Abstract:

This project utilizes object and face recognition technology to automate attendance tracking and authentication. The system captures images from a CCTV camera installed in a classroom or office to recognize individuals and generate attendance reports. It enhances efficiency in educational institutions and workplaces by eliminating manual attendance marking.

Key Features & Responsibilities:

- The system captures images or video feeds from a CCTV camera installed in a classroom, office, or hospital entrance.
- The system uses OpenCV and deep learning models to detect faces and classify individuals based on pre-trained datasets.
- Object recognition algorithms distinguish between different categories (e.g., humans, employees, patients).
- The detected faces are compared with stored profiles in the database using face embedding and feature extraction techniques.
- If a match is found, the system identifies the person and proceeds with the respective functionality (attendance marking, clock-in/out, or patient authentication).
- Once a student or employee is recognized, the system logs their attendance into the database without requiring manual input.
- The attendance report is automatically generated and stored for later reference.
- Employees are identified at entry and exit points to log their working hours automatically.
- The system stores clock-in/out timestamps, reducing manual tracking errors. When a patient arrives, the system identifies their face and pulls up their medical records.
- The system provides instant access to patient history, prescriptions, and appointments, reducing waiting time.
- Attendance records, employee work hours, and patient details are securely stored in MySQL
- Authentication is encrypted to prevent unauthorized access to sensitive records.
- The system can be linked to HRMS and HMS software to streamline operations and enhance workplace efficiency.
- Reports are generated automatically for attendance tracking and patient visits.
- Notifications can be sent to administrators for missing attendance or unauthorized access.

Technologies Used:

- Programming Language: Python, MATLAB
- Libraries & Frameworks: OpenCV, TensorFlow, Keras, dlib (for face recognition)
- Database: MySQL, MongoDB (for storing records)
- Hardware: CCTV Cameras, Image Processing Units
- Techniques: Facial Recognition, Object Detection, Machine Learning, Deep Learning