FaceRec Pro: Project Abstract

1. Introduction

FaceRec Pro is an AI-driven real-time surveillance and attendance management system designed to address the challenge of students skipping classes. Unlike traditional attendance systems that only record presence at the start of a session, FaceRec Pro provides continuous monitoring using a dual-camera setup. By leveraging state-of-the-art deep learning models, the system tracks students' movements between classrooms and corridors, automatically flagging unauthorized absences and notifying authorities in real-time.

2. Tech Stack

* Frontend: A responsive 'Glassmorphic' web interface developed with Vanilla HTML, CSS, and JavaScript.
* Backend: Powered by Python and the Django Web Framework for secure and scalable server-side operations.
* Database: MySQL is used for persistent storage of student records, attendance logs, and system alerts.
* AI Engine: YOLOv11 for high-speed face detection and face_recognition for precise identification.

3. Working Methodology

1. Dual-Camera Acquisition: The system captures live video feeds from a 'Classroom' camera and a 'Corridor' camera.
2. Face Detection & Recognition: Each frame is processed by YOLOv11 to locate faces, followed by identification using deep learning encodings.
3. Presence Tracking: Students in the Classroom are marked 'Present'. If a student is missing for >15s, a 'Missing' state is triggered.
4. Automated Alerts: The system monitors the Corridor for the student and sends email alerts to administrators upon confirmed absence.
5. Data Logging: All events are recorded in MySQL and displayed on a real-time Dashboard.

4. System Diagrams (Logical Overview)

4.1 Data Flow Diagram (DFD Level 0)

Summary: The DFD illustrates the flow of student eye/face data from CCTV cameras to the Django Engine. The engine

interacts with the MySQL Database to log attendance and missing events, while simultaneously updating the Admin Dashboard and sending Email Alerts.

4.2 Entity-Relationship (ER) Diagram

Summary: Entities: PERSON (Student details), FACE_IMAGE (Multiple encodings per student), ATTENDANCE (Daily logs), MISSING_LOG (Alert history), and DEPARTMENT. Relationships: A Person HAS many FaceImages, MARKS many Attendance records, and TRIGGERS MissingLogs.

4.3 System Architecture

Summary: Layers: Input Layer (Dual Cameras) -> Processing Layer (OpenCV, YOLOv11, FaceRec) -> Data Layer (MySQL, Media Repository) -> Presentation Layer (Glassmorphic Web UI, Email Service).

5. Conclusion

FaceRec Pro provides a automated solution for educational institutions to ensure student accountability. By combining real-time AI detection with proactive alerting, it bridges the gap in traditional attendance monitoring.