

# ICE ASSOCIATION NEWSLETTER



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## EDITOR'S NOTE:

Greetings,

As the editor for the 2021 edition of Sensors newsletter, I am pleased to introduce the latest issue of our newsletter. In this edition, we have included articles and features that highlight the latest research and developments in our very own department and in the field of Instrumentation and Control Engineering.

In this issue, you'll find articles that cover topics such as the papers published by our department, the patents applied, conferences attended and so on. We will also see about the latest trends and developments in our field of Instrumentation and Control engineering. We hope that these articles will be informative and insightful, and that they will inspire you to learn more about the Instrumentation and Control field and motivate you to participate in the future editions of Sensors.

We are always looking for ways to improve our newsletter and provide content that is relevant and useful to our readers. If you have any feedback or suggestions for future topics, please do not hesitate to contact us.

Thank you for your continued support and interest in Sensors.

-Tanaya





## **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.

## LIST OF PAPERS PUBLISHED BY DEPARTMENT:

The department of Instrumentation and Control has garnered a number of breakthroughs in numerous fields related to its domain in the year 2021. Listed below is the gist of a few of the 32 papers published by the department:

1. Simultaneous measurements for the interlink of electro-thermomechano-electro characteristics in shape memory springs.
2. Active stiffness control of a synergistically operated variable stiffness compliant actuator.
3. Event triggered estimator based controller design for networked control system.
4. Scalable multiple linear model RTDA controller formulation for constrained nonlinear processes .
5. Bandwidth assessment of scheduled and unscheduled communication in hybrid networked control systems.
6. SVM Classifier for Epileptic Seizure Prediction using Sub-Banding of IEEG Signals

## **LIST OF WORKSHOPS CONDUCTED BY THE DEPARTMENT:**

Our department over the years has always strived toward creating a more hands-on learning experience for anyone imbued with the passion for expanding knowledge across different domains and to achieve that very aim, the esteemed faculty of the department have conducted several workshops, a few of them being:

1. SPARC sponsored international workshop on Recent Trends in Biomedical Instrumentation and Assistive Technology

## **CONFERENCE PUBLICATIONS**

The conference publications of the department have been widely recognized and have contributed significantly to the advancement of the field. In this section, we will explore the conference publications of the Instrumentation and Control Engineering Department of NIT Trichy and their impact on the field.

1. The Bidirectional Position control of the Prismatic joint for Motorized single link Robotic arm using Adaptive Super-Twisting Sliding Mode Control, 36th Indian Engineering Congress
2. The Adaptive dual layer sliding mode control for Ball on plate system driven by shape memory alloy wire, 36th Indian Engineering Congress,
3. Design and implementation of a combined liquid pump and active-passive mixer for drug delivery system by utilizing two 1-DOF piezoelectric actuated beams.
4. Deep Learning Based Muscle Intent Classification in Continuous Passive Motion Machine for Knee Osteoarthritis Rehabilitation.

# INDUSTRIAL LECTURES

## **1. Understanding smart manufacturing concepts by Mr. Girish Ayya.:**

This lecture aims to provide insights into the smart manufacturing concepts that are currently transforming the industrial landscape. Mr. Girish Ayya will discuss the role of advanced technologies such as the Internet of Things (IoT), Artificial Intelligence (AI), and Machine Learning (ML) in driving manufacturing operations. The lecture will also cover topics such as Industry 4.0, digital twins, and data analytics, and their impact on production processes, quality control, and supply chain management.

## **2. Wearable healthcare devices and emerging trends by Mr. Janakiraman Rajamani**

In this lecture, Mr. Janakiraman Rajamani will explore the emerging trends and advancements in wearable healthcare devices. He will discuss the current state of the art in wearable devices such as smartwatches, fitness trackers, and medical sensors. The lecture will also delve into the potential of wearable devices in healthcare and the opportunities and challenges that come with their use.

## **3. How to stay focussed on a long term career and achieve results? By Dr. Jessy Christin**

This lecture will focus on the importance of long-term career planning and staying focused on achieving professional goals. Dr. Jessy Christin will share insights on developing a growth mindset, identifying career goals, and the importance of continuous learning and development. The

lecture will also touch upon strategies to maintain focus and productivity while dealing with setbacks and challenges.

#### 4. Need for nuclear energy by Dr. R Venkatesan, Jalaja Madan Mohan, K. Parthiappan, M. Ramu

This lecture will explore the need for nuclear energy as a key component of the global energy mix. The panel of experts, comprising Dr. R Venkatesan, Jalaja Madan Mohan, K. Parthiappan, and M. Ramu, will discuss the role of nuclear energy in meeting growing energy demand, reducing carbon emissions, and promoting sustainable development. The lecture will also cover topics such as nuclear safety, waste management, and the regulatory framework for nuclear power generation.

## PLACEMENT STATS

In the academic year 2020-2021, out of the total of 82 students who went through the placement process, a whopping 77 students cleared the process and have been placed in various core, software and management roles in top companies, boasting a near 100% placement record for this academic year. The highest package offered has gone up to 32.7 Lakhs per Annum. With more and more students opting for on campus placements, the number of companies that visit our campus and hire our department students are also consistently keeping up with the increasing applications and hence, we are always able to maintain a near 100% placement percentage.

## TECH CORNER:

### Full Self-Driving Software

Tesla's Full Self-Driving (FSD) software is a revolutionary technology that promises to change the way we travel. FSD is an advanced driver assistance system (ADAS) that uses a combination of cameras, radar, and sensors to allow a Tesla vehicle to navigate roads autonomously, without any human input. In this essay, we will explore the features and technical aspects of Tesla's Full Self-Driving software.

One of the key features of Tesla's FSD software is its ability to navigate a vehicle autonomously on both highways and city streets. The system can detect and respond to traffic signals, stop signs, and other road markings, allowing the vehicle to make decisions and navigate through complex traffic situations. This is made possible by the use of advanced computer vision algorithms, which allow the system to identify and classify objects in its environment.

The Tesla FSD software is also designed to handle a wide range of driving scenarios, including complex intersections and roundabouts. The system can detect and respond to other vehicles, cyclists, and pedestrians, and can make appropriate decisions to ensure the safety of all road users. Additionally, the system can change lanes, merge onto highways, and exit highways autonomously, without any input from the driver.

Another key feature of Tesla's FSD software is its ability to park autonomously. The system can detect available parking spots and can navigate the vehicle to the parking spot, and then park it. This feature is particularly useful in crowded city centers where parking can be a challenge.

The Tesla FSD software is also designed to be highly customizable. Drivers can choose between different driving modes, such as "Chill" or "Sport," depending on their driving preferences. Additionally, drivers can customize the responsiveness of the system's steering and acceleration to suit their preferences.

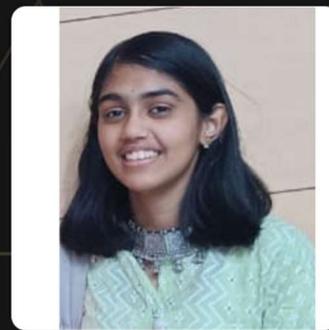
One of the most significant technical challenges of developing a fully autonomous driving system is ensuring the system's safety. Tesla's FSD software is designed to be highly reliable, with multiple redundant systems in place to ensure that the vehicle can continue to operate safely even in the event of a hardware or software failure. Additionally, the system is continuously learning and improving through machine learning algorithms, which allow it to adapt to changing road conditions and driving scenarios.

In conclusion, Tesla's Full Self-Driving software is a revolutionary technology that promises to change the way we travel. Its advanced computer vision algorithms, customizable driving modes, and safety features make it a highly capable and reliable system. While there are still technical and regulatory challenges to be addressed before fully autonomous driving becomes a reality, Tesla's FSD software represents a significant step towards achieving that goal.

## EDITORIAL BOARD:



MUKIL



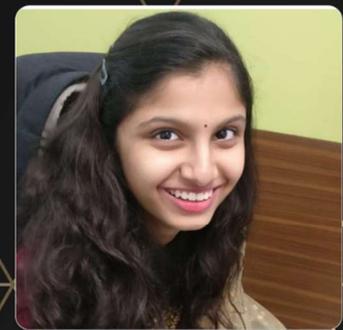
SREENIDHI



TANAYA



NARASHIMHAN



MAHIKA