

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.

Contents

1	Week 1	1
1.1	Framed the abstract	1
1.2	Basic working	1
2	Week 2	3
2.1	Proposed the Modules	3
2.2	Basic human recognition done	4
3	Week 3	5
3.1	Detection of presence of face(s)	5
3.2	Identification of person(s)	5
4	Week 4	7
4.1	Basic interface and environment setup	7
4.2	Debugging and optimization of code	7
4.3	Database and Management	7
5	Week 5	9
5.1	Backend for facial recognition done	9
5.2	Storage of data in Firebase	9
5.3	UI Enhancements	9
6	Week 6	11
6.1	Firebase for Facial Recognition done	11
6.2	Started attendance management module	11
6.3	UI Enhancements	11

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

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.