SMART FACIAL RECOGNITION ATTENDANCE SYSTEM FOR ONLINE LEARNING PLATFORMS

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1 ABSTRACT

This project presents an automated face recognition–based attendance system designed to streamline student attendance management. Using Face-API.js on the frontend and PHP with MySQL on the backend, the system captures real-time video through a webcam, detects and recognizes registered students, and records attendance automatically. Features include easy student and course management, real-time monitoring, and secure storage of attendance data with export to Excel for reporting. The system reduces manual effort, prevents proxy attendance, and ensures faster, more accurate record-keeping, offering a practical and user-friendly solution for educational institutions.

2 PROBLEM STATEMENT

Online and hybrid learning environments make it difficult to verify student attendance due to the lack of physical presence. Traditional methods such as manual roll calls or self-reported attendance are prone to errors, impersonation, and inflated records. There is a growing need for a robust, secure, and scalable attendance system that can confirm student identity, prevent spoofing, and provide lecturers with control over verification. The absence of such systems undermines academic integrity and accountability.

3 OBJECTIVES

- Design **admin and lecture dashboard** for registration and live attendance capture using webcam-based face detection.
- Implement **anti-spoofing mechanisms** including head-turn prompts, blink detection, and texture analysis for liveness verification.
- Develop **an admin dashboard** for lecturers to manage attendance sessions, monitor student attempts, and approve or reject attendance records.
- Integrate **a scalable database** capable of storing unlimited student records, face embeddings, and attendance logs with secure access and audit trails.

4 LITERATURE REVIEW

Approach	Strengths	Limitations / Gaps
Manual Roll Call	Simple, widely used	Time-consuming, prone to impersonation
Password-Based Login	Easy to implement	Can be shared, lacks identity verification
LBPH / Eigenfaces	Early biometric methods	Low accuracy, no liveness detection
FaceNet / VGGFace	High recognition accuracy	Limited anti-spoofing, privacy concerns
LMS Attendance Plugins	Integrated with learning platforms	No biometric verification, easily bypassed
Proposed System	Combines live face detection, anti-spoofing, and lecturer and admin dashboard	Addresses fraud, ensures privacy, supports SDG 4 and manages lecturers' and students' database efficiently

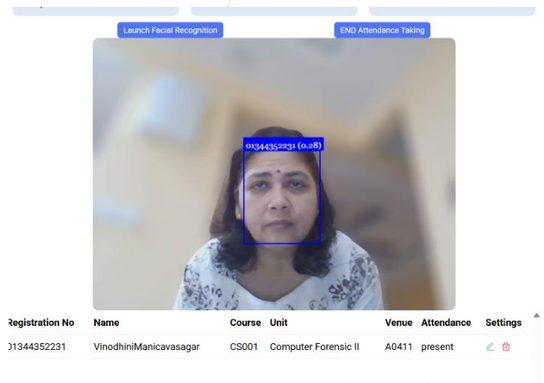
5 METHODOLOGY

The system uses a **web-based architecture** to automate attendance through real-time face recognition. A live webcam feed is captured on the frontend using **HTML, CSS, and JavaScript**, where **Face-API.js** detects and recognizes student faces.

During registration, facial features are extracted and stored as reference data. During attendance marking, live facial data is matched with stored records to identify students. The backend, developed using **PHP**, processes attendance requests and stores records securely in a **MySQL** database.

XAMPP provides the local server environment, while **MySQL Workbench** is used for database design and management. Attendance records can be exported to **Excel** for easy reporting.

6 RESULT & DISCUSSION



The face recognition–based attendance system successfully **identifies registered students in real time** and **automatically records** attendance through a live webcam feed. Attendance data is securely **stored in a MySQL database** and can be exported to **Excel** for easy reporting. The system improves accuracy, saves time, and reduces proxy attendance, though performance may be affected by poor lighting or face obstruction. Overall, it offers an efficient and user-friendly solution for automated attendance management.

7 CONCLUSION

The project demonstrates an **efficient, accurate, and automated face recognition–based attendance system**, improving attendance management while reducing time and errors.

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