



# SCHOOL OF ENGINEERING

## SOE-BULLETIN

The Official Newsletter of **School of Engineering**



# SCHOOL OF ENGINEERING

## Vision

Transform lives through excellence in engineering education, research and innovation with an emphasis on sustainability, inclusive technologies and global needs.

## Mission

1. Design and deliver contemporary engineering curricula to address regional and global needs while emphasizing ethics, values, integrity and regional relevance.
2. Carry out high impact academic research, industry projects and innovation activities with active student engagement to advance science and engineering knowledge and state-of-the-art industry practices.
3. Develop regional and national leaders to advance the society and economy.

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# SCHOOL OF ENGINEERING



**WORKSHOPS / SKILL DEVELOPMENT PROGRAMS**

## Faculty Development Program on “AI and Next-Gen Technologies for a Sustainable World: Breakthroughs in Health, Agriculture, and Intelligent Infrastructure”

This program is a collaborative endeavor by the School of Computer Applications and the Department of Computer Science and Engineering, School of Engineering, and is generously supported by AICTE-ATAL from 06-01-2025 to 11-01-2025.

This program welcome notes were delivered by Dr. Udaya Kumar Reddy K R, Dean SoE, DSU followed by a Presidential address by our beloved Vice Chancellor, Dr. Amit Bhatt, DSU, and finally a vote of thanks by Dr. Girisha G S, Professor & Chairperson CSE, DSU.

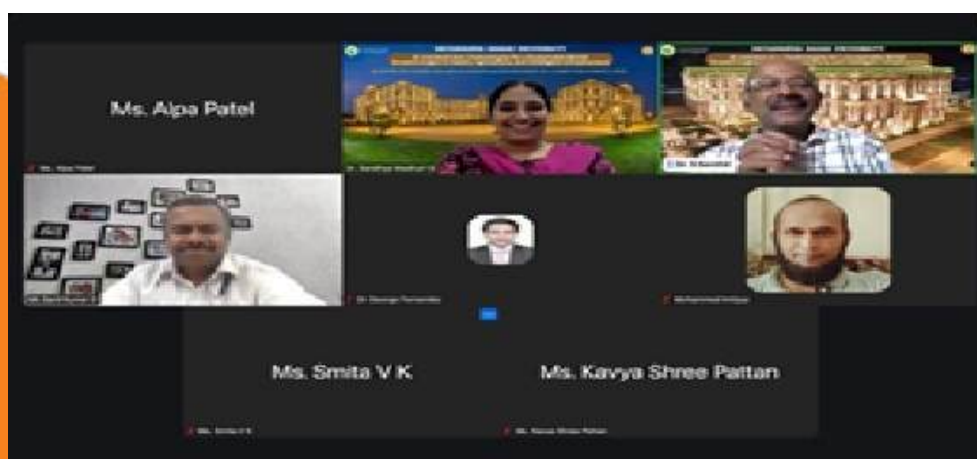
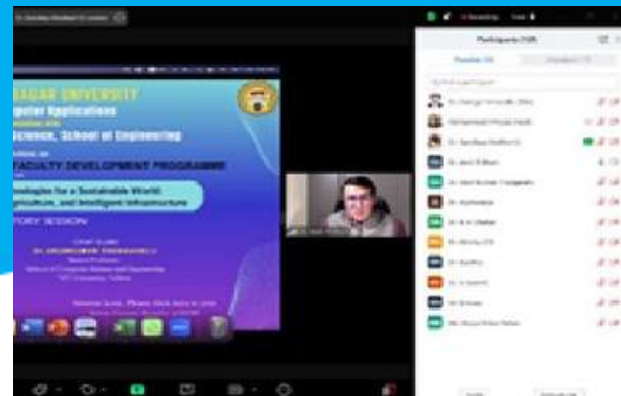
This program aims to equip faculty members with the knowledge and insights necessary to integrate these advancements into their teaching and research, thereby fostering innovation and addressing global challenges. The FDP attracted more than 170 participants.

This comprehensive faculty development program unleashed the transformative power of artificial intelligence, machine learning, and advanced technologies to tackle pressing global challenges. Participants explored cutting-edge innovations in healthcare, agriculture, and infrastructure, discovering how AI is revolutionizing these fields.

<b>DAYANANDA SAGAR UNIVERSITY</b> School of Computer Applications In association with Department of Computer Science, School of Engineering AICTE SPONSORED ATAL FACULTY DEVELOPMENT PROGRAMME		
<b>AI AND NEXT-GEN TECHNOLOGIES FOR A SUSTAINABLE WORLD:                      BREAKTHROUGHS IN HEALTH, AGRICULTURE, AND INTELLIGENT INFRASTRUCTURE</b> 06-01-2025 to 11-01-2025 <b>FDP SCHEDULE</b>		
Date & Time	Topic	Resource Person
06-01-2025 (Monday) 9:00 p.m. to 9:30 p.m.	Inaugural Session	<b>Dr. Madhan Kumar Srinivasan</b> CEO & Co-Founder, Web Work President & Co-Founder, Web Logic Co-Founder & CEO, DSA World
06-01-2025 (Monday) 6:30 p.m. to 8:00 p.m.	<b>Technical Session - 1</b> Influence of Futuristic Tech in Global Sustainable Development	<b>Dr. Madhan Kumar Srinivasan</b> CEO & Co-Founder, Web Work President & Co-Founder, Web Logic Co-Founder & CEO, DSA World
06-01-2025 (Monday) 8:00 p.m. to 9:30 p.m.	<b>Technical Session - 2</b> Technology for Agriculture	<b>Dr. R. Rajesh</b> Professor, IITM Department of Computer Science Central University of Kerala
07-01-2025 (Tuesday) 6:00 p.m. to 7:30 p.m.	<b>Technical Session - 3</b> Reliable AI Algorithms for Predictive Healthcare Analytics	<b>Dr. Nilanjana Dey</b> Associate Professor Technical Institutions, West Bengal, Kolkata
07-01-2025 (Tuesday) 7:30 p.m. to 8:00 p.m.	<b>Technical Session - 4</b> Smart and Sustainable IoT for Rural and Tribal Development Using IoT & Cloud Computing	<b>Dr. Srikanth Patnala</b> Director & Chairman, IITM, Hyderabad
08-01-2025 (Wednesday) 6:00 p.m. to 7:30 p.m.	<b>Technical Session - 5</b> Edge AI for Digitally Transformed Enterprises	<b>Dr. Pathyraj Reddy</b> Chief Architect, AI & ML, Consultant Bharatiga, IISc, Hyderabad, India
08-01-2025 (Wednesday) 7:30 p.m. to 8:00 p.m.	<b>Technical Session - 6</b> AI applications in agriculture for sustainable development - research opportunities	<b>Dr. J. B. Sriniva</b> Chief Architect, IITM, IISc, IITB AI & ML, Hyderabad, India
09-01-2025 (Thursday) 6:00 p.m. to 7:30 p.m.	<b>Technical Session - 7</b> Rural Decision Agents in Precision Agriculture: From Research to Field Deployment	<b>Dr. Mayukh Das</b> Senior Research Scientist ICAR Research Complex
09-01-2025 (Thursday) 7:30 p.m. to 8:00 p.m.	<b>Technical Session - 8</b> Assisting harvesting through AI-based ripeness recognition	<b>Dr. Sayed M. Shariq</b> Assistant Professor, IITM, IISc, IITB Researcher, IITM, IISc, IITB, Hyderabad
10-01-2025 (Friday) 6:00 p.m. to 7:30 p.m.	<b>Technical Session - 9</b> Cybersecurity in Precision Healthcare	<b>Mr. Karan Sharma</b> Co-Founder, AuthnSecure Cybersecurity Pvt Ltd
10-01-2025 (Friday) 7:30 p.m. to 8:00 p.m.	<b>Technical Session - 10</b> Exploring medical data inference through dermal and beyond	<b>Mr. Sanil Kumar</b> Founder & CEO, IITM, IISc, IITB Open Source Software & Technology Specialist, India
11-01-2025 (Saturday) 2:00 p.m. to 3:30 p.m.	<b>Technical Session - 11</b> Recent Developments in Deep Learning for Healthcare Systems	<b>Dr. R. Rajesh</b> Professor, Department of Computer Science, Manipal University, Manipal, Karnataka
11-01-2025 (Saturday) 3:30 p.m. to 5:00 p.m.	<b>Technical Session - 12</b> Leveraging Data for Enhanced Crop Health & Precision Farming: Resilient Agriculture through AI Innovation	<b>Dr. Anshu Parashar</b> Senior Lecturer, IITM, IISc, IITB United Kingdom
11-01-2025 (Saturday) 5:00 p.m. to 6:30 p.m.	<b>Technical Session - 13</b> Transformative Role of AI Algorithms in Healthcare	<b>Dr. Arun Kumar Thangavelu</b> Senior Lecturer, IITM, IISc, IITB & Engineering, VIT University, Vellore
11-01-2025 (Saturday) 6:30 p.m. to 8:00 p.m.	Online Test, Feedback & Valedictory Session	

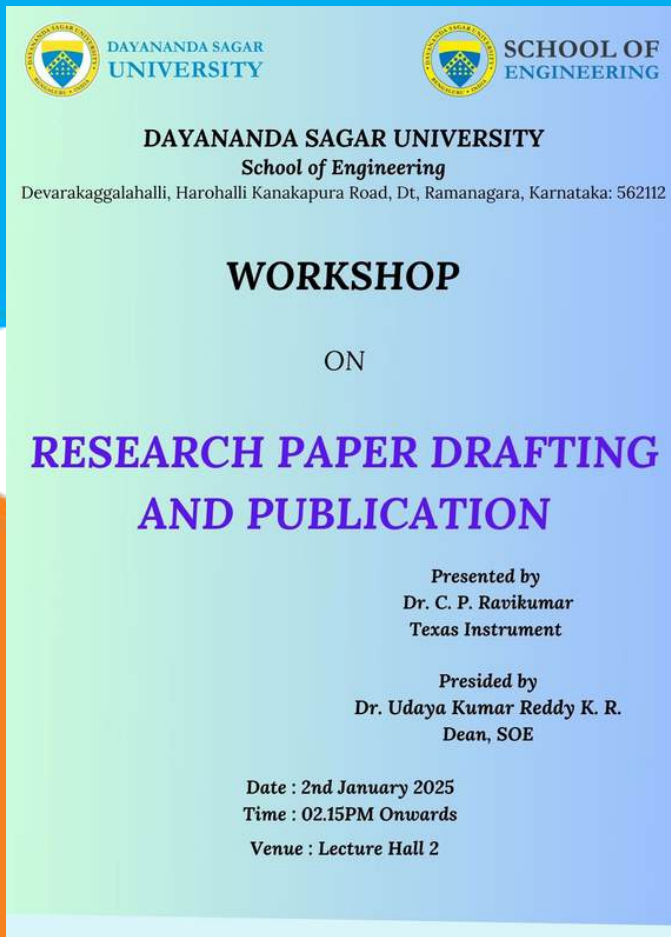
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## Workshop on “Research Paper Drafting and Publication”

Workshop on Research Paper Drafting and Publication by Dr. C. P. Ravi Kumar was conducted on 2nd January 2025, from 10:00 AM to 03:00 PM in LH 2, SOE, Dayananda Sagar University, Harohalli organized by Dr. Pramod Kumar Naik, Chairperson (AI and Robotics Engineering), Dr. Bharath Kumar S Assistant Professor, Dept. of AI and Robotics Engineering. More than 50+ faculties have registered and participated in the event.



The poster features the logos of Dayananda Sagar University and the School of Engineering at the top. The text is centered and reads: DAYANANDA SAGAR UNIVERSITY School of Engineering Devarakaggalahalli, Harohalli Kanakapura Road, Dt, Ramanagara, Karnataka: 562112. Below this, it says WORKSHOP ON RESEARCH PAPER DRAFTING AND PUBLICATION. The presenter is Dr. C. P. Ravikumar from Texas Instrument, and the workshop is presided by Dr. Udaya Kumar Reddy K. R., Dean of SOE. The date is 2nd January 2025, from 02:15 PM onwards, in Lecture Hall 2.

**DAYANANDA SAGAR UNIVERSITY**  
School of Engineering  
Devarakaggalahalli, Harohalli Kanakapura Road, Dt, Ramanagara, Karnataka: 562112

**WORKSHOP**  
ON  
**RESEARCH PAPER DRAFTING AND PUBLICATION**

Presented by  
**Dr. C. P. Ravikumar**  
Texas Instrument

Presided by  
**Dr. Udaya Kumar Reddy K. R.**  
Dean, SOE

Date : 2nd January 2025  
Time : 02.15PM Onwards  
Venue : Lecture Hall 2





# SCHOOL OF ENGINEERING



**WEBINARS / SEMINARS / TECHNICAL TALKS**

## Expert talk on “Empowering Educators: Elevating Lives through Personal and Professional Growth”

On 16th January 2025, the Department of CSE (AI & ML) organized an inspiring talk titled “Empowering Educators: Elevating Lives through Personal and Professional Growth.” The session aimed to provide educators with tools, insights, and strategies for fostering growth, both in their personal lives and professional careers. The event featured two distinguished speakers: Dr. P. Supraja, who joined virtually, and Ms. S.V.K.R. Rajeswari, who engaged with the audience in person. Dr. Supraja’s session focused on Universal Human Values and their alignment with the Sustainable Development Goals (SDGs). She emphasized nurturing compassion, aligning actions with SDGs, and fostering meaningful relationships for a fulfilling life. Ms. Rajeswari delivered an engaging talk on self-reflection, resilience, and overcoming negativity. She introduced the Mirror Method for self-assessment, strategies to build resilience, and techniques to maintain positivity. She also highlighted opportunities for self-improvement, such as skill certifications and leveraging challenges for growth.

**DAYANANDA SAGAR UNIVERSITY**  
DEVARAKAGGALAHALLI, HAROHALLI, KANAKAPURA RD, DIST. RAMANAGARA, KARNATAKA-562112

SCHOOL OF ENGINEERING  
DEPARTMENT OF CSE (ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING)

# INSPIRATIONAL TALK

ON  
**Empowering Educators: Elevating Lives Through Personal and Professional Growth**

**DR. P. SUPRAJA**  
Associate Professor,  
Indo - US Wistemm Fellow, USA (USC),  
Post-Doctoral Research Associate, UK,  
SRM Institute of Science and Technology  
Chennai, India

**S.V.K.R. RAJESWARI SATULURI**  
Assistant Professor, Researcher,  
Public Speaker, Life Coach,  
NLP Practitioner,  
Lifestyle Writer  
Dayananda Sagar University  
Bengaluru, India

2:00 P.M to 4:00 P.M  
16th Jan 2025

**CONVENERS:**  
Dr. D. Hemachandra Sagar  
Chancellor, DSU  
Dr. D. Premachandra Sagar  
Pro-Chancellor, DSU  
Dr. Amit Bhatt  
Vice Chancellor in Charge, DSU  
Dr. Puttamadappa C  
Registrar, DSU  
Dr. Udaya Kumar Reddy  
Dean, SDE, DSU  
Dr. Ramesh R Gallegere  
Dean (Acad) Science & Technology  
Dr. Kousalya Govardhanan  
Dean (R&D)  
Dr. Jayavinda Vindavanam V  
Professor & Chairperson CSE (AI & ML),  
DSU

**SCAN TO REGISTER!!!**





# SCHOOL OF ENGINEERING



**EVENTS: PROFESSIONAL SOCIETIES / CLUB ACTIVITIES**

## “Indoor Faculty Sports”

The Indoor Faculty Sports event was successfully conducted on January 1, 2025, organized by the Department of Computer Science and Engineering (CSE). The faculty coordinators for the event were Prof. Pooja Shree H R and Prof. Priyanka S. Marellavar from the CSE department. The event aimed to promote health, teamwork, and camaraderie among faculty members. A variety of team and solo activities were conducted, ensuring enthusiastic participation from faculty across all departments. The team events included Balancing the Balloon (4 members per team), Blind Snake (5 members per team), Pick Up the Ball (6 members per team), and Treasure Hunt (6 members per team). In addition, Dumb Charades brought an element of fun and creativity to the event.

Special thanks to our Dean, Dr. Udaya Kumar Reddy, and Department Chairperson, Dr. Girisha G.S., for their support in conducting and ensuring the success of the event. Their encouragement and guidance played a crucial role in making the event successful. Initiatives like this play a vital role in fostering bonds within the academic community and emphasizing the importance of maintaining a healthy work-life balance.





# SCHOOL OF ENGINEERING



## **FACULTY ACHIEVEMENTS**



**Dr.Sudha D**  
**Associate Professor**  
**Department of CST**

- Dr. Sudha reviewed the papers in the IEEE International Conference on Computing, Semiconductor, Mechatronics, Intelligent Systems and Communications (COSMIC – 2024) organized by Sahyadri College of Engineering and Management, Mangalore on 22nd and 23rd November, 2024.





**Dr. Santhosh Kumar J**  
**Associate Professor**  
**Department of CST**

- Dr. Santosh Kumar J published a patent on "AI-Based Railway Track Monitoring System for Obstacle Detection Using Satellite Imagery" (Application Number: 202541002584 A).

(12) PATENT APPLICATION PUBLICATION	(21) Application No.202541002584 A
(19) INDIA	
(22) Date of filing of Application :11/01/2025	(43) Publication Date : 24/01/2025
(54) Title of the invention : AI-Based Railway Track Monitoring System for Obstacle Detection Using Satellite Imagery.	
(51) International classification :G06V0020130000, G06V0020100000, B61L0023040000, G06V0010820000, G06N0020200000	(71)Name of Applicant : <b>1)Santosh Kumar Jankatti</b> Address of Applicant :dsu cst ----- <b>2)Dayananda Sagar University</b> Name of Applicant : NA Address of Applicant : NA (72)Name of Inventor : <b>1)Santosh Kumar Jankatti</b> Address of Applicant :dsu cst ----- <b>2)Dayananda Sagar University</b> Address of Applicant :Computer Science and Technology Department Dayananda Sagar University, Harohalli Kanakapura, Ramanagar district 562112 Bengaluru ----
(86) International Application No :NA Filing Date :NA	<b>3)Meenakshi</b> Address of Applicant :Mrs. Meenakshi Assistant professor, Dept of Computer Science and Engineering RNSIT, Bengaluru Bengaluru ----- <b>4)Sanju D J</b> Address of Applicant :Mr. Sanju D J. Assistant professor, Dept of Computer Science and Engineering RNSIT, Bengaluru Bengaluru -----
(87) International Publication No : NA	<b>5)Mrs.Mamtha Jajur</b> Address of Applicant :Mrs.Mamtha Jajur Assistant Professor, Dept of Computer Science and Engineering RNSIT, Bengaluru Bengaluru -----
(61) Patent of Addition to Application Number :NA Filing Date :NA	<b>6)Rashmi M</b> Address of Applicant :Rashmi M Assistant Professor, Dept of Computer Science and Engineering RNSIT, Bengaluru Bengaluru -----
(62) Divisional to Application Number :NA Filing Date :NA	<b>7)Deepa S</b> Address of Applicant :Deepa S Assistant Professor, Dept of Computer Science and Engineering RNSIT, Bengaluru Bengaluru ----- <b>8)Dr.Vidya Y</b> Address of Applicant :Dr.Vidya Y Associate professor, Dept of Computer Science and Engineering RNSIT, Bengaluru Bengaluru -----
(57) Abstract : This invention leverages satellite imagery and artificial intelligence (AI) for real-time monitoring of railway tracks to detect obstacles, track anomalies, and potential hazards. By processing high-resolution satellite data with advanced computer vision and machine learning algorithms, the system identifies obstructions, such as fallen trees, debris, or land shifts, along railway tracks. The system ensures proactive safety measures by alerting railway operators and facilitating preventive actions, offering a scalable and efficient solution for global railway networks.	
No. of Pages : 8 No. of Claims : 4	

- Dr. Santosh Kumar J published a patent on "AI-Driven Multi-Modal Framework for Enhanced Diagnosis and Personalised Treatment of Rheumatoid Arthritis" (Application Number: 202541002351 A).

(12) PATENT APPLICATION PUBLICATION	(21) Application No.202541002351 A
(19) INDIA	
(22) Date of filing of Application :10/01/2025	(43) Publication Date : 24/01/2025
(54) Title of the invention : AI-Driven Multi-Modal Framework for Enhanced Diagnosis and Personalized Treatment of Rheumatoid Arthritis	
(51) International classification :G06N0003045000, G16H0050200000, G06N0003080000, G16H0050700000, G06N0005040000	(71)Name of Applicant : <b>1)Jayashree L K</b> Address of Applicant :Jayashree L K Research Scholar, Dayananda Sagar University and Associate professor CS & BS DEPARTMENT KSSEM Bengaluru Research scholar at Dayananda Sagar University, Harohalli jayashreelk@kssem.edu.in 9164004006 -----
(86) International Application No Filing Date :NA :NA	<b>2)Dr. Santosh Kumar J</b> Name of Applicant : NA Address of Applicant : NA
(87) International Publication No : NA	(72)Name of Inventor :
(61) Patent of Addition to Application Number Filing Date :NA :NA	<b>1)Jayashree L K</b> Address of Applicant :Jayashree L K Research Scholar, Dayananda Sagar University and Associate professor CS & BS DEPARTMENT KSSEM Bengaluru Research scholar at Dayananda Sagar University, Harohalli jayashreelk@kssem.edu.in 9164004006 -----
(62) Divisional to Application Number Filing Date :NA :NA	<b>2)Dr. Santosh Kumar J</b> Address of Applicant :Dr. Santosh Kumar J Associate professor Computer science and Technology Dayananda Sagar University santoshkumar-ct@dsu.edu.in -----
(57) Abstract :	
Abstract: The invention presents an AI-driven multi-modal framework for enhanced diagnosis and personalized treatment of rheumatoid arthritis. By integrating imaging, genomic, and clinical data, the system improves diagnostic accuracy, predicts disease progression, and tailors treatment plans using advanced deep learning techniques. Key innovations include the use of GANs for data augmentation, RNNs for time-series analysis, and DRL for personalized therapeutic optimization. Explainable AI tools ensure transparency and foster clinical trust. Scalable and accessible, this framework bridges the gap between advanced AI research and real-world clinical applications, revolutionizing RA management.	
No. of Pages : 22 No. of Claims : 6	



**Prof. Abhilash O**  
Assistant Professor  
Department of ME



**Dr. Vinayak B Hemadri**  
Professor  
Department of ME

- Prof Abhilash O, Assistant Professor & Dr Vinayak B Hemadri, Professor, has published a Research article Titled “Production, Characterization and Emission Evaluation of B20 Milkscum waste” in Scopus Indexed Journal of Solid Waste Technology and Management, Special Issue 51, Issue SI 1, January 2025.

### ***Production, Characterization and Emission Evaluation of B20 Milkscum Waste***

**Abhilash O<sup>1\*</sup>, Vinayak B Hemadri<sup>1</sup>, Mritunjayaswamy K M<sup>2</sup>**

<sup>1</sup>Dayananda Sagar University, Karnataka, India

<sup>2</sup>A M C College of Engineering, Karnataka, India

*Received on: August 01, 2024*

*Accepted on: December 10, 2024*

#### **ABSTRACT**

The production of biofuel has garnered significant interest recently as a potential solution to meet increasing energy demands and the urgent need to reduce carbon emissions. An area of focus in bio-fuel production is the use of dairy milk scum waste. Dairy milk scum waste, rich in lipids, proteins, and carbohydrates, is currently treated primarily as an industrial byproduct, often disposed of in landfills or used minimally in animal feeds, posing environmental and economic challenges due to its underutilization and disposal costs. Lipids are transformed into bio- diesel through transesterification, a chemical process that is well-known and fairly straightforward. In present investigation dairy milk-scum waste is used for production of bio-fuel by basic transesterification process using potassium hydroxide to enhance the chemical reaction at faster rate and after the production of Bio-diesel separation of bio fuel from foreign particles and characterization of the bio-fuel extracted from dairy milk-scum waste is compared with standard diesel. Biodiesel blends, particularly the 20% blend, revealed key advantages over diesel in terms of emissions. At low brake

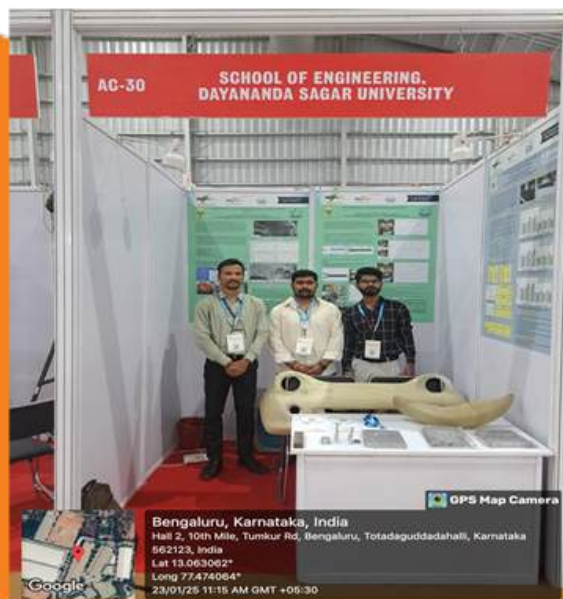


**Dr. Kamalbabu P**  
Assistant Professor  
Department of ME



**Dr. Ravitej Y P**  
Assistant Professor  
Department of ME

- Dr. Kamalbabu P. and Dr. Ravitej Y. P., successfully presented their research at the prestigious i2 Academia Pavilion – IMTEX 2025, Asia’s largest manufacturing exhibition. Their projects, "Advanced 3D-Printed Core-Structured Sandwich Composite Panels" and "Advanced Hybrid Metal Matrix Composites: Revolutionizing Automotive Applications", were showcased at the event held from January 23 to 29, 2025, at BIEC, Bangalore.





**Dr. Shashidhara L C**  
**Assistant Professor**  
**Department of ME**

- Dr. Shashidhar L C, Assistant Professor published his research article titles “Experimental analysis of mechanical properties and FTIR analysis of areca fiber-reinforced epoxy composites incorporating Al<sub>2</sub>O<sub>3</sub>” in the journal of Industry Textiles, sage journals.

### Journal of Industrial Textiles

Impact Factor: 2.2

5-Year Impact Factor: 2.7

 Open access | 

Research article

First published online January 9, 2025

**Experimental analysis of mechanical properties and FTIR analysis of areca fiber-reinforced epoxy composites incorporating Al<sub>2</sub>O<sub>3</sub>**

[Ashokkumar.R. Tavadi](#), [Dedapeer Basheer](#), [...],  
[L.C. Shashidhara](#)  [View all authors and affiliations](#)

[All Articles](#)

<https://doi.org/10.1177/15280837241313217>

PDF

Help



**Dr. Vinayak B Hemadri**  
Professor  
Department of ME



**Dr. Viswanathan R**  
Associate Professor  
Department of ME



**Vijay Kumar**  
Training and Placement Director  
SOE

- On January 27, 2025, Dr. Vinayak Hemadri, Dr. Viswanathan R, and Mr. Vijay Kumar, the Training and Placement Director of the School of Engineering at Dayananda Sagar University, visited IMTEX, one of the largest exhibitions for machine tools and manufacturing technologies, held at the Bangalore International Exhibition Centre (BIEC). During their visit, they explored the DSU Academic Pavilion, where students from the Department of Mechanical Engineering showcased their innovative projects.





**Dr. Vinayak B Hemadri**  
**Professor**  
**Department of ME**

- Dr. Vinayak Hemadri, Professor participated in the International Conference on Recent Advances in Materials (ICRAM-2025) held in Ahmedabad between 10-12th January 2025, where he served as a distinguished session chair. The prestigious event was jointly organized by IITRAM Ahmedabad, NIT Surat, and IIT Roorkee, bringing together experts and researchers from across the globe. In addition to chairing a session, Dr. Hemadri presented a research article that showcased his innovative work in the field.





**Dr. P M G B Asdaque**  
Assistant Professor  
Department of ME

- Dr. P M G Bashir Asdaque has presented in a hybrid-mode reputed conference MEICON 1.0 (SCOPUS indexed proceedings). Titled: "Modelling of Geometrically Nonlinear and Electromechanically Coupled Piezoelectric Based Slender Power Transducers", at the Mechanical Engineering International Conference Organized by the Department of Mechanical Engineering held on December 19- 20, 2024 at O. P. Jindal University, Raigarh, C.G. India.





**Dr. Ravitej Y P**  
Assistant Professor  
Department of ME

- Dr Ravitej Y. P., Assistant Professor published his research article titled “Effect of Zircon on Aluminium/Graphite Alloy Hybrid Composite and Wear Characterization with Load: Experimental and ANN Test” in the journal of bio and tribo corrosion journal. Springer publication.

Journal of Bio- and Tribo-Corrosion (2025) 11:31  
<https://doi.org/10.1007/s40735-025-00944-7>



## Effect of Zircon on Aluminum/Graphite Alloy Hybrid Composite and Wear Characterization with Load: Experimental and ANN Test

Y. P. Ravitej<sup>1</sup> · R. Keshavamurthy<sup>2</sup> · H. Adarsha<sup>3</sup> · Vishnu Vijay Kumar<sup>4</sup> · D. Saravan Bavan<sup>1</sup> · P. M. G. Bashir Asdaque<sup>1</sup>

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### Abstract

This study examines the influence of zircon and graphite reinforcement on the mechanical and tribological characteristics of LM13 aluminum alloy-based hybrid composites produced via the stir casting method. Copper chills were utilized to attain unidirectional solidification, guaranteeing enhanced microstructural homogeneity. The composites were formulated with zircon concentrations of 0, 3, 6, 9, and 12 wt%, in conjunction with a constant 3 wt% of graphite, then warmed to eliminate moisture and guarantee uniform dispersion. The tensile strength, hardness, and wear characteristics were assessed for both chill-end and non-chill-end specimens. Experimental findings indicate that tensile strength and hardness enhance with rising zircon concentration, reaching a maximum at 9 wt% and there after decreasing at 12 wt% due to zircon segregation at grain boundaries, as corroborated by microstructural analysis. Wear investigations utilizing a pin-on-disc apparatus demonstrated that the wear rate diminishes with rising zircon content up to 9 wt%, yielding the minimal wear rate, followed by an increase at 12 wt%. This behavior is ascribed to consistent reinforcement distribution at 9 wt% and reinforcement clustering at 12 wt%. Copper chill-end specimens had enhanced mechanical and wear qualities relative to non-chill-end specimens, highlighting the significance of chills in improving material performance. Artificial Neural Networks (ANN) were utilized to model and forecast wear behavior. The ANN predictions demonstrated a strong connection with experimental data.

**Keywords** Artificial neural network · Pin-on-disc · Stir casting · Wear resistance

### 1 Introduction

Numerous applications employ composites due to their excellent stiffness-to-weight ratio [1]. Two or more insoluble materials with different physical and chemical properties form a composite. Researchers prefer composite manufacturing that utilizes various reinforcements in a sandwich pattern to enhance the characteristics [2]. They especially recommend ceramic reinforcements due to their

higher compressive strength [3]. Researchers suggest using the metal matrix with the highest stiffness-to-weight ratio among all metals. The ideal matrix material for reinforcement should have a low melting point, be ductile, and facilitate casting [4]. In MMCs, reinforcements' main job is to transfer outside loads to the composite where the particulate and matrix layers meet [5]. Another step up from this is the use of dual reinforcement particles (DRP) with various grain sizes, which improve the characteristics of the composite [6]. Metallic chills made of copper, mild steel, cast iron, and silicon carbide were used to achieve unidirectional solidification of the molten composite, thereby enhancing its properties [7]. During the solidification process, the chill extracts heat from the liquid molten metal [8], performs wear and other mechanical property prediction using ANN [9], and places different thicknesses and metallic chills to assess their impact on the casting [10].

Equation 1 illustrates the use of volumetric heat capacity (VHC) to measure the impact of chilling [11].

$$\text{VHC} = \text{Volume (V)} \times \text{Specific heat (Cp)} \times \text{Density} \quad (1)$$

✉ Y. P. Ravitej  
Ravitejypp@gmail.com

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<sup>2</sup> Department of Mechanical Engineering, Dayananda Sagar College of Engineering, Bengaluru, Karnataka 560111, India

<sup>3</sup> Department of Mechanical Engineering, Jain University, Bengaluru, Karnataka 562112, India

<sup>4</sup> Structural Engineering, Division of Engineering, NYU, University of Abu Dhabi, 129188 Abu Dhabi, United Arab Emirates

Published online: 23 January 2025

Springer



**Dr. Sai Prasad Nayak**  
Assistant Professor  
Department of Chemistry

- Dr. Sai Prasad Nayak attended a six-day Faculty Development Program organized by ATAL-AICTE from January 6, 2025, to January 11, 2025, on the topic "Clean Energy and Environmental Sustainability" at Government Engineering College, Palamu.



- Dr. George Fernandez I, Associate Professor, Prof. Prolay Biswas, Prof. Yashaswini H C, Prof. Bharath M B, Prof. Sushma D S, Prof. Kavyashree I Pattan, Prof. Sumanth C M, Prof. Diana George, Prof. Benaka Santhosha S, Assistant Professor, Department of CSE, have successfully attended a six-day online Faculty Development Programme (FDP) sponsored by AICTE-ATAL from January 6th to 11th, 2025 organized by School of Computer Applications in association with the Department of Computer Science and Engineering, School of Engineering at Dayananda Sagar University, Bangalore on the title "AI and Next-Gen Technologies for a Sustainable World: Breakthroughs in Health, Agriculture, and Intelligent Infrastructure".





**Dr. Sivananda Reddy**  
**Associate Professor**  
**Department of CSE**

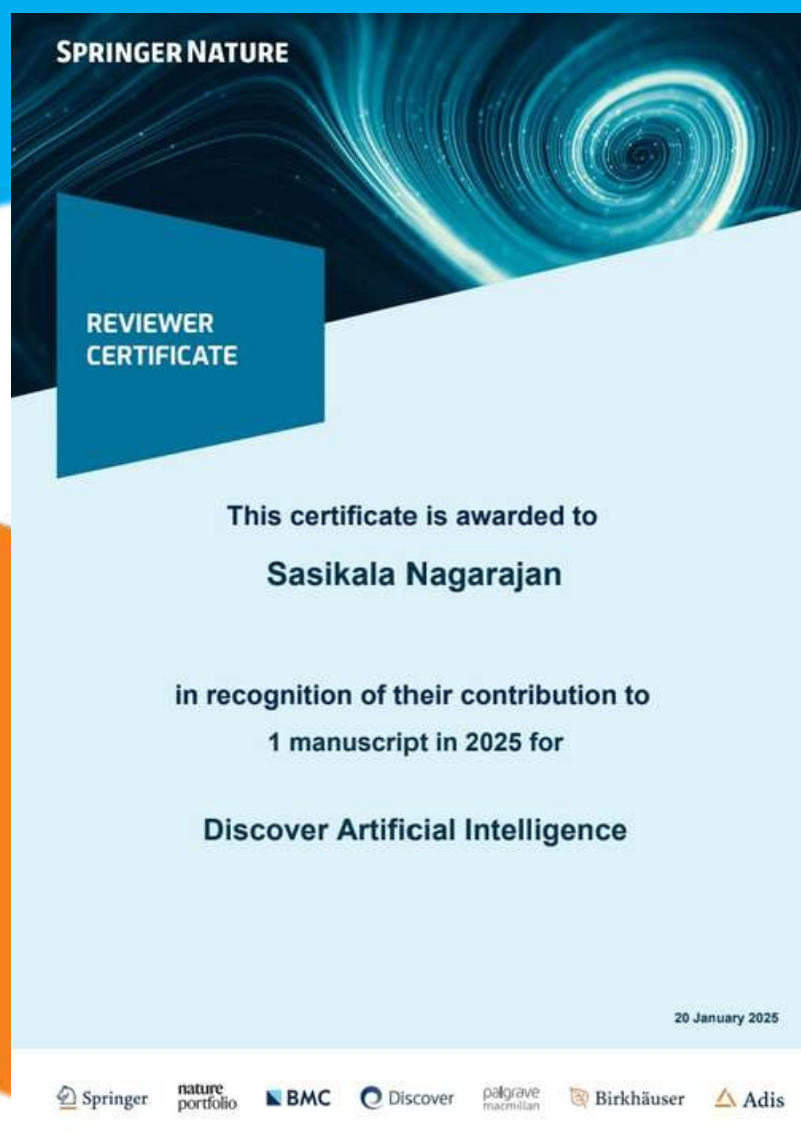
- Dr. Sivananda L Reddy, Associate Professor, Department of CSE has successfully presented the paper titled “Optimizing Latency and Communication in Federated Edge Computing with LAFO and Gradient Compression for Real-Time Edge Analysis” at the 6th IEEE International Conference on Mobile Computing and Sustainable Informatics (ICMCSI 2025) organized by Purbanchal University, Nepal, during 7-8 January 2025.





**Prof. Sasikala N**  
**Assistant Professor**  
**Department of CSE**

- Prof. Sasikala, Assistant Professor, Department of CSE has successfully served as a reviewer for 1 manuscript in the Springer Journal Discover Artificial Intelligence on 20th January 2025 and also served as a peer reviewer for IETE Journal Education for Taylor and Francis group during January 2025.





- Prof. Sasikala, Assistant Professor, Department of CSE has successfully completed an online course in the Kaggle with the title “Introduction to Machine Learning” on 25th January 2025.





**Prof. Muthu Bala N**  
**Assistant Professor**  
**Department of CSE**

- Prof. Muthu Bala, Assistant Professor, Department of CSE successfully completed the course on “Advanced Power BI Training” on Thursday, January 23, 2025, through the online Infosys Springboard Platform.



## COURSE COMPLETION CERTIFICATE

The certificate is awarded to

**Muthu Bala**

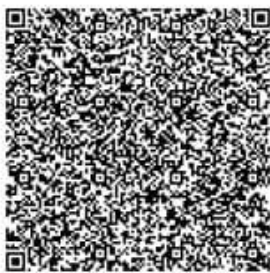
for successfully completing the course

**Advanced Power BI Training**

on January 20, 2025

**Infosys | Springboard**

*Congratulations! You make us proud!*



Issued on: Thursday, January 23, 2025  
To verify, scan the QR code at <https://verify.oninfosys.com>

Thirumala Arohi  
Executive Vice-President and Global Head  
Education, Training & Assessment (ETA)  
Infosys Limited



**Prof. Bharath M B**  
Assistant Professor  
Department of CSE



**Prof. Sushma D S**  
Assistant Professor  
Department of CSE

- Prof. Bharath B and Prof. Sushma, Assistant Professor Department of CSE have successfully participated in & completed the AICTE Training and Learning (ATAL) Academy Faculty Development Program on “Cyber Security and Intrusion Detection Forensics” at DON BOSCO INSTITUTE OF TECHNOLOGY from 20/01/2025 to 25/01/2025.





**Dr. Gayathri T**  
Assistant Professor  
Department of CSE

- Dr. T Gayathri, Assistant Professor, Department of CSE has successfully Published IEEE Scopus indexed conference paper with the title, “Bottom-Up Cracks Detection in Road Pavement in Artificial Neural Network”, in the 2024 First International Conference on Software, Systems and Information Technology (SSITCON) during January 2025.

2024 First International Conference on Software, Systems and Information Technology (SSITCON)

## Bottom-Up Cracks Detection in Road Pavement in Artificial Neural Network

1<sup>st</sup> Sunil Kumar, V  
*Department of Artificial Intelligence & Machine Learning  
Nitte Meenakshi Institute of Technology  
Bengaluru, India  
sunil.kumar@nitte.ac.in*

2<sup>nd</sup> Laith H. Alzubaidi  
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The Islamic University of Babylon  
Babylon, Iraq  
laith.h.alzubaidi@uimajaf.edu.iq*

3<sup>rd</sup> G. P. Ramesh  
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St. Peter's Institute of Higher Education and Research (SPIHER)  
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4<sup>th</sup> Sreenath, M. V  
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5<sup>th</sup> T. Gayathri  
*Department of Computer Science and Engineering  
School of Engineering  
Dayananda Sagar University  
Bangalore, India  
gayal28@gmail.com*

**Abstract**—In recent years, road crack detection is a significant task for detecting surface defects, road safety and road maintenance. But there is lack of approach that able to detect the concealed cracks especially bottom-up cracks, and this is challenging due to poor continuity of cracks, various crack's widths, and low contrast among cracks and the surrounding pavement. The Artificial Neural Network (ANN) algorithm is proposed for detecting and classifying the structural health status of bottom-up crack in road pavements, which allows detecting surface defects and failures. The approach aims at collection of these signatures by utilizing acoustic-sensors, located at roadside, and also classification of SHS in pavements over the ANN approaches. The various Machine Learning (ML) classifiers such as Multilayer Perceptron (MLP), 2-Dimensional Convolutional Neural Network (2D-CNN), Support Vector Classifier (SVC) and Random Forest Classifier (RFC) are utilized as well as compared for the analysis of crack in road pavement. The experimental results illustrate the probability of associating with great accuracy 92.7% of MLP, 96.7% of 2D-CNN, 92.5% of RFC and 99.3% of SVC respectively.

**Keywords**—2-dimensional convolutional neural network, bottom-up crack, machine learning, multilayer perceptron, road pavement, random forest classifier, support vector classifier.

### I. INTRODUCTION

Considering the wide-spread presence of cracks on pavements and the dangers they cause, it is paramount to take measures to pinpoint the areas with a high number of such cracks, eliminate them, and prevent their worsening that would consequently improve the traffic safety [1]. The available datasets most commonly describe pavement cracks based on transverse, longitudinal and mesh patterns and are a prerequisite for models recognition to be accurate and efficient [2-3]. With an increase in road networks comes a larger need for updating road condition statistics [4], making affordable and effective inspection methods a priority. The initial methods used to track pavement wear and tear, such as camera, laser, and infrared measurements [5-6] were awkward, costly, time-consuming, and generally posed accuracy limitations. These developments have stimulated the rise of a number of new machine learning methods, especially directed gradient histogram analysis, support vector machine algorithms and Canny edge detection [7-8]. Manual inspection continues to be employed with limited options in the least

developed nations and it is associated with safety risks, inefficiency, high costs, and subjective judgment, making the case for automated alternatives a priority [9]. Advanced technologies like self-driving road inspection cars equipped with infrared or sensors systems are also becoming popular more [10]. The major contributions are listed as follows:

- ANN algorithm is proposed for detecting and classifying the structural health status of bottom-up crack in road pavements, which allows detecting surface defects and failures.
- The various ML classifiers such as MLP, 2D-CNN, RFC and SVC are utilized for the analysis of crack in road pavement.
- The outcomes are outclassed with evaluation metrics as accuracy for analyzing the bottom-up crack in the road pavement.

The upcoming sections are illustrated in this paper is systematized as follows: Section 2 establishes related works of existing approaches. Workflow of proposed approaches is demonstrated in Section 3. Section 4 represents experimental outcomes of this developed approach. Section 5 represents conclusion and at last, this concludes over references.

### II. RELATED WORKS

Yuan et al. [11] developed deep hierarchical feature learning segmentation approach based detector of pavement crack (CurSeg). This technique has a wide range of applications that can supply context-specific data to improve their understanding of these concepts. The developed structure ideals come up with efficient cracked performance by reducing noise propagation through multiple stages of operations at scales and levels. In addition to that, the new RDA mechanism was put forward to enhance the judgment structure and in difficult environments it was able to discover precisely the crack location than the existing networks, and the system then becomes better equipped for discrimination and robustness. CurSeg method was examined on four datasets in order to check its tendency to get better results in case of cracks fine. However, suggested approach did not succeed to provide better results with cracks fine.

Sun et al. [12] presented the road crack detection network under noise based on feature pyramid structure with feature

2024 First International Conference on Software, Systems and Information Technology (SSITCON) | 978-1-109-88100-0/2024/IEEE | DOI: 10.1109/SSITCON62437.2024.10796629



**Prof. Arjun Krishnamurthy**  
Assistant Professor  
Department of CSE

- Prof. Arjun Krishnamurthy, Assistant Professor, Department of CSE, was invited to the Institute de Technologie du Cambodge in Phnom Penh, Cambodia as a guest speaker for a workshop on 2nd January 2025. The workshop was held at Département de Génie Informatique et Communication. The Institute of Technology of Cambodia (ITC) is the best of Cambodia's higher education institutions. Prof. Arjun successfully conducted the workshop, titled "Bridging AI and NLP", which focused on introducing the fundamental concepts of Artificial Intelligence (AI) and Natural Language Processing (NLP) and their diverse applications in various industries.

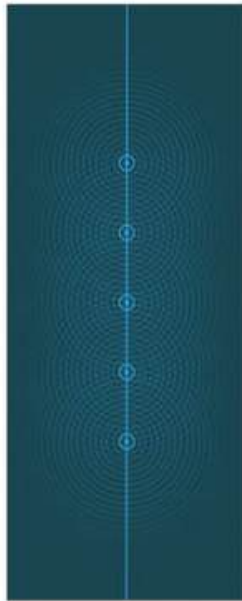




**Dr. Mubeen Ahmed Khan**  
**Assistant Professor**  
**Department of CSE(CY)**

- Dr. Mubeen Ahmed Khan has actively participated in and completed all the modules listed below under "Ethics" from the Researcher Academy.

<b>Certified Module</b>	<b>Date of certification</b>
Demystifying Permissions	20.12.2024
Authorship	30.12.2024
Why you can't afford to ignore publication ethics	30.12.2024
Plagiarism: Decision making & dealing with grey-zones across academic fields	31.12.2024
What is Plagiarism and how to avoid it	31.12.2024
Content ownership	19.12.2024



Researcher Academy researcheracademy.com

## Certificate of Completion



This certifies that

**Mubeen Ahmed Khan**

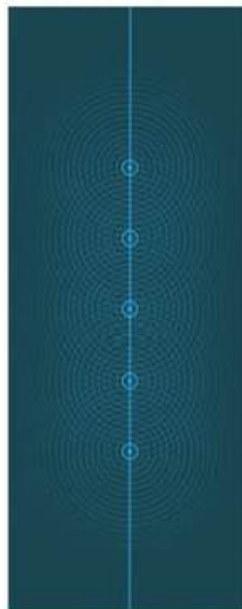
has successfully completed the following module

**Why you can't afford to ignore publication ethics (41 minutes)**

on Monday 30 December, 2024

Presented by Catriona Fennell

Laura Hassink  
Managing Director, Science,  
Technology & Medical Journals,  
Elsevier



Researcher Academy researcheracademy.com

## Certificate of Completion



This certifies that

**Mubeen Ahmed Khan**

has successfully completed the following module

**Demystifying permissions (14 minutes)**

on Friday 20 December, 2024

Presented by Hop Wechsler

Laura Hassink  
Managing Director, Science,  
Technology & Medical Journals,  
Elsevier









**Dr. Durbadal Chattaraj**  
Associate Professor & Chairperson  
Department of CSE(CY)

- Dr. Durbadal Chattaraj has actively participated in the hybrid seminar on “The Evolution of Power Management ICs in Semiconductor Industry” by Prof. Qadeer Khan organized by IEEE-IISc VLSI Chapter on January 5, 2025.





**Dr. Indushree M**  
**Assistant Professor**  
**Department of CSE(CY)**

- Dr. Indushree M has successfully participated in & completed the AICTE Training and Learning (ATAL) Academy Faculty Development Program on “AI and Next-Gen Technologies for a Sustainable World: Breakthroughs in Health, Agriculture, and Intelligent Infrastructure” at DAYANANDA SAGAR UNIVERSITY from 06/01/2025 to 11/01/2025.





**Dr. Dilip Kumar Jang Bahadur Saini**  
Associate Professor  
Department of CSE(CY)



**Dr. Prajwalasimha S N**  
Assistant Professor  
Department of CSE(CY)

- Dr. Dilip Kumar Jang Bahadur Saini and Dr. Prajwalasimha S N have been recognized for their contribution to research as Session Chair at the 1st International Conference on Healthcare Innovation and Smart Systems (ICHISS-2024).





**Prof. Sharanabasappa Tadkal**  
**Assistant Professor**  
**Department of CSE(CY)**

- Prof. Sharanabasappa Tadkal has actively participated in the National Level Research Workshop (Online) on "Strategies to Publish Research Articles in Reputed Journals" on 04.12.2024 organized by PROGREZZ ACADEMY (Training and Research Institute), Tirupur, Tamil Nadu with CERT. NO: PROG2024RR019.



**PROGREZZ ACADEMY**  
REG. NO: 28/0096986  
TAMIL NADU, INDIA

## **CERTIFICATE PARTICIPATION**

WE ARE PROUDLY PRESENTING THIS CERTIFICATE TO

**PROF. SHARANABASAPPA TADKAL**  
**ASSISTANT PROFESSOR, DEPARTMENT OF CYBER SECURITY**  
**DAYANANDA SAGAR UNIVERSITY, BENGALURU**  
**CERT. NO: PROG2024RR019**

For actively participating in National Level Research Workshop (Online) on "Strategies to Publish Research Articles in Reputed Journals" on 04.12.2024 organized by PROGREZZ ACADEMY (Training and Research Institute), Tiruppur, Tamil Nadu.

05-12-2024

ISSUED ON

**DR.C. SUDHARSHAN**  
**MANAGING DIRECTOR**  
**PROGREZZ ACADEMY**



**Prof. P. Ranjima**  
**Assistant Professor**  
**Department of CSE(CY)**

- Prof. P. Ranjima has successfully completed the course titled “Cryptography” through Study Webs of Active Learning for Young Aspiring Minds (SWAYAM) July 2024 Semester with a consolidated score of 80%.

<b>Study Webs of Active-Learning for Young Aspiring Minds (SWAYAM) July 2024 Semester Score Card</b>							
Roll Number:	KXD4002088	Application No:	2415130004487				
Candidate's Name :	RANJIMA P	Date of Birth :	22-04-1991				
Mother's Name :	JAYABHARATHI T	Father's Name :	RAMADAS P				
Gender:	FEMALE	Nationality :	INDIAN				
Person With Disability (PwD) :	NO	Category:	GENERAL				
<b>SCORE DETAILS</b>							
Course Code	cec24_cs16						
Course Name	Cryptography						
Date of Exam	14-12-2024						
Shift of Exam	03:00 P.M. - 06:00 P.M.						
Maximum Marks	100						
Marks obtained	80						
Marks Obtained in words	Eighty Only						
<b>Date of Declaration of Result (CBT COURSES): 17-01-2025</b>							
						<b>Sd/-          Senior Director (NTA)</b>	
<b>Note:</b>							
1. Candidate particulars have been indicated as mentioned by her/him in the online application form, which is subject to verification by the admitting authorities. 2. Candidate, if found submitting incorrect information or tampering with the Score Card, will be considered as using unfair means and their candidature will be cancelled. 3. Candidates must preserve this Score Card for future use. 4. Final scores & certificates will be given by respective National Coordinators.							
Application Number : 2415130004487		IP Address:42.105.159.19		Date and Time: 19-01-2025 12:48:32		[Page 1 of 1]	



**Dr. Dilip Kumar Jang Bahadur Saini**  
Associate Professor  
Department of CSE(CY)

- Dr. Dilip Kumar J B S has presented the research paper titled “An IoT-Driven Emergency Medical Service Vehicle Detection System Using WaveResNet and YOLOv8 for Real-Time Traffic Management” at the 1st International Conference on Healthcare Innovation and Smart Systems (ICHISS-2024), hosted by Shri Shankaracharya Institute of Professional Management & Technology, Raipur, India, which took place on December 29-30, 2024.





**Dr. Shaila S. G**  
**Professor and Chairperson**  
**Department of CSE(DS)**



**Prof. Monish L**  
**Assistant Professor**  
**Department of CSE(DS)**

- Prof. Monish L., and Dr. Shaila S G, presented a Conference Paper ID: 198 titled, Electroencephalogram Signal Processing based Emotion Analysis and Recognition using and Deep Networks the International Conference on Healthcare Innovation and Smart Systems (ICHISS 2024) Organised by the Department of Computer Science and Engineering, Shri Shankaracharya Institute of Professional Management and Technology, Raipur, Chhattisgarh, India, during 29th-30th December 2024.



Shri Shankaracharya Institute of  
Professional Management &  
Technology, Raipur, India

**ICHISS2024**

**1st International Conference on Healthcare  
Innovation and Smart Systems (29 & 30 DEC)**



**AIP  
Publishing**

## *Certificate of Appreciation*

This is to certify that

**Monish L**

Presented the Paper ID **198** titled

**Electroencephalogram Signal Processing based Emotion Analysis and Recognition using and Deep  
Networks**

Authored by

**Monish L and Shaila SG**

at 1st International Conference on Healthcare Innovation and Smart Systems (ICHISS-2024), organized  
by the Department of Computer Science & Engineering, Shri Shankaracharya Institute of Professional  
Management and Technology Raipur, Chhattisgarh, India during 29th - 30th December 2024.

Dr Suman Kumar Swarnkar  
General Chair  
ICHISS-2024

Dr Yogesh Kumar Rathore  
General Co-Chair  
ICHISS-2024

Prof Anand Tamrakar  
General Co-Chair  
ICHISS-2024

Dr Alok Jain  
Principal  
SSIPMT, Raipur

- Prof. Monish L., and Dr. Shaila S G presented the Paper titled Electrocardiogram Signal Based Analysis and Predictions of Emotions using Deep Networks at the 5th International Conference on Paradigms of Communication, Computing and Data Analytics (PCCDA 2025) held on January 18-19, 2025.



5<sup>th</sup> International Conference on Paradigms of Communication, Computing and Data Analytics (PCCDA 2025)

Organized by

Pt. Lalit Mohan Sharma Campus, Rishikesh, Sri Dev Suman Uttarakhand University, Uttarakhand, India



## Certificate of Presentation

This is to certify that **Monish L** has presented the paper titled **Electrocardiogram Signal Based Analysis and Prediction of Emotions using Deep Networks** authored by **Monish L, Shaila SG** in the 5<sup>th</sup> International Conference on Paradigms of Communication, Computing and Data Analytics (PCCDA 2025) held during January 18-19, 2025.

Dr. Himanshu Mittal  
General Chair

Dr. Satyasai Jagannath Nanda  
General Chair

SCRS/PCCDA2025/PC/112

Springer

<https://scrs.in/conference/pccda2025>



**Dr. Shaila S. G**  
**Professor and Chairperson**  
**Department of CSE(DS)**



**Prof. Monish L**  
**Assistant Professor**  
**Department of CSE(DS)**



**Dr. U. Pavan Kumar**  
**Assistant Professor**  
**Department of CSE(DS)**

- Prof. Monish L, Dr. Shaila S G, Dr. U. Pavan Kumar presented a Conference Paper ID: 201 titled, Piezoelectric Sensor based Apnea Disorder Prediction IoT using Monitoring System the International Conference on Healthcare Innovation and Smart Systems (ICHISS 2024) Organised by the Department of Computer Science and Engineering, Shri Shankaracharya Institute of Professional Management and Technology, Raipur, Chhattisgarh, India, during 29th-30th December 2024.



Shri Shankaracharya Institute of Professional Management & Technology, Raipur, India

### ICHISS2024

1st International Conference on Healthcare Innovation and Smart Systems (29 & 30 DEC)



AIP Publishing

## *Certificate of Appreciation*

This is to certify that

**Monish L**

Presented the Paper ID **201** titled

**Piezoelectric Sensor-Based IoT Monitoring System for Apnea Disorder Prediction**

Authored by

**Monish L, Rajesh TM, Shaila SG , Vinuraj Vamshi, Sumana SG, Pavan Kumar U**

at 1st International Conference on Healthcare Innovation and Smart Systems (ICHISS-2024), organized by the Department of Computer Science & Engineering, Shri Shankaracharya Institute of Professional Management and Technology Raipur, Chhattisgarh, India during 29th - 30th December 2024.

Dr Suman Kumar Swarnkar  
General Chair  
ICHISS-2024

Dr Yogesh Kumar Rathore  
General Co-Chair  
ICHISS-2024

Prof Anand Tamrakar  
General Co-Chair  
ICHISS-2024

Dr Alok Jain  
Principal  
SSIPMT, Raipur

- Dr. Shaila S G, Dr. U. Pavan Kumar, and Prof. Monish L participated in Conference Paper ID: 109 titled, Mobile Net-based Driver Drowsiness Detection and Monitoring System the International Conference on Healthcare Innovation and Smart Systems (ICHISS 2024) Organised by the Department of Computer Science and Engineering, Shri Shankaracharya Institute of Professional Management and Technology, Raipur, Chhattisgarh, India, during 29th-30th December 2024.

## Mobile Net-based Driver Drowsiness Detection and Monitoring System

Shaila S G<sup>1, a)</sup>, Pavan Kumar U<sup>1, b)</sup>, Sumana S G<sup>2, c)</sup>, VinuRaj Vamshi<sup>1, d)</sup>  
Rajesh TM<sup>1, e)</sup> Monish L<sup>1, f)</sup>

<sup>1</sup>*School of Engineering, Dayananda Sagar University, Harohalli, Bengaluru-562 112, Karnataka, India.*

<sup>2</sup>*School of Computer Applications, Dayananda Sagar University, Kudlu Gate, Bengaluru-562 068, Karnataka, India.*

<sup>a)</sup>*Corresponding author: [shaila-cse@dsu.edu.in](mailto:shaila-cse@dsu.edu.in)*

<sup>b)</sup>*[drpavankumar-ds@dsu.edu.in](mailto:drpavankumar-ds@dsu.edu.in)*

<sup>c)</sup>*[sg.sumana-ca@dsu.edu.in](mailto:sg.sumana-ca@dsu.edu.in)*

<sup>d)</sup>*[vinuraj2004@gmail.com](mailto:vinuraj2004@gmail.com)*

<sup>e)</sup>*[rajesh-cse@dsu.edu.in](mailto:rajesh-cse@dsu.edu.in)*

<sup>f)</sup>*[monishl-cse@dsu.edu.in](mailto:monishl-cse@dsu.edu.in)*

**Abstract.** Driver sleepiness is a primary contributor to traffic accidents, leading to considerable loss of life and property. Creating an efficient real-time sleepiness detection system is essential for improving road safety. This work presents a novel approach for identifying and monitoring driver drowsiness via Mobile Net, a lightweight and effective deep learning model. The architecture of Mobile Net is geared for mobile and embedded platforms, rendering it appropriate for use in practical automotive applications. The technology employs a camera to capture real-time footage of the driver's face and analyzes these images to identify critical facial traits, including as eyelid closure and yawning frequency, which are significant markers of tiredness. Utilizing Mobile Net's computational efficiency, the model can operate in real-time while maintaining accuracy. The suggested method exhibits great precision in identifying tiredness under diverse illumination situations and driver positions while ensuring little computing burden. The incorporation of this system into vehicular settings could markedly diminish the probability of accidents attributable to drowsy driving, providing a pragmatic option to improve road safety.

**Keywords:** Driver, Face, Drowsiness, HaarCascade, Mobile Net.

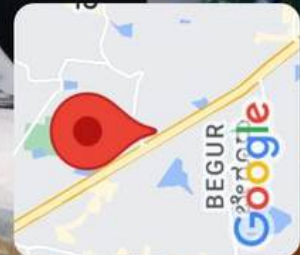


**Dr. Shaila S. G**  
**Professor and Chairperson**  
**Department of CSE(DS)**

- Dr. Shaila S G participated in a two-day workshop on "Research and Publication Ethics" organized by the office of Dean Research, Dayananda Sagar University, Lecture Hall 2, Main Campus Harohalli, Ramanagara Dt. on 24 & 25th January 2025.



Karnataka, भारत  
Sagar IT Park, S T Rd, Kudlu Gate,  
Srinivasa Nagar, Hal Layout, Sing...  
Lat 12.887599 Long 77.642218  
25/01/2025 02:10:18 PM





**Dr. Shaila S. G**  
Professor and Chairperson  
Department of CSE(DS)



**Dr. U. Pavan Kumar**  
Assistant Professor  
Department of CSE(DS)

- Dr. Shaila S G., and Dr. U. Pavan Kumar have participated in Conference Paper ID: 223 titled, An IoT-Driven Emergency Medical Service Vehicle Detection System Using WaveResNet and YOLOv8 for RealTime Traffic Management the International Conference on Healthcare Innovation and Smart Systems (ICHISS 2024) Organised by the Department of Computer Science and Engineering, Shri Shankaracharya Institute of Professional Management and Technology, Raipur, Chhattisgarh, India, during 29th-30th December 2024.

### **An IoT-Driven Emergency Medical Service Vehicle Detection System Using WaveResNet and YOLOv8 for Real- Time Traffic Management**

Shaila S G<sup>1,a)</sup>, Pavan Kumar U<sup>1,b)</sup>, Sumana S G<sup>2,c)</sup>, VinuRaj Vamshi<sup>1,d)</sup>  
Rajesh TM<sup>1,e)</sup>, Dilip Kumar J B S<sup>1,f)</sup>

<sup>1</sup>School of Engineering, Dayananda Sagar University, Harohalli, Bengaluru-562 112, Karnataka, India.

<sup>2</sup>School of Computer Applications, Dayananda Sagar University, Kudlu Gate, Bengaluru-562 068, Karnataka, India.

<sup>a)</sup> Corresponding author: [shaila-cse@dsu.edu.in](mailto:shaila-cse@dsu.edu.in)

<sup>b)</sup> [drpavankumaru-ds@dsu.edu.in](mailto:drpavankumaru-ds@dsu.edu.in)

<sup>c)</sup> [sg.sumana-ca@dsu.edu.in](mailto:sg.sumana-ca@dsu.edu.in)

<sup>d)</sup> [vinuraj2004@gmail.com](mailto:vinuraj2004@gmail.com)

<sup>e)</sup> [rajesh-cse@dsu.edu.in](mailto:rajesh-cse@dsu.edu.in)

<sup>f)</sup> [dilipsaini@gmail.com](mailto:dilipsaini@gmail.com)

**Abstract.** Visual and audible warning signals facilitate operations at high velocities by emergency vehicles. The right of way belongs to other road users. Despite all these precautions, there are situations where drivers can look at emergency vehicles near them and be driving so distracted that traffic incidents and response delays occur. This research presents novel audio and vision based systems to detect emergency vehicles and expedite their passage by modifying traffic signals into green. First, we present the YOLOv8-Emergency Vehicle Detection system, a customized YOLOv8 model especially intended for emergency vehicle detection. At the same time, we build a unique image dataset to improve the vision based emergency vehicles detection. Our approach to incorporate cross stage partial connections strongly improves the YOLOv8 Emergency Vehicle Detection model. It results in an extraordinary 95% mean average precision exceeding other single stage object detectors. At the same time, we propose WaveResNet, a convolutional neural network designed for the end to end detection of emergency vehicles in audio. The thing that this system does is basically compare the sounds of sirens to the background 'noise' of traffic. WaveResNet is robust and accurate above 95% in normal traffic situations using raw waveform inputs of at least one second and noise. Both WaveResNet and YOLOv8-Emergency Vehicle Detection systems also meet real time operating requirements. To bring together a comprehensive solution, we combine the WaveResNet and YOLOv8-Emergency Vehicle Detection systems with an Arduino board to control traffic signals. Solving the emergency vehicle detection problem, this innovative method combines vision and audio based technologies to optimize real time response and traffic signal control.

**Keywords:** Emergency Vehicle, Traffic, Siren Detection, YOLOv8, WaveResNet.



**Dr. Pramod Kumar Naik**  
Associate Professor & Chairperson  
Department of AI&RO



**Dr. Gangadhar T G**  
Associate Professor  
Department of AI&RO

- Dr. Gangadhar T G and Dr. Pramod Kumar Naik from the AI & Robotics Department visited the Central Manufacturing Technological Institute (CMTI), Government of India, on 07-1-2025 and submitted two ongoing projects SLAM Algorithm Development for Autonomous Robots and Parallel Computing.





**Dr. Rupam Bhaduri**  
**Professor**  
**Department of AI&RO**

- Dr. Rupam Bhaduri, Professor participated as a distinguished jury member on 10th January 2025 at the DERBI Foundation. Applications under the EV & Mobility and CleanTech sectors for the NIDHI PRAYAS (National Initiative for Developing and Harnessing Innovations – Promoting and Accelerating Young and Aspiring Innovators & Startups) program were assessed. This initiative by the Department of Science and Technology, Government of India, provides grants, mentorship, and prototyping facilities to early-stage innovators and startups.





**Dr. Pramod Kumar Naik**  
Associate Professor & Chairperson  
Department of AI&RO

- Dr. Pramod Kumar Naik, Professor has presented a technical talk on “Integrating AI with IoT: Smart Solutions for a Connected World” which was a part of ATAL Online Six-day Faculty Development Programme on “Deep Dive into AI: Latest Trends using Machine Learning and Deep Learning” conducted by School of Computer Science and Engineering, REVA University from January 13th to 18th, 2025.



**Dr. Srikumar**  
Associate Professor  
Department of Mathematics

- Dr. SRIKUMAR has published an article “Mathematical analysis of COVID-19 and TB co-infection dynamics with optimal control” in the journal “Modelling Earth Systems and Environment” published by Springer Nature on 8th Jan 2025. It is a Scopus indexed Q1 journal with impact factor of 2.7. DOI: <https://doi.org/10.1007/s40808-024-02197-8>

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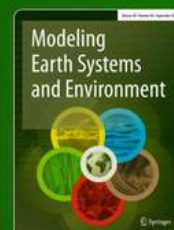
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## Mathematical analysis of COVID-19 and TB co-infection dynamics with optimal control

Review Article | Published: 08 January 2025

Volume 11, article number 65, (2025) [Cite this article](#)



**Modeling Earth Systems and Environment**

[Aims and scope](#) →



**Prof. Mayank Singh Bhakuni**  
Assistant Professor  
Department of Mathematics

- Prof. MAYANK SINGH BHAKUNI has published an article “Stability analysis of multi-criteria decision-making techniques for relief centre location selection: A safety-centric relocation model with cost considerations” in the journal “Engineering Applications of Artificial Intelligence” published by Elsevier on 25h Jan 2025.  
DOI: <https://authors.elsevier.com/c/1kVE33OWJ98h~s>

Engineering Applications of Artificial Intelligence 144 (2025) 109932

Contents lists available at ScienceDirect

**Engineering Applications of Artificial Intelligence**

journal homepage: [www.elsevier.com/locate/engappai](http://www.elsevier.com/locate/engappai)

Research paper

**Stability analysis of multi-criteria decision making techniques for relief centre location selection: A safety-centric relocation model with cost considerations**

Mayank Singh Bhakuni<sup>a,b</sup>, Pooja Bhakuni<sup>c</sup>, Amrit Das<sup>a,\*</sup>

<sup>a</sup> Department of Mathematics, School of Advanced Sciences, Vellore Institute of Technology, Vellore, India  
<sup>b</sup> Department of Mathematics, School of Engineering, Dayananda Sagar University, Bengaluru, India  
<sup>c</sup> Department of Data Analytics & Mathematical Sciences, Jain Jayanagar Campus, Jain Deemed-to-be University, Bengaluru, India

**ARTICLE INFO**

**Keywords:**  
Post-disaster relocation models  
Stability analysis  
Multi-criteria decision making techniques  
Multi-objective solid transportation problem  
Single-valued trapezoidal neutrosophic number  
Multi-objective compromise techniques

**ABSTRACT**

The persistent threat of large-scale disasters necessitates effective emergency management strategies to mitigate their extensive physical and psychological impacts. This research introduces a safety-centric relocation model that addresses the safest relocation of affected populations within disaster relief operations. The model incorporates specific cost considerations, such as emergency services, route analysis, transit points, en-route assistance, and establishing secure healthcare facilities to enhance the safety and efficiency of relocation processes. In the aftermath of a disaster, establishing a suitable location for a relief centre is paramount for effective disaster response and recovery efforts. The study compares and implements six distinct multi-criteria decision-making (MCDM) techniques with five distinct weight methods to optimize the selection of relief centre sites utilizing ten criteria. Stability analysis identifies combined compromise solution (COCOSO)  $\lambda = 0.5$  as the most reliable MCDM technique. The study further highlights the importance of implementing these MCDM techniques for society's benefit. The unpredictability and vagueness of input data in post-disaster scenarios are addressed using single-valued trapezoidal neutrosophic numbers. The research employs optimization techniques using the linear interactive and general optimizer optimizing (LINGO) solver to obtain the optimal solution for the proposed multi-objective solid transportation model. The minimum value of the cost objective function is obtained using goal programming while the minimum value for the time objective function is obtained using fuzzy goal programming. The global criterion method provides the intermediate cost and time objective function results. The model's application is demonstrated through a case study on the



**Dr. Prosantha Sarkara**  
**Assistant Professor**  
**Department of Mathematics**

- Dr. PROSANTHA SARKARA has published an article “On Some Neighbourhood Degree-Based Structure Descriptors and Their Applications to Graphene” in the journal “The European Physical Journal Plus” published by Springer Nature on 9th Jan 2025. It is a Scopus indexed Q2 journal.

DOI: <https://doi.org/10.1140/epjp/s13360-024-05939-w>

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## On some neighborhood degree-based structure descriptors and their applications to graphene

Regular Article | Published: 09 January 2025  
Volume 140, article number 13, (2025) [Cite this article](#)



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**Dr. Shreyas Rajendra Hole**  
**Assistant Professor**  
**Department of CSE(AIML)**

- Dr. Shreyas Rajendra Hole, Assistant Professor, Dept. of CSE (AI&ML) has successfully completed a One Day Faculty Orientation Program on “Empowering Academia: Integrating High-Performance Computing in Education and Research” Organized by Department of Computer Science and Engineering, IIIT Nagpur, Walchand College of Engineering, Sangli Under the aegis of National Supercomputing Mission, Government of India On 6th January 2025.





**Prof. Sriramkumar R**  
**Assistant Professor**  
**Department of CSE(AIML)**

- Prof. Sriramkumar R, Assistant Professor, Dept. of CSE (AI&ML) has been awarded the certificate for successfully presenting the paper entitled “Leveraging Blockchain for Secure and Efficient Crowdfunding: An Optimized Particle Swarm Approach” at the 9th International Conference on Communication and Electronics Systems (ICCES 2024) organized by PPG Institute of Technology, Coimbatore, India on 16-18, December 2024.





**Dr. Lakshmanan**  
Assistant Professor  
Department of CSE(AIML)

- Dr. Lakshmanan, Assistant Professor, Dept. of CSE (AI&ML) has published a Journal titled "Implementation of Energy-Aware Optimal Routing for Improving Traffic Capacity in Ad Hoc Wireless Network Using Hybrid Heuristic Algorithm," Int. J. Commun. Syst., vol. 38, no. 4, pp. e6126, 2025. DOI: <https://doi.org/10.1002/dac.6126>. Q2, Impact Factor: 1.7



RESEARCH ARTICLE

## Implementation of Energy-Aware Optimal Routing for Improving Traffic Capacity in Ad Hoc Wireless Network Using Hybrid Heuristic Algorithm

Nandakumar Seekarajapuram Dinakaran ✉ Lakshmanan Muthusamy ✉  
Divya Sundar Vellore Sundaresan ✉

First published: 20 January 2025 | <https://doi.org/10.1002/dac.6126>

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### ABSTRACT

Ad hoc wireless network has been one of the significant research topics, as its uses are spread over various applications. The energy-aware routing (EAR) protocols must create a routing environment with both the security and energy factors, such that the ad hoc



**Prof. Subhash Mondal**  
Assistant Professor  
Department of CSE(AIML)

- Prof. Subhash Mondal, Assistant Professor, Dept. of CSE (AI&ML) has published a Journal titled "An Efficient Malware Detection Approach Based on Machine Learning Feature Influence Techniques for Resource-Constrained Devices", Access: <https://ieeexplore.ieee.org/document/10830491/authors#authors>

## An Efficient Malware Detection Approach Based on Machine Learning Feature Influence Techniques for Resource-Constrained Devices

Publisher: **IEEE** [Cite This](#) [PDF](#)

Subir Panja ; Subhash Mondal ; Amitava Nag ; Jyoti Prakash Singh ; Manob Jyoti Saikia ; Anup Kumar Barman [All Authors](#)

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Abstract

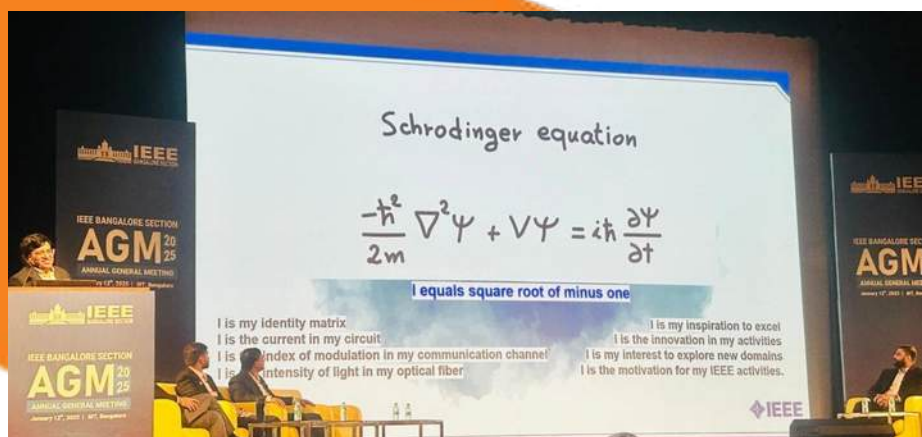
**Abstract:**

The growing use of computer resources in modern society makes it extremely

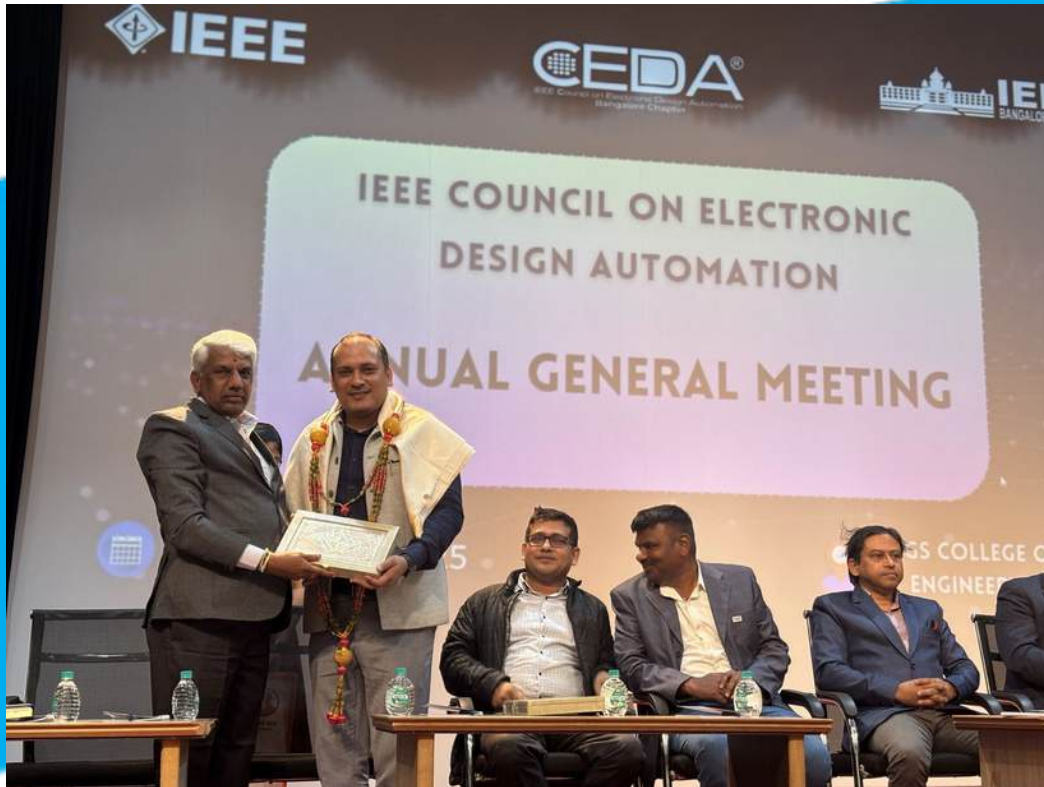


**Dr. Arun Balodi**  
Professor & Chairperson  
Department of ECE

- Dr. Arun Balodi, Professor attended the IEEE Bangalore Section Annual General Meeting 2025 held at the International Institute of Information Technology, Bangalore.



- Dr. Arun Balodi, Professor attended the Annual General Meeting (AGM) of IEEE CEDA Bangalore on January 11, 2025, held at BGS College of Engineering and Technology, Bangalore.





**Dr. Vinu R**  
**Associate Professor**  
**Department of ECE**

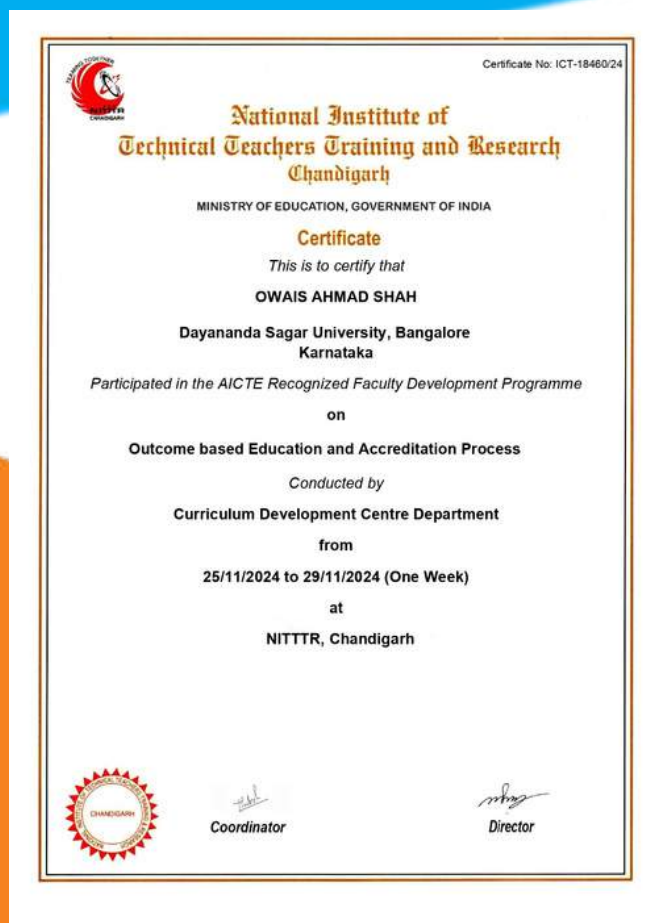
- Dr. Vinu R. Associate Professor, along with co-author Prof. Jisy N.K., Assistant Professor, presented a research paper titled “Artificial Intelligence-based Fast Billing System” at the 5th IEEE-sponsored International Conference on IoT Based Control Networks and Intelligent Systems (ICICNIS 2024). The conference was organized by the T. John Institute of Technology, Bengaluru, and held on December 17-18, 2024.





**Dr. Owais Ahmad Shah**  
**Assistant Professor**  
**Department of ECE**

- Prof. Owais Ahmad Shah, Assistant Professor, has successfully participated in the AICTE Recognized Faculty Development Programme on Outcome-Based Education and Accreditation Process. This program was conducted by the Curriculum Development Centre Department of the National Institute of Technical Teachers Training and Research (NITTTR), Chandigarh, from November 25, 2024, to November 29, 2024.





**Dr. B. M. Ashwin Desai**  
Associate Professor  
Department of ECE

- Dr. B. M. Ashwin Desai (Associate Professor), Rakshith Prajwal R. S. (ENG21EC0093), and Sameer A. Nadaf (ENG21EC0102) from the Department of Electronics and Communication Engineering attended the IEEE 18th International Conference on Industrial and Information Systems (ICIIS 2024) held at IIT Madras from December 21st to 23rd, 2024.





**Dr. Theodore Chandra S**  
**Associate Professor**  
**Department of ECE**

- Dr. Theodore Chandra S, Associate Professor, has successfully completed the AICTE-QIP-PG Certificate Programme in Machine Learning conducted between 01 July to 24 December 2024 at the Centre for Continuing Education, Indian Institute of Science, Bengaluru, Sponsored by AICTE, New Delhi. He was one of the 48 selected out of 593 applicants after a national level selection process."





**Prof. Nadeem Pasha**  
Assistant Professor  
Department of ECE

- Prof. Nadeem Pasha, Assistant Professor, successfully presented a research paper titled "QoS-Driven Cluster Head Selection Optimization in Heterogeneous Wireless Sensor Networks for IoT Applications" at the 2nd IEEE International Conference on Innovations in High-Speed Communication and Signal Processing (IEEE-IHCSP 2024). The event took place from 6th to 8th December 2024 at Maulana Azad National Institute of Technology, Bhopal.



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INNOVATIONS IN HIGH-SPEED COMMUNICATION AND SIGNAL PROCESSING  
(IEEE-IHCSP 2024)  
6<sup>TH</sup> - 8<sup>TH</sup> DECEMBER, 2024

## CERTIFICATE OF PARTICIPATION

This is to certify that paper entitled "QoS-Driven Cluster Head Selection Optimization in Heterogeneous Wireless Sensor Networks for IoT Applications" Authored by J. Seetaram, Chandrugonda Malleswar Rao, M. Shakunthala, Sankati Ramakrishna, Vishal Mehra has been presented by Nadeem Pasha in the "2<sup>nd</sup> IEEE International Conference on Innovations in High-Speed Communication and Signal Processing (IEEE-IHCSP 2024)" organized at Department of Electronics & Communication Engineering, Maulana Azad National Institute of Technology, Bhopal from 6<sup>th</sup> - 8<sup>th</sup> December 2024.

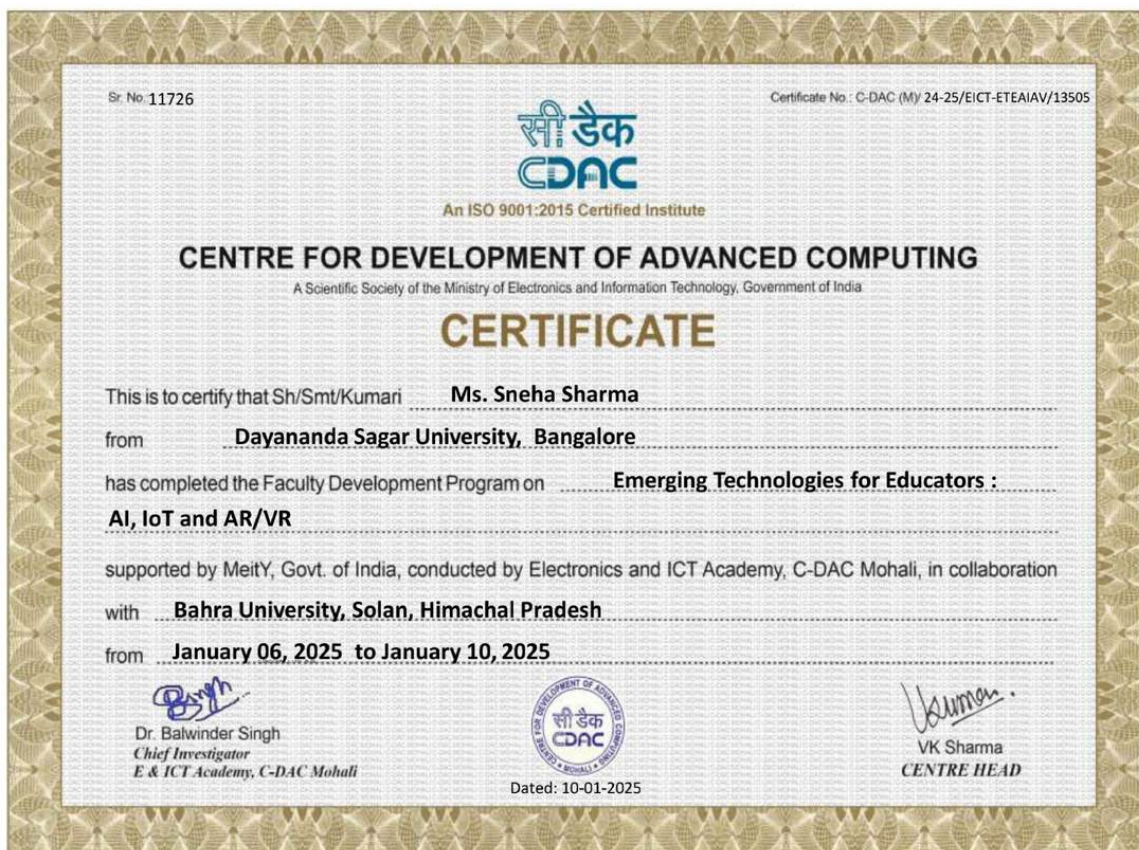
  
Conference Secretary

  
Conference Chair



**Prof. Sneha Sharma**  
**Assistant Professor**  
**Department of ECE**

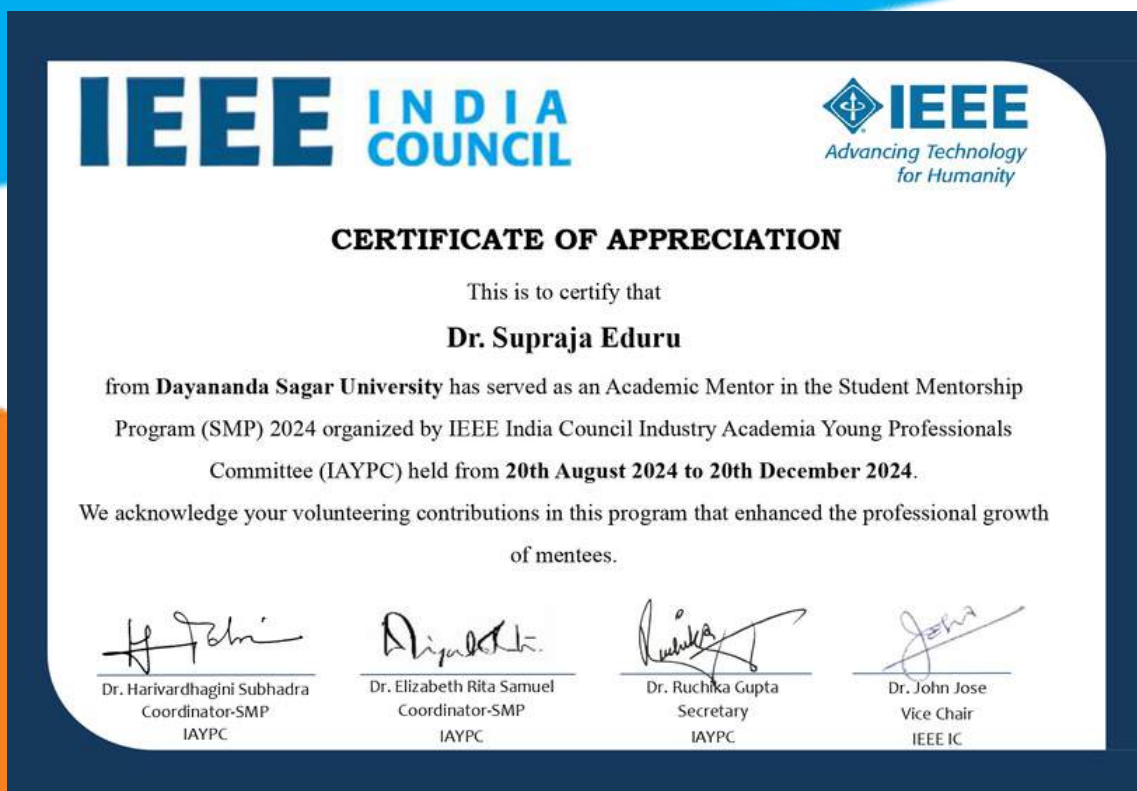
- Prof. Sneha Sharma, Assistant Professor successfully completed the Faculty Development Program (FDP) on Emerging Technologies for Educators: AI, IoT, and AR/VR. The program was conducted by the Electronics and ICT Academy, C-DAC Mohali, in collaboration with Bahra University, Solan, Himachal Pradesh, from January 6 to January 10, 2025.





**Dr. Supraja Eduru**  
Assistant Professor  
Department of ECE

- Dr. Supraja Eduru, Assistant Professor has been recognized for her outstanding contribution as an Academic Mentor in the Student Mentorship Program (SMP) 2024, organized by the IEEE India Council Industry Academia Young Professionals Committee (IAYPC).



- Dr. Supraja Eduru, Assistant Professor has successfully completed the transcription editing task using the Machine Learning Tool - Chitralekha for the NPTEL course "Cloud Computing and Distributed Systems (106104182)" offered by IIT Kanpur.



- Dr. Supraja Eduru, Assistant Professor has successfully completed the transcription editing task using the Machine Learning Tool - TransLingua for the NPTEL course "Integral and Vector Calculus (111105122)" offered by IIT Kharagpur.





# SCHOOL OF ENGINEERING



## STUDENT ACHIEVEMENTS

- Mr. Rahul Jadvani (ENG22CS0129), Ms. Ashwini Jadhav (ENG22CY0005), Mr. Sachin Pujappa Baluragi (ENG22CY0020), Mr. Sai Jadhav (ENG22CS0145) 5th-semester students from the Departments of Computer Science Engineering (CSE) and Computer Science Engineering (Cybersecurity) had an outstanding achievement at the National Level "I Love Hackathon" hosted by Blockon and Nuchain on 27th-28th December 2024, our student team emerged victorious, showcasing their innovative problem-solving skills and technical expertise. The winning team secured the first position, earning a prestigious cash prize of 300 USD.



- Mr. Bhuvaneshwer S (ENG24CY1002) has taken part in the event Hardware Hackathon conducted during the International Level Annual Technical Symposium, Phase Shift 2024 held at BMSCE on the 5th and 6th of December 2024.



- Mr. Batchu Himacharan (ENG23CY0098) has actively contributed to the Indic Wikimedia Hackathon Bhubaneswar 2024, organized by the Indic Media Wiki Developers User Group and Odia Wikimedians User Group.



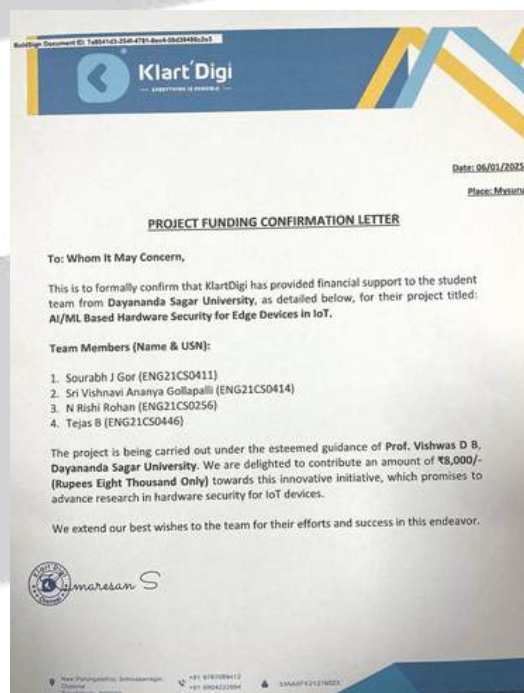
- Mr. Theerthesh M R (ENG21CY0049) has successfully earned the eLearn Security Junior Penetration Tester (eJPT) certification, demonstrating his expertise and foundational knowledge in penetration testing and cyber security.



- Mr. Vatsal (ENG22AS0023), an Autodesk Fusion Catalyst, actively participated in IMTEX 2025.



- Mr. Sourabh J Gor (ENG21CS0411), Ms. Vishnavi Ananya Gollapalli (ENG21CS0414), Mr. N Rishi Rohan (ENG21CS0256), and Mr. Tejas B (ENG21CS0446) 7th semester CSE Students, under the guidance of Prof. Vishwas D B, Assistant Professor, received a project funding of Rupees 8000/ from Klart Digi for the title “AI/ML Based Hardware Security for Edge Devices in IoT” on 6th January 2025.



- Mr. Prajwal B R (ENG22CS0121), Mr. Navtej S (ENG22CS0109), Mr. Nithin P Hegde (ENG22CS0113), Mr. Pavankumar P S (ENG22CS0117) and Mr. Pratham U K (ENG22CS0123), 5th semester CSE Students, under the guidance of Prof. Mala B A, Assistant Professor published IEEE conference paper titled “Smart Cradle: A Secured Assistance and Monitoring system for baby using IoT” in the 5th International Conference on IoT Based Control Networks and Intelligent Systems (ICICNIS 2024) during January 2025.



- Mr. VinuRaj Vamshi (ENG22DS0047) presented a Conference Paper ID: 109 titled, Mobile Net-based Driver Drowsiness Detection and Monitoring System the International Conference on Healthcare Innovation and Smart Systems (ICHISS 2024) Organised by the Department of Computer Science and Engineering, Shri Shankaracharya Institute of Professional Management and Technology, Raipur, Chhattisgarh, India, during 29th-30th December 2024.



- Mr. VinuRaj Vamshi (ENG22DS0047) presented a Conference Paper ID: 223 titled, An IoT-Driven Emergency Medical Service Vehicle Detection System Using WaveResNet and YOLOv8 for Real-Time Traffic Management the International Conference on Healthcare Innovation and Smart Systems (ICHISS 2024) Organised by the Department of Computer Science and Engineering, Shri Shankaracharya Institute of Professional Management and Technology, Raipur, Chhattisgarh, India, during 29th-30th December 2024.



- Mr. Shashi Kumar C (ENG23DS0034) successfully accomplished the official ACE-220: Enterprise Prototyping with Arduino Portenta Proto Kit on 8th January 2025.



- Mr. Venkat Nivas Reddy K (ENG22DS0022) participated at the Asian Youth Summit held on 28th & 29th December 2024 in the Indo-Nepal Cabinet Committee as Prime Minister of Nepal and having secured BEST DELEGATE along with received Cash prize of Rs.4000/-



- Mr. Jaice Joseph (ENG21CT0011) published a research article titled “A Survey on transforming 2D images into immersive 3D Models” at the International Conference on Advances in Engineering and Technology (AET-2024), jointly organized by ACEECom, AMAE, ACEE, on 30th December 2024.



- Mr. R Keertish Kumar (ENG21CT0032) of 7th semester CST got selected in CGI Inc Campus Placement Drive organized by Department of Training and Placement on 16th January 2025.



- Mr. Manoj N (ENG21CT0024), Mr. Manikanta (ENG21CT0022), Mr. Thanmay (ENG21CT0021), Mr. Tarun Pradeep (ENG21CT0045) and Prof. Ramandeep Kaur, Assistant Professor published a research article titled “Improvising Healthcare Data Security through Federated Learning and Blockchain Framework” at the 9th International Conference on Smart Trends in Computing and Communications on 29 - 31 January 2025.



- Mr. Hemal (ENG21CT0009), Ms. Sohana (ENG21CT0037), Mr. Tarun Pradeep (ENG21CT0045) and Dr. M. Shahina Parveen, Professor published a research article titled “Predictive Modelling of Childhood Fever Prevalence: Leveraging Machine Learning in Maternal and Child Health” at the 9th International Conference on Smart Trends in Computing and Communications on 29 - 31 January 2025.



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# SCHOOL OF ENGINEERING

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