



National Institute of Technology Kurukshetra
(Institution of National Importance)



Research & Development *Newsletter*

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*From the Desk of
Dean Research and Consultancy*

GREETINGS FROM NIT KURUKSHETRA

I am happy to share with you 4th Volume of the R & D Newsletter of NIT Kurukshetra. The newsletter further underlines the interesting and innovative work undertaken by the students and faculty of the Institute. Our prime focus has been on getting high value and high end research projects of societal utility.

The imperative initiatives have also been taken to engage the undergraduate students in the R&D ecosystem of the Institute, which has begun to show the significant outcomes. Worth to mention is the mobile App development by the students for feedback mechanism and drawing intelligent inferences from the voluminous data for quality improvement of content delivery and assessment. The Institution Innovation Council under the aegis of Innovation Cell of MHRD is providing the right platform to the students to showcase their creativity and innovative ideas.

The R & D Newsletter has been successful in disseminating information about the R & D initiatives undertaken and outcomes of the efforts of our faculty and students. I thank the editorial team for presenting their valued contribution in the domain of research and innovation to the fraternity.

We look forward to hearing from you. Your feedback will be of immense value and help us in further improvement in our humble attempt to connect with you all.



Prof. Brahmjit Singh

NEW SPONSORED RESEARCH PROJECTS

Utilization of agricultural waste as an electrode material for energy storage devices

Funding agency: SERB, DST



D. Anurag Gaur

Department of Physics

Large quantities of agricultural wastes resulting from crop cultivation may be a promising source of energy from rural areas of the concerned region. This project aims to convert agricultural wastes into activated carbon by thermal processes to produce a strong porous structure with enlarged surface area. Then electrode will be fabricated from obtained activated carbon and its performance will be evaluated for electrochemical energy storage

devices such as batteries and super capacitors. Outcome of this project will help to achieve rural development through utilization of agricultural waste for energy storage devices.

Study of degree of approximation and absolute summability factors of infinite Series

Funding agency: SERB, DST



Smita Sonker

Department of Mathematics

This project aims to use the summability technique to improve the result of degree of approximation and to apply absolute summable factor for infinite series. The summability techniques are widely used in approximating the signals of digital filters including finite and infinite impulse response filters. Application areas also cover audio signal processing, speech and image processing, communications, radar, sonar, medical signal processing, etc.

Development of Insensitive High Energy Materials Containing Heterocyclic Backbone Substituted with Amino, Azido and Nitro Explosophores

Funding agency: ARMREB, DRDO



Ghule Vikas D.

Department of Chemistry

Modern weaponry relies on high energy materials (HEMs) to explode or propel. This project aims to develop the HEMs that include the key requirements such as, tailored performance, insensitivity, stability, vulnerability, and environmental safety. The major objective of this work is to investigate nitrogen-rich energetic materials, carbonyl azides and energetic salts for 'Green' and 'Environmentally Friendly' applications.

Design and Development of an Approach for Secure Storage of Data on External Media and Lossless Retrieval

Funding agency: DRDO



Jitender Kumar Chhabra

Department of Computer Engineering

The proposed project aims to design and develop a novel approach so that different types of files can be stored in an external media in a way that their contents are not revealed in any operating system or any software except the legitimate one. The project consists of three broad components: first component will be designed and developed for securing the selected files and folders, second component will be developed for accessing the secured files and folders and re-produce the original contents from these secured files and folders, third component shall be responsible for providing suitable user interface for both of above mentioned components. First component will be developed by analysis of the system level storage and machine language representation of the contents. Different file formats and their storage will be made secure by using some meta heuristic algorithms and second component will be developed by reverse engineering of the applied process, ensuring the lossless retrieval of the contents.

Development of spinel-type metal oxide-rGO nanocomposites for NO_x gas sensing application

Funding agency: UGC-DAE-CRS, Kalpakkam (Node)

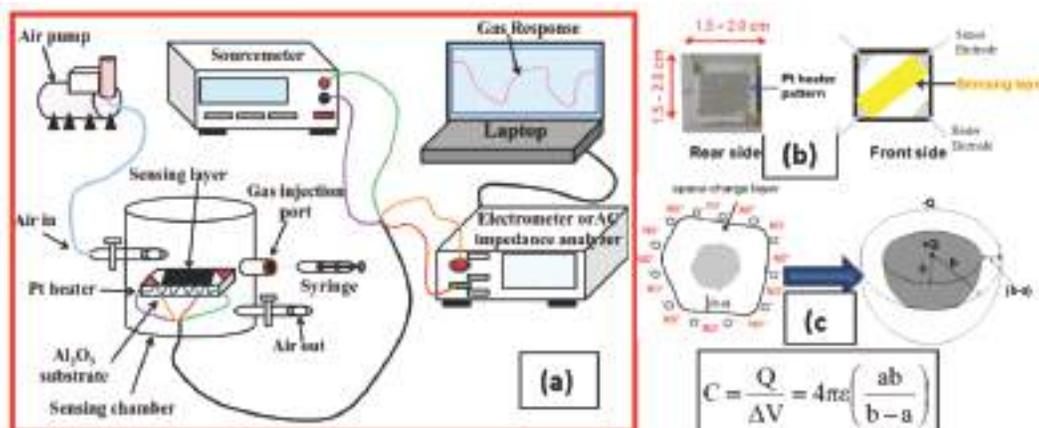


C. R. Mariappan

Department of Physics

Remarkably, NO_x is one of the most dangerous air pollutants due to its toxicity for people, animals and plants and also its role in generating acid rain and photochemical smog. NO_x comprises of NO₂ and NO with threshold limit values (TLV) of 2 ppm and 25 ppm respectively. Due to public, industrial and environmental safety demands; development of highly sensitive and reliable NO_x sensors with real-time monitoring capabilities is rapidly increasing. The development of cost-effective, highly sensitive and reliable NO_x gas sensor is really challenging. Focus of the project to develop simple, highly sensitive and reliable

NO_x gas sensor with metal oxides-rGO nanocomposites by using ac impedance method as illustrated in figure given below .



CONFERENCES ORGANIZED

IEEE PIICON 2018 **8th IEEE Power India International Conference** **December 10-12, 2018**

The 8th Power India International Conference organized by the Department of Electrical Engineering NIT Kurukshetra under the aegis of IEEE PES-IAS Delhi Chapter and PELS-IES Chapter Delhi Section began on 10th December 2018 with more than 150 dignitaries, resource persons and participants from India and abroad. The conference on the theme “Planning Operation and Control of Futuristic Power Systems” was inaugurated by Sh. Sanjeev Mehra, Managing Director, Tata Power Trading Co. Ltd. as the Chief Guest. Director, Dr. Satish Kumar presided over the inaugural function. Prof. Ratna Dahiya, General Chair of the conference extended cordial welcome to the attendees.



Lighting the lamp at Inaugural Ceremony



A Plenary Session in progress

The Chief Guest in his inaugural address stressed on the need for increased power trading in India which is currently 3% as compared to that of Europe 50%. He apprised the audience that our country has installed capacity of 357 GW of electric power and we are just 2% short of our peak demand.

Prof. D. P. Kothari in his plenary talk on “Energy and Environmental Problems facing the Third world and their probable solutions using soft computing techniques for sustainable development”. Prof. S. C. Srivastava on the topic “Transforming electricity sector through smart grid technology: Few Challenges and Status in India”. This was followed by the plenary talks by Dr. V. K. Sood on “HVDC Transmission – Past, Present and Future”. Prof. Bheem Singh, IIT Delhi, and Dr. C C Reddy IIT Ropar were among the distinguished participants in the conference and shared their knowledge and experience for working towards planning, operation, and control of Futuristic Power Systems.

130 research papers were presented in 20 technical sessions spread over three days. Industries of repute including OPAL-RT Technologies, Typhon-HIL, PRDC also participated in the conference through exhibits of their products.

Director NIT Kurukshetra in his address welcomed all the dignitaries and participants and wished them with quantum of knowledge exchange in during the conference. He emphasized the need to move from centralized generation to clean, green and distributed generation. He further stressed the need to invent ways to securely manage energy with utmost reliability and sustainability to meet 100% of our power demand, and coined electric energy as backbone of economy. Concluding his talks, he placed four major issues before the audience; key role of energy in development, need for more investment into clean energy, energy efficiency and need to work together globally on climate change. He also mentioned that our goal remains to reduce poverty through sustainable development and climate change oriented economic growth.

Electrical Engineering Department organizes an awareness workshop on Applications of SCADA and Augmented Reality (ASAR-18)



Participants attentive in the Workshop

A 2-day workshop ASAR-18 was organized by Elect. Engg. Dept. Mr. Amitesh, an alumnus of the Institute from NPCL Noida, Mr. Mirza Asif from NPCL Kanpur and Mr. Ramakant from General Electric, Bengaluru were industry experts who apprised the students of practical aspects of SCADA in the workshop.

The participants were also introduced to multi-touch and augmented reality based on Pranav Mistry's sixth sense device by the experts from Infizeal Technologies. They were made to learn how to convert laptop screen into touch screen.

School of Renewable Energy and Efficiency organises Quiz Competition on 'Energy Conservation and Renewable Energy' 3rd November 2018

A Quiz competition on Energy Conservation and Renewable Energy (ECRE-18) was organized in association with Bureau of Energy Efficiency, GoI, Ministry of Power, New and Renewable Energy Department, Haryana and Haryana Renewable Energy Development Agency Panchkula on November 3, 2018. The quiz was aimed at sensitizing students about the depleting energy sources and a need to come up with alternative sources of energy and to refurbish the existing ones. The competition witnessed participation of seven teams hailing from different parts of the State.



The Director Dr. Satish Kumar at the Inauguration of Quiz Competition

16th Convocation of the Institute



Lighting of the Lamp by the Chief Guest

Presiding over the function, Mr. Jagdish Khattar, Chairperson, Board of Governors of the Institute said "Impact is not created by individuals or team, but ideas which have potential to create an impact on the world".

In this convocation, 1353 degrees were awarded including B.Tech., M Tech, MBA, MCA and Ph.D. Director of the Institute, Dr. Satish Kumar congratulated the young graduates on achieving the major milestone in their life.

"This institute is one of reasons behind whatever I am today". Said Shri Pawan Munjal, a proud alumnus and Chairman, Managing Director & CEO, Hero Motocorp Ltd. with deep feeling of nostalgia as the Chief Guest on the occasion of 16th convocation of NIT Kurukshetra held on 16.11.2018. He further emphasized, "The world out there is too demanding, so brace yourselves as you begin to create a masterpiece on the blank canvas. Never let your thirst for knowledge be quenched. Keep learning each and every moment".



Presenting Memento to Sh. Pawan Munjal

Techspardha-2018

Gracing the inaugural function of TechSpardha, a national level techno-managerial fest are Mr Naresh Kumar, Director, SASE DRDO, Prof. T.J. Kamlanabhan, Dept. of Management Studies, IIT Madras; Dr Jaiteerth R Joshi, Chairman, Indian Society for Non-Destructive Testing, Hyderabad Chapter and Vice President of ISNT Headquarters along with Dr. Satish Kumar



Inaugural Ceremony of TechSpardha -2018



Queries related to research and consultancy may please be addressed to:

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