme' on 31 October, 2021 at Kanpur. Dr K K Singh Tomar, SDO, Gumti, KESCO, Kanpur was the Guest Speaker on the occasion and in his address mentioned that 24X7 availability of reliable,

quality and affordable power is the key to economic development of the country.

Kanyakumari

Organised Webinar on the topic 'Microfluidic Diagnostic Devices in Healthcare Sector' on 18 November 2021. Mr Z E Jeroish, Research Scholar, University Malaysia, Pahang delivered the Keynote address on the application of Microfluidics mechanism in healthcare sector. He predicted that in near future, Lab-on a chip devices with their ability to perform complete diagnosis can change the way of practising medicine and accurate diagnosis.

Madurai

Organised lecture meeting on 9 October 2021 through online platform on the topic 'Internet of Robotics Things'. Mrs K Padmapriya, Assistant Professor, AAA College of Engineering and Technology, Amathur, Sivakasi was the Chief Guest. She explained IoT and Robotics and their applications in various fields of engineering, medical and industry, which include system maintenance, manufacturing, automation, Defence etc.

Nagpur

Organised Annual Function and 24th Dr V M Dokras Memorial Oration on 29 October 2021 at Nagpur. The theme of the programme was 'Management in New Normal'. Chief Guest of the function, Dr Pramod Padole, Director, VNIT Nagpur in his oration explained the audience about various emerging technologies in Bio Medics and the role of engineers. He further stressed upon the significance of application of Artificial Intelligence to the society.

Organised Er A B Kottewar Memorial Oration on 17 November 2021 at Nagpur to acknowledge invaluable contribution of Er A B Kottewar, a well-known practicing Electrical Engineer in Vidarbha Region, an expert in the fields of electrical safety, reliability, power sector reforms, consumer protection and regulatory control.. On the occasion, Mr V M Bodhankar, Ex-Senior Distribution Engineer, BSES, Mumbai and SCECO, Gizan, Saudi Arabia, an eminent Electrical Engineer in the field of Urban Power Distribution in metro cities was the Chief Guest and Keynote Speaker. In his address, he emphasized the need of uninterrupted power supply and shared his experience at power sector.

Organised three-day National Conference on Fly Ash Utilization & Green Building Materials 'Green Ashcon and Green Buildcon 2021' during 16-18 December 2021 at Nagpur. Shri Nitin Jairam Gadkari, Hon'ble Minister, Ministry of Road Transport and Highways, Government of India graced the function as Chief Guest. During his speech, Hon'ble Minister opined that the power generating companies should aggressively promote use of fly ash in the precast industry wherein it can be used substantially to manufacture different products. On the occasion, Member of Parliament, Rajay Sabha, Dr Vikas Mahatme put forth his thoughts before the audience and guided on how impetus can be given to channelize the utilization of fly ash. Also he assured to promote and support the fly ash initiatives. Mr Sudhir Paliwal, Mr Bipin Shrimali IAS, CMD, Mahatma Phule Renewable Energy & Infrastructure Technology Limited and Mr V M Motghare, Director, Maharashtra Pollution Control Board (MPCB) also spoke on fly ash issues and shared their views.

In association with Department of Computer Technology, Yeshwantrao Chavan College of Engineering (YCCE), Nagpur organised six-day Faculty Development Programme on the topic 'Cyber Forensic and Cyber Security' during 20-25 December 2021. On the occasion, the resource persons were Mr Piyush Varma and Mr Parimal Padhye from FORnSEC Solutions.

Pantnagar

Organised Saturday Talk on the topic 'Harnessing Solar Energy for different applications' on 24 July 2021. Resource person of the event, Dr Lokesh Varshney, Professor & Head, Department of Mechanical Engineering, College of Technology, G B Pant University of Agriculture & Technology,

Pantnagar shared his views on harnessing solar energy for different applications, transformation and conservation of solar energy etc.

Organised Saturday Talk on the topic 'Power Quality Disturbances and Impact' held on 31 July 2021. Dr Sunil Singh, Associate Professor, Department of Electrical Engineering College of Technology, G B Pant University of Agriculture & Technology, Pantnagar delivered lecture on the topic and deliberated on power quality, voltage imbalance and fluctuation etc.

Organised Saturday Talk on the topic '5G Technology : What is New and How it will Benefit Us' on 7 August 2021. Dr Sanjay Mathur, Chairman, Pantnagar Local Centre, IEI delivered lecture on the topic and shared his views on the basics of 5G Technology, differences between the previous generation of mobile Networks & 5G, 5G capabilities, ubiquitous mobile network service, mobile network evolution, Long Term Evolution (LTA) mobile communication system, Network Architecture Evolution, Mobile Traffics, expectations from 5G, how it will benefit us and our future, etc.

Organised Saturday Talk on the topic 'Applications of Robotics in Manufacturing Industry' held on 21 August 2021. Mr Devaki Nandan, Assistant Professor, Department of Industrial and Production Engineering, College of Technology, G B Pant University of Agriculture & Technology, Pantnagar delivered lecture on the occasion. In his address, the speaker shared his views on the applications of Robotics in manufacturing industry, different aspects of Robotics etc.

Puducherry

In association with Sri Venkateshwara College of Engineering & Technology, Puducherry observed World Habitat Day on 27 November 2021 at Puducherry. Chief Guest, Mr Umanath Selvan, Senior Associate Consultant, CGI, Chennai in his address appealed that the aspiring engineers should responsibly play their role in implementing their acquired knowledge and should ensure to make the world free from carbon footprints.

Ranipet

Organised an industrial visit at Same DeutzFahr (India) Private Limited, Sipcot Industrial Complex, Ranipet on 13 December 2021. The company is a pioneer in manufacturing 4-wheel drive tractors.

Observed World Standards Day on 18 October 2021 on the theme 'Shared Vision for a better world' in association with C Abdul Hakeem College of Engineering & Technology, Melvisaram, Ranipet. On the occasion, Dr B Murali Manohar, Professor – HAG, VIT, Vellore spoke on global energy transformation, energy transition, analysis and insights of key sectors, key areas of energy transformation etc.

Tiruchirappalli

Organised Lecture meeting on 21 September 2021 through virtual mode. Dr M Annie Jenifer, Assistant Professor, VIT School of Agricultural Innovations and Advanced Learning, Vellore Institute of Technology, Vellore delivered lecture on the topic 'Assessment and Monitoring of Groundwater Resources in Tiruchirappalli District Using Geospatial Technologies'.

Organised lecture meeting through virtual mode on 12 October 2021. Ms. S Sivapriya, Assistant Professor, Aerospace Engineering Department, Periyar Maniammai Institute of Science and Technology, Thanjavur delivered lecture on the topic 'Advances in Aviation Gas Turbines' and explained the operational features and applications of gas turbine.

Organised lecture meeting through virtual mode on 19 October 2021. Dr Arunprakash R, Assistant Professor, Department of Computer Science & Engineering, University College of Engineering, Ariyalur delivered lecture on the topic 'Machine Learning and its Perspective'. The speaker explained the applications of machine learning algorithms, Supervised, Unsupervised and Reinforcement Machine Learning.

Organised lecture meeting through virtual mode on 26 October 2021. Dr N Nithya, Associate Professor, Sona College of Technology, Salem delivered lecture on the topic 'Skill Set for Aspiring Engineering Managers'. During lecture, the speaker mentioned that development of managerial skills will help aspiring managers to have an efficient and effective work place experience. The speaker cited real life examples for development of managerial skills.

Udaipur

Observed World Environment Day on 5 June 2021 and organised a webinar on the theme of the day 'Ecosystem Restoration'. Chief Guest of the day, Dr Ramesh Dod, Professor & In-charge of Environmental Engineering, School of Civil Engineering, Dr Vishwanath Karad MIT World Peace University, Kothrud, Pune delivered lecture on the theme. He expressed concern about ecosystem threats such as climate change, loss of bio-diversity, disruption of fresh water system and chemical pollution and their devastating effects on the health of ecosystems. Keynote Speaker of the session, Dr M L Parihar, Senior Scientific Officer, Nuclear Fuel Complex, Kota Project, Department of Atomic Energy, Rajasthan delivered lecture on the theme and mentioned that every effort should be made to streamline our economic,

social and technological development to sustain the balance between nature, environment and ecosystem.

Convened Annual General Meeting on 25 October 2021. On the occasion, a talk on 'Social Responsibilities of Engineers' was organized. Mr M K Sharma, Committee Member of the host Centre was the keynote speaker.

Varanasi

Observed World Habitat Day on 4 October 2021 and organised a webinar on the theme 'Accelerating Urban Action for a Carbon-free World'. Speaker, Prof. Madhoolika Agrawal, Dean, Faculty of Science, Professor of Botany and Coordinator, Interdisciplinary School of Life Science at Banaras Hindu University, Varanasi delivered lecture on the theme and stressed on an action oriented zero carbon plan.

Visakhapatnam

Celebrated 218th Birth Anniversary of Sir Arthur Thomas Cotton on 15 May 2021. Dr I Satyanarayana Raju, Former Chief Engineer, I&CAD and NABARD-RIDF was the Guest Speaker of the event. In his address, Dr Raju remembered the contribution of Sir Arthur Thomas Cotton.



World Water Day 2022

Theme: Groundwater: Making the Invisible Visible

March 22, 2022

World Water Day became a UN observance day in 1993. It seeks to focus attention on the global water crisis. On 22 March every year, people and organizations mark World Water Day by taking action to tackle the water crisis.

Groundwater provides almost half of all drinking water worldwide, about 40% of water for irrigated agriculture and about 1/3 of water supply required for industry. It sustains ecosystems, maintains the base flow of rivers and prevents land subsidence and seawater intrusion. Groundwater is an important part of climate change adaptation and is often a solution for people without access to safe water. Despite these impressive figures, groundwater is out of sight and out of mind for most people.

Human activities (including population and urbanisation) and climate variability are mounting pressure on invisible groundwater resources; consequently, pollution and over-extraction problems are regularly reported in many parts of the world. Regardless of their importance and of evident threats - we know very little about the state and current trends of the World's groundwater resources.

As the world's largest distributed store of fresh water, groundwater plays a central part in sustaining ecosystems enabling human adaptation to climate variability and change. Aquifers have a buffering capacity and they are naturally more resistant to external impact than surface waters.

Groundwater is a common-pool resource and is often utilized at an individual level regardless of overall impact on the aquifer because neither use nor impacts are necessarily immediately visible. This becomes even more complex when aquifers cross state or national borders (most of large aquifers in the world are trans-boundary). Therefore, aquifers need to be governed through a process of shared responsibility and participation, information availability and transparency, and rule of law. Otherwise, mining and polluting of groundwater will continue.

Various kinds of ecosystems depend on groundwater: aquatic (wetlands, rivers and lakes receiving groundwater), terrestrial (vegetation, either shallow-rooted in alluvial settings or deep-rooted in arid zones) and even subterranean (in limestone formations with karstic caverns). Accordingly, groundwater is an essential part of any ecosystem-based adaptation measure, green infrastructure or a nature-based solution. Water-related disease remains one of the major health concerns in the world. The improvement of groundwater quality, in conjunction with improvement in sanitation and personal hygiene is the main strategy to reduce water-borne disease. Groundwater can be polluted from agriculture, sanitation, industry and mining, landfills and waste disposals, traffic and transport and also from chemical processes with geological environment. Regular groundwater monitoring, vulnerability assessment, protection from point-source and diffuse pollution, and pollutant removal, are some of necessary actions in preserving and improving groundwater quality and our health.

About two third of all abstracted groundwater is used in agriculture. Global food production is increasingly relying on groundwater but over-abstraction (depletion) of groundwater eventually leads to decline of food production. About one-fourth of the energy used globally is spent on food production and supply, including groundwater pumping. Deep aquifers, as a potential source and a sink for heat, can play much more prominent role in the provision of renewable geothermal energy.

Groundwater is the main source of water supply in many cities around the world and increasingly under a pressure due to continuous urbanisation, climate change and inadequate water management; for example, groundwater depletion and land subsidence are serious problems in many cities. The pumping rates in the megacities need to be reduced and compensated by urban rainwater harvesting, rural-urban water transfers, aquifer recharge with wastewater and similar measures. The Institution will be observing the World Water Day on 22 March 2022 with the core focus on the theme of Water Day 2022 and to inspire mitigative policies and actions towards achieving the mandate of Sustainable Development Goal 6 which pronounces "water and sanitation for all by 2030".



The Institution of Engineers (India)

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.



IEI - Springer Journal



ISSN Print: 2250-2149
ISSN Online: 2250-2157

SCOPUS Indexed



ISSN Print: 2250-0545
ISSN Online: 2250-0553

SCOPUS Indexed



ISSN Print: 2250-2106
ISSN Online: 2250-2114

SCOPUS Indexed



ISSN Print: 2250-2483
ISSN Online: 2250-2491

SCOPUS Indexed



ISSN Print: 2250-2122
ISSN Online: 2250-2130

SCOPUS Indexed





The Institution of Engineers (India)

IEI YOUNG ENGINEERS AWARD 2022-2023

Notification

The Institution of Engineers (India) is a multi-disciplinary professional body of engineers with 15 engineering disciplines and over 9,00,000 members in India and abroad. The Institution was established in 1920 and was incorporated by Royal Charter in 1935. It has been in the forefront of engineering profession addressing the socio engineering problems for progress of the country. IEI functions among professional engineers, academicians, research workers to update their professional knowledge through continuous professional development. With its large international linkages and a network of 125 Centres in India and Six Overseas Chapters, the Institution has built up wide reach and large infrastructure to meet its objectives of promoting engineering in all aspects.

With a view to promote the pursuit of excellence in the field of engineering, IEI has instituted 'IEI Young Engineers Award'. The Award consists of a Plaque and a Certificate. The purpose of the Award is to recognize outstanding achievements/contributions made by young engineers in engineering research, excellence in engineering technology development, technology transfer, etc. Any engineer citizen of India not older than 35 years of age as on March 31, 2022 is eligible for the Award. The IEI Young Engineers Award is presented to awardees for all the 15 Engineering Divisions of the IEI during the respective National Conventions. The awardees attending the National Convention will be provided with free accommodation & their traveling expenses (AC-3 Tier train fare by shortest route) will be reimbursed on production of original documents.

The Application Proforma may be downloaded from the link <https://www.ieindia.org/webui/IEI-Activities.aspx#young-engineering-awards>. Soft copy of the filled-in application proforma should be forwarded to award@ieindia.org by March 31, 2022. Further, six copies of the duly filled application form, along with all supporting documents, endorsed by appropriate authority should be sent to the below mentioned address so as to reach us latest by **April 10, 2022**:

Director (Technical)

The Institution of Engineers (India)
8 Gokhale Road, Kolkata 700020

The envelope containing the application should be superscribed at the top as 'IEI Young Engineers Award 2022-2023' and name of the engineering division under which the applicant desires to be considered for the Award.



The Institution of Engineers (India)

A Century of Service to the Nation

Celebrates

World Engineering Day for Sustainable Development



March 4, 2022

Theme: Build Back Wiser Engineering the Future

IEI NEWS

ISSN 0971-3352

Owner : The Institution of Engineers (India), 8 Gokhale Road, Kolkata 700 020
Printer : Maj Gen MJS Syali, VSM (Retd), Secretary & Director General
Publisher : Maj Gen MJS Syali, VSM (Retd), Secretary & Director General
Published from : 8 Gokhale Road, Kolkata 700 020
Printed from : M/s Florence Offset Process Pvt. Ltd.
6A S N Banerjee Road, Kolkata 700013
Editor : Maj Gen MJS Syali, VSM (Retd), Secretary & Director General

President : Dr Hemant Omkarrao Thakare

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