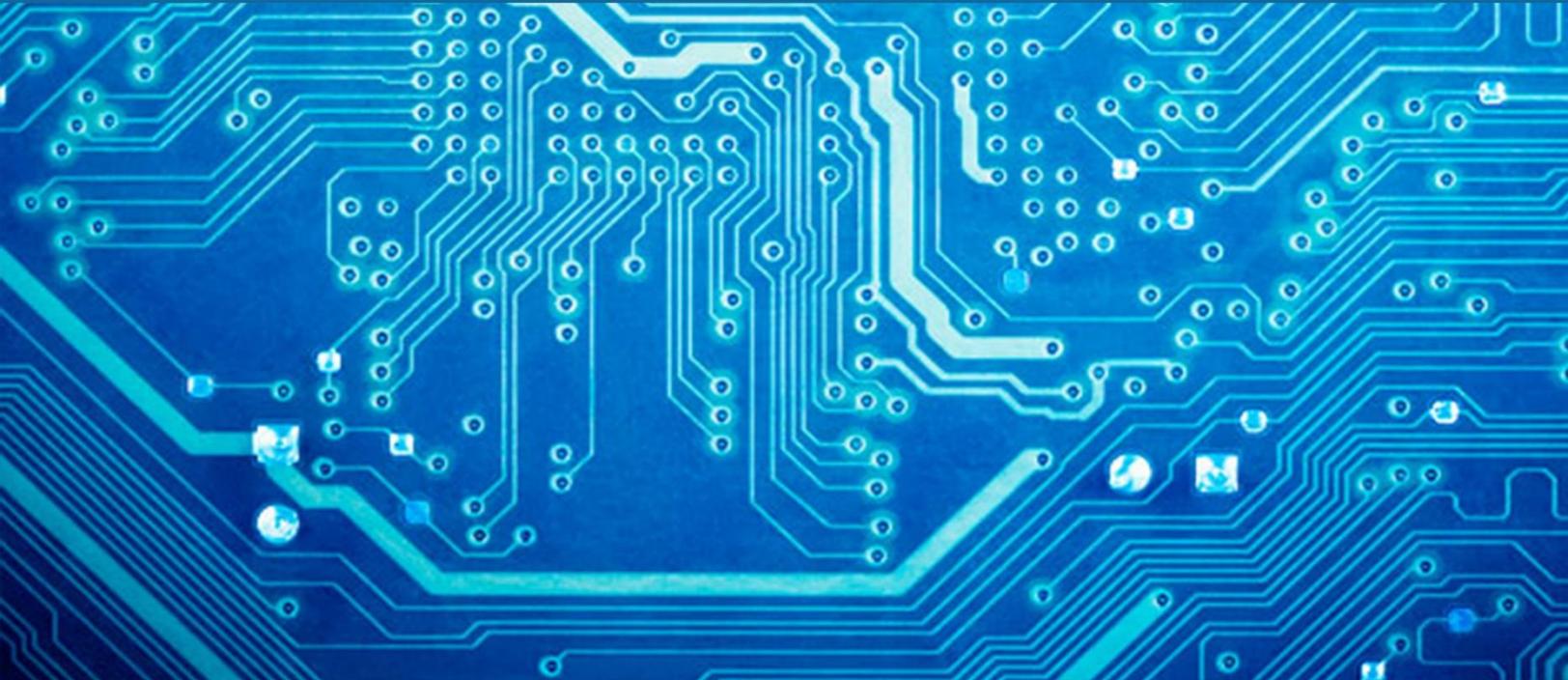


# NEWSLETTER

2015 Issue -2



**SENSORS '15**

sense · control · actuate

Sensors Issue



-JAYANTH PARCHURI

# Editor's Note

## IN THIS ISSUE

It is with great pride, we present to you the second edition of ICEA's Newsletter, for the year 2014 -15. The ICEA kick started its activities for the current academic year during its inauguration in September 2014, in the presence of eminent academicians. ICEA's vision is to stand out from others by introducing various activities that would continually benefit students. In a short span of three months, we were able to make an impact on the student community & were appreciated greatly by the faculty body. The events report is documented in this edition.

The month of March is extremely important for ICEA, for it is also the month of Sensors—a national level technical symposium for Instrumentation and Control Engineers. A preview of Sensors'15 is included in this newsletter. We are ready to take up the challenge of elevating Sensors'15 to heights greater than those scaled by its predecessors & will strive to realize our dreams. We are satisfied with the progress so far, but confining ourselves within the boundaries of satisfaction, undermine the capabilities of the

enthusiastic students of the ICE Department. Therefore, we look forward to break the confinements and explore new heights, with energy and determination, and set a benchmark for the subsequent editions of Sensors.

ICEA takes this opportunity to thank all the students and faculty members of the department, who have helped us tremendously in organizing various activities; we request for your kind co-operation and support with our future endeavors, too.

Filled with nostalgia of seeing Sensors transform during the 4 years of my association with the Department of ICE, and this being the last of them, I wish the legacy continues and students cope-up with the exponential growth, which we have managed to achieve. I once again extend a warm invitation, on behalf of all the members of the ICEA and Sensors'15 team, to our symposium, Sensors'15. I hope you enjoy reading this edition of the ICEA Newsletter and have a great time at Sensors.



### Launch of ICEA Newsletter-1

Launch of ICEA Newsletter Issue 1 for the academic year 2014 -15 in the ICEA inauguration held on 17th September, 2014. From left Dr. Sivakumaran, Head of Department, ICE. Centre is the Chief Guest, Dr. Alagu Sundaram, Director, IICPT, Tanjore. To the right is Dr. Arul Daniel, Dean, Academics presenting the first copy to the Chief Guest.



### Sneak Peek of Sensors 2015

The Instrumentation and Control Engineers Association of NIT Trichy would like to take this opportunity to welcome you all to another great edition of "Sensors".

## Welcome Address

On behalf of students it is a great honor & personal pleasure to welcome you here on the inauguration of the Instrumentation & Control Engineering Association in short known as ICEA. First, I would like to welcome Dr. K Alagu Sundaram, Director, IICPT, Tanjore & thank him for accepting our invitation to grace this occasion as Chief Guest. I also welcome Dr. S. Arul Daniel, Dean (Academic) NIT Trichy who will preside over the Inauguration. In the same breath I welcome Dr. N. Sivakumaran, Head of Department, Instrumentation & Control Engineering, NIT Trichy & Dr. S. Narayanan, Faculty Advisor, ICEA. They were the backbone of encouragement & without their advice we couldn't have organized this function on this level. I welcome all the esteemed Faculty, always helpful Staff & ever enthusiastic students for gracing this occasion. Thank you all for joining us. Your presence here is not only in joyous celebration of the occasion, but it is an expression of your interest in ICEA Activities. And this very fact, places on us a huge responsibility to achieve great things surpassing the benchmarks set by our previous office bearers. We promise you all that we will honor this responsibility faithfully. ICEA was always a torch bearer in designing &



applying innovative idea to reach students & help them in a large way. We would continue the same tradition this year. ICEA is synonymous to organizing mega events. Sensors -2015, the national level symposium of ICEA department, NIT Trichy will be unprecedented & organized reaching out to previously untapped students & colleges. ICEA aims to reach this goal by taking cooperation from each & everyone present here. I would like to conclude this address by welcoming you all once again for joining us on our inauguration. I would like to thank my fellow office bearers. Thank You!

-BHARATH VS

## INAUGURATION OF ICEA

The inauguration of ICE Association, NIT Trichy had transpired with great pomp & show on 17th September, 2014 in EEE Auditorium. It was attended by the Chief Guest, Mr. Alagu Sundaram, Director IICPT, Tanjore along with Dr. N. Sivakumaran, HOD, ICE and other dignitaries. The event was kick started with a prayer song which was followed by lightening of the lamp by the Chief Guest.

Mr. V.S Bharath, the overall co-ordinator of ICEA, extended a warm welcome to the audience. Speaking on the occasion, Mr. Alagu Sundaram, the Chief Guest, pitched for devising pragmatic ways to integrate image processing into food processing industries. He envisaged such an initiative would prove invaluable to both the food processing sector and the farming sector. He solicited NIT, Trichy's esteemed faculty, research scholars and the students to jointly pact with IICPT and work relentlessly for the welfare of agriculture and food processing industries. Dr. Sivakumaran congratulated the newly instated office bearers of ICEA and appealed to the student fraternity for the fusion of instrumentation with the agricultural sector for the benefit of large number of farmers. Dr. A.Ramkalyan, senior faculty and Dr. S.Narayanan, faculty advisor, asked the students to organize, proactively, a series of guest lectures from eminent personalities. Dr. Arul Daniel, Dean, Academics, presided over the function & inaugurated the ICEA Newsletter. He handed over the first copy to the Chief Guest. He urged students to organize activities with unabated enthusiasm. The event culminated with the vote of thanks by Mr. Rahul Srivastava, President, ICEA.

## STUDENT EXPERIENCES

I came into this department as a scrawny teenager and I have seen myself grow into a confident and positive individual. Being surrounded by people from a multicultural background has taught me to view things from different perspectives. Working for Sensors every year and participating in NITTFEST has given me more to learn from than classes. It gave me the confidence to stand for the position of CIC Rep, and the belief that I could handle all the responsibility that came with it. This helped me get to know my classmates on a better and more personal level. The best thing, however would be that I have made some amazing friends, friends who will stay with me for a lifetime. It has been a rollercoaster ride, one that I wish wouldn't end so soon.

- Navya Kiran, CIC Rep, 2015 Batch

## STUDENTS AT IGA WORKSHOP



## Scilab Workshop

A workshop was conducted by interest groups association to train the students in the educational software Scilab.



## Sensors website launch

The Sensors website was launched on 15<sup>th</sup> Feb this year. The site is the portal where the students can register for Sensors 15.

## FAST FACTS

+66%

Online publicity reach

+42%

Online registrations for workshops



## Sensors 2015 Sneak Peek

by Jayanth P

ICEA, the students association of department of Instrumentation & Control Engineering, the youngest department of NIT Trichy. Ever since the association came into form, it has created incredible evolution in the department in terms of the opportunities made available to the students in various fields. ICEA also organizes 'Sensors', the national level technical symposium of ICE department, which records ever increasing registrations every year and is one of the most successful symposiums of NIT Trichy. Just like previous versions of sensors. This edition of Sensors also is ready take you through a joyous ride of learning.

## Guest Lectures:

Shri. Jaywant Kulkarni

Hardware Architect at Intel India Corp.:

- Digital Design Engineer at Texas Instruments India (10 Years)
- System Design Engineer at Tata Elxsi (4 Years)
- Contractor at Racal Instruments (2 Years)

Topic: System Design, VLS

## Workshops:

## Flight Instrumentation

Ever felt the urge to soar high & reach the skies? Ever felt the curiosity on flights. Come join us as we decode the beauty of

Instrumentation behind these brilliant man made inventions which defies the traditional thought school & helped us to soar high, reach the stars.

## Highlights:

- Basics of flight
- Types of Aeroplanes (Air crafts and classes)
- Controls of Flight
- Axis of Control
- Pilot controls
- Factors important for flight-Airspeed, Altitude, Pressure etc.
- Measuring Factors, Instruments in cockpit
- Fail safety and Safety requirements
- In-flight sensors
- Demo of Flight Simulators and Space flight

## SPEECH CONTROLLED ROBOTICS

Have a passion for Artificial Intelligence? Can you master the beasts of artificial intelligence through your speech? You are in the right place. Robots are projected in near future to be in open market to help us all. Let us take a step ahead as engineers, let us build our own robots. What's the thrill in lifeless robots, let us try to infuse them with life. Let our voice become their thoughts.

## Highlights:

- Basics of MicroController coding (Atmega8)
- Arduino Coding

- Interfacing Bluetooth module with Arduino
- USART Communication
- Working with Google's speech engine using MIT app Inventor
- Introduction to android app development
- Interfacing motor drivers with Arduino
- Working with simulation softwares
- Exploring possibilities
- Demonstration of speech controlled robot

### Bulls & Bears:

Bulls & Bears is the workshop on Investment/ Share Market. The motto of this workshop is to learn about stock market and its principle elements. It will make the participants knowledgeable about daily happenings of share market, Indian economic distribution, goods and services. Students will learn How

- Common terminology in Stock Market
- Every day usage and practical problem
- Trading/Trade Systems/Protocols
- Clearing and Settlement
- Trading Membership
- Introduction to Commodities Trading
- Currency Trading
- Career in investment market

### Web Designing:

Ever tried designing a website of your own? Now is time to learn how to design a website using simple techniques. We, in this workshop, will teach you best ways to design a website. Also we will show you how to use JavaScript libraries efficiently in your website.

to Trade, how to use Newspaper, Portals, Magazines and Charts to do technical analysis, know about various opportunities in Investment Market.

### Highlights:

Topics to be covered:

- Investment Basic /Why/How/When
- Basics of Stocks
- Theory of Stock Exchange

### Highlights:

- Structuring a web-page using HTML
- Beautifying the web-page using CSS
- Browser side scripting using JavaScript
- Introduction to jquery library - Events and triggers
- Serverside scripting with PHP
- Introduction to database MySQL
- Registrations and Login

## EVENTS

### GENERAL QUIZ

The ultimate test of the breadth and depth of your knowledge. The General Quiz encompasses all topics under the sun. From sports to politics, and from animals to planets, if you know it all, you win it all.

### ENCIPHER

Have a keen eye for that misplaced piece of code? Then unleash the coding genius within you!

### TECH TAC TOE

An interactive quiz that will put your technical knowledge, intuition and engineering acumen to test.

### TECH CROSSWORD

Want to know how much instrumentation and control vocabulary you've got? Or how you compare to others just like you? Well, you've come to the right place.

### PROJECT DEMONSTRATION

A platform created exclusively to showcase your ideas and innovation. So come forth and thrill the world of engineering.

### EVENT RULES:

- You have to bring and demonstrate working model of your project or a video footage of your model while working.
- Maximum of 3 persons can form a team.
- Project area: Instrumentation, control, electronics.
- One submission per team is sufficient and only one is allowed.
- Decision of Judges will be final.

## Excavate, explore -a story on ancient Indian Science

The Mars Orbiter Mission turned the world's attention towards India, not just for its successful insertion into the red planet's orbit, but also because it made a benchmark for frugal engineering. It was one proud moment for the Indian scientists who had put their heart and soul in accomplishing this magnificent task, and the nation, in turn, was proud of them. While the story of Mangalyaan stands tall, its background illustrates our evolution from a seed to a tree in the field of space technology, since independence.

But what was happening in India before it was invaded by foreign forces? – a question that has intrigued many historians. The Vedic scriptures offer some insight, but they are ambiguous due to the poetic style of narration. Nevertheless, the monuments that have withstood adverse conditions, the verity of astrology and the ancient texts on statesmanship and warfare, are indicators of the fact that we were pioneers in Architecture, Engineering, Astronomy and Statecraft.

The contributions made by astrophysicists, like Aryabhata and Bharkara, their theories on heliocentric model of the universe and their description of tools and instruments used for calculating and predicting planetary occurrences predate the Renaissance era theories.

Let's have a peek at the construction, working and some fundamentals of these instruments (retro time)

### SAMRAT YANTRA

The Samrat Yantra is the largest sundial in the world at over 27 meters high, and is capable of telling the time, day or night, with an accuracy of about two seconds. Its design is slightly different from that of classical sundials, which consist of a stick (called the gnomon) that creates a shadow and a flat scale on which the time is read. The Samrat Yantra's gnomon is a huge triangle made of local stone. The gnomon's upper face is angled at 27° (the latitude of Jaipur), and the gnomon follows the local meridian, with the highest point pointing to geographical north. The shadow cast by the gnomon falls on a pair of marble-faced curving quadrants on the east and west sides of the Samrat Yantra. The quadrants are curved so that, unlike on a normal flat sundial, the hours are spaced equally apart.

The reason that the Samrat Yantra and the other instruments at Jantar Mantar are so enormous is that Jai Singh wanted to obtain the greatest accuracy possible. Because of the Samrat Yantra's massive size, its shadow can be seen moving at the rate of about 6 centimeters per minute. You can use the Samrat Yantra to tell the time at night by observing the position of a star from one of the quadrants and moving until the star just touches the top of the gnomon.

### DHRUVA YANTRA

A brass instrument for finding the position of the Pole Star at night, it also serves to show the position of the twelve zodiac signs, each comprising 30 degrees of the celestial circle, and measures the declination of the sun (that is, how many degrees north or south of the equator it is). The instrument is graduated and inscribed in Hindi letters, showing both time and position.

Indians measure angles in degrees and minutes nowadays. But the traditional method of calculating time is based on a different system. The basic unit of this system is the human breath, reckoned to be equivalent to a length of 6 seconds.

4	breaths	=	1	pala	(24	sec.)
60	palas	=	1	gati	(24	min.)
60 gatis = 1 day (24 hrs.)						

### RASHIVALAYAS YANTRA

Twelve sundials, one for each sign of the zodiac. You can easily find your own sign. Each instrument works in exactly the same way as the samrat yantras. The instruments have been so constructed that one is available at the instant each zodiacal sign crosses the meridian; hence they enable observations to be made approximately every two hours.

Each constellation has its own position, and this can be read off the appropriate instrument. Astrology and astronomy were two parts of the one science, as far as Indians were concerned; astronomy was the pure science, and astrology the applied. Human and earthly activity was considered to be bound with the movement of the heavens, and so astrology was seen as a means to help one pass effortlessly through life.

## JAYA PRAKASH YANTRA

This elegant instrument is the piece de resistance of the Jaipur Observatory. It acts as a double check on all the other instruments and is unique to the Jantar Mantar. The Jai Prakash measures the "rotation" of the sun. It consists of two hemispherical cavities set in the ground. They are complementary; if put together they would form one complete hemisphere, which would be a map of the heavens. Crosswires are strung north to south and east to west. Where these join is a small circular iron plate with a hole in the center. The shadow cast by this ring falls on the marble hemisphere below, indicating the sun's longitude and latitude and the sign of the zodiac through which it is passing. If the shadow falls on an empty space in one hemisphere, it will fall on a solid, uncut portion in the other. The bowls have been segmented and separated so as to allow accurate reading. The observer only has to descend the stairs to get a close view of exactly where the shadow is lying. If the hemisphere had been undivided, such an accurate reading would not have been possible. Moreover, other heavenly bodies can be directly observed from the well of the instrument. This is done by looking upward from the appropriate point on the graduated inscription and observing the passage of the body across the intersection of the wires.

There is an underground passage connecting the two bowls. This is a fine example of Jai Singh's love of things that were both practical and aesthetically pleasing. One of the most charming and ingenious of his instruments, it is ideal for demonstrating the apparent motion of the sun and is much used to this day in introducing novice astronomers to the science.

## CHAKRA YANTRA

A graduated brass circle that can be revolved about a diameter parallel to the earth's axis, this gives the ascension and declination – that is, angle of an object from the equator. It is an exact counterpart to the modern instrument known as an equatorial. On either side of the chakra yantra, lays another instrument called the Kapali. It is a miniature version of the Jai Prakash, though here there are no pathways cut in the bowls.

- Vaishali Swaminathan



# Creative Space

## Girl Child-

In the maternity wing, lying on the bed, she remembered her father's happy tears. Those tears that rolled down his cheeks, on her first kick to his heart, with her tiny little feet. His happy tears when she took her first step, first syllable & wore her first gown. Her father's proud moments, when he lived in her songs, dance & achievements. No, my soul mate can't miss all those moments. She took the decision.

Watching her, for the first time his mother's words made sense to him. He remembered her anecdotes of pregnancy time, month by month. His mother's smile when she told him about his first kick in womb, tinge of painful happiness, for the troubles he gave for nine months. He couldn't forget her sweetened words that hid the excruciating pain of his birth, and the love she showered on him since his birth. He felt his wife's pain for the first time in all these months. No, my soul mate should feel the joy of motherhood after the pain. He confirmed her decision.

"Yes, it is a girl child", he said proudly and "We are keeping it", he proclaimed to the world outside the door, before walking away to the invisible joy of the baby girl.

# Tech Corner- It's Time

The best news was that Apple didn't just launch a smartwatch, it launched a whole raft of smartwatches. By combining the three different Apple Watch categories, the two different face sizes and the accompaniment of straps, there is the potential for 34 different Apple Watches, so there is a style to suit anybody. And crucially, since Apple is offering two watch face sizes, the Apple Watch will be as comfortable on a female wrist as on a man's wrist



. I remember meeting one activity tracker brand that tried to convince me that their activity tracker was designed to appeal to the fashion-conscious woman; they even thought that women would wear it around their neck like a necklace. But at the end of the day it wasn't jewellery. None of the fitness trackers are.

It's a similar story with smartwatches. Sure, over the past year they've become more and more popular with guys looking for the latest tech gadget, but they don't appeal to everyone. One major issue is that most smartwatches I've seen are designed for men. They wouldn't sit comfortably on a smaller wrist.

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