VIGNAN'S INSTITUTE OF MANAGEMENT AND TECHNOLOGY FOR WOMEN

INSIGHT

NEWS LETTER

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

VOLUME NO.: 39

JAN - MAR, 2026

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

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

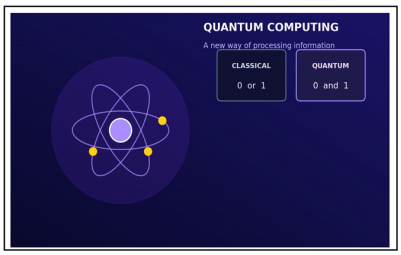
Dr. Phijik Battula,
Associate Professor &
HoD, DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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, Mrs D Geetha,
Assistant Professor (CSE)

Quantum Computing & Post-Quantum Cybersecurity-Preparing Future Engineers

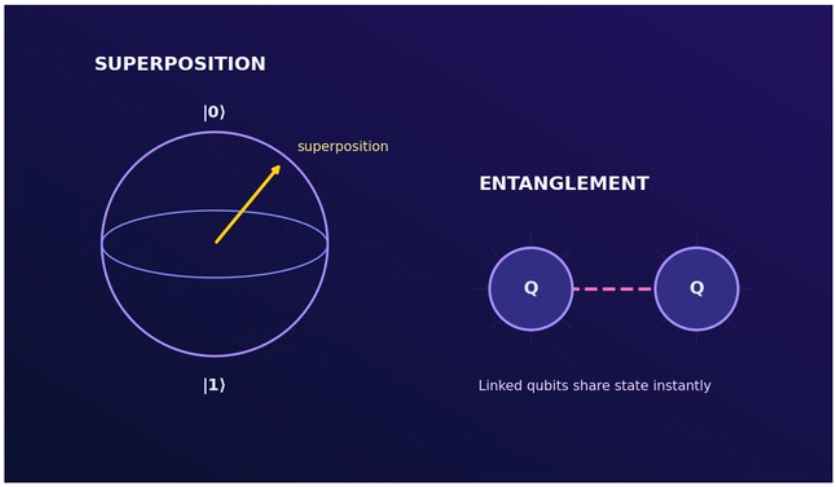


Introduction to Quantum Computing

Classical computers store and process information as bits, each one strictly a 0 or a 1. Quantum computers use quantum bits, or qubits, which can exist in a combination of both states at once. This fundamentally different way of handling information allows quantum computers to explore many possible solutions simultaneously for certain types of problems, rather than checking them one at a time. Quantum computing is not simply a faster classical computer; it is a different computing paradigm that is becoming increasingly relevant to engineers across many fields.

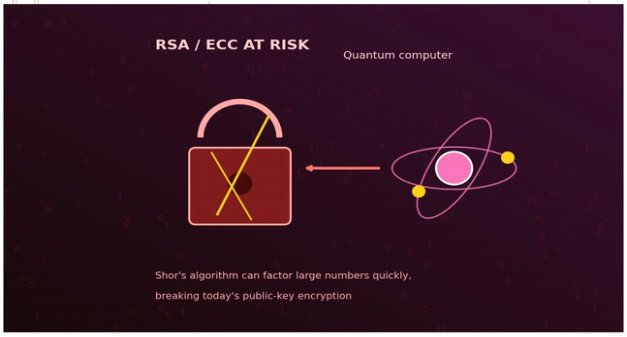
Qubits, Superposition & Entanglement

Two ideas make quantum computing possible: superposition and entanglement. Superposition means a qubit can represent a mix of 0 and 1 at the same time, rather than being locked into one value. Entanglement means two or more qubits can become linked so that the state of one instantly relates to the state of another, no matter the distance between them. Together, these properties let quantum computers represent and manipulate far more information per operation than classical bits, which is the source of their potential power for specific kinds of calculations.



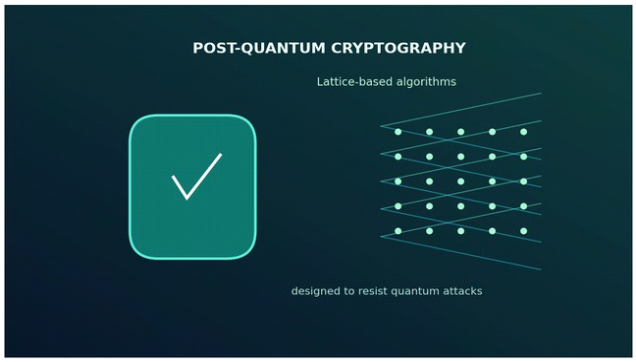
Why Quantum Threatens Classical Encryption

Much of today's digital security, including RSA and elliptic-curve cryptography, relies on math problems that are extremely slow for classical computers to solve, such as factoring very large numbers. A sufficiently powerful quantum computer running an algorithm known as Shor's algorithm could solve these problems dramatically faster, potentially breaking the encryption that protects banking, communications, and government data. This is why quantum computing is not only an opportunity for innovation, but also a serious concern for cybersecurity professionals preparing for the years ahead.



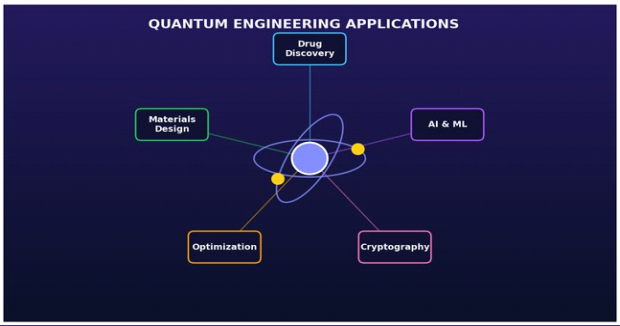
Post-Quantum Cryptography (PQC)

Post-quantum cryptography refers to new encryption methods designed to remain secure even against attacks from powerful quantum computers. Many of these methods are based on lattice problems and other mathematical structures that, unlike factoring, are believed to stay hard even for quantum algorithms. Governments and standards organizations are already rolling out post-quantum algorithms to replace older encryption before large-scale quantum computers become a practical threat, an effort often called "quantum-proofing" today's digital infrastructure.



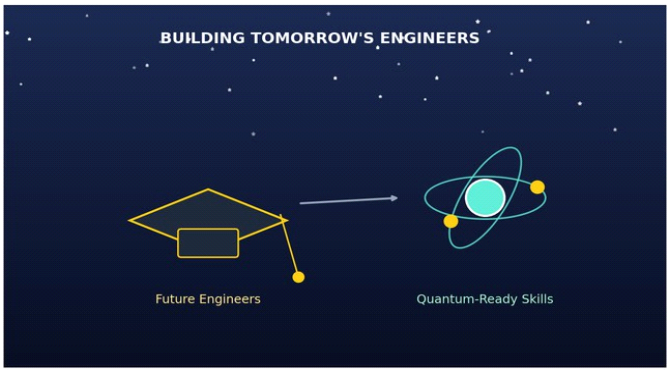
Quantum Computing Applications in Engineering

Beyond cybersecurity, quantum computing has promising applications across many engineering and scientific fields. It can help simulate molecules for faster drug discovery, model new materials at the atomic level, solve complex optimization problems in logistics and manufacturing, and even accelerate parts of machine learning. Because quantum computers handle certain calculations in fundamentally different ways, they open possibilities that would take classical supercomputers an impractical amount of time to explore.



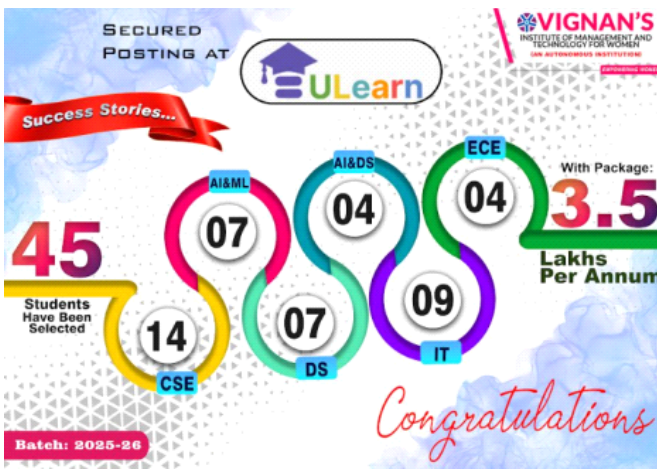
Preparing Future Engineers for the Quantum Era

Quantum computing and post-quantum security are moving from research labs into real engineering practice, and future engineers will need at least a working understanding of both. This means learning the basics of quantum principles, staying aware of which cryptographic systems are quantum-vulnerable, and knowing how to plan for a transition to quantum-safe standards. Students who build this foundation now will be far better prepared to design, secure, and adapt the systems of tomorrow.



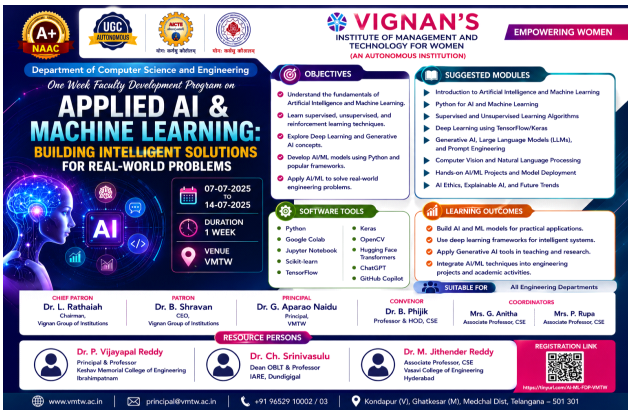
Placements:

Sl. No	Company Name	Package	Designation	No. of CSE Students placed
1	Truerize	4.5 LPA	AI, Data Science & business Analyst	23
2	Ulearn	3.5 LPA	Research Analyst	14
3	Aurus	4 LPA	Software Developer	7



Events:

FDP ON Applied AI & Machine Learning: Building Intelligent solutions for real world problems



The Department of Computer Science & Engineering, Vignan's Institute of Management and Technology for Women (VMTW), Hyderabad, successfully organized a One-Week Faculty Development Programme titled "Applied AI & Machine Learning: Building Intelligent Solutions for Real-World Problems" from 07 July 2025 to 14 July 2025. The programme was designed to equip faculty members with the knowledge and practical skills required to build, evaluate and deploy modern AI/ML solutions, bridging the gap between conceptual understanding and hands-on implementation.

A total of 45 faculty members from the CSE and CSE (AI & ML) departments participated. The programme spanned the full AI/ML lifecycle — data preprocessing, supervised and unsupervised learning, deep learning, Generative AI and Large Language Models, computer vision, natural language processing, model deployment and AI ethics — delivered by three distinguished resource persons from Keshav Memorial College of Engineering, the Institute of Aeronautical Engineering (IARE) and Vasavi College of Engineering.

Each day combined forenoon conceptual sessions in the Seminar Hall with an afternoon hands-on laboratory session in the AI/ML Computing Laboratory, using Python, Google Colab, Jupyter Notebook, Scikit-learn, TensorFlow, Keras, OpenCV, Hugging Face Transformers, ChatGPT and GitHub Copilot. The programme ran over seven working days; Sunday, 13-07-2025 was observed as a holiday and the concluding day was therefore held on Monday, 14-07-2025.

Objectives of the FDP

As stated in the programme brochure, the FDP was conducted with the following objectives:

- To understand the fundamentals of Artificial Intelligence and Machine Learning.
- To learn supervised, unsupervised and reinforcement learning techniques.
- To explore Deep Learning and Generative AI concepts.
- To develop AI/ML models using Python and popular frameworks.
- To apply AI/ML to solve real-world engineering problems.

STUDENT PROJECTS

Optimising Cybersecurity Attack Detection

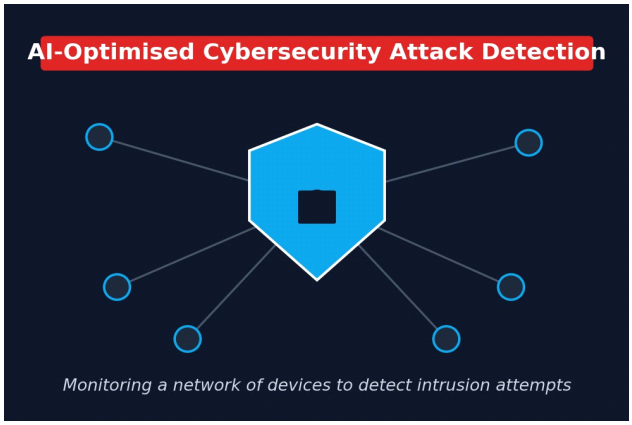
G Nandini Reddy

(22UP1A0564)

Introduction:

Cybersecurity attack detection has become one of the most pressing requirements for protecting digital infrastructure in an era where organisations depend heavily on interconnected systems, cloud platforms, and networked devices. Attackers continuously develop new techniques, ranging from malware and phishing campaigns to sophisticated network intrusions and denial-of-service attacks, making it increasingly difficult for security teams to keep pace using conventional methods alone. As the volume of network traffic grows and attack strategies evolve in complexity, the gap between traditional detection capabilities and real-world threats continues to widen.

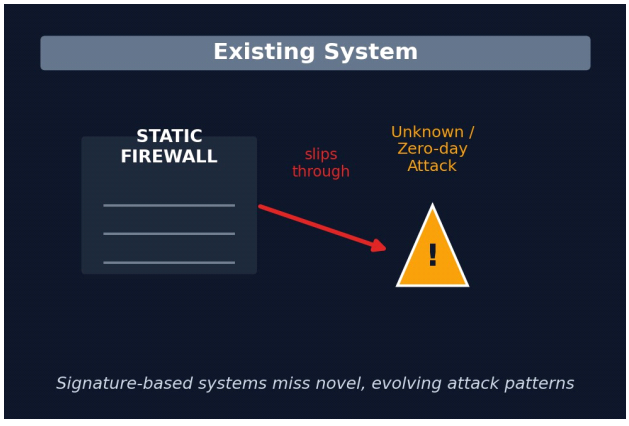
This project focuses on optimising attack detection by combining real-time network traffic monitoring with intelligent, data-driven classification techniques. The core objective is to build a system that can accurately distinguish between legitimate and malicious activity, minimise false positives that burden security analysts, and respond to threats with minimal delay. By improving detection accuracy and response time, the system aims to strengthen the overall security posture of an organisation, reduce the risk of data breaches, and protect sensitive information and critical systems from compromise.



Existing System:

Current cybersecurity systems largely depend on traditional signature-based detection, static firewall rules, and antivirus databases that identify threats by matching incoming traffic or files against a known catalogue of attack signatures. While this approach is effective against previously identified threats, it is fundamentally reactive in nature. It can only recognise attacks that have already been documented, leaving networks vulnerable to zero-day exploits and novel attack variants that have not yet been catalogued or studied by security researchers.

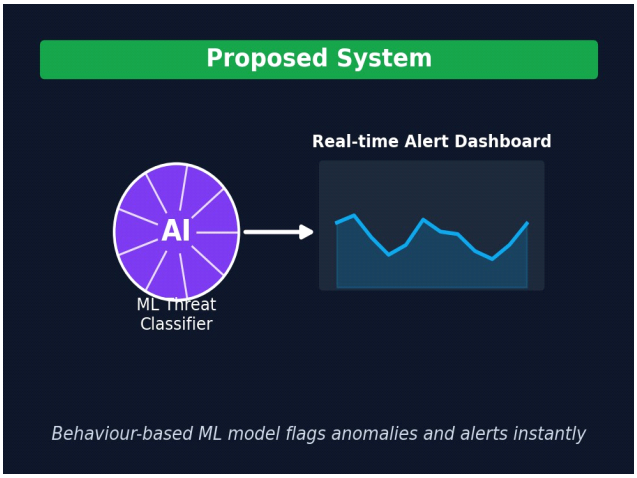
Beyond the inability to detect unknown threats, existing systems commonly suffer from a high rate of false positives, which forces security teams to spend valuable time investigating benign activity flagged as suspicious. Many traditional tools also lack adaptive or self-learning capability, meaning their rule sets must be manually updated as new threats emerge, a process that is slow and resource intensive. Furthermore, these systems often provide limited real-time visibility into ongoing network behaviour, delaying detection and response and leaving organisations exposed during the critical window between an attack's onset and its eventual discovery.



Proposed System:

The proposed system optimises attack detection by combining machine learning based classification with continuous, real-time network traffic monitoring. Rather than relying solely on fixed signatures, the system applies feature optimisation techniques to identify the most relevant indicators of malicious behaviour, allowing it to recognise both known and previously unseen attack patterns through behavioural analysis. This shift from static pattern matching to adaptive learning significantly improves the system's ability to detect emerging and evolving threats.

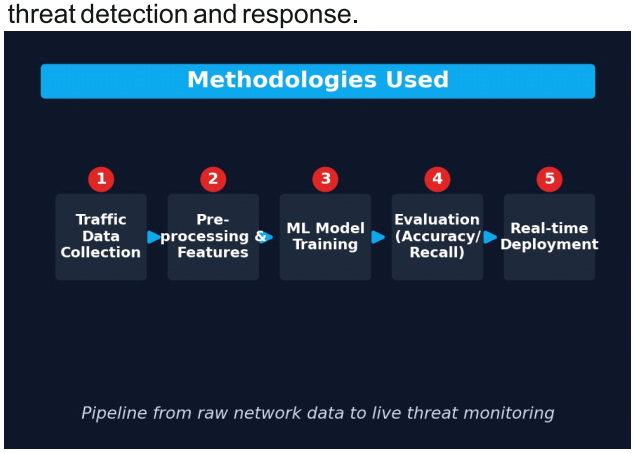
When the model identifies anomalous or suspicious activity, it automatically triggers real-time alerts, enabling security teams to respond quickly before an attack can escalate or cause significant damage. The system is designed to continuously refine its detection accuracy as it is exposed to more data, reducing false positives over time while maintaining high sensitivity to genuine threats. Overall, this approach results in a detection pipeline that is faster, more accurate, and considerably more resilient to the constantly changing threat landscape than conventional systems.



Methodologies Used:

The development methodology begins with the collection of network traffic data from real or simulated environments, capturing a wide range of both normal and malicious activity to ensure the resulting model generalises well. This raw data is then pre-processed to remove noise and inconsistencies, followed by a feature selection and optimisation stage that isolates the attributes most indicative of malicious behaviour, such as packet frequency, connection duration, and payload characteristics.

A machine learning model, such as a Random Forest classifier or a neural network, is then trained on the processed dataset and rigorously evaluated using performance metrics including accuracy, precision, recall, and F1-score to ensure reliable detection with minimal false alarms. Once validated, the model is tested against a range of simulated attack scenarios to confirm its robustness before being deployed within a real-time monitoring dashboard, where it continuously analyses live traffic and generates alerts for ongoing threat detection and response.



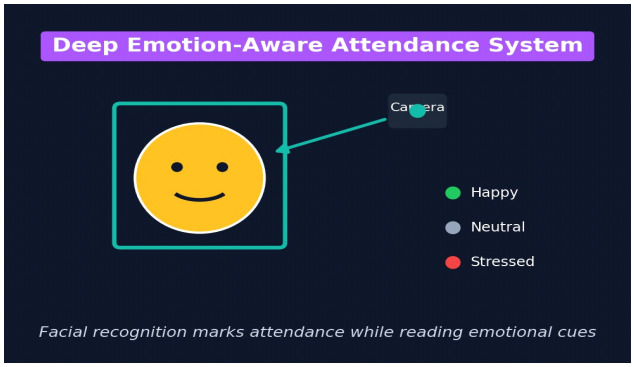
Pipeline from raw network data to live threat monitoring

Deep Emotion-Aware Attendance System using Real-Time Facial Recognition & Mood Visualization (22UP1A0585)

Introduction:

Attendance tracking is a routine but essential process across schools, colleges, and workplaces, yet traditional systems capture only a single dimension of information: whether a person was present or absent. This narrow focus overlooks a wealth of contextual information about how individuals are actually feeling and engaging during a session, information that can be critical for identifying disengagement, stress, or wellbeing concerns before they escalate into larger problems such as poor performance or dropout.

The Deep Emotion-Aware Attendance System is designed to close this gap by combining facial recognition based attendance marking with real-time emotion detection. As a camera captures live video of a classroom or workplace, the system simultaneously identifies each individual to log their attendance and analyses their facial expressions to infer emotional state. This dual-purpose approach gives institutions a far richer, more actionable understanding of both presence and engagement, enabling data driven decisions that support student or employee wellbeing over time.

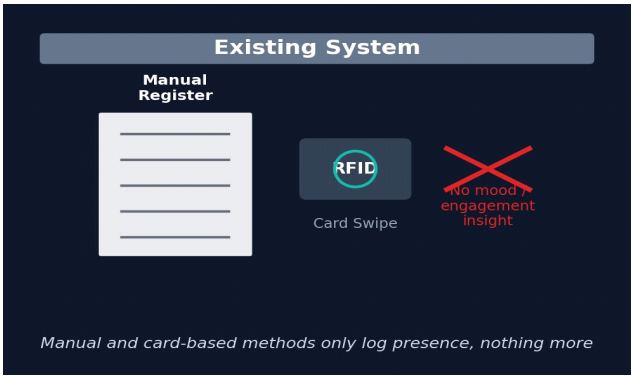


Facial recognition marks attendance while reading emotional cues

Existing System:

Most attendance systems in use today rely on manual roll calls, RFID card swipes, or basic facial recognition that does nothing more than confirm a person's presence. Manual roll calls are time consuming and disrupt the flow of a class or meeting, while RFID and card based systems are vulnerable to proxy attendance, where one person swipes a card on behalf of another, undermining the accuracy of the records altogether.

More importantly, none of these existing approaches offer any insight into how engaged, attentive, or emotionally comfortable individuals are during the session being tracked. Teachers and managers have no early warning signs of stress, disengagement, or dissatisfaction within their group, since attendance data alone cannot reveal how people are actually experiencing their environment. This absence of emotional or behavioural insight leaves a significant blind spot in how institutions monitor and support the people they are responsible for.

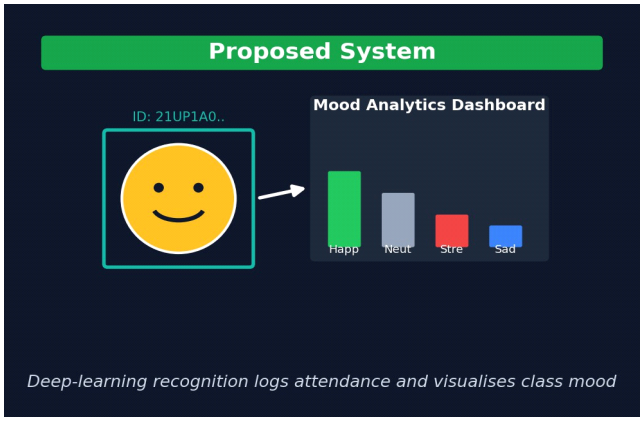


Manual and card-based methods only log presence, nothing more

Proposed System:

The proposed system uses deep learning based facial recognition to automatically detect and identify individuals from live video, marking their attendance without requiring any manual input or physical contact. Running in parallel, a convolutional neural network analyses each detected face to classify the underlying emotional state, such as happy, neutral, sad, or stressed, based on subtle facial expression patterns captured in real time.

The results from both the attendance and emotion recognition pipelines are compiled into a unified mood visualisation dashboard, giving teachers or managers a clear, aggregated view of engagement and wellbeing trends across a class or team over time. This enables timely, informed interventions, whether that means checking in with a struggling student, adjusting the pace of a lesson, or identifying broader patterns of stress within a group, all while streamlining and automating the attendance process itself.

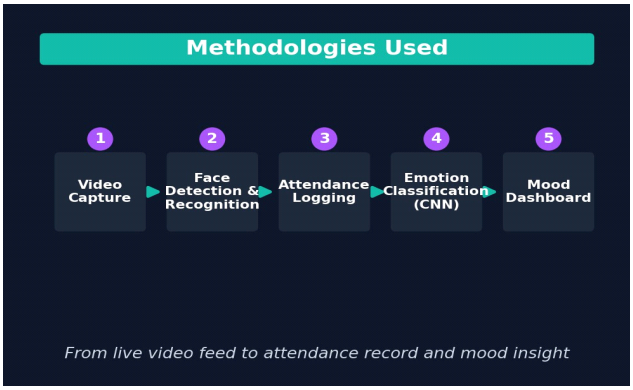


Deep-learning recognition logs attendance and visualises class mood

Methodologies used:

The system pipeline begins with real-time video capture from a camera positioned within the classroom or workspace, followed by a face detection and recognition stage that identifies each individual against a registered database and automatically logs their attendance. This recognition stage is built using computer vision techniques such as OpenCV combined with deep learning models trained to reliably identify faces under varying lighting and angle conditions.

A separate emotion classification model, trained on labelled facial expression datasets covering a range of emotional categories, processes each detected face to determine the individual's current emotional state. All attendance and emotion data is stored in a structured database and rendered through an interactive mood analytics dashboard, which visualises trends over time and allows administrators to filter and review engagement patterns at both the individual and group level.



From live video feed to attendance record and mood insight

Task Tracker Tool

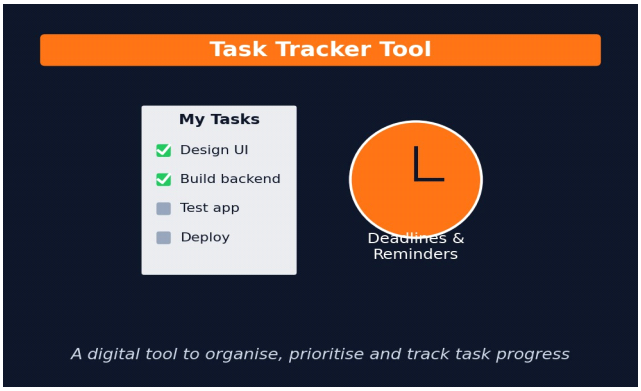
Jangam Harshini

(22UP1A0574)

Introduction:

Effective task management is fundamental to both individual productivity and successful team collaboration, yet many people and organisations still struggle to keep track of what needs to be done, who is responsible for it, and how close each task is to completion. Without a clear, shared system for organising work, deadlines are frequently missed, responsibilities become unclear, and it becomes difficult to gauge overall progress on a project.

The Task Tracker Tool is designed to address these challenges by providing a centralised digital platform where users can create, organise, prioritise, and monitor tasks from start to finish. By bringing all task related information into a single, accessible interface, the tool aims to reduce missed deadlines, improve accountability across teams, and give users a clear, real-time picture of their workload, ultimately making both individual and collaborative work more organised and efficient.

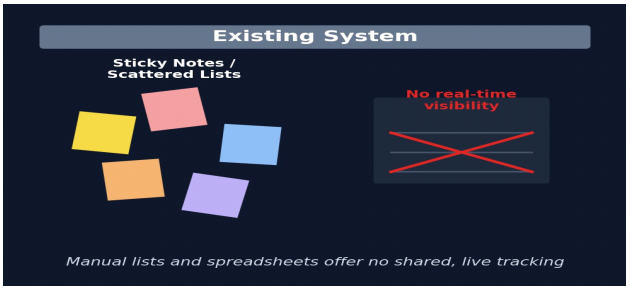


A digital tool to organise, prioritise and track task progress

Existing System:

Despite the wide availability of digital tools, task management in many settings still relies on informal methods such as manual to-do lists, spreadsheets, or physical sticky notes. These approaches may work for very small, individual tasks, but they quickly become unmanageable as the number of tasks grows or when multiple people need to collaborate on shared work, since they offer no built-in support for real-time updates or coordination.

These informal systems make it difficult to prioritise work effectively, are easy to lose, forget, or let fall out of date, and provide no shared visibility for teams working together toward common goals. As a result, deadlines are frequently missed, duplicate effort is common, and it becomes nearly impossible to gain an accurate picture of how work is distributed or how a project is progressing across a group, leading to inefficiency and miscommunication.

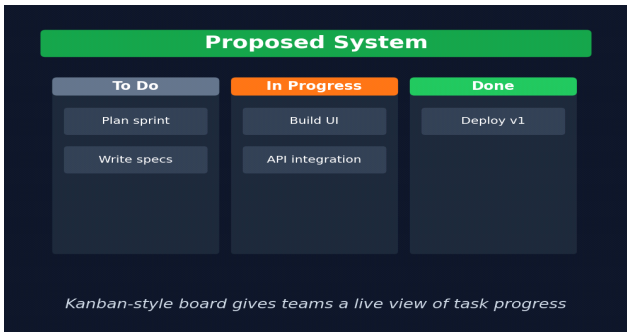


Manual lists and spreadsheets offer no shared, live tracking

Proposed System:

The proposed Task Tracker Tool provides an intuitive digital platform where users can create tasks, set deadlines, assign priority levels, and organise work into clear stages such as To Do, In Progress, and Done. This structured, visual approach makes it easy to see at a glance what needs attention, what is currently being worked on, and what has already been completed, reducing the mental overhead of tracking tasks manually.

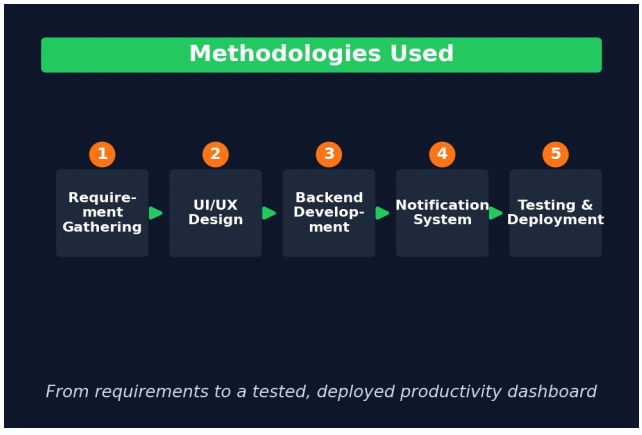
Automated reminders and notifications help ensure that upcoming deadlines are never missed, while a shared, real-time view allows every team member to see workload distribution and overall progress simultaneously. This transparency improves coordination, reduces duplicate effort, and gives managers or team leads an accurate, up-to-date picture of productivity, enabling better planning and more informed decision making across the team.



Kanban-style board gives teams a live view of task progress

Methodologies Used:

Development of the tool begins with a requirement gathering phase to understand the specific needs of its intended users, followed by a UI/UX design stage focused on creating a clean, intuitive interface that makes task creation and tracking as simple as possible. Careful attention is given to designing layouts, such as the kanban style board, that make task status immediately clear at a glance.The backend is then developed to handle core functionality including task creation, updates, deadline management, and secure data storage, with a notification system integrated to deliver timely reminders for approaching deadlines. Once built, the tool undergoes thorough testing for usability and performance to ensure a smooth user experience, before being deployed alongside a productivity dashboard that gives users ongoing visibility into task completion and overall team output.



From requirements to a tested, deployed productivity dashboard

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.