



A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

A
Mini Project Report on
Smart Attendance System

Submitted in partial fulfillment of the requirements
for the degree of
BACHELOR OF ENGINEERING
IN
Computer Science & Engineering
Artificial Intelligence & Machine Learning

by

1. Jay Thakare (23106052)
2. Saanj Shetty (23106070)
3. Sneha Utekar (23106116)
4. Divya Patil (23106124)

Under the guidance of
Prof. Shraddha Dalvi



**Department of Computer Science & Engineering
(Artificial Intelligence & Machine Learning)
A. P. Shah Institute of Technology
G. B. Road, Kasarvadavali, Thane (W)-400615
University Of Mumbai
2024-2025**



Parishwami Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CERTIFICATE

This is to certify that the project entitled “**Smart Attendance System(Face recognition & Qr Scanner)**” is a bonafide work of Jay Thakare(23106052), Saanj Shetty(23106070), Sneha Utekar(23106116) , Divya Patil (23106124) submitted to the University of Mumbai in partial fulfillment of the requirement for the award of **Bachelor of Engineering in Computer Science & Engineering (Artificial Intelligence & Machine Learning)**.

Prof. Shraddha Dalvi
Mini Project Guide

Dr. Jaya Gupta
Head of Department



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

Project Report Approval

This Mini project report entitled “**Smart Attendance System**” by **Jay Thakare, Saanj Shetty, Sneha Utekar and Divya Patil** is approved for the degree of *Bachelor of Engineering* in *Computer Science & Engineering (AI&ML) 2024-25*.

External Examiner: _____

Internal Examiner: _____

Place: APSIT, Thane

Date: 08/02/25



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

Declaration

We declare that this written submission represents my ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in our submission. We understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

Jay Thakare
(23106052)

Saanj Shetty
(23106070)

Sneha Utekar
(23106116)

Divya Patil
(23106124)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

ABSTRACT

In educational institutions and workplaces, traditional attendance management methods are often inefficient, error-prone, and susceptible to proxy attendance. This project introduces a Smart Attendance System that integrates Face Recognition and QR Code Scanning to provide a contactless, secure, and automated solution. The system leverages computer vision and artificial intelligence to authenticate individuals based on facial features, ensuring accurate attendance tracking. Additionally, a QR code-based method enables mobile-friendly, quick authentication for users. The proposed system enhances efficiency, reduces human intervention, and prevents fraudulent attendance practices. This dual authentication mechanism ensures real-time monitoring, secure data storage, and seamless integration into existing institutional frameworks.

.



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

Index

Index	Page no.
Chapter-1	
Introduction	2
Chapter-2	
Literature Survey	
2.1 History	5
2.2 Review	6
Chapter-3	
Problem Statement	9
Chapter-4	
Experimental Setup	
4.1 Hardware setup	11
4.2 Software Setup	11
Chapter-5	
Proposed system and Implementation	
5.1 Block Diagram of proposed system	13
5.2 Description of Block diagram	13
5.3 Implementation	15
Chapter-6	
Conclusion	19
References	21



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CHAPTER 1

INTRODUCTION



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

1. INTRODUCTION

In the modern era, automation plays a crucial role in enhancing efficiency and accuracy across various domains. One such domain where automation has significantly impacted is attendance management in educational institutions and workplaces. Traditional attendance systems, such as manual attendance registers and RFID-based methods, often face challenges related to inaccuracies, proxy attendance, time consumption, and inefficiency. These conventional methods are prone to human error, loss of records, and unauthorized access, which ultimately affect the integrity of the attendance system. As institutions and workplaces strive to streamline their operations and ensure a secure and reliable method of tracking attendance, there is a growing need for an advanced solution that overcomes these limitations.

To address these challenges, this project presents a Smart Attendance System using Face Recognition and QR Scanning. The system integrates advanced computer vision and machine learning techniques to identify and authenticate individuals based on their unique facial features. Face recognition technology leverages deep learning algorithms to detect and verify individuals with high accuracy, minimizing the risks associated with manual entry and unauthorized attendance marking. This ensures that attendance records remain precise and free from fraudulent practices. Additionally, the incorporation of QR code-based attendance provides an alternative authentication mechanism, allowing flexibility in different scenarios. By offering multiple authentication options, the system enhances usability and reliability, ensuring seamless attendance tracking even in varied environments.

The dual authentication approach—face recognition and QR scanning—enhances



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

security, efficiency, and ease of use. Users can mark their attendance effortlessly without requiring physical contact, making the system highly suitable for environments where hygiene is a concern, such as hospitals, schools, and offices. The integration of face recognition technology eliminates the possibility of proxy attendance, as it ensures that only the authorized individual can mark their presence. Furthermore, QR code-based authentication provides an additional layer of verification, making the system more robust and adaptable.

By implementing this smart attendance system, institutions and workplaces can achieve better record-keeping, real-time monitoring, and improved operational efficiency. The automation of attendance tracking not only reduces administrative workload but also enhances the security and integrity of records. The system provides an efficient, user-friendly, and technologically advanced alternative to traditional attendance methods, ensuring reliability and accuracy. As technology continues to evolve, the adoption of such smart systems will play a vital role in transforming attendance management, making it more secure, efficient, and convenient for all stakeholders.



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CHAPTER 2

LITERATURE SURVEY



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

2. LITERATURE SURVEY

2.1-HISTORY

Traditional attendance systems relied on manual registers, where students or employees signed their presence. This method was time-consuming and prone to human errors. With technological advancements, various automated attendance systems have emerged:

RFID-based systems: Used radio-frequency identification for marking attendance but suffered from unauthorized access and inefficiencies.

Biometric systems: Utilized fingerprint or retina scans but required physical contact, raising hygiene concerns.

Face recognition technology: Advanced AI-driven systems that use facial features for authentication, offering contactless and accurate attendance tracking.

2. Related Work

Several research studies have explored automated attendance systems. Notable contributions include:

Deep Learning-Based Face Recognition: Studies indicate that convolutional neural networks (CNNs) significantly improve face recognition accuracy.

QR Code-Based Authentication: Researchers have integrated QR codes with attendance systems for an additional layer of verification, enhancing accessibility and security.

Edge AI in Attendance Systems: Newer studies focus on edge computing, where face recognition happens on local devices rather than cloud-based systems, improving response time and security.



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

2.2-LITERATURE REVIEW

[1] ‘Real-Time Smart Attendance System using Face Recognition Techniques’ by Shreyak Sawhney, Karan Kacker, Samayak Jain, IEEE, Noida India ,July 2019.

This paper presents a real-time attendance system using face recognition to automate and enhance accuracy. It captures student images, processes them with deep learning models, and updates the database, reducing time and preventing fraud.

[2] ‘A Students Attendance System Using QR Code’ by Fadi Masalha, Nael Hirzallah, International Journal of Advanced Computer Science and Applications (IJACSA),2014.

This paper presents a digital attendance system where students scan a unique QR code to mark their presence. The system automates attendance tracking, reduces manual errors, and ensures accuracy by integrating QR code scanning with a database for real-time updates.

[3] ‘Smart Classroom Automation: A Fusion of AI with Voice, Gesture, and Face Recognition Attendance System’ by Md Raihan Khan, Abdullah Al Ahad, Airin Akter Tania, Tithi Das,IEEE,2024.

This paper presents a smart classroom automation system using AI-driven voice, gesture, and face recognition for attendance tracking and device control. It enhances efficiency, accuracy, and security, reducing manual effort and creating a more interactive learning environment.

[4] ‘Development of Attendance Monitoring System with Artificial Intelligence Optimization in Cloud’ by , Mohamad Fakir Naen,Muhamad Hariz Muhamad Adnan,Nurul Adilah Yazid,Chee Ken, International Journal of Artificial



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

Intelligence,2021.

This paper discusses an AI-powered attendance system using face recognition and QR scanning, integrated with cloud computing for better efficiency and scalability. It overcomes issues like proxy attendance and inefficiency in traditional methods by ensuring accurate and automated tracking.



A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CHAPTER 3

Problem Statement



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

3. PROBLEM STATEMENT

To develop a smart, secure and efficient attendance system which combines face recognition, QR code scanning and GPS technology for added precision and accessible only within a predefined radius.



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CHAPTER 4

Experimental Setup



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

4. Experimental Setup

4.1 - Hardware Requirements

- Laptops(I5 and above)
- Webcam for real-time face detection.
- Mobile devices(IOS and Android) for QR scanning.

4.2 - Software Requirements

- Windows(O.S.)
- Python 3.21 for scripting and backend processing.
- Streamlit for the web interface.
- MySQL 9.1 for data storage.



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CHAPTER 5

Proposed system and Implementation



5. Proposed system and Implementation

5.1 - Block Diagram of proposed system

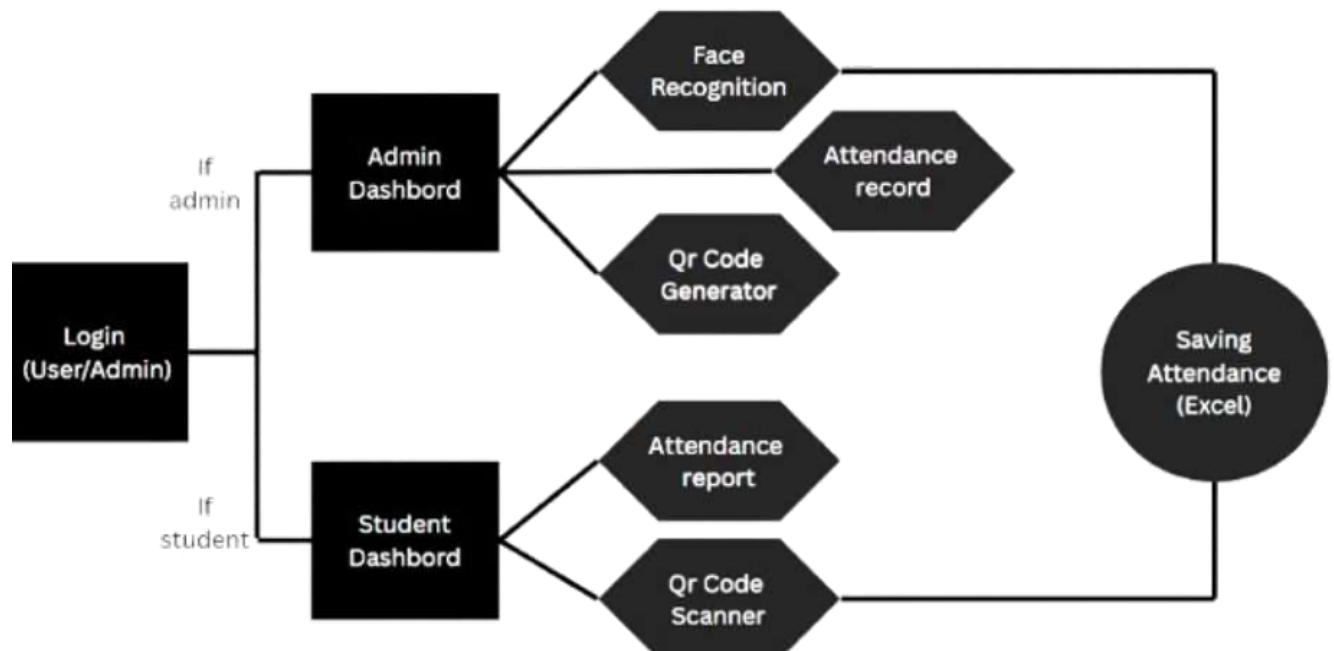


Figure 1: Block Diagram

5.2 - Description of Block diagram

The smart attendance system starts with a login page, where users can either log in or register. During registration, students provide their name, ID, roll number, password, class, and an image. This information is stored in an SQL database under either the admin or student category. During login, the system verifies credentials, directing users to their respective dashboards based on their role.

In the admin dashboard, there are three primary functions: face recognition, QR code generation, and viewing attendance reports. When the face recognition option is selected, the system activates the webcam and scans faces using OpenCV and Dlib. If a recognized face matches a stored entry, attendance is marked with the student's roll number, name, and a remark. Similarly, the admin can generate a QR code using the qrcode library that contains the name, class, subject, and timestamp.



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

Students can scan this QR code using pyzbar, and their attendance will be marked accordingly. The attendance reports are displayed in a structured table format in the admin panel, with an option to download them in XLSX format using the XlsxWriter library.

In the student dashboard, the student's profile is displayed along with the option to scan QR codes. If the scanned QR is valid and the student is within a 10-meter radius of the admin's system, their attendance is recorded. Additionally, if multiple attendance entries originate from the same device, the system detects potential proxy attempts.

All attendance records are automatically saved in an 'Excel' folder, with filenames structured as subject_time_date_class.xlsx. A new file is created for each session, ensuring systematic data storage and retrieval.



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

5.3 – Implementation



Figure 2: login page



Figure 3: Admin Dashboard



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

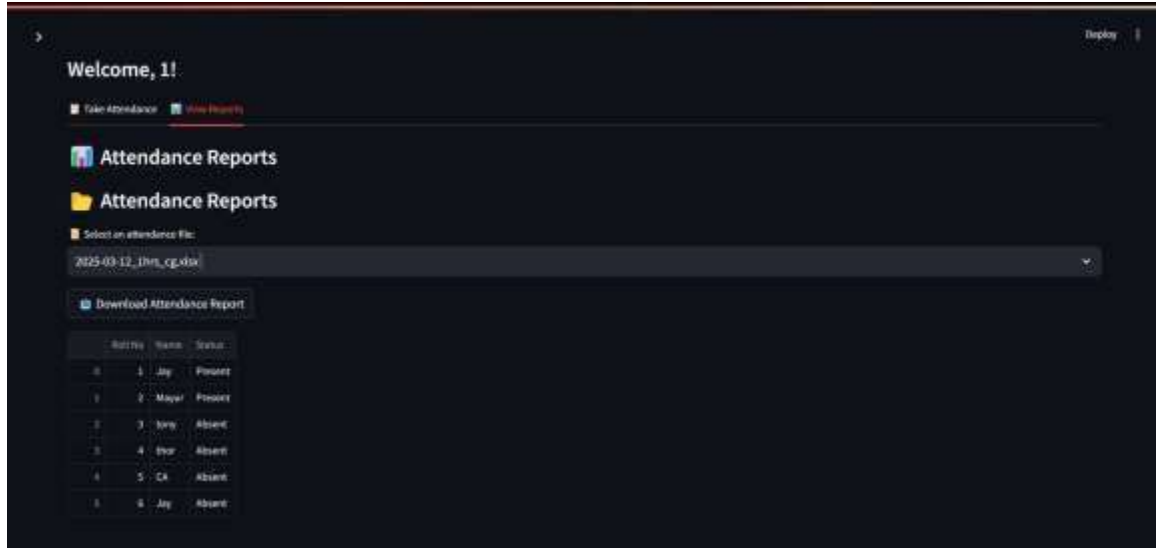


Figure 4: Daily Attendance Reports

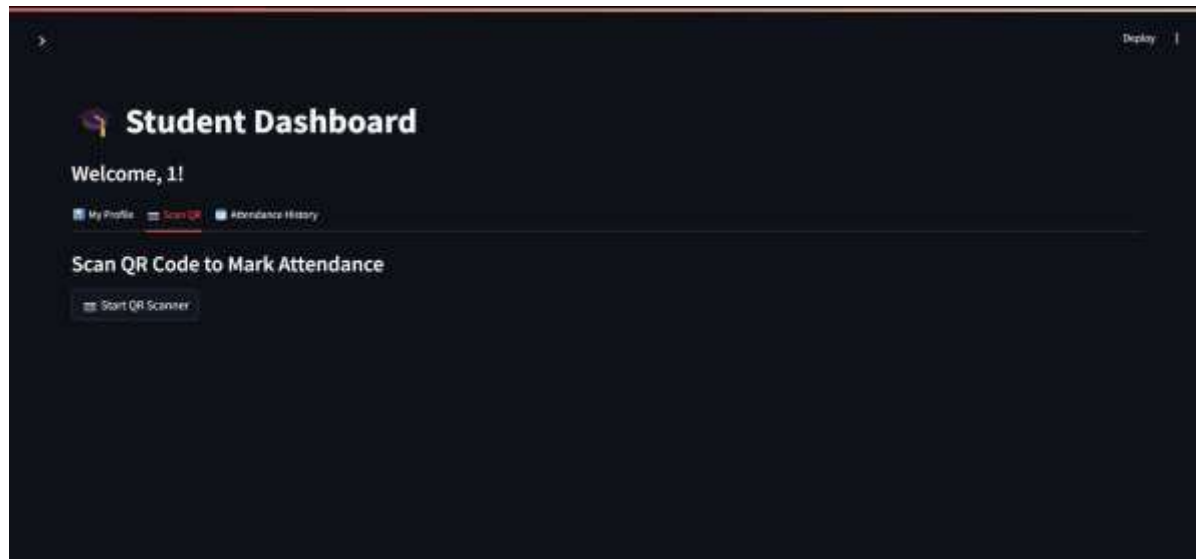


Figure 5: Student Dashboard



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

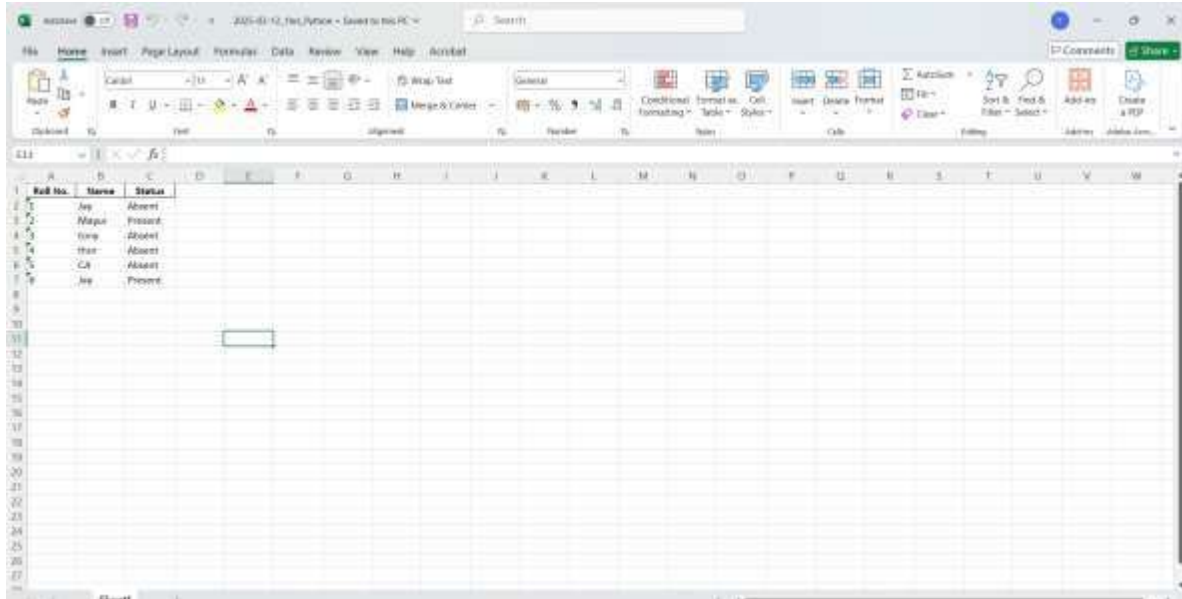


Figure 6: Excel



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

CHAPTER 6

Conclusion



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

6. Conclusion

The Smart Attendance System successfully integrates face recognition and QR scanning to automate attendance marking, enhancing efficiency, accuracy, and security while eliminating manual intervention. Future enhancements include AI-based behavioral analysis, cloud integration, mobile application support, multi-factor authentication, and real-time notifications to further improve accessibility and system effectiveness.



Parshwanath Charitable Trusts
A. P. SHAH INSTITUTE OF TECHNOLOGY
(Approved by AICTE New Delhi & Govt. of Maharashtra, Affiliated to University of Mumbai)
(Religious Jain Minority)



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

References



**DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING
(ARTIFICIAL INTELLIGENCE & MACHINE LEARNING)**

References

- [1] 'Real-Time Smart Attendance System using Face Recognition Techniques' by Shreyak Sawhney, Karan Kacker, Samayak Jain, IEEE, Noida India, July 2019.
- [2] 'A Students Attendance System Using QR Code' by Fadi Masalha, Nael Hirzallah, International Journal of Advanced Computer Science and Applications (IJACSA), 2014.
- [3] 'Smart Classroom Automation: A Fusion of AI with Voice, Gesture, and Face Recognition Attendance System' by Md Raihan Khan, Abdullah Al Ahad, Airin Akter Tania, Tithi Das, IEEE, 2024.
- [4] 'Development of Attendance Monitoring System with Artificial Intelligence Optimization in Cloud' by , Mohamad Fakir Naen, Muhamad Hariz Muhamad Adnan, Nurul Adilah Yazid, Chee Ken, International Journal of Artificial Intelligence, 2021.
- [5] 'Think Python' by Allen B. Downey, 2002.
- [6] 'Learning SQL' by Alan Beaulieu, 2005.