

# **Progress Report Book**

**On**

**Automated Attendance Management System  
using  
Facial Recognition**

**19-202-0611 Mini Project**

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# Preface

This progress report book provides a comprehensive overview of the development and implementation of the attendance management system. The goal of this project is to create a user-friendly system for tracking student attendance, enabling teachers and administrators to easily view attendance records and generate reports. The system is web-based, allowing users to access it from any device with an internet connection.

The project team consists of four individual. Our team is committed in delivering a high-quality system that meets the needs of attendance management.

This progress report book will provide an overview of the project's objectives, scope, methodology, and deliverables. We will also discuss the challenges encountered during the development process, and the strategies implemented to overcome them. In addition, we will provide a detailed description of the system's features, including the user interface, data management, security, and reporting capabilities.

We hope that this progress report book will serve as a valuable resource, providing insight into the development process and the system's functionality.



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# Week 1

08/03/2023

## 1.1 Framed the abstract

In this week, we have framed the abstract of the project.

## 1.2 Basic working

Develop a real-time system which utilizes the knowledge and concepts revolving around facial recognition using Artificial Intelligence to mark students' attendance. A model will be trained in order to recognize a batch of students during its training phase. In the real time testing environment, it will be able to recognize these students uniquely by their facial features, which will be linked to their personal student information in a database upon which the attendance status will be reflected.

Teachers will have access to a mobile phone application which can scan the QR associated to a camera or use the one present in their very mobile system to take the snapshot of the classroom/course when they desire to take the attendance. The image will be captured and faces of students will be recognized by the model upon which attendance will be updated in the database. Teachers can later track attendance and export them as .csv or .xls files for future reference.





# Week 2

15/03/2023

## 2.1 Proposed the Modules

The different modules included in the projects were proposed.

- **Face Detection Module:** This module detects the faces of individuals in a given image or video stream. It identifies the location of faces within an image and is an essential part of face recognition systems.
- **Face Recognition Module:** This module recognizes the identity of individuals by comparing the detected face to a database of known faces. It uses machine learning algorithms to identify the person by comparing features of the face such as the distance between the eyes, the shape of the nose, and the contours of the face.
- **Database Management Module:** This module stores and manages the data of registered users, such as their name, ID number, and face template.
- **Attendance Management Module:** This module records and tracks attendance for each user. It logs the time and date of each attendance and stores it in a database.
- **User Interface Module:** This module provides a graphical user interface that allows users to interact with the system. Users can register their faces, view their attendance records, and perform other actions through the interface.

## 2.2 Basic human recognition done

In this week, we have tried basic human recognition using OpenCV and an open source trained model **haarcascade\_frontalface\_default.xml** which worked successfully.

**Basic human recognition Source:**

<https://github.com/gobmj/Attendance.git>

**Trained data set Source:**

[https://github.com/opencv/opencv/blob/master/data/haarcascades/haarcascade\\_frontalface\\_default.xml](https://github.com/opencv/opencv/blob/master/data/haarcascades/haarcascade_frontalface_default.xml)

# Week 3

23/03/2023

## 3.1 Detection of presence of face(s)

The presence of face(s) is done primarily with the help of OpenCV, CMake, dlib and face\_recognition libraries available in support with Python.

## 3.2 Identification of person(s)

Identification of person(s) corresponding to the face(s) whose presence has been detected, utilizes the encodings created by face\_recognition library corresponding to each face in the input image data and compares it to the encodings generated during real-time image capture.



# Week 4

29/03/2023

## 4.1 Basic interface and environment setup

We have set up the basic interface for the basic utilities and an environment setup for the utilities.

## 4.2 Debugging and optimization of code

We are currently working on debugging and optimizing the code to ensure smooth performance and eliminate any errors. This involves thorough testing and analysis of the code to identify and resolve any issues that may arise.

## 4.3 Database and Management

As we have completed the initial setup and debugging phase, we are now moving forward to the database and attendance management aspect of the project. This involves designing and implementing a robust database system to store and manage attendance data efficiently.



# Week 5

05/04/2023

## 5.1 Backend for facial recognition done

Once the system captures the face of the individual, it compares the extracted features with the stored features in the database and marks the attendance accordingly. The backend also manages the database of all the users, their images, and the attendance records for future reference.

## 5.2 Storage of data in Firebase

Firebase is used to store data in the facial recognition part of the project. The resources of individuals is stored in Realtime Database along with their attendance records. Firebase provides a scalable and secure storage solution that can be easily integrated into the backend of the project.

## 5.3 UI Enhancements

Currently developed a proper UI for visually seeing which person's attendance is captured by the camera.





# Week 6

12/04/2023

## 6.1 Firebase for Facial Recognition done

Completed the firebase integration of facial recognition with features of storing the image data by corresponding roll numbers and the real-time database is completed.

## 6.2 Started attendance management module(UI)

Started the works regarding the attendance management module. The works for frontend interface is started and is done using popular JavaScript library ReactJS since it is user friendly and could be integrated with the backend framework with ease.

## 6.3 Started attendance management module(Backend)

Started the works regarding the attendance management module. The works for backend is started and is done using popular Python web application framework Flask.



# Week 7

19/04/2023

## 7.1 Developed Dashboard UI

Developed a dashboard module using React.js with navigation menus, data displays, and visual elements. Implemented dynamic rendering of data for real-time updates and relevant information. Designed a user-friendly layout with responsive styling for optimal user experience.

## 7.2 Developed User Profile Module

Created a user profile module allowing users to view and update their personal information.

## 7.3 Developed Attendance Module

Developed an attendance module with interfaces for viewing records and generating reports.



# Week 8

26/04/2023

## **8.1 Class Management Module Development Started**

Initiated development on the class management module for creating, managing, and organizing classes.

## **8.2 Teacher and Student Management Module Development Started**

Started building teacher and student management modules for profile creation and data management. Successfully integrated Firebase for efficient data storage and synchronization.

## **8.3 Implemented Role-Based Access Control**

Implemented user authentication for role-based access control and enhanced security.



# Week 9

14/06/2023

## 9.1 Backend Development Started

Started developing a Flask app as the back end for facial recognition in the attendance management system.

## 9.2 Recognition API Created

Created an API call within the Flask app to capture snapshots for facial recognition and API tested using Postman. Implemented scaling of captured snapshots for standardization and improved facial recognition accuracy.





# Week 10

21/06/2023

## 10.1 User Deletion API Created

Created an API call in the Flask app for deleting teacher user data and API tested using Postman.

## 10.2 Integrated Firebase with Backend

Integrated the Flask app with Firebase for real-time updates of attendance data.



# Week 11

28/06/2023

## 11.1 Integrating API and Testing

Integrated the APIs with frontend and tested by real life data.

## 11.2 Bug Fixing and Review

Conducted Bug Fixes and code reviews, ensured the API returns the absolute value.



# Week 12

05/07/2023

## **12.1 Integrated the Frontend and Backend**

Integrated React and Flask apps for seamless functionality and data exchange.

## **12.2 Performed Testing and Bug Fixes**

Conducted bug fixes and performed extensive testing to ensure system stability and correctness.