Project Title

AI-Based Face Recognition Attendance System

Abstract Summary

The AI-Based Face Recognition Attendance System is a Python/Django-based application that automates employee attendance tracking using real-time face detection and recognition technology. It replaces traditional methods (biometrics, manual sign-in) with an accurate, touchless, and efficient computer vision approach. The system uses the face_recognition library (built on Dlib) to enroll unique 128-dimensional face encodings for each employee and instantly log their check-in and check-out times upon recognition via a connected camera feed.

Key Features of the System

1. Automatic Attendance Logging: Real-time recognition of employees' faces logs their entry/exit automatically.

2. Enrollment Portal: Admin interface for registering new employees by capturing face data and generating unique face encodings.

3. High Accuracy Recognition: Utilizes robust Deep Learning models for accurate face recognition, even with minor changes in appearance.

4. Real-time Monitoring: Live camera feed display with detected bounding boxes and recognized names.

5. Leave and Irregularity Alerts: Integration with Django to flag late arrivals, early departures, or no-shows.

6. Comprehensive Reporting: Generate daily, weekly, or monthly attendance reports for payroll and HR analysis.

Modules Included

1. Employee Enrollment Module: Manages the capture and storage of employee face encodings and profile data.

2. Live Recognition Module: Interfaces with the camera (using OpenCV) to detect and recognize faces in real-time.

3. Attendance Logging Module: Manages the database storage of check-in/check-out timestamps.

4. Admin Dashboard Module: Provides real-time insights into employee presence status.

5. Reports Generation Module: Allows exportable reports on attendance data.

Software Specifications

Programming Languages: Python (with Django, OpenCV, face_recognition), JavaScript.
Frontend: HTML5, CSS3, Bootstrap, potentially WebSockets (for live video feed).
Database: MySQL or PostgreSQL (for storing user profiles and attendance logs).
Web Server: Gunicorn/Apache/Nginx.