

# ICE ASSOCIATION NEWSLETTER



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## EDITOR'S NOTE:

Greetings,

As the editor for the 2023 edition of Sensors newsletter, we are glad to introduce the latest edition of our newsletter. In this edition, we are presenting the articles and features that emphasise the latest research and developments in our very own department and in the field of Instrumentation and Control Engineering. The ultimate goal of sensors is to implement various events and activities that constantly benefit students.

In this edition of the newsletter, we have articles related to various publications by our department, patents applied, conferences attended, workshops conducted and attended and so on. We'll also dive into the latest trends, developments in instrumentation and control engineering. A glimpse of Sensors 2023 is also included in the newsletter. Sensors'23 was a grand success. It had informative workshops, events and guest lectures from the respective field experts. Also, there was active participation from students in outside colleges. We look forward to exploring new areas, innovating, ideating new events and set a standard for the subsequent editions of sensors.

We are always happy in looking for ways to improve our newsletter and provide content that is relevant and beneficial to our readers. We are open to receive any feedback or suggestions for future editions, please feel free to contact us..

I hope you feel free reading this edition of sensors newsletter. Thank you for your constant support and enthusiasm in Sensors.

-Narasimhan



## VISION AND MISSION:

The department of Instrumentation and Control has always strived for perfection, and this is achieved by following our departments Vision and Mission

### Vision:

- To become a world-class centre of excellence in Instrumentation and Control Engineering.

### Mission:

- To inspire our students to realise their aspirations and potential through quality education in Instrumentation and Control Engineering.
- To enhance knowledge, create passion for learning, foster innovation, and nurture talents towards serving the society and the country.
- To encourage our faculty and students to keep in pace with the latest technological developments and to pursue research in those areas.
- To enable our students to engage themselves in entrepreneurship and product development for the benefit of the global community.

We believe that our vision and mission statement will provide a clear direction and purpose for our department, as well as inspire our faculty and students to strive towards excellence.

## WELCOME ADDRESS:

Good morning everyone, and welcome to the inauguration of the 26th edition of Sensors, the national-level technical symposium of the Instrumentation and Control Engineering department at NIT Tiruchirappalli. It gives me immense pleasure to welcome you all to this exciting initiative.

As you all know, the field of Instrumentation and Control Engineering is one that is rapidly evolving, and plays a crucial role in a wide range of industries and sectors. Establishing this forum was an important step towards fostering a culture of innovation, collaboration, and learning among students, faculty members, and industry professionals interested in this field.

Our symposium aims to provide a platform for students to enhance their knowledge and skills and to learn from experts in the field. Through various activities such as workshops, seminars, and industrial visits, we hope to expose our members to the latest developments and trends in instrumentation and control engineering and to facilitate interactions with experts from academia and industry.

The success of this association will depend on the active participation and contributions of all its members. We encourage you to get involved, share your knowledge and expertise, and help us build a strong community of students and professionals interested in this field.

On behalf of the association, I would like to extend a warm welcome to all the faculty members, industry professionals, and students who have taken the time to join us today. We hope that this event will catalyse the growth and development of the instrumentation and control engineering community at NIT Trichy.

Thank you once again for being a part of this special occasion. We look forward to working with you all, and to making a meaningful contribution toward the advancement of instrumentation and control engineering.

.- Deekshitha Rathod

## SENSORS INAUGURATION:

The inauguration of Sensors 2023, annual technical symposium of department of instrumentation and control engineering had embarked with splendour on 17th March 2023 at EEE Auditorium. It was featured by Chief Guest Mr. S.Gowrishankar General Manager BHEL Tiruchirappalli along with Guest of honour Mrs. Madhavi Ramanan, Delivery unit head NOKIA and Dr G.Aghila, Director NIT Tiruchirappalli, Faculty Advisor Dr.R.Periyasamy, Head of the department, Instrumentation and Control Engineering Dr.K.Dhanalakshmi and other dignitaries. The event kicked off with 'Tamil Thaaai Vazhthu' followed by lighting of lamp by chief guests and Director.

Ms.Deekshitha, the overall co-ordinator of SENSORS, extended a warm welcome to the gathering. Talking about the occasion, Mr S.Gowrishankar, Chief Guest, Addressed the students with insights on "how the technology in Control and automation can be used in industry 4.0 and IoT application based industries". Then Mrs Madhavi Ramanan, Guest of honour, gave valuable information on industry 4.0 and how it impacts on our day-to-day life. On the occasion, Dr Aghila, Director, NIT Trichy, addressed the gathering and honoured the chief guest and guest of honour Dr Periyasamy, Faculty advisor and Dr Dhanalakshmi, Head of the department, encouraged the students to coordinate and organise series of workshops and guest lectures also asked the students to actively participate and indulge activities conducted in SENSORS.

## LIST OF PAPERS PUBLISHED BY DEPARTMENT:

The department of instrumentation and control engineering has garnered a number of breakthroughs in numerous fields related to its domain in the year 2023. Listed below is the gist of a few of the papers published by the department:

1. Performance enhanced piezoelectric rotational energy harvester using reversed exponentially tapered multi-mode structure for autonomous sensor systems.544 (2023) 117429
2. Deep Neural Network-based linearization and cold junction compensation of thermocouple Volume 72, (2023), 2500609.
3. Self-sensing variable stiffness actuation of shape memory coil by an inferential soft sensor.23(5), 2442; Feb 2023
4. Design and control of monolithic compliant grippers using shape memory alloy wires.23(4),2052, Feb 2023
5. Variable inductive shape memory spring based multifunctional module for high sensitivity measurements.15 march 2023 112449 (1-8)
6. An enhanced dynamic soft sensor-based online estimation of missing data for water distribution system with inherent disturbances. 2023,doi:10.1177/0142331222 1147553
7. Automated Detection of seizure types from the higher-order moments of maximal overlap wavelet distribution.2023;13(4):621.
8. A hybrid technique to control superheater steam temperature in a power plant using multi modelling and predictive sliding mode control. 55,2023,102912
9. An EEG-based subject-independent emotion recognition model using a differential-evolution-based feature selection algorithm 341-377(2023)
10. A novel dual-slope resistance to digital converter with lead resistance compensation. Vol.72 p.2001410,2023
11. Experimental evaluation of event triggered sliding mode control for trajectory tracking of a quadcopter. DOI: 10.1177/095,9651823115 3324, (IF-1 623),Feb 2023,(SCIE)



## PATENTS:

1. Shape guided rotary actuator for grippers and method thereof -(Feb 2023)
2. A method and system for implementing MPPT technique for extracting the maximum power in teg systems (2023)
3. A device for measurement of bilirubin concentration in neonates and method thereof (Feb 13,2023)

## NOTABLE ACHIEVEMENTS:

1. Dr. Shiraz Sohail- Associate editor,IET science measurement and technology (IET UK)
2. Setti Suresh (4140420051), Supervisor-Dr Geetha.C-Young scientist award(URSI international union of radio science)-InRaSS

## CONFERENCE:

1. A Versatile portable framework for economic & skill empowerment of women's sustainable livelihoods through digital literacy (19-23 December 2022, 23-27 January 2023,13-17,February 2023)
2. First international conference on intelligent solutions for emergency response and disaster management(Jan 9-11,2023)
3. A dual-slope RDC using T-network for low resistance measurement-(IEE APCON conference 2023, Bengaluru, January 2023.
4. A simple fringing field impedance sensor to measure the quality of toned milk.(PIECON 2023,Aligarh,February,2023)

## LIST OF WORKSHOPS, GUEST LECTURES CONDUCTED BY THE DEPARTMENT:

1. Dr.Sri Ram Shankar R NIT-Datanetiix Hackathon, NIT Tiruchirappalli
2. Dr.R.Periyasamy SENSORS 23, 17-19, March 2023
3. Dr.Jose Jasper, Senior Neurologist, KMCH, Tiruchirappalli, Seizure detection and biomedical Instrumentation (14/03/2023)
4. Dr.R.Periyasamy on "How to start up a new company" Tiruchirappalli, 06 March 2023
5. Dr.Sri Ram Shankar on "Scanning probe microscope- A versatile tool for nanoscale characterization (Tamil Nadu agricultural university, Coimbatore, 9th Feb 2023)

## LIST OF WORKSHOPS, EVENTS, AND GUEST LECTURES CONDUCTED IN SENSORS :

### WORKSHOPS:

1. **Frontiers of RFID technology:**  
This workshop provided an understanding of RFID technology and its diverse sensing applications through hardware demonstration.  
*Speakers:* Mr Setti Suresh, Research scholar, ICE department and Mohammed Arshad Ali Khan, Research scholar, ICE department
2. **Autonomous driving system(Hands ON):**  
Understanding different CNN based object detection and tracking algorithms and architectures for autonomous driving.  
*Speakers:* Dr.M.Sridevi, Faculty,CSE Department, NIT Trichy. Dr.Sugirtha, Faculty, CSE department, IIIT Trichy.
3. **Advanced IOT(Hands ON):**  
Understanding communication protocols in IoT with hands-on experience with esp32 boards along with a variety of sensing and actuation systems  
*Speakers:* Dr.Sridevi, Faculty,ICE department, Mr Abhishek, Mr.Rakesh and Mr Shivacharan, M.Tech Industrial Automation-final years.

4. **Automation systems for human convenience(Hands ON):**

Hands-on bot building session with web bot, Fake social bots making and mainly identify and avoid creating fake profiles.

*Speakers:* Dr. Akhila, PhD scholar,CSE department,NIT Calicut.

## EVENTS:

1. **3 in 8 :**

It consists of 3 problem statements which are to be completed in 8 minutes (team event consisting of 4 in a team)

2. **Find the faults :**

It is a hackathon-based event in which all the teams will be provided a problem statement and they have to code and solve within the time limit.

3. **Ideathon :**

Each participant has to speak about an idea 3 minutes long on the given domain or topic provided during the event.

4. **Cirucraft :**

The event involves designing and implementing circuits using an online simulator(MATLAB). The circuits can range from simple combinational logic circuits to more complex systems with multiple inputs and outputs.

## GUEST LECTURES:

1. **Robotics embedded systems :**

Mr.Naveen Shamsudhin Co-founder,Humane warriors and Kaliedo. Delivered an eye opening lecture to get a glimpse of the trends, breakthroughs and the future of embedded systems.

2. **Data analytics and strategy :**

Mrs.Aarthi Manoharan Senior Manager, Genentech. With 13 years of experience in consulting for fortune 500 companies, she gave a vivacious lecture on data analytics and strategy.

3. **Industry 4.0 and YOU :**

Mrs Madhavi Ramanan, Engineering leader, NOKIA. With almost 20 years of experience in the field, she unveiled each and every insight about industry 4.0 and how it impacts on engineers.

#### 4. **Cyber security and cloud computing A.I :**

Mr.Pravin Hungund, Chief technological officer, MetaZ digital Gave an enlightening lecture about technology innovation and how deep the tech is disrupting various industries.



## **MEDIA MONITOR:**

### **1. NIFTM holds a session on AI in food processing:**

TRICHY: Students of National Institute of Food Technology, Entrepreneurship and Management – Thanjavur, and those studying under Science and Engineering Research Board’s Accelerate Vigyan Scheme participated in hands-on session with a prototype of a two-tonne solar-assisted cold storage system at the department of instrumentation and control engineering in National Institute of Technology, Trichy. According to sources, NIFTEM-Thanjavur organised a seven-day training programme on application of AI in food processing, sponsored by SERB, which commenced from November 23. K Dhanalakshmi, head of the department, welcomed the gathering. Over 25 participants across the country are attending the workshop. They attended a lecture by N Sivakumaran, professor, ICE. The participants also visited various laboratories in the department. Eyarkai Nambi, associate professor of NIFTEM-Thanjavur was present.

### **2. WORKSHOP ON SAFER WOMEN’S WORKSPACE:**

TRICHY: The internal complaints committee of NIT-Trichy organized a five-day workshop on sexual harassment (Prevention, Prohibition and Redressal) Act 2013 for stakeholders at the institute on Monday on the theme ‘Towards a safer

women workspace'. Sessions on gender sensitization, Posh Act, Vishaka guidelines, sexual harassment at workplace, yoga and self-defence, talk on mental health, and work-life balance were held at the workshop. It was presided over by institute director Professor G Aghila. PENN Trust will conduct a half-day self-defence workshop on December 8. The five-day workshop was organized by the presiding officer of ICC, Dr G Uma.

### **3. CENTRE OF EXCELLENCE IN EMERGENCY SUPPORT SYSTEM TO BE OPENED IN NIT-T:**

A Centre of Excellence in Emergency Response Support System (CoEERSS) will be inaugurated at the National Institute of Technology, Tiruchi (NIT-T) on January 10. CoEERSS is the first research centre established jointly by NIT-T and the Centre for Development of Advanced Computing (C-DAC), Thiruvananthapuram. The Emergency Response Support System (ERSS) with a single Emergency Number, 112, was launched by the Union Ministry of Home Affairs to respond to emergency situations faced by citizens. ERSS is designed to address various emergencies reported through different communication channels such as voice calls, SMS, e-mail, SOS signals, ERSS web portal, social media etc. ERSS-112 will track the rescue and service vehicles of all services (including Police, Fire and Rescue, Health etc.) in real-time on a digital map of the State/UT and direct the right vehicle to reach the person in emergency situation and render necessary support quickly. Citizens may easily seek help of the 'Public Safety Access Point' (PSAP) in the capitals of the State by dialling 112, sending SMS to 112, tapping SoS in 112 India App, e-mail or WhatsApp to the designated numbers. Officers attending the calls would be able to see the caller's details and location on a computer and quickly respond to critical emergencies through District Coordination Centres (DCC). Dispatchers sitting in the districts would send the nearest emergency rescue units to attend to the emergency on priority. The PSAP / DCC would continuously monitor the situation on the digital map. ERSS-112 will be connected to disaster management, Railways, women and child helplines, a press release from NIT-T said. C-DAC has recently signed an MoU with NIT-T for collaborative works on advanced research areas, by setting up a Centre of Excellence in the campus of NIT-T. The research work focuses on delivering specific value-additions to ERSS-112 to make it more powerful and intelligent. The CoEERSS would be inaugurated by C. Sylendra Babu, Director General of Police, in the presence of G. Aghila, Director, NIT-T, E.Magesh, Director General, C-DAC, and Kalai Selvan, Director, C-DAC, Thiruvananthapuram. N. Sivakumaran, Professor, Department of Instrumentation and Control Engineering will head the CoEERSS and its team comprising T.K.Radhakrishnan, K. Srinivasan, Sishaj P. Simon, M.Venkata Kirthiga, M.Brindha, B.Janet, Rebekka, P.A. Karthick, Usha Kiruthika and R.Sriram Shankar, the release said.

## TECH CORNER:

### “Sensor Fusion Annotation and Anonymization Technology Optimised for Autonomous Driving”

*‘INFINIQ’* demonstrated its sensor fusion annotation technology at the CES 2023 with lidar and camera sensors.

INFINIQ is a leading AI data service provider that specialises in autonomous driving. It has an end-to-end data platform called ‘DataStudio’ which includes data collection, data anonymization, and data annotation throughout the whole lifecycle of data processing to improve the perception level of autonomous driving.

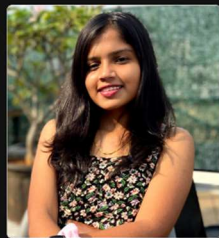
It provides a highly accurate (99.7%), cost-effective, fast, AI-powered automated video & image labelling service that can increase productivity by up to 2 times cutting costs for an AI project. At the INFINIQ booth of CES, visitors were able to see themselves labelled in real-time. Human behaviour was detected and identified using its AI model. This is very crucial for an autonomous vehicle to identify the behaviour of people on the street to prevent accidents.

Visitors experienced an AI engine built-in anonymization kiosk in real-time. INFINIQ’s anonymization solution Wellid can automatically detect and anonymize all identifiable faces and licence plates in videos and images by blurring or deepfake at a high speed. With over 99.9% accuracy, it can protect personal information in the vast amounts of data collected for autonomous driving, complying with privacy laws such as GDPR (General data protection regulation) and CCPA (California consumer privacy act).

‘MyCrowd’ is INFINIQ’s very own AI-powered data annotation platform that uses a pre-trained AI model to automatically label many different objects. It increases annotation speed up to 10 times. The platform also provides an AI-powered 3-level data quality control process, checking if labelled data fit customers’ requirements guaranteeing a 99.7% high-quality dataset. The platform also can provide a sensor fusion annotation tool where 2D images and 3D point-cloud data are synced and labelled simultaneously and 3D segmentation. The customer dashboard enables for customers to check the entire status of their annotation projects on a daily, weekly, or monthly basis.

## SENSORS CORE TEAM:

2022 - 2023



DEEKSHITHA  
OVERALL  
COORDINATOR

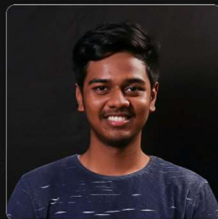


ABHINAV TIWARI  
CHAIRPERSON



SAIRAM K  
TREASURER

### PUBLICITY-HEADS



RITHWIK



CHERALATHAN



SHERYL

### GUEST LECTURES-HEADS



SUKHMANPREET SINGH



ARYAN HAJELA



AATHITHYAN

## GENERAL SECRETARY



**ALWIS GURU K V**

## QUALITY ASSURANCE-HEADS



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**NAVEEN**

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**GREESHMA**

## DESIGN-HEADS



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**DEEPANSHU DHRUW**



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