

Face Attendance System Using Facial Recognition

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Abstract—Attendance management is an important activity in educational institutions and organizations. Traditional attendance systems require manual effort and are often affected by proxy attendance, human errors, and inefficient record management. To overcome these issues, a Face Attendance System using facial recognition technology is proposed.

The developed system automates attendance marking by detecting and recognizing faces through a webcam. The application captures facial data, verifies user identity, and stores attendance records automatically in a database. The system improves accuracy, reduces manual effort, and provides secure attendance management.

The application was developed using modern web technologies including React.js for frontend development, Node.js and Express.js for backend processing, and PostgreSQL for database management. Facial recognition algorithms are integrated for real-time face detection and verification.

The proposed system demonstrates efficient attendance management with improved reliability and reduced chances of proxy attendance. The project can be used in schools, colleges, offices, and other organizations requiring automated attendance systems.

Index Terms—Face Recognition, Attendance Management System, Facial Detection, React.js, Node.js, PostgreSQL, Automation, Artificial Intelligence.

I. INTRODUCTION

Attendance management plays a vital role in educational institutions and organizations. Most traditional attendance systems rely on manual processes such as paper registers or ID verification methods. These methods consume time, require human effort, and may lead to inaccurate attendance records.

With advancements in artificial intelligence and facial recognition technologies, automated attendance systems have become more efficient and reliable.

Facial recognition systems identify individuals based on unique facial features and automate attendance recording without manual intervention.

The proposed Face Attendance System is designed to automate attendance marking using webcam-based facial recognition. The system detects faces, compares them with stored facial data, and marks attendance automatically in the database.

The application improves security, reduces proxy attendance, and simplifies attendance management.

II. PROBLEM STATEMENT

Traditional attendance systems face several limitations:

Time-consuming attendance process

Human errors in record management

Possibility of proxy attendance

Difficulty in maintaining large attendance records

Lack of automation and security

The proposed system solves these issues by implementing an automated face recognition-based attendance mechanism.

III. OBJECTIVES

The objectives of the proposed system are:

To automate attendance management using facial recognition

To reduce manual effort and attendance fraud

To improve attendance accuracy and efficiency

To store attendance records digitally

To provide a secure and user-friendly attendance system

IV. LITERATURE REVIEW

Several attendance systems have been developed using biometric technologies such as fingerprint recognition, RFID cards, and iris recognition.

However, facial recognition systems provide contactless and more convenient attendance management.

Recent research shows that AI-based facial recognition systems improve attendance accuracy and reduce manual intervention. Web-based attendance applications integrated with databases provide efficient storage and retrieval of attendance records. The proposed system combines facial recognition with modern web technologies to create a scalable and efficient attendance management solution.

V. SYSTEM ARCHITECTURE

The Face Attendance System consists of the following modules:

Frontend User Interface

Backend Server

Face Detection and Recognition Module

Database Management System

Workflow

User accesses the attendance application.

Webcam captures facial image.

Face detection algorithm identifies the face.

Face recognition module verifies identity.

Attendance is marked automatically.

Attendance records are stored in the database.

VI. TECHNOLOGIES USED

Frontend

React.js

HTML

CSS

JavaScript

Backend

Node.js

Express.js

Database

PostgreSQL

Facial Recognition

Face detection libraries

Webcam integration

VII. IMPLEMENTATION

The frontend interface was developed using React.js to provide a responsive and user-friendly

environment. The backend server was implemented using Node.js and Express.js to handle attendance processing and database communication.

PostgreSQL was used to store user information and attendance records. The facial recognition module captures webcam images and compares them with stored facial data for verification.

The application integrates frontend and backend modules using APIs to ensure smooth communication between system components.

VIII. TESTING AND RESULTS

The developed system was tested under different scenarios to verify functionality and performance.

Test Cases

Test Case	Expected Result
User Login	Successful login
Face Detection	Face recognized correctly
Attendance Marking	Attendance stored successfully
Database Retrieval	Attendance displayed correctly

Results

The system successfully:

Detected and recognized faces accurately

Reduced manual attendance effort

Prevented proxy attendance

Stored attendance records securely

Improved attendance management efficiency

IX. ADVANTAGES OF THE PROPOSED SYSTEM

Automated attendance process

Improved accuracy

Reduced human intervention

Secure attendance tracking

Faster attendance marking

Digital record management

X. FUTURE ENHANCEMENTS

Future improvements can include:

Mobile application integration

AI-enhanced face recognition

Cloud-based storage systems

Real-time analytics dashboard

Multi-user authentication
Email and SMS notifications

XI. CONCLUSION

The Face Attendance System using facial recognition technology provides an efficient and automated solution for attendance management. The developed system successfully eliminates manual attendance errors, reduces proxy attendance, and improves accuracy.

The project demonstrates the practical implementation of facial recognition integrated with modern web technologies and database systems. The system can be effectively used in educational institutions and organizations for secure attendance management.

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