

VOLUME 01

ISSUE NO. 01

THE SPARK

Igniting Innovations

DEPARTMENT OF
ELECTRICAL AND ELECTRONICS
ENGINEERING

SEP
2024



UNIVERSITY COLLEGE OF ENGINEERING KAKINADA (A)
JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA

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MESSAGE BY THE PRINCIPAL

Greetings to you all.

I am happy to know that the Department of EEE, UCEK has been coming with a colorful monthly Newsletter with the name "The Spark: Igniting Innovation". I congratulate Prof. K. Venkata Reddy, Head of EEE Department and the Chief Editor who is the backbone in designing this innovative Newsletter.



It is inspiring to note that this institution strives for the all-round development of its students' knowledge, intellectual, mental, and physical capability to equip themselves to meet the global challenges. The Spark will serve as a platform to showcase our students' and faculty members' technical achievements, research endeavors, and industry insights. It will also keep you informed about upcoming events, workshops, and conferences.

I encourage everyone to contribute articles, case studies, and innovative ideas to make this newsletter a valuable resource for all. I am very sure that this Newsletter will definitely reach its zenith and lead the students to pinnacle of glory. I wish my institution to reach the helm.

Let us all join together to work on the Newsletter. I also assure you this newsletter will help you land in the good golden days.

Thank you to the editorial team for their tireless efforts in bringing this project to life.

Team work, Works

Let our prayers reach the Heaven to shower his blessings.

Jai Hind.

Prof. N. Mohan Rao

Principal, UCEK, JNTUK

MESSAGE BY THE HEAD OF THE DEPARTMENT

Dear Students, Faculty, and Alumni,

It is my immense pleasure to announce the launch of 'The Spark: Igniting innovation', the official technical newsletter of the Electrical and Electronics Engineering Department. This initiative embodies our department's commitment to fostering innovation, creativity, and knowledge sharing.

The Spark' aims to:

- Showcase student projects and research endeavors
- Highlight faculty achievements and expertise
- Provide industry insights and trends
- Foster collaboration and networking



I encourage each of you to contribute articles, case studies, and innovative ideas to make 'The Spark' a valuable resource for our community. Please submit your articles and suggestions to thespark@jntucek.ac.in.

Congratulations to the editorial team on this outstanding effort!

Best regards,

Prof. Venkata Reddy Kota

Head of Electrical and Electronics Engineering Department

ACHIEVEMENTS



- Dr. R. Srinivasa Rao, Professor has been appointed as the Hon'ble Vice-Chancellor (i/c) of Krishna University, Machilipatnam in July 2024.

- Dr. K. Ravindra, Professor received Best Teacher Award at the Teacher's Day Celebrations 2024, organized by the UCEK under JNTUK, Honoring Excellence in Teaching.



- Dr. K. Venkata Reddy, Professor has been appointed as the Head of the Department of EEE Department, UCEK, JNTUK in August 2024.

- Dr. M. Nageswara Rao, Professor has been appointed as the Controller of Examinations, JNTUK Kakinada in August 2024.



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Ms. Y. SAI SARANYA
(21021A0220)



Ms. K. KUSUMA
(21021A0240)



Ms. K. ISWARYA SAI
(21021A0244)

with CTC 5 LPA

MOOC CERTIFICATIONS

- Dr. K. Ravindra, Professor has completed MOOC on “Electric cars: Technology” by Delft X through edX.
- Dr. K. Venkata Reddy, Professor of EEE has completed MOOC on “Electric Cars: Technology” by Delft X through edX.
- Mr. Thota Sai Govinda Krishna (22021A0246) of III B.Tech EEE has completed MOOC on “Hardware and Operating Systems” by IBM through edX.
- Ms. Ch Pragya (22021A0217) of III B.Tech EEE has completed MOOC on “Introduction to SQL” by IBM through edX.
- Ms. Rayudu Kanaka Ysaswini Satya Sree (22021A0218) of III B.Tech EEE has completed MOOC on “Java programming fundamentals” by GalileoX through edX.
- Ms. Sontena Tanuja (22021A0209) of III B.Tech EEE has completed MOOC on “Python basics for data science” by IBM through edX.
- Ms. K.S.N. Sowmya (22021A0213) of III B.Tech EEE has completed MOOC on “Python basics for data science” by IBM through edX.
- Ms. Thulasi Borra (22021A0248) of III B.Tech EEE has completed MOOC on “Becoming an Entrepreneur” by MITx through edX.
- Ms. Shaik Karimunnisa (21021A0207) of IV B.Tech EEE has completed MOOC on “Introduction to the Internet of things (IoT)” by Curtin University through edX.
- Ms. Kasilanka Iswarya Sai (21021A0240) of IV B.Tech EEE has completed MOOC on “Machine Learning with Python: A Practical Introduction” by IBM through edX.
- Mr. M Maharshi (21021A0211) of IV B.Tech EEE has completed MOOCs on: “Machine Learning with Python: A Practical Introduction” by IBM through edX.
- Ms. Kasa Chaitra Lahari (21021A0246) of IV B.Tech EEE has completed MOOCs on: “Git and GitHub Basics” by IBM, “Build Your First IoT Application with Arm” by arm education through edX.
- Ms. Pampanaboina Gowri Shankar Sripriya (21021A0231) of IV B.Tech EEE has completed MOOC on “Machine Learning with Python: A Practical Introduction” by IBM through edX.
- Ms. Duba Vijaya Ramya (21021A0214) of IV B.Tech EEE has completed MOOC on: “Machine Learning with Python: A Practical Introduction” by IBM & “Introduction to the Internet of things (IoT)” by Curtin University through edX.
- Ms. Vanamu Lakshmi Prasanna (21021A0203) of IV B.Tech EEE has completed MOOC on “Machine Learning with Python: A Practical Introduction” by IBM through edX.

ADITYA L1'S 1% TOWARDS SUN

This mission is the first ever mission to be launched towards sun by INDIA. It is a major mission implemented by ISRO; it consists of 7 payloads for the observation of different aspects of sun's atmosphere. This is not the first ever satellite to be launched towards sun but it has its unique advantages of studding the sun's atmosphere.

The distance of Aditya L1 from earth is equal to 1% of the distance between sun and earth that is 1.5 million kilometers this point in the space is known as lagrangian point. The closest approach done till date is 4.13% of earth to sun distance by NASA which is approximately equal to 6.2 million kilometers.

The cost of this project is around 400 crores in rupees even though it is very difficult to achieve such targets with this budget it is successfully launched and entered into its orbit.



<https://images.app.goo.gl/fZons76qD28dbscZ6>

ADITYA L1'S PAYLOADS

Visual Emission Line Coronagraph (VELC):

This apparatus is provided in Aditya L1 for capturing the high-resolution images of sun corona in order to observe the sun's coronal activities like coronal mass ejection and to analyze the effect of the activities on space weather. It blocks the direct light of sun and captures the high-resolution images. It only operates in visible region.



<https://images.app.goo.gl/fZons76qD28dbscZ6>

Solar Ultra-Violet Imaging Telescope (SUIT):

Unlike VELC, SUIT is operated in UV region it is a kind of telescope so it does not block light instead it directly captures the high-resolution UV images for analyzing the dynamics of corona, solar flares and prominences.

Solar Low Energy X-ray Spectrometer (SoLEXS):

This particular apparatus is designed in order to observe the low frequency emission during solar flares, this particular apparatus is placed inside Aditya in order to provide a better analysis in low frequency emissions and their effects on solar weather.

High Energy L1 Orbiting X-ray Spectrometer (HEL1OS):

It analyses the high frequency x rays for the study of acceleration of particles and their process this gives an understanding on dynamics of high energy emissions and their timings.

Magnetometer:

This instrument helps the satellite to analyze the magnetic fields variations caused by different solar activities like solar flares, corona mass emission also it helps the scientists to know about the effects caused in earth magnetic field.

Aditya Solar wind Particle Experiment (ASPEX):

This equipment contains two major components. SWIS which measures velocity, temperature and density of photons released by sun. Through this the properties of solar wind and its effects on earth atmosphere, communication etc., are being analyzed. STEPS is installed in Aditya L1 in order to analyze the higher energy particles released in solar flares or other events this crucial for forecasting the space weather like geomagnetic storms.

Plasma Analyzer Package for Aditya (PAPA):

As we all know the three states of matter but we also have plasma as a fourth state of matter. This instrument especially designed to observe plasma dynamics of ions released through solar flares this also helps in predicting space weather and effects on earth magnetosphere, power grids

WRITTEN BY
M. JAI SURYA
(22021A0221)

*"If You Want to Shine Like a Sun, First
Burn Like a Sun."*
-Dr. A.P.J.Abdul Kalam

TECHNOLOGY BEHIND WAR

The iron dome, Israel's advanced air defence system, incorporates several key engineering principles to intercept and neutralize incoming threats effectively. Their technology in defence systems is far beyond our imagination. Many engineering principles and techniques were implemented in this greatest innovation. Let's take a peek into the technology of wars.

1) RADAR TECHNOLOGY: The system uses sophisticated radar to detect and track incoming threats. This radar operates on radio waves, which can function accurately even in adverse weather conditions.

2) CONTROL SYSTEMS AND AUTOMATION:

The iron dome employs advanced control systems developed by Israeli firm mPrest. These systems analyze radar data, compute the incoming threat's trajectory, and determine the optimal interception point. This process is highly automated, reducing the need for human intervention.



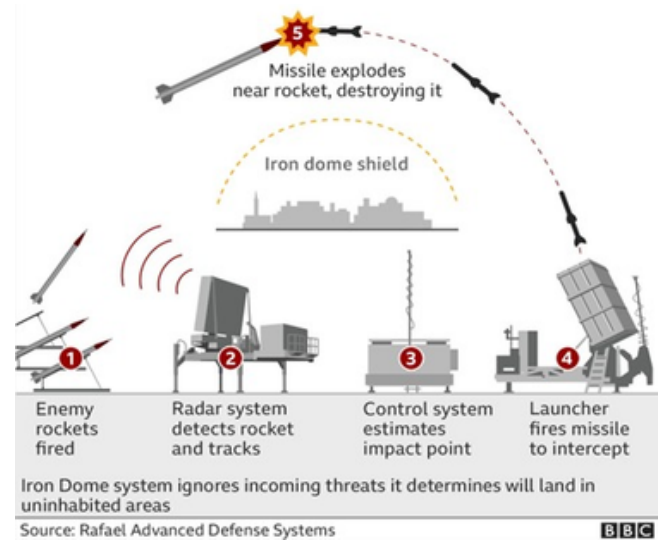
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3) INTERCEPTION MECHANICS:

The system includes mobile firing units equipped with Tamir interceptor missiles. These missiles are launched to intercept and destroy incoming threats mid-air, minimizing the risk of damage on the ground.

4) MACHINE LEARNING AND IoT:

The Iron Dome leverages machine learning protocols and the Internet of Things (IoT) to improve its efficiency over time. This allows the system to adapt and respond to new threats more effectively.



5) MODULAR AND MOBILE DESIGN:

The iron Dome's components are designed to be mobile, allowing for rapid deployment and flexibility in various operational scenarios. This includes both land-based and naval platforms.

HOW DOES IRON DOME WORKS?

Iron dome detects and assesses and intercepts a variety of shorter-range targets such as rockets, artillery and mortars. It is effective day or night and in all weather conditions including low clouds, rain, dust storms and fog. It features a first-of-its-kind multi-mission launcher designed to fire a variety of interceptor missiles. And the mobile "firing units", each of which contains 20 Tamir rockets that intercept the incoming fire. Israel employs several of these batteries, which cover roughly 60 square miles (155 square kilometres) each and reportedly cost \$10 million apiece. What makes Iron dome so effective is its ability to quickly detect what is a real threat and what isn't, and then fire the Tamir interceptor rockets as-needed. According to Raytheon, Iron dome is designed to detect threats from about 2.5 to 43.5 miles (4 to 70 kilometres) away.

**WRITTEN BY
P.PRASANTHI
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*"War is the Ultimate realization of
modern technology."
-Don Delillo*

EVENTS AND WORKSHOPS

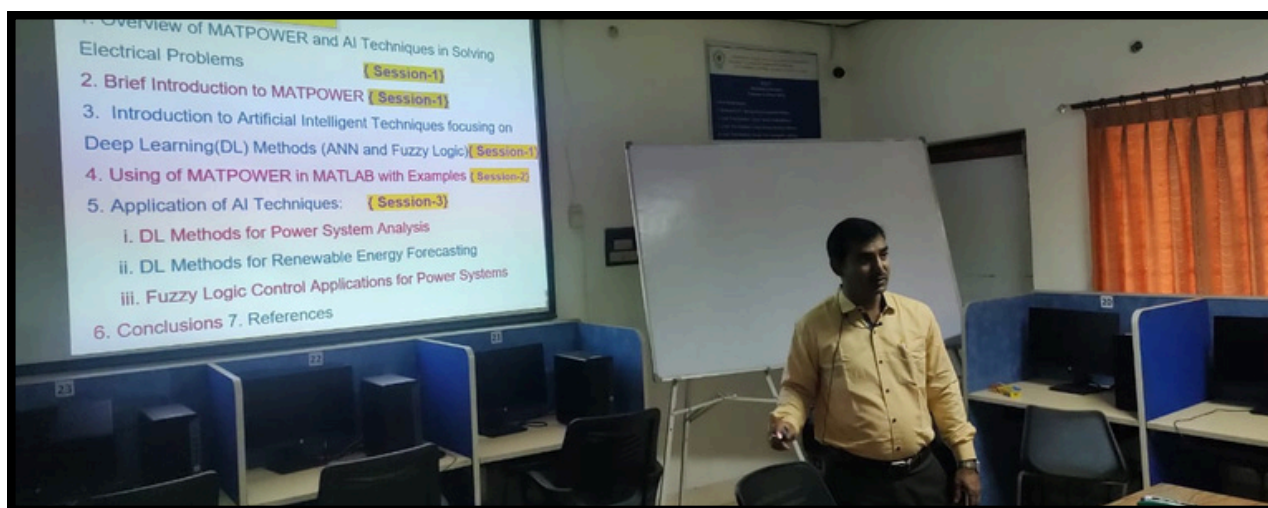


Express gratitude from the EEE department to the former HOD Dr. K. Ravindra, Professor of the EEE Department in August 2024.

Dr. K. Venkata Reddy Head of the Department, EEE, JNTUK along with University officials visited Reliance Power Ltd on 3rd September 2024.



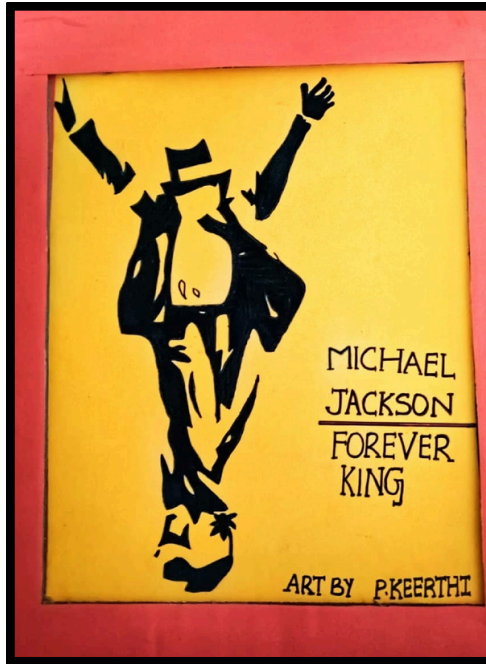
The EEE Department organized Hands-on-workshop on “**Applications of AI for Power Systems Analysis**” as a part of Institute of Engineers (India) student chapter activity in August 2024.



ARTS AND CULTURALS



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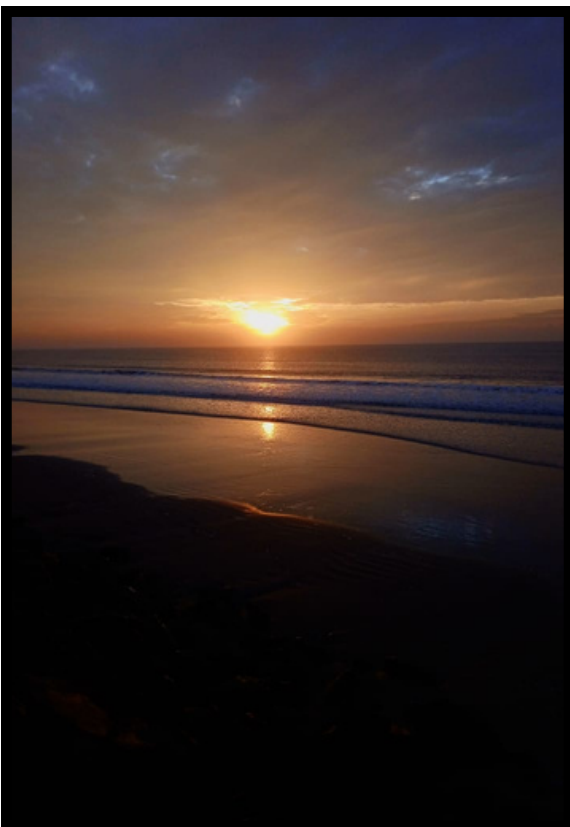
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