
DEPARTMENT OF INSTRUMENTATION AND CONTROL ENGINEERING
SARANATHAN COLLEGE
OF ENGINEERING
VOLUME 5, ISSUE 2
iCERYX
The Voice of ICE
NEC

FOREWORD

With great pride and Honour it is a privilege to inform the readers that the department of Instrumentation and Control Engineering along with 5 other departments has been successfully accredited by the NBA for a period of three years. This is a remarkable achievement which tells about the efforts put in by all the stakeholders especially the teaching fraternity so as to have an outcome based education for the student who are the prime stakeholders of this institution. To continue the policy of the department in having a good industrial exposure to the student there has been successful training sessions conducted by National Instruments for the pre-final and final year students. Special training sessions have been given to final years so as to get prepared for an industrial certification exam called CLAD. In improving the aptitude and verbal skills of our students there was a also being a special training camp related to their placement skill development To add pride to the departments pre final year and 2nd year students have been in through internships through Internshala and other means. Many student projects of the past final years has been convert to good Publications. I hope and believe that the current students could take up the trend and add value to the resume and make the resume much more stronger than their predecessors. The department for the first time is going to throw opportunities for its students to work in DST sanctioned project for which a new laboratory is under preparation. With all these said I sincerely look forward for a harmony among the teachers and students to hit at resonance and bring out wonders for the department. Best wishes for a more productive year than the previous one.

Dr. S.M. Girirajkumar
HoD/ ICE

FROM THE EDITORIAL BOARD

The exemplary achievements of the department is aclassic example of how commitment can produce wonders. The department solley believes that a healthy mind is a prerequisite for a prosperous future. So utmost care and concern is given for the students to realize their aims and to accomplish their goals in the future days to come. Our department has shown a tremendous growth in terms of national level. The PR team feels it its greatest previlege to put to light to the outer world the remarkable and cummulative efforts of all of us which ahs led to this magnificent achievemnt.

R.Santhoshini, Final Year
P.N.Subbulakshmi, Final Year
C.T.Muthalagappan, Final Year
R.Milan Patel, Pre-Final Year
G.Subbiah Srinivasan, Pre-Final Year
B.Irhfann Ameer, Pre-Final Year
R.S.Sanchhali, Pre-Final Year

CONTENTS

LABVIEW TRAINING CORE-2

Core-2 LabVIEW training had be held on 12.5.2018 to 20.5.2018.

The Trainer for the course is Mr.Sivamanikandan and Mr.Prakash from opthit-tech and they gave a effeicient traning to our students. 39 studentss from final had attend the training

Below are the listed topics that are covered during the period of training..

Day 1: 12.05.2018 - Session Time – 9.30 am to 4.30pm

- Revision of Core-1 and Basic LabVIEW concepts.
- Introduction about NI-Myrio hardware kit of LabVIEW
- Basics of NI-Myrio hardware and Programming.

Day 2: 13.05.2018 - Session Time – 9.30 am to 4.30pm

- Exercise on LabVIEW graphical programming
- Working of customer timer as subVI
- Special Session on Hardware interface devices
- Exercise on NI-Myrio Starter Kit.

Day 3: 14.05.2018 - Session Time – 9.30 am to 4.30pm

- Application Exercise on Product and Consumer using .ini files
- Developed an application on RO plant purifier using .csv file
- Exercise on NI-Myrio Mechatronics Kit

Day 4: 15.05.2018 - Session Time – 9.30 am to 4.30pm

- Controls are developed command file and FGV using .ini command file
- Special Session
- Hardware in loop- motor speed control demo
- Exercise on NI-Myrio Embedded Kit

Day 5: 16.05.2018 - Session Time – 9.30 am to 4.30pm

- Interfacing of Sensor to the hardware
- Working on FGPA VI and deploying

Day 6 to Day 9: 17.05.2018 to 20.05.2018 - Session Time – 9.30 am to 4.30pm

- Doing Project using all the sensors
- Practicing all the kits of NI-Myrio and LabVIEW programming

TRAINING AND PLACEMENT:

A training session on verbal and aptitude was conducted for final year students of all departments from 25th June 2018 to 30th June 2018, from 9:30 AM to 4:45 PM. The training session was handled with a prime motive of providing ample practice to the students to face the placement tests.

The training session was scheduled in two parts. The classroom teaching of the concepts went hand in hand with the lab sessions where the students were able to take mock practice test to analyze and keep a track on their progress. The trainers shared a lot of experiences which were an eye opener to many. The trainers even discussed on time management and the efficiency by which the test should be attended. The first day the trainer began with the basic concepts of aptitude and verbal and gradually proceeded to further concepts in further days of the training session.

PLACEMENT DRIVE:

C E L C O M Technologies is a company recruiting students from various departments like ICE, EEE, IT and CSE.

15 Students from our department had attend the 1st round which is held on 30.06.2018. And 12 students had cleared the 1st round and selected for 2nd round.

The 2nd round was attend by that 12 students and 8 students were cleared the 2nd round also.

These are the 8 students who are all cleared the 2nd round.

S.NO	NAME	YEAR
1.	Arshad Alam Mohammed.M	Final Year
2.	Ashwin Shivram.H	Final Year
3.	Azhagu Vigna Rajan.M	Final Year
4.	Harishraj.R	Final Year
5.	Santhoshini.R	Final Year
6.	Shyam Sundar.K	Final Year
7.	Sreedivya.S	Final Year
8.	Sri Priya.R	Final Year

IN-PLANT TRAINING:

Students from final year had gone for In-plant training to NTPL (National Thermal Power PLant) in Tuticorin for 4 days. from 30.05.2018 to 02.06.2018.

S.NO	NAME	YEAR	
1.	Azhagu Vigna Rajan.M	Final Year	
2.	Arjun.M	Final Year	
3.	Jithendrriyan.B.B	Final Year	
4.	Mohamed-pharsath.M	Final Year	

FUTURE TRENDS IN ENGINEERING

By
Subbulakshmi.PN
FInal year,ICE

In the field of instrumentation and control, the trends toward more advanced and diverse technology have progressed dramatically with the development of virtual instrumentation technology, such as software sensors and virtual metrology. In instrumentation field, applications of sophisticated electronic instrumentation technology have advanced, and the objects to be measured are also being more diverse. Moreover in control field, there is increasing demand for control technology for high-speed and high-precision temperature control and positioning control.

In new markets where changes are created continuously by new applications, the automated system and system integration will become a necessary part of the solution. The innovation and development of products and engineering services will become primary work for automation engineers. In some new applications, artificial intelligence will become the spotlight that reflects the core value of automation.

The Internet of things (IoT) now in full swing will enter a high-growth path by 2020. In a time when people and things are all connected by network, automation engineers and end users will care most about the stability and reliability of the industrial network. The intellectualization, collection, and detection of data will mostly be resolved. The harder part is the troubleshooting and reliability of the industrial network. If situations arise in the network, whether in the business network or in the network controlling production, the whole operation of the enterprise will confront difficulties and hinder decision making in real time because control engineers rely on the industrial network for assessment and indicators. The primary concern for engineers will be the stability and reliability of the networked automation.

LIMIT SWITCH

By
Nagimma Begam
FInal year,ICE

A limit switch is a switch operated by the motion of a machine part or presence of an object.

WORKING PRINCIPLE:

It can be a switch in series with the power supply. When the object hits the plunger, the motor is disconnected from the main supply It can be a in series with the power supply. When the object hits the plunger, the motor is disconnected from the main supply.

But they can also by connected to a digital card that acquires their status and decide which action to do.

Usually safety limit switch are in series with the supply. (NO) is the normally open contact (open if the plunger is free), NC is the normally closed contact (closed if the plunger is free) and COM is the common.

Then NO normally will be open with respect to COM while NC will be shorted with COM. When the object hit the plunger, NO will be shorted with the COM while NC will be open with respect to COM

They are used for controlling machinery as part of a control system, as a safety interlocks, or to count objects passing a point.[1] A limit switch is an electromechanical device that consists of an actuator mechanically linked to a set of contacts.

When an object comes into contact with the actuator, the device operates the contacts to make or break an electrical connection.

Limit switches are used in a variety of applications and environments because of their ruggedness, ease of installation, and reliability. They can determine the presence or absence, passing, positioning, and end of travel of an object.

They were first used to define the limit of travel of an object. Standardized limit switches are industrial control components manufactured with a variety of operator types, including lever, roller plunger, and whisker type.

Limit switches may be directly mechanically operated by the motion of the operating lever.

A reed switch may be used to indicate proximity of a magnet mounted on some moving part.

Proximity switches operate by the disturbance of an electromagnetic field, by capacitance, or by sensing a magnetic field.

Rarely, a final operating device such as a lamp or solenoid valve will be directly controlled by the contacts of an industrial limit switch, but more typically the limit switch will be wired through a control relay, a motor contactor control circuit, or as an input to a programmable logic controller.

Miniature snap-action switch may be used for example as components of such devices as photocopiers, computerb printers,convertible tops or microwave ovens to ensure internal components are in the correct position for operation and to prevent operation when access doors are opened.

A set of adjustable limit switches are installed on a garage door opener to shut off the motor when the door has reached the fully raised or fully lowered position.

A numerical control machine such as a lathe will have limit switches to identify maximum limits for machine parts or to provide a known reference point for incremental motions.

Limit switches are a type of sensor that detect and absence.

Specifically, mechanical limit switches are switches that are mechanically activated, meaning that they have some sort of arm, lever, knob, plunger, etc.,

which is physically—or mechanically—activated by making contact with another object.

As the object makes contact with the actuator of the switch, it eventually moves the actuator to its “limit” where the contacts change state.

Other varieties of sensors / switches exist, including proximity sensors, light sensors, electric switches, among others.

In its simplest form, a limit switch is a “switch” that can be mounted into remote locations so that it is actuated by an object other than a human operator.

Some basic functions of limit switches are:

- Detecting presence/absence
- Counting
- Detecting range of movement
- Detecting positioning & travel limit
- Breaking a live circuit when unsafe
- Detecting speed and hundreds of other applications

Limit switches are a practical solution for sensing in most situations. There are, however, a few disadvantages to using limit switches. Some of the strengths and weaknesses of the product are listed below:

Strengths
- Switching high currents
- is no problem (up to 10A)
- High precision, accuracy, and repeatability
- Economic sensing solution
- Can withstand most Environme nts

Weaknesses :
- Must make physical contact with an object to actuate
- Mechanical component can wear out

The Metallic, Non-metallic, and Safety series are all physically interchangeable and share the same body desig across the product range. The miniature pre-wired range a specially designed compact line of switches available in 30mm (standardized) and 35mm widths.

ALLEN BRANDELY PLC:

HISTORY:

By
Muthalagappan.CT
FInal year,ICE

Programmable logic controller have made it possible to precisely control large process machines and driven equipment with less physical wiring and wiring time than it requires with standard electro-mechanical relays, pneumatic system, timers, drum switches, and so on.

The programmability allows for fast and easy changes in the relay ladder logic to meet the changing needs of the process or driven equipment without the need for expensive and time consuming rewiring process.

Modem PLCs are “electrician friendly”, PLC can be programmed and used by plant engineers and maintenance electricians without much electronic and computer programming background. They can programmed by using the existing ladder diagrams.

The company was initially founded as the Compression Rheostat Company by Dr. Stanton Allen and Lynde Bradley with an initial investment of $1,000 in 1903.

In 1910 the company was renamed the Allen-Bradley Company.

In 1952 they opened a subsidiary in Galt, Ontario, Canada, that now employs over 1000 people.

In 1985 a new company record was set as they ended the fiscal year with 1 billion dollars in sales. On February 20, 1995, Rockwell International (now Rockwell Automation) purchased Allen-Bradley for $1.651 billion, which is the largest acquisition in Wisconsin’s history.

Allen-Bradley is the same name associated with low temperature sensors, since a now obsolete line of carbon-compositeresistors manufactured by Allen-Bradley show an approximately inversely proportional temperature dependence at low temperatures.

This undesirable characteristic for commercial resistors (since an ideal resistor should have no temperature dependence) is suited for cryogenic measurement, which paradoxically has partly helped establish a name for Allen-Bradley among the lay electronics enthusiast.

Allen-Bradley resistors are commercially available at a premium, often supplied withcalibration datasolenoid valve removes the potential from the hazardous area.

Programmable logic controller have made it possible to precisely control large process machines and driven equipment with less physical wiring and wiring time than it requires with standard electro-mechanical relays, pneumatic system, timers, drum switches, and so on.

The programmability allows for fast and easy changes in the relay ladder logic to meet the changing needs of the process or driven equipment without the need for expensive and time consuming rewiring process.

Modem PLCs are "electrician friendly", PLC can be programmed and used by plant engineers and maintenance electricians without much electronic and computer programming background. They can programmed by using the existing ladder diagrams.

INDIAN HUMAROID ROBOTS

By
Subbulakshmi.PN
FInal year,ICE

Humanoids robots have been gaining popularity in India for quite some time now. Although the country is still catching up with the developments in artificial intelligence and robotics as compared to others, Indian startups, as well as the government, are working at a rapid pace to integrate new age technologies. According to an IFR research, robot sales in India increased by 27 percent to a new peak of 2,627 units in India — almost the same as in Thailand. Another survey claims that India ranks third in implementing robotic automation.

Manav

Manav is India's first 3D-printed humanoid robot. The two kilo, two-feet tall robot has an inbuilt vision and sound processing capability which allows it to walk, talk and dance — just in response to human commands.

Developed by Delhi's A-SET Training and Research Institute, the humanoid robot is primarily meant for research purposes and is made available to research institutes which offer robotics as a subject of study.

Mitra

The first indigenously built humanoid robot is capable of interacting with humans smartly. The five feet-tall humanoid robot is made of fibreglass and is programmed to greet customers using contextual help, autonomous navigation and facial and speech recognition. It also has a touchscreen on its chest which can be used to interact where speech is not possible. It can work for eight hours on a single charge. It can also understand multiple languages.

The humanoid robot was launched by Prime Minister Narendra Modi and Ivanka Trump, First Daughter and advisor to the President of the United States Donald Trump, at the Global Entrepreneurship Summit (GES) conference last year.

Developed by a Bengaluru-based robotics startup Invento Robotics, the robot can be found floating in the corridors of the Canara Bank and PVR Cinemas in Bengaluru, chatting with the customers and making them feel welcome.

Robocop

Hyderabad-based AI and ML startup H-Bots Robotics has developed a police robot to assist in handling the law, order, and traffic management. The life-sized robot, which was deployed last year in Hyderabad, is equipped with cameras and an array of different sensors like ultrasonic, proximity and temperature sensors. The robot is designed to protect and secure places like offices, malls, airports, signal posts and other public spaces and can take care of security if deployed autonomously. Reportedly, the Robocop can diffuse bombs too. The beta version robot is made in India using all Indian components.

KEMPA

Passengers visiting Bengaluru airport may soon be greeted by a special robot assistant. Built to suit the needs of the Kempegowda International Airport, the little bot assistant, named KEMPA, will answers queries of confused passengers in English as well as Kannada. The humanoid is built on AI by a Bengaluru-based startup Sirena Technologies. The advanced humanoid is completely designed and manufactured in Bengaluru.

RADA

Vistara, a joint venture between Tata Sons and Singapore Airlines, has created a unique artificial intelligence-based robot called RADA to automate simple tasks and improve customer experience.

According to a statement released by Vistara, the RADA will be placed at Vistara's Signature Lounge at Delhi's Indira Gandhi International Airport's Terminal 3 from 5 July 2018 to assist customers before they board their flights. It will also help promote Vistara's product and services with the help of distinct messages recited by the bot.

RADA will be further developed over a period of time in terms of functionality and features for future use cases, after gauging customer feedback. It is conceived, designed and engineered by its team of technology experts and apprentices from Tata Innovation Lab with support from students of reputed institutions.

Built on a chassis of four wheels, RADA can rotate 360 degrees and has three inbuilt cameras for cognitive interaction. Combining these components with an

effective voice technology, Vistara has developed the robot to provide a simple solution to cater to the emerging and future trends.

DRDO's Daksh

This made-in-India robot is primarily designed to detect and recover Improvised Explosive Devices (IEDs). Developed by Defence Research and Development Organisation (DRDO), the robot was inducted by Indian Army around 2011. Reportedly, 20 Daksh robots are already being used by the Indian Army.

Using its X-ray vision, Daksh can identify a hazardous object and can diffuse it with a jet of water. Daksh is capable of climbing staircase and negotiating cross-country terrains and is capable of towing a suspected vehicle away from a crowded area. Additionally, it can be operated from a distance of 2.5 kilometres and can handle car explosives with its high-calibre shotgun. Reportedly, after it got an upgrade in 2015, it not only became lighter, faster and rugged, but has also been equipped with chemical, biological, radiological and nuclear hazard detection mechanism. The new Daksh is made of aluminium alloy which has reduced the weight and has become three-time faster, compared to the older version, which was made of steel.

Thus, India's robotics industry is still small when compared with those of South Korea, Japan, US and China. Nonetheless, there are only three robots per 10,000 employees in India. But it is only a matter of time before the country becomes a major player in robotics design and development. India already has many of the basic elements in place to become a robotics industry, including established business, academic research, government support and an increasingly entrepreneurial business community.

Parker Solar Probe: A satellite to touch the sun

By
B.Akshaya
Pre-Final Year/ ICE

For the first time, a NASA spacecraft will swoop in and touch the sun. The Parker Solar Probe will make 24 orbits of the star before swooping into the outermost part of the solar atmosphere, known as the corona, to study the sun up close and personal. At its closest approach, Parker Solar probe will fly within 3.7 million miles (6 million kilometers) of the sun's surface — more than eight times closer than any other spacecraft and more than eight times closer than Mercury.

Journey to the Sun

Launch Date and Site: Aug. 12, 2018 Cape Canaveral Air Force Station, Florida. Flying into the outermost part of the Sun's atmosphere, known as the corona, for the first time, Parker Solar Probe will employ a combination of in situ measurements and imaging to revolutionize our understanding of the corona and expand our knowledge of the origin and evolution of the solar wind. It will also make critical contributions to our ability to forecast changes in Earth's space environment that affect life and technology on Earth.

Extreme Exploration

At closest approach, Parker Solar Probe hurtles around the Sun at approximately 430,000 mph (700,000 kph). That's fast enough to get from Philadelphia to Washington, D.C., in one second.At closest approach to the Sun, the front of Parker Solar Probe's solar shield faces temperatures approaching 2,500 F (1,377 C). The spacecraft's payload will be near room temperature.

Materials used

To perform these unprecedented investigations, the spacecraft and instruments will be protected from the Sun's heat by a 4.5-inch-thick (11.43 cm) carbon-composite shield, which will need to withstand temperatures outside the spacecraft that reach nearly 2,500 F (1,377 C).

The spacecraft carries four instruments:

The Solar Wind Electrons Alphas and Protons Investigation (SWEAP) will specifically count the most abundant particles in the solar wind, measuring the properties electrons, protons, and helium ions.

The Wide-field Imager for Solar Probe Plus (WISPR) is a telescope that will make three-dimensional images of the sun's corona and inner heliosphere to actually "see" the solar wind and provide 3-D images of shocks and other structures as they travel by the spacecraft.

The Electromagnetic Fields Investigation (FIELDS) will make direct measurements of the shock waves that course through the sun's atmospheric plasma.

The Integrated Science Investigation of the Sun (IS☐IS) consists of two instruments that will take an inventory of the elements in the solar atmosphere by using a mass spectrometer to study charged particles near the probe.

Why do we study the Sun and the solar wind?

The Sun is the only star we can study up close. By studying this star we live with, we learn more about stars throughout the universe. The Sun is a source of light and heat for life on Earth. The more we know about it, the more we can understand how life on Earth developed. The Sun also affects Earth in less familiar ways. It is the source of the solar wind; a flow of ionized gases from the Sun that streams past Earth at speeds of more than 500 km per second (a million miles per hour). The solar wind also fills up much of the solar system, dominating the space environment far past Earth. Thus the remarkable journey started successfully and it will create a record in space history ever done by mankind . One Small step is taken for touch the sun via Parker mission.

SIX ETHICS OF LIFE

Before you pray-Believe.
Belief enhances positive thoughts.
Before you speak-Listen.
Listening widens understanding.
Before you spend-Earn.
Earning educates the value of money.
Before you write-Think.
Thinking inspires and unleashes creativity.
Before you quit - Try.
Trying leads you to success.
Before you die - Live.
Live in such a way that you may live forever.

By
Sabthami. M
ICE-II yr.

Parker Solar Probe - A Mission to Touch the Sun (By NASA)

Parker Solar Probe Mission Quick Facts

Launch Date: Aug . 11, 2018 (Successfully launched)

Launch Site: Space Launch Complex 37, Cape Canaveral Air Force Station

Launch Vehicle: United Launch Alliance Delta IV Heavy rocket
Launch: Targeted for 3:48 a .m . EDT (approximately 45-minute window)

Spacecraft Separation: Targeted for approximately 36 minutes after launch

Orbit: Elliptical orbit around the Sun at 3 .4 degree inclination from the ecliptic plane

Orbital Period: 88 days for final orbits with closest approach
Mission Duration: Baseline seven-year science mission

Operations: The Johns Hopkins University Applied Physics Lab in Laurel, Maryland, will perform ground commanding, flight operations and data telemetry, as well as data processing and archiving .

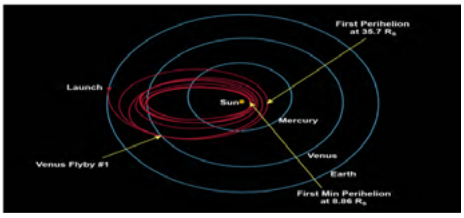
Ground Data Passes: Parker Solar Probe will transmit data via NASA's Deep Space Network .

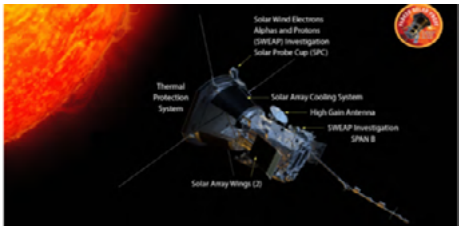
Parker Solar Probe Quick Facts: The Spacecraft **Mass:** The mass of the spacecraft after fueling is about 1,400 pounds (635 kilograms) . The heat shield, called the Thermal Protection System (TPS), weighs 160 pounds (73 kilograms) .

Spacecraft Dimensions: The spacecraft is about 9 .8 feet (3 meters) tall and about 3 .3 feet (1 meter) in diameter below the cooling system . The Thermal Protection System is a little over 4 .5 inches (11 .43 centimeters) thick and has a diameter of about 7 .5 feet (2 .3 meters) .

Solar Arrays: The two solar arrays are each about 3 .7 feet (1 .12 meters) long by 2 .26 feet (0 .69 meters) wide, for a total area of 17 .2 square feet (1 .6 square meters) .

Power: Parker Solar Probe's solar arrays can produce 388 watts of power, depending on configuration —about enough to run a kitchen blender .



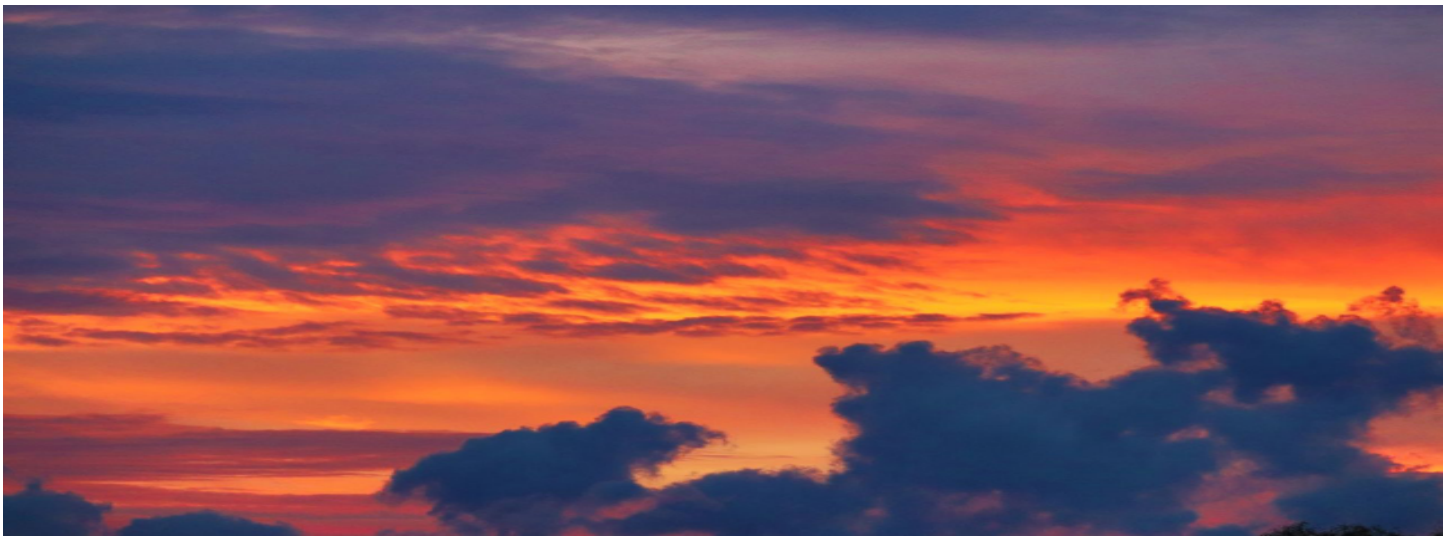


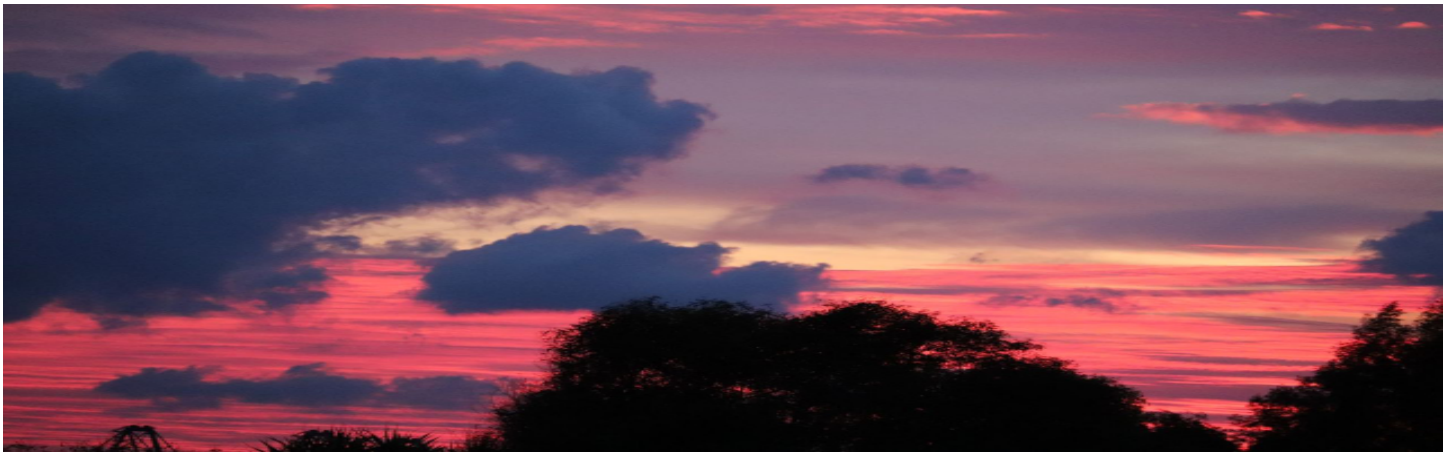
By,
Surya S
ICE-2nd Year

ART CORNER:

By
M.RANJITH KUMAR
Final Year/ ICE

PHOTGRAPHY CORNER:





By
Surya Kumar.B
Final Year/ ICE

By
Kiruba Govind Bangaram
Final Year/ ICE

By
M.RANJITH KUMAR
Final Year/ ICE

By
SHRI HARI.S
Second Year/ ICE

Brought to you by the Public Relations team of
The department of Instrumentation and Control Engineering,
Saranathan College of Engineering, Trichy.
Post your valuable feedback to ice.prteam@gmail.com