WEEKLY

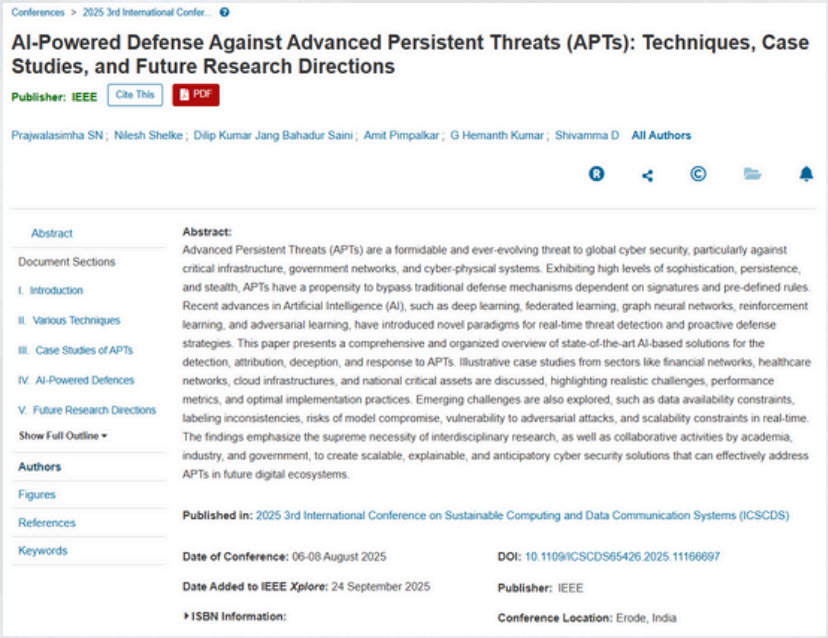
NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

RESEARCH ACCOMPLISHMENTS

Dr. Dilip Kumar Jang Bahadur Saini and Dr. G Hemanth Kumar collaboratively published a research paper titled: "AI-Powered Defense Against Advanced Persistent Threats (APTs): Techniques, Case Studies, and Future Research Directions" in the proceedings of the 3rd International Conference on Sustainable Computing and Data Communication Systems (ICSDCS-2025), indexed by IEEE Xplore.

DOI: https://doi.org/10.1109/ICSCDS65426.2025.11166697



Conferences > 2025 3rd International Confer...

AI-Powered Defense Against Advanced Persistent Threats (APTs): Techniques, Case Studies, and Future Research Directions

Publisher: IEEE | Cite This | PDF

Prajwalasimha SN ; Nilesh Shelke ; Dilip Kumar Jang Bahadur Saini ; Amit Pimpalkar ; G Hemanth Kumar ; Shivamma D All Authors

Abstract

Document Sections

I. Introduction

II. Various Techniques

III. Case Studies of APTs

IV. AI-Powered Defences

V. Future Research Directions

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Abstract:

Advanced Persistent Threats (APTs) are a formidable and ever-evolving threat to global cyber security, particularly against critical infrastructure, government networks, and cyber-physical systems. Exhibiting high levels of sophistication, persistence, and stealth, APTs have a propensity to bypass traditional defense mechanisms dependent on signatures and pre-defined rules. Recent advances in Artificial Intelligence (AI), such as deep learning, federated learning, graph neural networks, reinforcement learning, and adversarial learning, have introduced novel paradigms for real-time threat detection and proactive defense strategies. This paper presents a comprehensive and organized overview of state-of-the-art AI-based solutions for the detection, attribution, deception, and response to APTs. Illustrative case studies from sectors like financial networks, healthcare networks, cloud infrastructures, and national critical assets are discussed, highlighting realistic challenges, performance metrics, and optimal implementation practices. Emerging challenges are also explored, such as data availability constraints, labeling inconsistencies, risks of model compromise, vulnerability to adversarial attacks, and scalability constraints in real-time. The findings emphasize the supreme necessity of interdisciplinary research, as well as collaborative activities by academia, industry, and government, to create scalable, explainable, and anticipatory cyber security solutions that can effectively address APTs in future digital ecosystems.

Published in: 2025 3rd International Conference on Sustainable Computing and Data Communication Systems (ICSCDS)

Date of Conference: 06-08 August 2025

DOI: 10.1109/ICSCDS65426.2025.11166697

Date Added to IEEE *Xplore*: 24 September 2025

Publisher: IEEE

ISBN Information:

Conference Location: Erode, India

WEEKLY

NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

RESEARCH ACCOMPLISHMENTS

Ms. Vinitha V has co-authored and published a research article titled:
"Next-Gen Air Quality Index Forecasting with Hybrid Machine Learning Models and Cloud Synergy"
in the International Journal of Engineering Trends and Technology (IJETT), Volume 73, Issue 8, August 2025.

DOI: https://doi.org/10.14445/22315381/IJETT-V73I8P111

International Journal of Engineering Trends and Technology
ISSN: 2231–5381 / https://doi.org/10.14445/22315381/IJETT-V73I8P111

Volume 73 Issue 8, 129-136, August 2025

Original Article

Next-Gen Air Quality Index Forecasting with Hybrid Machine Learning Models and Cloud Synergy

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Received: 01 March 2025 Revised: 17 July 2025 Accepted: 31 July 2025 Published: 30 August 2025

Abstract - *Globally, nowadays, air pollution remains a major menace in terms of both environmental and public health; as such, accurate monitoring and forecasting the quality of air are essential for mitigating its deleterious impact. The Air Quality Index (AQI) is used to detect the quality of air and its hazardous effects on human health. This paper tries to formulate a forecasting mechanism for AQI by measuring the rate of the major issues causing air pollutants such as PM2.5, PM10, O3, CO, SO2, NO2, Pb(lead), and NH3. Hence, this paper formulates a model that combines both Convolutional Neural Networks (CNNs) along with Transformers and an enhanced Attention Mechanism to improve the prediction accuracy. CNNs are intended for effective feature extraction and capturing spatial patterns in air quality data, while the transformer model captures the sequential dependencies, allowing for accurate predictions over time. This proposed hybrid model addresses the limitations of age-old time-series models like ARIMA and LSTM, which often struggle to analyze the complex spatial-temporal air quality relationship. The proposed model was trained using the same historical air quality data provided by the Government of India (GoI) for training and validation, with real-time deployment with live sensor data. Also, the use of cloud computing ensures efficient handling of live data streams, enabling real-time data processing, prediction, and updates. This allows for quick, scalable and reliable predictions on large, diverse datasets, timely public health alerts, and supports proactive environmental management.*

Keywords - *Air Quality Forecasting, Attention mechanism, Transformer, CNN, Cloud computing.*

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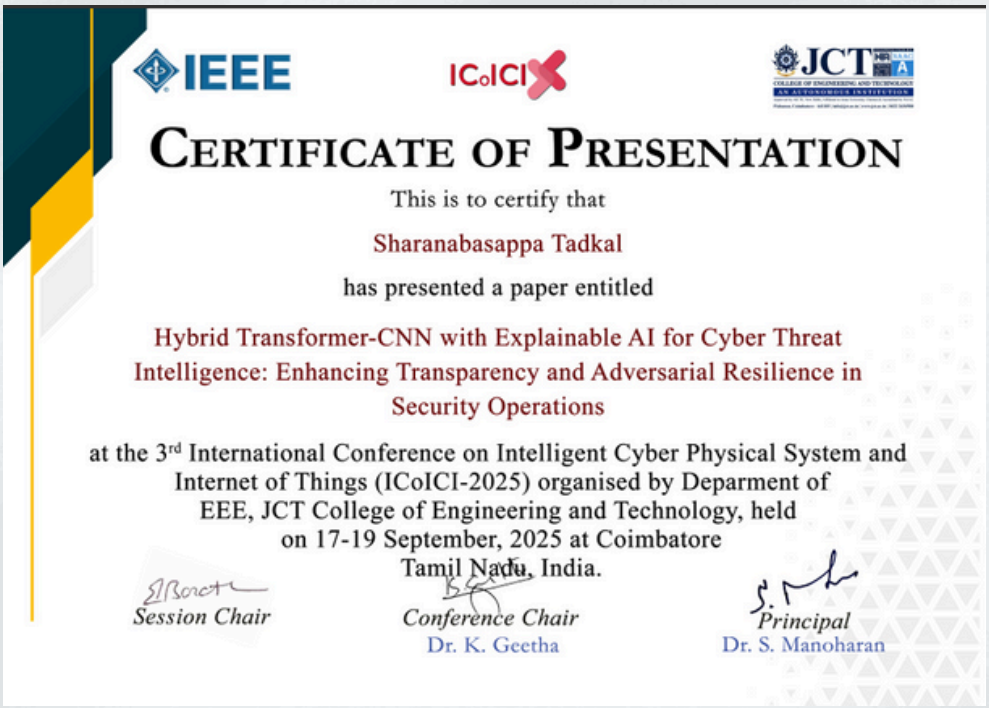
NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

RESEARCH ACCOMPLISHMENTS

Mr. Sharanabasappa Tadkal has successfully presented a research paper titled "Hybrid Transformer-CNN with Explainable AI for Cyber Threat Intelligence: Enhancing Transparency and Adversarial Resilience in Security Operations" at the 3rd International Conference on Intelligent Cyber Physical System and Internet of Things (ICoICI-2025), organized by the Department of EEE, JCT College of Engineering and Technology, Coimbatore, Tamil Nadu, held on 17th–19th September 2025.



IEEE ICoICI JCT

CERTIFICATE OF PRESENTATION

This is to certify that

Sharanabasappa Tadkal

has presented a paper entitled

Hybrid Transformer-CNN with Explainable AI for Cyber Threat Intelligence: Enhancing Transparency and Adversarial Resilience in Security Operations

at the 3rd International Conference on Intelligent Cyber Physical System and Internet of Things (ICoICI-2025) organised by Deparment of EEE, JCT College of Engineering and Technology, held on 17-19 September, 2025 at Coimbatore Tamil Nadu, India.

Session Chair

Conference Chair
Dr. K. Geetha

Principal
Dr. S. Manoharan

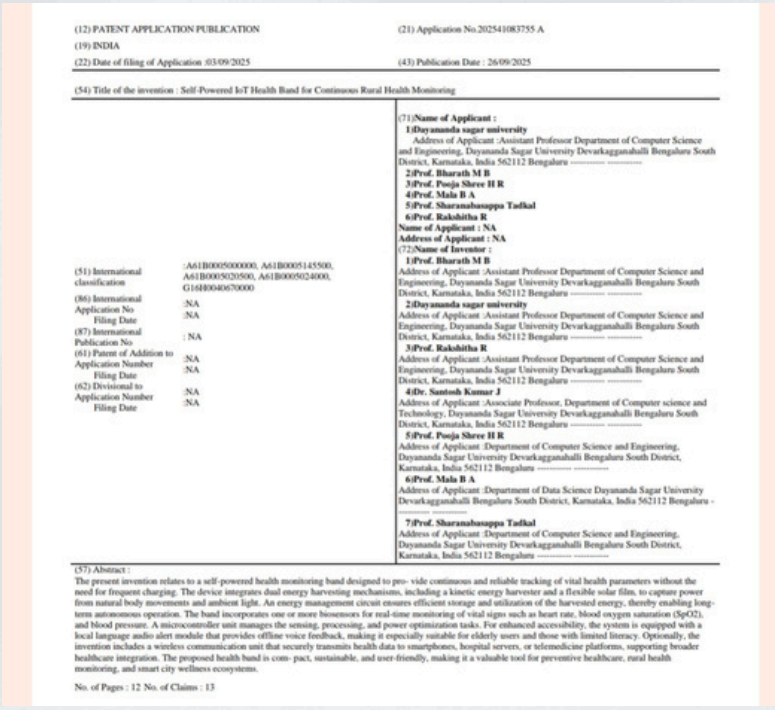
WEEKLY

NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

RESEARCH ACCOMPLISHMENTS

Mr. Sharanabasappa Tadkal has achieved a significant milestone with the successful filing and subsequent publication of his Indian Patent Application titled “Self-Powered IoT Health Band for Continuous Rural Health Monitoring.” The patent application (Publication No. 202541083755 A), developed in collaboration with his co-inventors, details a groundbreaking, battery-free health monitoring band that utilizes dual energy harvesting from kinetic motion and a flexible solar cell to continuously track vital signs. This crucial step in the patent process was officially marked by the publication on September 26, 2025.



(12) PATENT APPLICATION PUBLICATION
(19) INDIA
(22) Date of filing of Application :03/09/2025

(21) Application No.202541083755 A
(43) Publication Date : 26/09/2025

(54) Title of the invention : Self-Powered IoT Health Band for Continuous Rural Health Monitoring

(51) International classification :A61B0005000000, A61B0005145500, A61B0005020500, A61B0005024000, G16H0040670000
(86) International Application No :NA
Filing Date :NA
(87) International Publication No : NA
(61) Patent of Addition to Application Number :NA
Filing Date :NA
(62) Divisional to Application Number :NA
Filing Date :NA

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3)Prof. Pooja Shree H R
4)Prof. Mala B A
5)Prof. Sharanabasappa Tadkal
6)Prof. Rakshitha R
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(57) Abstract :
The present invention relates to a self-powered health monitoring band designed to pro- vide continuous and reliable tracking of vital health parameters without the need for frequent charging. The device integrates dual energy harvesting mechanisms, including a kinetic energy harvester and a flexible solar film, to capture power from natural body movements and ambient light. An energy management circuit ensures efficient storage and utilization of the harvested energy, thereby enabling long-term autonomous operation. The band incorporates one or more biosensors for real-time monitoring of vital signs such as heart rate, blood oxygen saturation (SpO2), and blood pressure. A microcontroller unit manages the sensing, processing, and power optimization tasks. For enhanced accessibility, the system is equipped with a local language audio alert module that provides offline voice feedback, making it especially suitable for elderly users and those with limited literacy. Optionally, the invention includes a wireless communication unit that securely transmits health data to smartphones, hospital servers, or telemedicine platforms, supporting broader healthcare integration. The proposed health band is com- pact, sustainable, and user-friendly, making it a valuable tool for preventive healthcare, rural health monitoring, and smart city wellness ecosystems.

No. of Pages : 12 No. of Claims : 13

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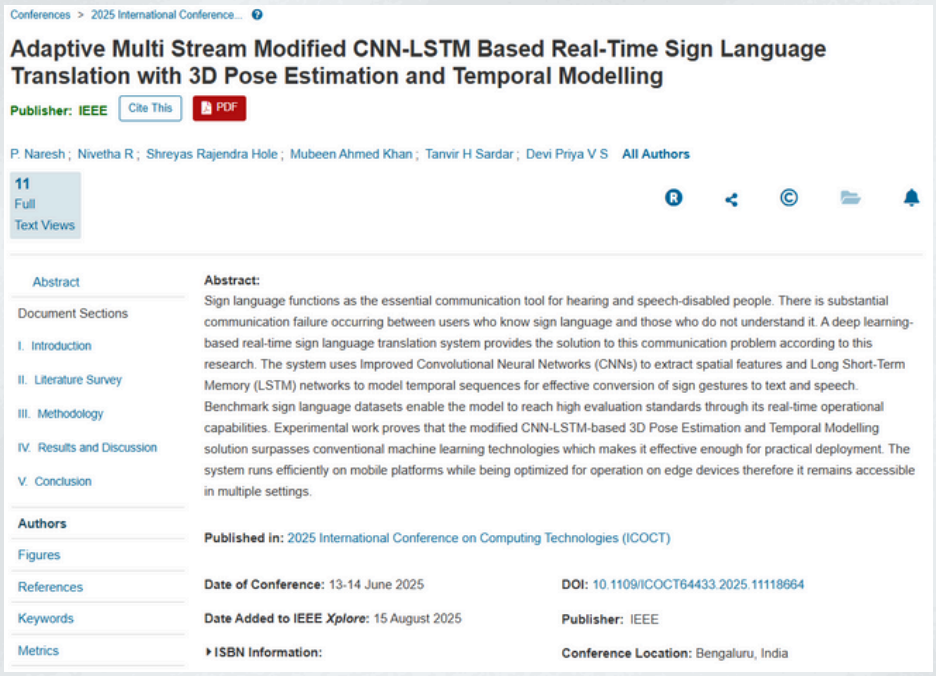
NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

RESEARCH ACCOMPLISHMENTS

Dr. Mubeen Ahmed Khan and Dr. Devi Priya V S collaboratively published a research paper titled: "Adaptive Multi Stream Modified CNN-LSTM Based Real-Time Sign Language Translation with 3D Pose Estimation and Temporal Modelling" in the proceedings of the 2025 International Conference on Computing Technologies (ICOCT), held in Bengaluru, India, on June 13-14, 2025.

DOI: https://doi.org/10.1109/ICOCT64433.2025.11118664



Conferences > 2025 International Conference...

Adaptive Multi Stream Modified CNN-LSTM Based Real-Time Sign Language Translation with 3D Pose Estimation and Temporal Modelling

Publisher: IEEE | Cite This | PDF

P. Naresh ; Nivetha R ; Shreyas Rajendra Hole ; Mubeen Ahmed Khan ; Tanvir H Sardar ; Devi Priya V S All Authors

11 Full Text Views

Abstract

Document Sections

I. Introduction

II. Literature Survey

III. Methodology

IV. Results and Discussion

V. Conclusion

Authors

Figures

References

Keywords

Metrics

Abstract:

Sign language functions as the essential communication tool for hearing and speech-disabled people. There is substantial communication failure occurring between users who know sign language and those who do not understand it. A deep learning-based real-time sign language translation system provides the solution to this communication problem according to this research. The system uses Improved Convolutional Neural Networks (CNNs) to extract spatial features and Long Short-Term Memory (LSTM) networks to model temporal sequences for effective conversion of sign gestures to text and speech. Benchmark sign language datasets enable the model to reach high evaluation standards through its real-time operational capabilities. Experimental work proves that the modified CNN-LSTM-based 3D Pose Estimation and Temporal Modelling solution surpasses conventional machine learning technologies which makes it effective enough for practical deployment. The system runs efficiently on mobile platforms while being optimized for operation on edge devices therefore it remains accessible in multiple settings.

Published in: 2025 International Conference on Computing Technologies (ICOCT)

Date of Conference: 13-14 June 2025

DOI: 10.1109/ICOCT64433.2025.11118664

Date Added to IEEE *Xplore*: 15 August 2025

Publisher: IEEE

ISBN Information:

Conference Location: Bengaluru, India

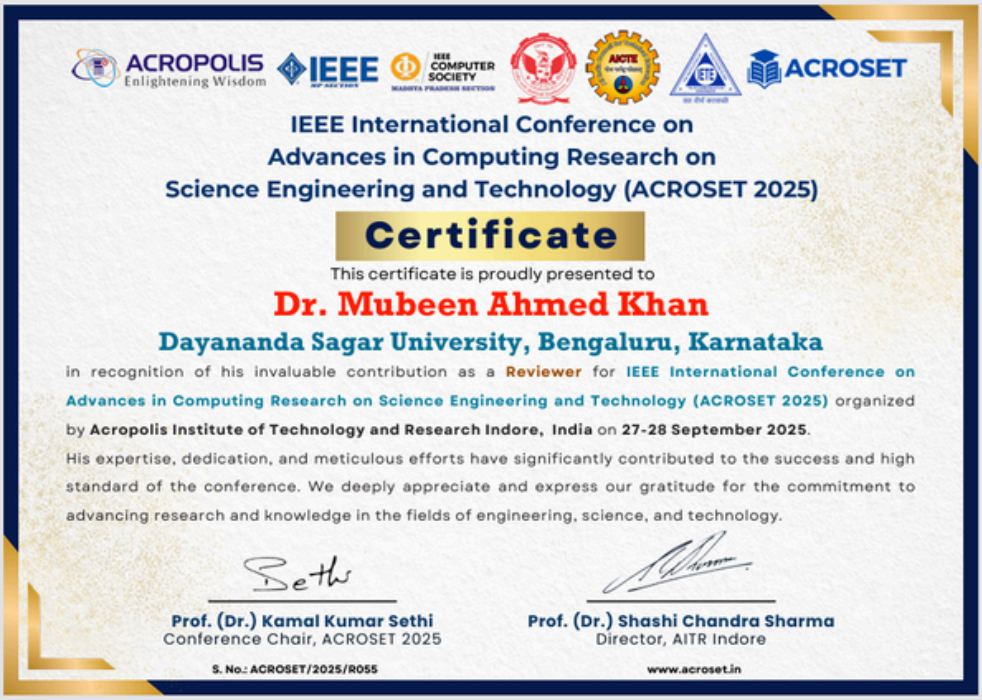
WEEKLY

NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

FACULTY ACHIEVEMENTS

Dr. Mubeen Ahmed Khan recently contributed as a Reviewer for the IEEE International Conference on Advances in Computing Research on Science Engineering and Technology (ACROSET 2025). The conference was organized by Acropolis Institute of Technology and Research Indore, India. The conference was held on 27th – 28th September 2025 and brought together researchers and academicians from diverse disciplines of engineering, science, and technology.



ACROPOLIS Enlightening Wisdom · IEEE · IEEE COMPUTER SOCIETY · AICTE · ACROSET

IEEE International Conference on
Advances in Computing Research on
Science Engineering and Technology (ACROSET 2025)

Certificate

This certificate is proudly presented to

Dr. Mubeen Ahmed Khan

Dayananda Sagar University, Bengaluru, Karnataka

in recognition of his invaluable contribution as a **Reviewer** for **IEEE International Conference on Advances in Computing Research on Science Engineering and Technology (ACROSET 2025)** organized by **Acropolis Institute of Technology and Research Indore, India** on **27-28 September 2025**.

His expertise, dedication, and meticulous efforts have significantly contributed to the success and high standard of the conference. We deeply appreciate and express our gratitude for the commitment to advancing research and knowledge in the fields of engineering, science, and technology.

Prof. (Dr.) Kamal Kumar Sethi
Conference Chair, ACROSET 2025

Prof. (Dr.) Shashi Chandra Sharma
Director, AITR Indore

S. No.: ACROSET/2025/R055

www.acroset.in

WEEKLY

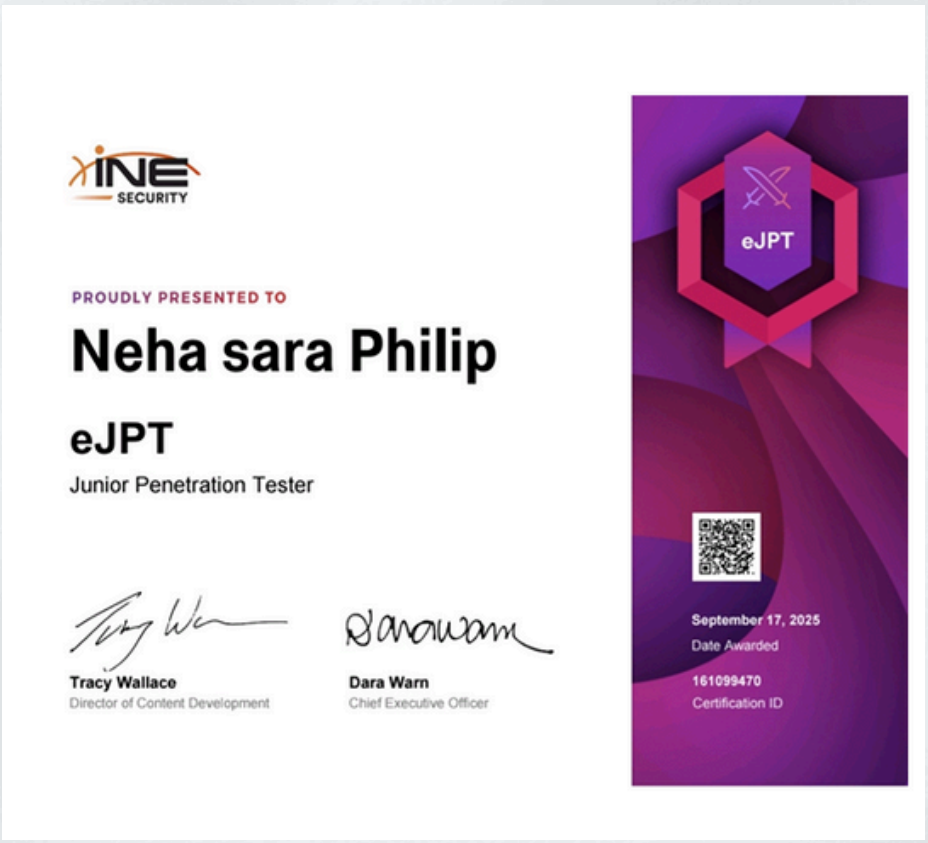
NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

STUDENT ACHIEVEMENTS

Ms. Neha Sara Philip (ENG22CY0036) has successfully completed the eJPT (Junior Penetration Tester) certification on September 17, 2025.

The program provided comprehensive foundational knowledge and practical, hands-on exposure to essential penetration testing practices, including reconnaissance, vulnerability assessment, exploitation, post-exploitation, and reporting methodologies within the cybersecurity domain.



WEEKLY

NEWSLETTER

September 2025 (22.09.25 to 29.09.25)

STUDENT ACHIEVEMENTS

Mr. Manjunath Vittal Naik (ENG23CY1002) has successfully completed the Certified Ethical Hacker (CEH) examination and has met all the necessary criteria for official certification.
The CEH certification validates the foundational knowledge and technical skills required to effectively operate in the domain of ethical hacking and information security.