VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN

INSIGHT

NEWS LETTER

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VOLUME NO.: 40

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Vision of the Department

To achieve value oriented and quality education with excellent standards on par with evolving technologies and produce technocrats of global standards with capabilities of facing futuristic challenges.

Mission of the Department

M1: To enrich advanced knowledge among students for reinforcing the domain knowledge and develop capabilities and skills to solve complex engineering problems.

M2: To impart value based professional education for a challenging career in Computer Science and Engineering.

M3: To transform the graduates for contributing to the socio-economic development and welfare of the society through value based education

Program Educational Objectives

PEO1: To acquire logical and analytical skills in core areas of Computer Science & Information Technology.

PEO2: To adapt new technologies for the changing needs of IT industry through self-study, graduate work and professional development.

PEO3: To demonstrate professional and ethical attitude, soft skills, team spirit, leadership skills and execute assignments to the perfection.

Program Specific Outcomes

PSO1: Software Development: Ability to grasp the software development life cycle of software systems and possess competent skill and knowledge of software design process.

PSO2: Industrial Skills Ability: Ability to interpret fundamental concepts and methodology of computer systems so that students can understand the functionality of hardware and software aspects of computer systems.

PSO3: Ethical and Social Responsibility: Communicate effectively in both verbal and written form, will have knowledge of professional and ethical responsibilities and will show the understanding of impact of engineering solutions on the society and also will be aware of contemporary issues.

EDITORIAL BOARD

Dr. B Phijik, HOD (CSE)

Dr. V Suzan Shalini, Professor, BS&H,
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Nimitha Cirasanagandla CSE (student),
Aishwarya Bulusu CSE (student)

COMPUTER SCIENCE AND ENGINEERING

Established in 2008, the CSE Department at VMTW has grown from an intake of 90 to 240 students, reflecting its commitment to excellence. The department earned NBA accreditation in 2019 and reaccreditation in 2022, ensuring high academic standards.

With experienced and research-driven faculty, the department promotes innovation through Centres of Excellence in IoT and AI & ML and collaborations with MSME, ALEAP, and TASK. Active associations with ISTE, CSI, and IETE enrich student learning through workshops and seminars.

Boasting 90% placements in leading companies like Amazon, Flipkart, Accenture, and Cognizant, and a highest package of ₹ 20 LPA, the department stands as a hub of innovation, research, and success.

HOD'S MESSAGE

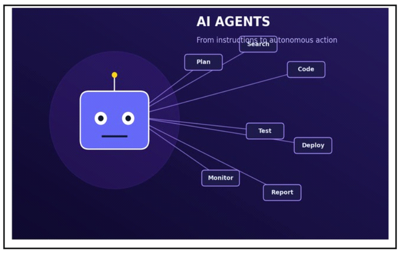
Dr. Phijik Battula,
Associate Professor &
HoD, DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

Dr. Phijik Battula brings over 20 years of academic and research experience to his role as Associate Professor and Head of the Department of Computer Science & Engineering at Vignan's Institute of Management and Technology for Women (VMTW), Hyderabad. He earned his Ph.D. in Computer Science from Osmania University, Hyderabad in 2023. He holds an M.Tech. in Computer Science and Engineering from Jawaharlal Nehru Technological University Hyderabad (JNTUH). Dr. Battula's expertise spans Computer Networks, Software Engineering, Operating Systems, Machine Learning, and Blockchain Technologies. He has made significant scholarly contributions, including:3 national patents,1 authored book,10 journal publications, including(1 in SCIE-indexed journal,4 in SCOPUS-indexed journals,5 in UGC- approved journals,2 international conference papers).He also served as an Academic Counsellor with the Indira Gandhi National Open University (IGNOU), Regional Services Division, Maidan Garhi, New Delhi, through Aurora Degree College Study Center (Code: 0111), Hyderabad. A dedicated mentor and educator, Dr. Battula has guided over 100 B.Tech graduates from VIGNAN's Group Institutions, Hyderabad. He is an active member of several professional organizations, Life Member, Indian Society for Technical Education (ISTE) – LM-137313,Life Member, International Association of Engineers (IAENG) – Member No: 277087,Life Member, Society of Digital Information and Wireless Communication (SDIWC) – ID: 30616.

FACULTY ARTICLE

By, Mr. Amol Badge,
Assistant Professor (CSE)

AI Agents & Autonomous Engineering-Transforming the Future of Work (2025–2026)

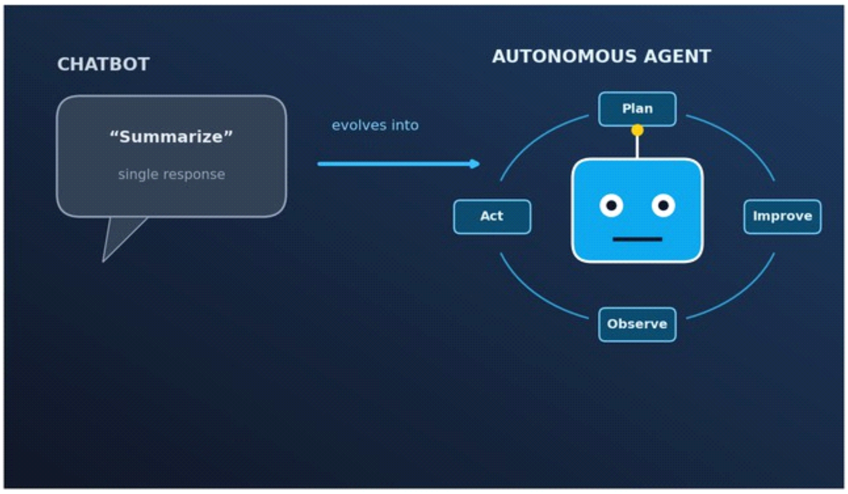


Introduction to AI Agents

An AI agent is a system that can perceive information, reason about a goal, and take action on its own — not just answer a single question. Unlike a simple chatbot that responds once and stops, an agent can plan a series of steps, use tools such as web search or code execution, check its own results, and keep going until the task is done. Between 2025 and 2026, this shift from passive assistants to active agents has become one of the most significant changes in how AI is used in the real world, especially in engineering and software development.

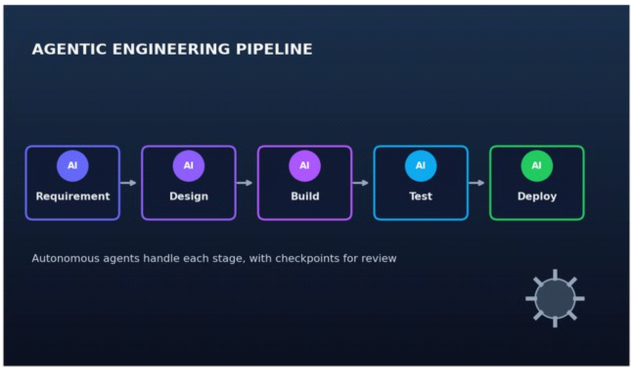
From Chatbots to Autonomous Agents

Early AI tools were built around a single request and a single response: you asked a question, and the model answered. Autonomous agents work differently. They follow a loop — plan, act, observe, and improve — repeating it until the goal is reached. This means an agent can write code, run it, read the error message, fix the bug, and try again, all without a human typing each step manually. This evolution from single-turn chat to continuous autonomous action is what makes today's AI agents feel less like a search box and more like a capable digital coworker.



Agentic Workflows in Engineering

In engineering teams, agentic AI is increasingly used across the whole project pipeline — from gathering requirements and drafting designs, to writing and testing code, to preparing a deployment. Each stage can be handled or assisted by an AI agent, with human engineers reviewing the output at key checkpoints rather than performing every step themselves. This does not remove engineers from the process; it shifts their role toward guiding, reviewing, and making the final decisions, while agents handle much of the repetitive execution.

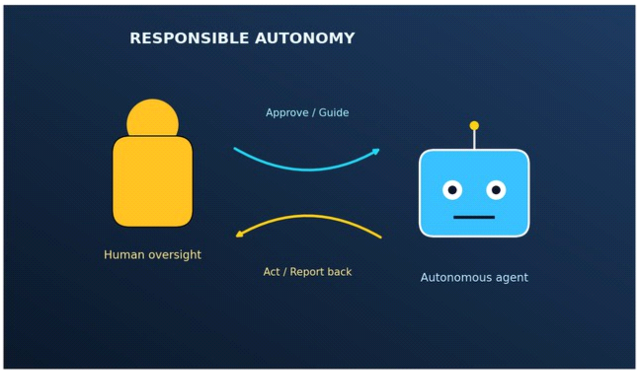


Multi-Agent Systems & Collaboration

Many real-world problems are now tackled not by a single AI agent, but by a team of specialized agents working together. A manager agent might break down a task and assign parts of it to a research agent, a coding agent, a testing agent, and a review agent, similar to how a human engineering team is organized. These multi-agent systems communicate, share results, and coordinate their work, allowing complex projects to be completed faster and with more thorough checking than a single model working alone.

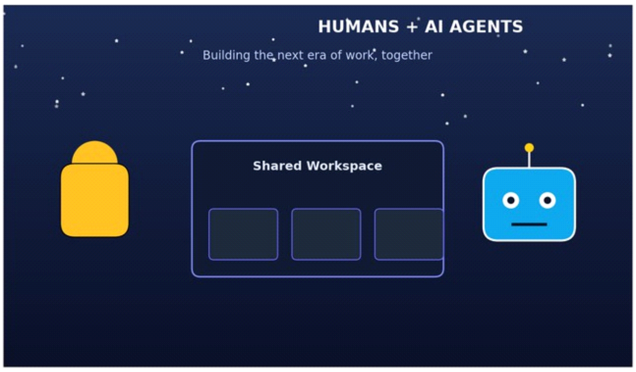
Human-in-the-Loop & Responsible Autonomy

Giving AI agents more independence raises an important question: how much autonomy is safe? Responsible autonomy means keeping a human in the loop for key decisions — approving major changes, reviewing sensitive actions, and setting clear boundaries on what an agent is allowed to do without asking first. This balance protects against mistakes and unintended consequences while still letting agents handle routine work independently. For future engineers, understanding where to place these checkpoints is as important as building the agents themselves.



The Future of Work: Humans + AI Agents

The future of work will not be humans versus AI agents, but humans and AI agents working side by side. Routine, repetitive, and well-defined tasks are increasingly handled by autonomous systems, freeing people to focus on creativity, judgment, strategy, and the human relationships that technology cannot replace. Engineers who learn to design, direct, and collaborate with AI agents today will be the ones shaping how this partnership unfolds across every industry in the years ahead.



Placements:

Sl. No	Company Name	Package	Designation	No. of CSE Students placed
1	Movate	3.2 LPA	Digital Infrastructure Services	5
2	JARO	10.16 LPA	Graduate Trainee	1
3	TCS	7.09 LPA	System Engineer	5

Events:

FDP on Generative AI and AI Tools for Teaching, Research & Academic Administration

The Department of Computer Science & Engineering at Vignan's Institute of Management and Technology for Women (VMTW), Hyderabad, successfully organized a One-Week Offline Faculty Development Programme titled "Generative AI and AI Tools for Teaching, Research & Academic Administration" from 08-12-2025 to 14-12-2025. The programme was conducted under the aegis of the Vignan Group of Institutions and was open to faculty members of all engineering departments. A total of 55 faculty members registered and attended the programme.

Generative Artificial Intelligence has, within a very short span of time, moved from being a research curiosity to an everyday academic instrument. Tools such as ChatGPT, Google Gemini, Claude and Microsoft Copilot are now capable of assisting a teacher in preparing lesson plans, drafting question papers, mapping questions to Bloom's Taxonomy, summarising research literature, and compiling the voluminous documentation demanded by NBA and NAAC accreditation processes. However, the effective and ethical use of these tools requires structured training — an untrained user obtains generic, unverifiable and often incorrect output, whereas a trained user obtains precise, curriculum-aligned and verifiable output. This FDP was designed to bridge exactly that gap.

The programme was structured around nine key modules: Fundamentals of Generative AI; Prompt Engineering for Faculty; a comparative study of ChatGPT, Gemini, Claude and Microsoft Copilot; AI-assisted lesson planning and content creation; AI for question paper generation and Bloom's Taxonomy mapping; AI for NBA/NAAC documentation; AI for research paper writing and literature review; AI ethics and responsible use; and daily hands-on workshops. Sessions were delivered by five distinguished resource persons drawn from both industry (Aditi Digital Solution and HCL Technologies) and academia (Vasavi College of Engineering, Anurag University and Mohan Babu University), ensuring a balanced exposure to practical tool usage and academic rigour.

Every day of the programme concluded with a hands-on workshop in which participants worked on their own laptops and produced a tangible academic artefact — a prompt library, a unit lesson plan, a CO-mapped question paper, an NBA criterion write-up, a literature review matrix and a draft abstract. By the end of the week, each participant had assembled a complete portfolio of AI-assisted academic deliverables directly usable in the current academic year.

Objectives of the FDP

The FDP was conducted with the objective of building the capability of faculty members to apply Generative AI tools responsibly and productively across teaching, research and academic administration. Its specific objectives were:

- To provide a clear conceptual understanding of Generative AI, Large Language Models, and their capabilities and limitations in an academic context.
- To develop practical proficiency in prompt engineering so that faculty can obtain precise, curriculum-aligned outputs from AI tools.
- To familiarise participants with the leading AI platforms — ChatGPT, Google Gemini, Claude and Microsoft Copilot — and to help them select the right tool for a given academic task.
- To enable faculty to design AI-assisted teaching materials such as lesson plans, lecture notes, slide decks, assignments and laboratory manuals.
- To train participants in AI-assisted question paper generation, difficulty balancing and Bloom's Taxonomy mapping with Course Outcome alignment.
- To automate and accelerate academic documentation work required for NBA and NAAC accreditation.
- To improve research productivity through AI-assisted literature review, research gap identification, paper drafting and language refinement.
- To create awareness of AI ethics, hallucination, bias, data privacy, plagiarism and academic integrity, and to promote the responsible application of AI in education.

STUDENT PROJECTS

A Hybrid CNN-LSTM Approach for Precision Deepfake Image Detection Based on Transfer Learning

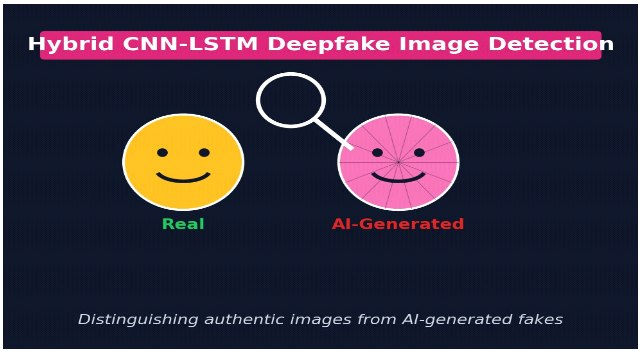
Sadineni Manaswini

(22UP1A05F1)

Introduction:

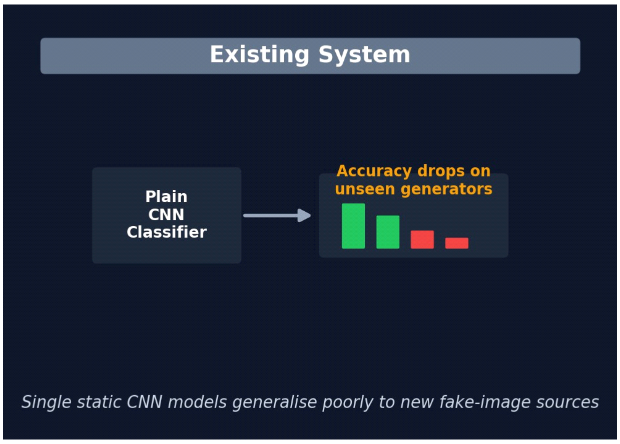
The rapid advancement of generative AI has made it possible to create highly realistic synthetic images and deepfakes that are often indistinguishable from genuine photographs to the human eye. This poses serious risks across areas such as misinformation, identity theft, fraud, and the erosion of public trust in digital media. As deepfake generation techniques continue to improve in visual quality and realism, the need for equally sophisticated and reliable detection methods has become increasingly urgent for platforms, institutions, and individuals alike.

This project proposes a hybrid CNN-LSTM approach for precision deepfake image detection, built on top of transfer learning to leverage powerful, pretrained feature extractors. By combining the spatial feature extraction strength of Convolutional Neural Networks with the sequence modeling capability of Long Short-Term Memory networks, the system aims to capture both fine-grained visual artefacts and subtle patterns across image regions, resulting in higher detection accuracy and stronger generalisation to new and evolving deepfake generation techniques.



Existing System:

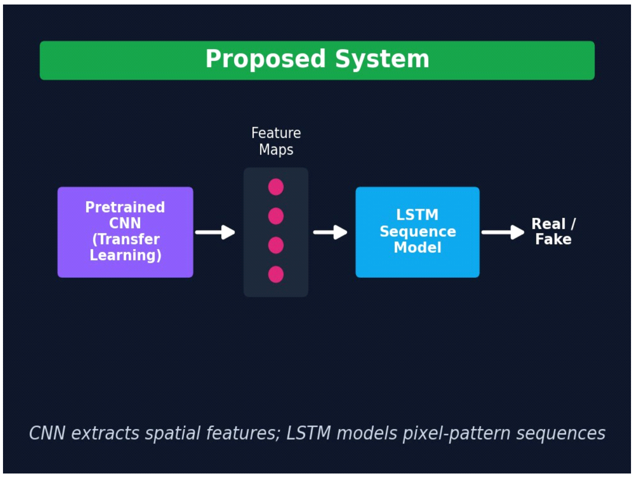
Most existing deepfake detection systems rely on a single, plain Convolutional Neural Network trained end-to-end on a labelled dataset of real and fake images. While such models can achieve reasonable accuracy on the specific dataset and generation technique they were trained on, they frequently fail to generalise well to images produced by unseen or newly emerging deepfake generators, since each generation method leaves behind distinct, technique-specific artefacts that a single static model may not have learned to recognise.



Proposed System:

The proposed system introduces a hybrid architecture that combines a pretrained CNN, adapted through transfer learning, with an LSTM network to improve deepfake detection precision. The CNN component, initialised with weights learned from large-scale image datasets, is fine-tuned to extract rich, high-level spatial features from input images, capturing subtle visual inconsistencies such as unnatural textures, blending artefacts, or irregular lighting that are often present in manipulated content.

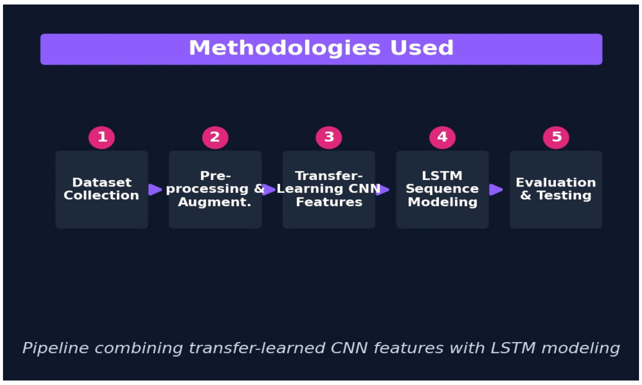
These extracted feature maps are then passed into an LSTM network, which models sequential dependencies and relationships across different spatial regions or feature sequences, allowing the system to detect more complex and distributed patterns of manipulation that a CNN alone might miss. By fine-tuning only the later layers of the pretrained CNN through transfer learning, the system also reduces training time and data requirements while improving robustness and generalisation to previously unseen deepfake generation techniques.



CNN extracts spatial features; LSTM models pixel-pattern sequences

Methodologies Used:

The methodology begins with assembling a diverse dataset of real and deepfake images sourced from multiple generation techniques, followed by pre-processing steps such as face cropping, resizing, normalisation, and data augmentation to improve model robustness and reduce overfitting. A pretrained CNN architecture is then selected and fine-tuned through transfer learning to extract discriminative spatial feature representations from each image.



Pipeline combining transfer-learned CNN features with LSTM modeling

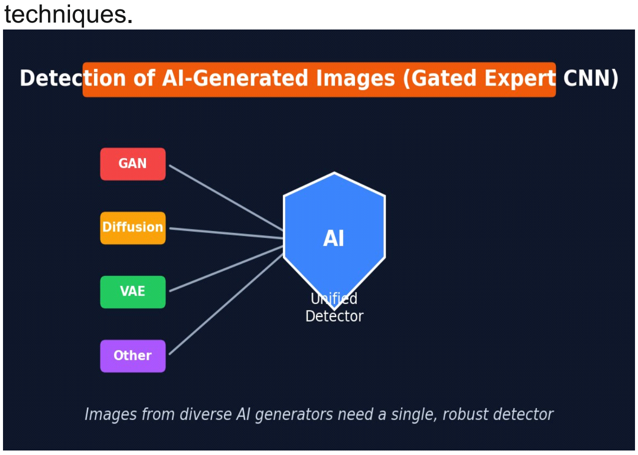
Detection of AI-Generated Images from Various Generators Using Gated Expert CNN J Manoj Vaishnavi

(23UP5A0508)

Introduction:

The proliferation of AI image generators, including Generative Adversarial Networks, diffusion models, variational autoencoders, and other emerging architectures, has made it possible to produce synthetic images at scale, each generator leaving behind its own subtle and distinct artefacts. This diversity presents a significant challenge for detection systems, since a model trained to recognise images from one type of generator may struggle to accurately identify images produced by a different, structurally distinct generation technique.

This project proposes a detection system built around a Gated Expert CNN architecture, designed specifically to identify AI-generated images across a wide variety of generator types. Rather than relying on a single, generalised model, the system employs multiple specialised expert sub-networks, each tuned to recognise artefacts characteristic of a particular generator family, coordinated by a gating mechanism that intelligently routes each input to the most relevant experts, improving overall detection accuracy and robustness across diverse and evolving generation techniques.

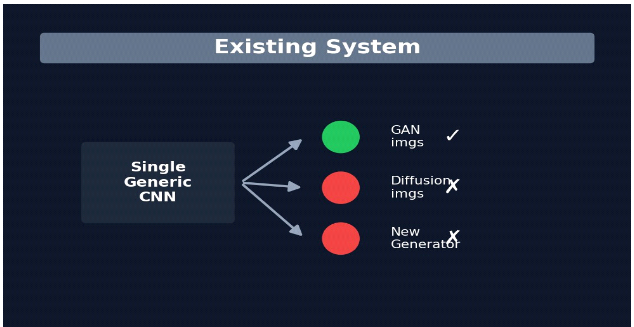


Images from diverse AI generators need a single, robust detector

Existing System:

Most current AI-generated image detection systems rely on a single, generic Convolutional Neural Network trained on a dataset that typically emphasises one or two generation techniques, most commonly GAN-produced images. While such models can perform reasonably well on the specific generator type they were trained on, their accuracy tends to degrade significantly when evaluated against images from other generator families, such as diffusion models, or entirely new generators that emerge after the model was trained.

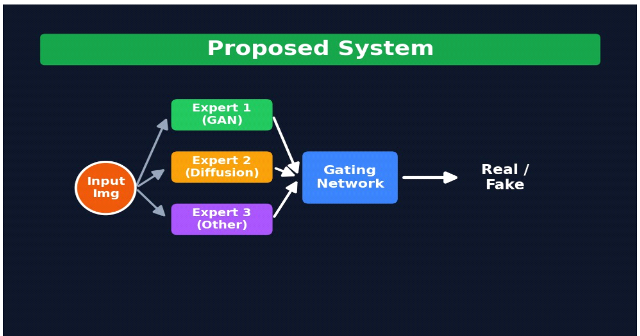
This lack of adaptability stems from the fact that different generative techniques introduce distinct, technique-specific artefacts in the images they produce, and a single, uniformly trained CNN often learns features that are overly specialised to its training distribution rather than general, transferable indicators of synthetic content. As a result, existing systems frequently exhibit poor generalisation, requiring frequent retraining or separate models to keep pace with rapidly evolving generative AI technology.



One-size-fits-all CNNs generalise poorly across generator types

Proposed System:

The proposed system addresses this limitation using a Gated Expert CNN architecture, structured as a mixture of specialised expert sub-networks, each trained to detect artefacts characteristic of a particular category of AI generator, such as GAN-based, diffusion-based, or other emerging techniques. Rather than forcing a single model to generalise across all generator types simultaneously, this design allows each expert to develop a focused, highly discriminative understanding of the artefact patterns specific to its assigned generator family.



A gating network weights specialised expert CNNs per generator type

Methodologies Used:

The methodology begins with the assembly of a comprehensive, multi-generator dataset containing real images alongside synthetic images produced by a variety of generator types, followed by pre-processing steps such as resizing, normalisation, and artefact-preserving augmentation to maintain the subtle generation-specific patterns the model relies on for detection. Each expert CNN branch is then trained independently on data corresponding to its designated generator category, allowing it to specialise in recognising the relevant artefact signatures.

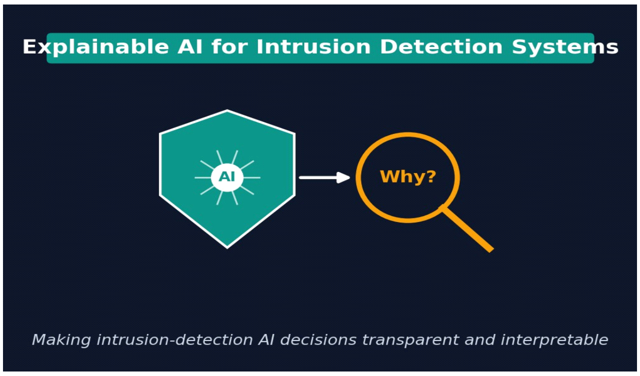
Training specialised experts and a gating layer for robust detection

Explainable AI for Intrusion Detection Systems (IDS)Thatikonda Dedeepya

(22UP1A05H2)

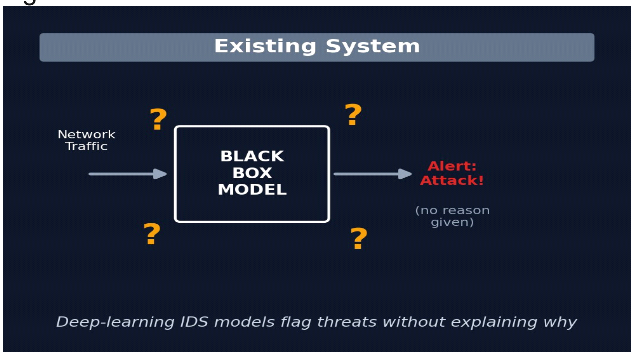
Introduction:

Intrusion Detection Systems play a vital role in safeguarding networks by identifying malicious activity such as unauthorised access, malware propagation, and denial-of-service attacks. In recent years, machine learning and deep learning models have significantly improved detection accuracy by learning complex patterns from network traffic data. However, these high-performing models are often highly complex and function as opaque black boxes, making it difficult for security analysts to understand why a particular alert was raised or which specific traffic features led to that decision.



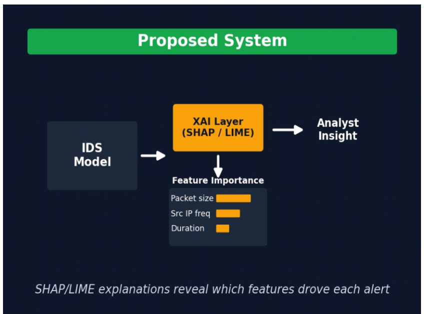
Existing System:

Most existing Intrusion Detection Systems built on machine learning or deep learning rely on complex models such as deep neural networks, ensemble classifiers, or support vector machines, which are selected primarily for their ability to achieve high detection accuracy on network traffic datasets. While these models are effective at distinguishing between normal and malicious traffic, their internal decision-making process is largely opaque, offering no insight into which specific features or patterns contributed to a given classification.



Proposed System:

The proposed system integrates Explainable AI techniques, such as SHAP (SHapley Additive exPlanations) and LIME (Local Interpretable Model-agnostic Explanations), directly into the intrusion detection pipeline to make model decisions transparent and interpretable. Rather than replacing the underlying high-performance detection model, the explainability layer works alongside it, analysing each prediction to determine which specific input features, such as packet size, connection duration, or source IP frequency, contributed most strongly to the model's decision.



Program Outcomes:

PO1: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and Engineering sciences.

PO3: Design/Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health safety, and the cultural, societal, and environmental considerations.

PO4: Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5: Modern Tool Usage: Create, select and apply appropriate techniques, resources and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The Engineer and Society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and Sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of,and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

Po9: Individual and Team Work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.

Po10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11: Project Management and Finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team to manage projects and in multidisciplinary environments.

Po12: Life-Long Learning: Recognize the need for and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change.