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VISAGE ANALYSE APPEARANCE

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Abstract - Traditional student attendance methods, such as roll calls and sign-in sheets, are time-consuming, error-prone, and vulnerable to proxy attendance. To address these issues, this study proposes an Automated Attendance Management System (AAMS) that integrates CCTV cameras, facial recognition, and GPS verification. The system captures students' facial images in real-time using classroom CCTV cameras without manual intervention, ensuring seamless and continuous attendance monitoring. Face detection is performed using a Haar Cascaded Classifier, and recognition is achieved through the FaceNet model, which compares captured embedding with a pre-registered student database. Additionally, GPS-based location verification confirms that students are within the classroom's geofenced area, preventing fraudulent attendance. This dual-verification system offers a secure, accurate, and efficient alternative to traditional attendance methods.

Key Words: *Face Recognition, Face Embedding, MCTNN, Face Detection.*

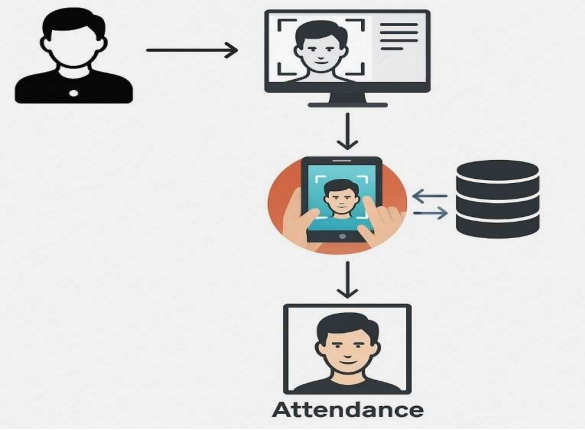
INTRODUCTION

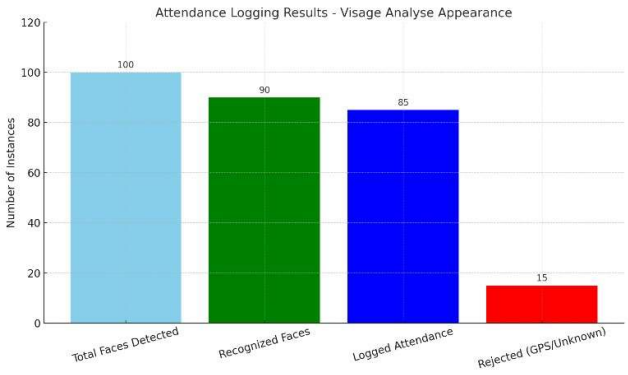
Visage Analyze Appearance is an advanced facial analysis project designed to identify individuals and analyze key appearance attributes such as age, gender, and facial features using deep learning techniques. The system employs MTCNN for efficient face detection and for generating unique facial embedding for recognition. By leveraging real-time image processing and computer vision, the project aims to provide accurate, automated, and intelligent analysis of human faces, making it suitable for applications in surveillance, identity verification, and smart human-computer interaction systems.

Visage Analyze Appearance is an advanced facial analysis system that integrates real-time face detection, recognition, and appearance attribute classification. The system uses MTCNN (Multi-task Cascaded Convolutional Networks) for efficient and accurate face detection, while FaceNet combined with InceptionResnetV1 is employed to generate unique facial embedding for precise recognition. Additionally, the system can analyze attributes such as age, gender, and emotion using deep learning-based classifiers. Developed using Python and libraries like OpenCV, PyTorch, and Tensor Flow, it is designed with a modular architecture for flexibility and scalability. This solution is ideal for applications such as smart surveillance, biometric-based access control, automated attendance systems, and human-computer interaction.

Table 1: Summary of Test Cases and Results for Online Blood Donation Notify and Response System

Test Case	Expected Outcome	Observed Outcome
Face Detection & Recognition	Accurately detect and identify registered faces	Faces detected and recognized correctly under normal conditions





Attendance Logging	Log attendance only for verified students within GPS bounds	Attendance logged correctly with GPS verification
GPS Verification	Prevent attendance if location is outside classroom geofence	Attendance rejected outside geofence
Unregistered Faces	Should not recognize or log unknown/unregistered individuals	Unrecognized faces were correctly ignored
Database Logging	Store attendance records reliably in Excel or database	Logs updated accurately without data loss
System Performance	Real-time processing with minimal delay (<2s per face)	Average recognition time was ~1.2 seconds per face

various sectors such as education, corporate environments, and events. Future improvements can include expanding the system's robustness under diverse lighting and environmental conditions, integrating multi-factor authentication.

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