

DESIGN THINKING FOR INNOVATION
A PROJECT REPORT OF THE PROTOTYPE
SMART ATTENDANCE SYSTEM USING FACE RECOGNITION

Submitted by

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BONAFIDE CERTIFICATE

Certified that this project report “ SMART ATTENDANCE SYSTEM USING FACE RECOGNITION” is that bonafide work of A. Madhuri (22KQ1A0701), A. Sri kavya (22KQ1A0702), G. Amrutha Sri (22KQ1A0710), T. Akshitha (22KQ1A0732), K. Santosh Kumar (22KQ1A0750), L. Arun Kumar (22KQ1A0753), P. Varun (22KQ1A0757), V. Karthik (22KQ1A0766) in partial fulfillment of the course Design Thinking for Innovation (COURSE CODE: P21MCT04) for the academic year 2024-2025. This work is done under my supervision and guidance.

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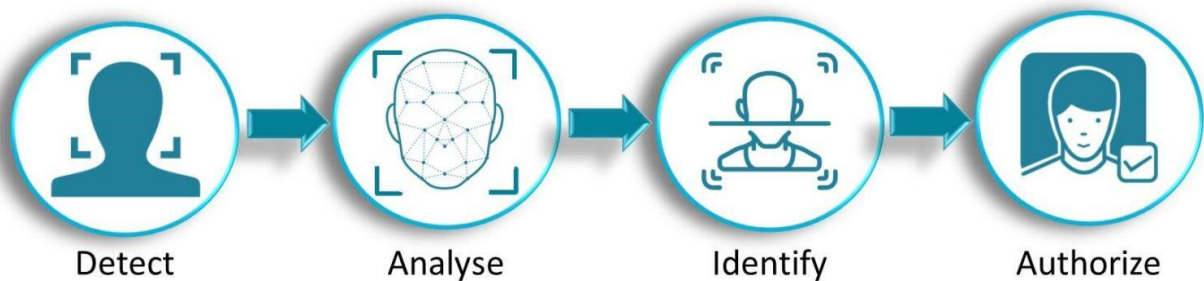
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ABSTRACT

This project presents a Smart Attendance System that uses face recognition to automatically record attendance. Traditional systems are time-consuming and prone to error or proxy attendance. Our system detects and recognizes faces using deep learning algorithms to ensure an efficient, secure, and contactless attendance process.

INTRODUCTION



Attendance systems have evolved from manual registers to biometric and now AI-based face recognition systems. This project leverages facial recognition to improve the reliability and automation of attendance tracking.

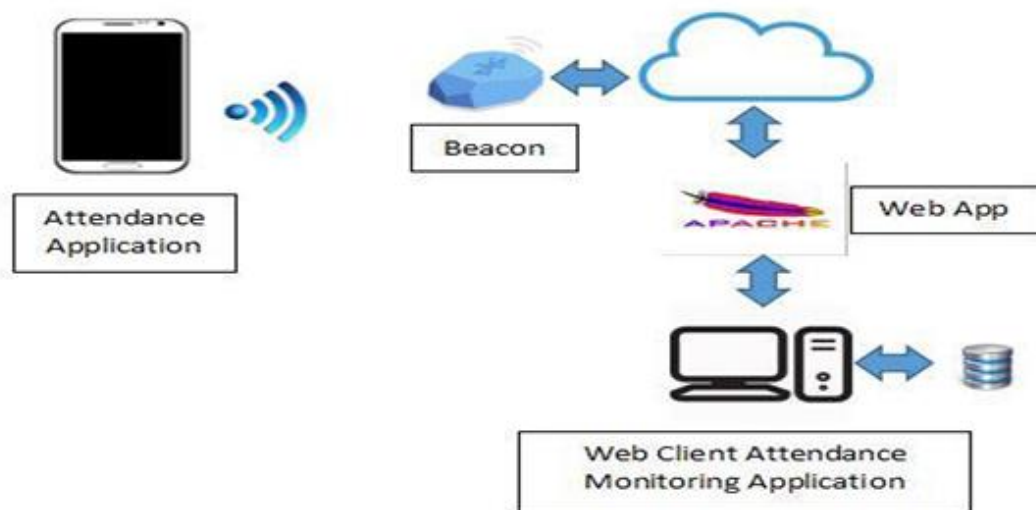
Traditional attendance systems are often time-consuming, prone to human error, and vulnerable to proxy attendance. To address these issues, smart attendance systems leveraging face recognition technology have emerged as a more secure, efficient, and automated solution.

OBJECTIVE

The primary objective of this system is to automate attendance marking using face recognition to improve accuracy, security, and efficiency in educational institutions, offices, and other organizations.

- Develop a face recognition-based attendance system.
- Eliminate proxy attendance.
- Automate data entry and reporting.
- Provide a user-friendly interface.

SYSTEM DESIGN & ARCHITECTURE



Components:

- Webcam/Camera
- Face Detection Module (Open CV, Haar Cascade)

- Face Recognition Model (D lib / Face Net / Deep Face)
- Database (SQLite/Firebase)
- User interface

Workflow:

1. Camera captures video
2. Face detection occurs in real-time
3. Extracted face is compared with the database
4. If matched, attendance is logged with time & date
5. Records are saved and accessible by the admin

FEATURES

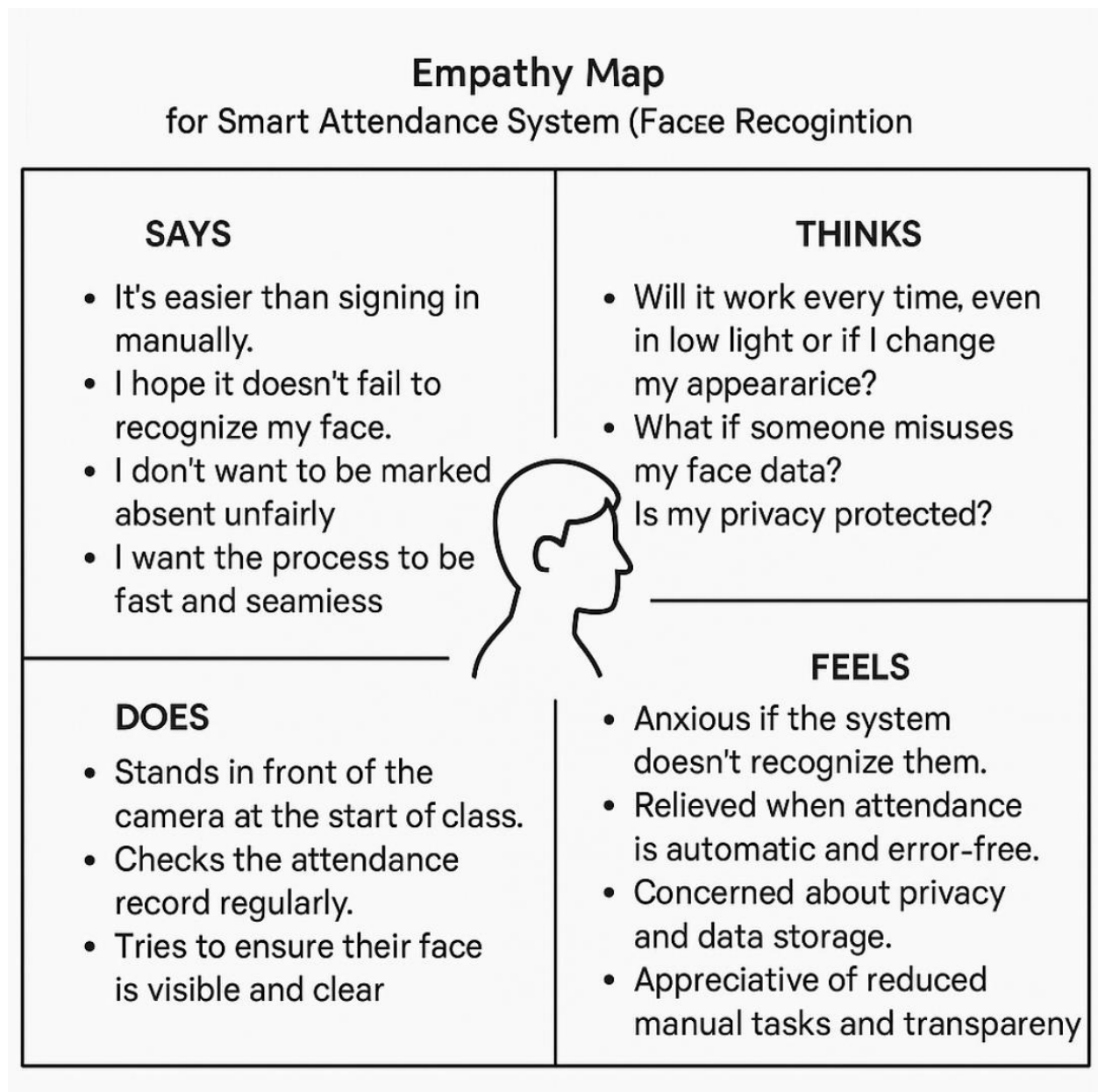
- Contactless and real-time attendance
- High accuracy and speed
- Eliminates proxy and buddy punching
- Integration with notifications and reports
- Scalable for large institutions

TOOLS & TECHNOLOGIES

Tool/Tech	Purpose
Python	Programming Language
Open CV	Image Processing
D lib / Face Net	Face Recognition

SQLite / Firebase	Database
T Kinter / Flask	GUI / Web Interface
Webcam / Pi Cam	Real-time Image Capture

EMPATHY MAPPING



IMPLEMENTATION



Tracking Settings



General
Common tracking
configuration



Walk-Ins
For non scheduled sign-
ins



Appointments
Calendar and scheduled
sign-ins options



Class Attendance
Tracking options for
classes



Virtual Sessions
Options for virtual or
remote meetings

- Faces are enrolled and stored during registration
- Attendance is auto marked when a recognized face appears
- Admin can view, export, and manage data

RESULTS

The screenshot shows a web browser at localhost/atd/View.php. The application has a green header with 'Smart Attendance' and a search bar. A dark sidebar on the left contains navigation links: Dashboard, View, Edit, Insert, Delete, and Graphs. The main content area is titled 'Student Attendance Report' and features two dropdown menus: 'Select Semester' (set to 'Spring-2018') and 'Select Course' (set to 'Computer Fundamental Section PC-A'). Below these are 'Submit' and 'Cancel' buttons. A table titled 'Student Attendance:' displays the following data:

Id	Name	Attendance	Date
142-15-168	Rumana Ruma	✓	2018-02-04 15:15:24
142-15-154	Amir Shah	✓	2018-02-04 15:15:24
142-15-131	Karim Khan	✓	2018-02-04 15:15:24
142-15-3682	Md. Golam Saklayen	✓	2018-02-04 15:15:24
142-15-138	Mohsin Khandakar	✓	2018-02-04 15:15:24
142-15-135	Shifat Jaman	✓	2018-02-04 15:15:24
142-15-143	Abu Bakar	✓	2018-02-04 15:15:24

- Attendance is marked within seconds
- Reports are generated in CSV format
- Detection accuracy: ~95% under good lighting

ADVANTAGES

- No physical interaction required
- Fast and efficient
- Difficult to spoof (unlike ID cards)
- Easily scalable
- Improves record management
- Saves time during attendance collection

LIMITATIONS

- Accuracy depends on camera and lighting
- Performance may drop with large datasets
- Faces with masks or significant changes may not match
- Privacy Concerns regarding facial data
- Initial setup and training cost

FUTURE SCOPE

- Integrate with mobile app
- Add temperature sensing (COVID screening)
- Cloud-based data storage
- Integration with school ERP systems

APPLICATIONS

- Schools and Colleges
- Corporate offices
- Events and conferences
- Government agencies

CONCLUSION

This Smart Attendance System demonstrates how AI and computer vision can modernize routine tasks like attendance making. It ensures accuracy, reduces fraud, and simplifies data management, proving to be a valuable addition to academic and corporate institutions.