ICSIE 2025

Proceedings of

16TH INTERNATIONAL CONFERENCE ON SCIENCE AND INNOVATIVE ENGINEERING 2025

October 11th and 12th, 2025

Organised by
Prince Dr.K.Vasudevan college of
Engineering and Technology, India.

In collaboration with
Manipal University College, Malaysia.

16th INTERNATIONAL CONFERENCE ON
"SCIENCE AND INNOVATIVE ENGINEERING – 2025"
(ICSIE – 2025)

October 11th – 12th, 2025

ORGANIZED BY

ORGANIZATION OF SCIENCE AND INNOVATIVE
ENGINEERING & TECHNOLOGY (OSIET)

Chennai, India.

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In Association with

PRINCE DR. K. VASUDEVAN COLLEGE OF ENGINEERING
AND TECHNOLOGY

Medavakkam - Mambakkam Road, Ponmar, Chennai – 600 127

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In Collaboration
Manipal University College Malaysia (Melaka Campus)
Melaka, Malaysia
https://manipal.edu.my/

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Venue:

Prince Dr. K. Vasudevan college of Engineering and Technology Medavakkam - Mambakkam Road, Ponmar, Chennai – 600 127

CHAIRMAN'S MESSAGE

I am delighted to welcome you all to the International Conference on Science and Innovative Engineering" (ICSIE Sep 2025) which brings together experts and academics from around the world. The conference this year has brought together a tremendous and rich diversity of authors and speakers from universities, government and industry to share ideas and new perspectives on a wide range of Communications, Electronics, Networking, Computer Science, Mechanical and Electricals research and technologies. Addressing the new technical and business issues are essential to advance in today's engineering and technological environments. In order to provide an outstanding technical level for the presentations at the conference, we have invited more than 15 distinguished experts in the Engineering and Technology field to participate in the Advisory Committee. Academic excellence has always been the hall mark of our institute and we are committed to provide a comprehensive education which seeks to develop the students into academically proficient, morally upright and socially well integrated individuals. I would like to express my thanks to all authors for their outstanding contributions and in particular the members of the program board for their competent evaluation of the large number of submissions

We are very pleased with the quality, depth, and breadth of this year's technical program. I wish you a most enjoyable experience at the Conference.

Dr.K.Vasudevan

Chairman
Prince Group of Educational Institutions

VICE CHAIRMAN'S MESSAGE

The words "Engineering" and "Technology" are not just words but are vital disciplines that guide the world by bringing huge changes to the current way of living. Modern Engineering and Technological innovations are making people think that nothing is impossible in this world. Everything can be achieved with an extremely powerful vision and a path to attain that vision. If a person is doing a marvel, keep in mind that you too can outshine them with perseverance. Dr. A. P. J Abdul Kalam said "Dream is not something that comes when you sleep, it is something that doesn't let you sleep", so, dream a lot about how to bring changes and try to make the changes come true. Remember earning money is not life; it is just a part of life which can be easily earned when you do it with dedication. Science and technology have become so closely intertwined, and I hope the conference will help you to reinforce each other.

We are very much elated in welcoming you all to our college for the 16th International Conference on Science and Innovative Engineering and I wish the students all the very best for their presentations.

Dr. V.Vishnu Karthick,
Vice Chairman,
Prince Shri Venkateshwara Padmavathy Engineering College.

ADMINISTRATIVE OFFICER'S MESSAGE

The world is growing fast in fact it grows in such a way that a thing invented yesterday becomes obsolete today, which means there is a plethora of competition in each and every discipline of engineering and technology. This scenario goes well with a famous quote of a philosopher Heraclitus, who said, "Change is the only constant in this world." Nowadays people need new inventions for their daily works so that they can do it with ease. People not only need to do their activities with ease but they also need it to be done within a period of time. As an engineer we need to solve problems that are left unsolved. As a way of showcasing the talents of young minds to find solutions we have organised this 16th International Conference on Science and Innovative Engineering.

I welcome you all to this event, my warm wishes to the students who are going to present their papers and also hearty thanks for the staff who have made this event a great success.

Er. K. Parthasarathy

Administrative Officer

Prince Group of Educational Institutions

ICSIE 2025

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College Oman, Sohar, Oman

Dr. G. N. R. PRASAD, Associate Professor, Chaitanya Bharathi Institute of
Technology, Gandipet, Telangana, India

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Telangana

Dr.H.S.Niranjana Murthy, Associate Professor, Ramaiah Institute of
Technology, Bangalore, Karnataka

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In an era where artificial intelligence (AI) systems increasingly underpin critical domains such as healthcare diagnostics, autonomous vehicle navigation, and judicial risk assessments, the imperative for transparency in algorithmic decision-making has never been more pronounced. Explainable AI (XAI) emerges as a pivotal paradigm to demystify the opaque "black box" nature of complex models, fostering trust, accountability, and ethical deployment in high-stakes environments. This paper elucidates data science techniques integral to XAI, including local interpretable model-agnostic explanations (LIME), SHapley Additive exPlanations (SHAP), counterfactual reasoning, and prototype-based methods, while delineating their theoretical underpinnings and practical adaptations for robustness under uncertainty. Drawing on interdisciplinary insights from machine learning, cognitive science, and decision theory, we explore applications in high-stakes contexts—such as predictive policing, medical prognosis, and financial lending—where erroneous decisions bear profound societal costs. Through a systematic review and empirical case studies, we demonstrate how XAI not only enhances human-AI symbiosis by enabling post-hoc interpretability but also mitigates biases and regulatory non-compliance risks. Ultimately, this work advocates for a human-centered XAI framework that balances predictive fidelity with explanatory fidelity, paving the way for scalable, equitable AI governance in consequential decision arenas.

36. COMPARATIVE ANALYSIS OF YOLOV8, RESNET, AND ENHANCED EFFICIENTNET-B4 + U-NET

FOR AUTOMATED ROAD DAMAGE DETECTION AND SEGMENTATION

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Automated road surface damage detection and segmentation is essential for modern infrastructure maintenance and smart-city applications. This paper presents a detailed comparative study of three deep-learning approaches applied to a unified pothole segmentation dataset: (1) a ResNet-based segmentation baseline, (2) YOLOv8 as a fast detection baseline, and (3) a proposed Enhanced EfficientNet-B4 encoder with a U-Net decoder (EfficientNet-U-Net). Our experiments use a curated dataset of 780 annotated images (720 train / 60 val) derived from the Pothole Image Segmentation Dataset (Farzad Nekouei). The proposed EfficientNet-U-Net achieves the best segmentation performance with an overall accuracy of 94%, Dice coefficient of 0.74, and Intersection-over-Union (IoU) of 0.62. We include end-to-end workflow and architecture diagrams, extensive ablations, and a broad literature comparison (2020–2025) to contextualize our findings. The paper demonstrates that a compound-scaled encoder (EfficientNet-B4) combined with attentive skip connections and deep supervision yields superior boundary fidelity and region overlap for pothole segmentation.

37. EXPERIMENTAL REVIEW ON THE USE OF COPPER SLAG AS A PARTIAL REPLACEMENT FOR FINE AGGREGATE IN CONCRETE

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