

# **PROJECT BASED LEARNING - II REPORT**

**ON  
'SMART  
ATTENDENCE SYSTEM'**

**REPORT SUBMITTED TOWARDS PARTIAL FULFILLMENT OF THE  
REQUIREMENT FOR THE AWARD OF THE DEGREE OF**

**BACHELOR OF TECHNOLOGY  
IN  
(INFORMATION TECHNOLOGY)**

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## CERTIFICATE

The project titled “**SMART ATTENDENCE SYSTEM**” submitted to the Symbiosis Institute of Technology, Pune for the third-year project in **INFORMATION TECHNOLOGY** is based on our original work carried out under the guidance of **Dr. HARSHAL PATIL**. The report has not been submitted elsewhere for the award of any degree or for any other research related activity.

The material borrowed from other source and incorporated in the report has been duly acknowledged and/or referenced.

We understand that we could be held responsible and accountable for plagiarism, if any, detected later.



Date: **20 April 2023.**

**Signature of the candidate**

**Research Guide**

Dr. Harshal Patil

**Head of the Department**

(Dr. Deepali Vora)

## ACKNOWLEDGEMENT

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## **ABSTRACT**

The attendance system was developed in schools, colleges, and universities to preserve discipline and allow pupils to learn everything possible.

There are two typical methods for keeping track of a class's attendance. In the first, the roll number is called, and in the second, students sign a piece of paper next to their roll number. Therefore, this system has to be developed in order to be more user-friendly, efficient, and time-saving.

It will save time while effectively identifying and reducing the likelihood of proxy attendance. The teacher can take the class's attendance without being disturbed or wasting time thanks to this automatic technology [1].

This project's primary goal is to construct an automatic attendance system using Eigenface technique with DB/Python libraries and recognizer algorithm have been implemented the concept can be applied in many ways, one of which is facial identification, [2] which will save time.

# CHAPTER-1

## Introduction

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### 1.Overview: -

During this era of technology and automation we are still using the same old ways of classroom management. In the [2] present situation, recording student attendance in class sessions is one of the subject teachers' most important duties because it can control how many students attend sessions and confirm the total number of students in the class. Any institution's principal responsibility is to handle and maintain student data. [3] We require something that can make this correct in order to make this smooth. The manual process of recording attendance uses a pen and paper. The subject teachers have to work harder and spend more time using this method, and the data may occasionally be inaccurate. [4] To stay clear of these issues. This application is primarily intended for faculty members and other Institute staff members who consistently maintain attendance and grades.

When the attendance system is efficient, more students engage in class and learn more. The traditional method has over time shown to be ineffective due to students' ease in writing absentee notes for pals, as well as the ease with which records can be lost or destroyed. There is also the issue of impersonation among students, where fraudulent identities are utilised to enter exam rooms and take part in exams. This has [5] had a terrible impact on the validity of exams and the eligibility of graduates for employment following graduation. The server's MySQL database was utilised to maintain all of the data used in the suggested attendance system. The suggested attendance [6] system connected the Android smartphone and the server using two Wi-Fi connection types. Additionally, the threat of exam impersonation can be eradicated from the institutions to provide a setting for free and fair testing. In turn, this greatly increases the credibility of degrees granted by institutions.

## **1.1 Project Idea**

When we returned to our physical education classes after the pandemic, this notion crossed our minds. It was very simple for teachers and professors to take attendance during our online sessions because there was no need for any fuss or wastage of time.

The concept for this project stemmed from the fact that taking attendance in person takes considerably longer than it does online, and maintaining the attendance file is more complex.

As a result, we needed to design something that would make taking attendance simpler and more easily accessible to everyone.

## **1.2 Motivation**

Our way of life is currently divided into two categories: before and after COVID-19. We know how we're going to use the technology at COVID-19.

Classes were conducted online, and attendance was also kept that way. However, once classes were offline, attendance was kept on paper.

Because we learned in covid that we must be ready for any worst-case scenario, we believe we can create an app that will make taking attendance simple and lead to paperless work.

## CHAPTER-2

### LITREATURE -SURVEY

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Numerous studies have been done so far on the various approaches that can be used to put in place an efficient attendance tracking system. The sorts of input techniques, types of data processing, and controllers utilized to build the systems all differ according to these approaches. Looking for the numerous solutions with the benefits and drawbacks of each system in this part.

- i. Ghalib Al-muhaidhari-2019 [1], “Attendance System Using face technology with Embedded Camera on Mobile Device” .The two devices are essentially electromagnetic induction-responsive inductor coils. In order to create an electromagnetic field with a specific radius and strength, the active device is used. which formerly employed an attendance system.
- ii. Global Journals Inc. (USA)-2016 [2] “Development of Voice Recognition for Student Attendance” A more potent version of the attendance system could be built using biometric technology as an alternative. A biometric authentication method recognises the distinctive characteristics of every human being. Because it is a natural signal to produce, voice recognition is used in this situation as a biometric. To make this new class attendance more successful and efficient, each person's distinctive speech and voice characteristics can be recorded and analysed. Speech recognition and speaker recognition are the two categories into which voice recognition can be split. Both employ voice biometric in distinctive ways. Speaker recognition is the capacity to identify the person speaking, whereas speech recognition is the capacity to identify what has been spoken.
- iii. Rajan Datt, Utsav Shah,-2018 [3],”Student Attendance Management System using Fingerprint Scanner” In this study, they created a system called Student Attendance Management System that uses fingerprints to uniquely identify students. To build this system, we used a Raspberry Pi 3, a Serial 16x2 Serial LCD, and fingerprint scanner software. Using this, we developed a system that keeps track of student data., verifies specifics, and generates reports for use in the future. Student presses his finger against the scanner during the attendance verification process, and the system determines whether the record is there in the database and displays the appropriate message.

- iv. Sifatnur Rahman-2018 [4] “Automated Student Attendance System using Fingerprint Recognition” In this system, Following student biometric identification, attendance is recorded. Students are identified via a fingerprint recognition-based identifying system. The fingerprint features are regarded to be the most accurate and efficient biometric identification method. These qualities are more reliable to use because they are unique to each person and remain constant throughout time. Even if the science of fingerprint recognition is highly developed nowadays, it still takes time to recognise a particular person from a collection of registered fingerprints.
- v. Department of Telecommunication Engineering, Jamshoro, Pakistan, MUET, 2018 [5]The "Smart Attendance Management System Using Face Recognition" In this essay, they made use of The system begins capturing pictures automatically as the time for a certain subject approaches. Once a face detection and recognition algorithm has been applied to the provided image, students who have been identified are recorded as present, and their attendance is updated with the appropriate time and subject ID.They created this system using deep learning techniques. The histogram of oriented gradient approach is used to identify faces in photos, and the deep learning method computes and compares the facial features of students to identify them. Our system has the ability to recognise numerous faces simultaneously.
- vi. Folasade Jumoke Soyemi-2020, O. Isinkaye [6] "A Face Recognition System for Class Attendance and Malpractice Control based on Android" In this research, the authors outline the creation of a mobile solution for the Android operating system that makes use of Eigen faces and the Viola-Jones object detection framework to perform user-friendly and secure student facial recognition and record class attendance. The system's 95% facial recognition accuracy rate and 78% facial detection accuracy rate were both assessed. The system's robust backend and distinctive modular structure were key components in achieving the system's highest level of security performance.
- vii. Risanuri Hidayat, Rudy Hartanto, and Khem Puthea - 2017 [7] An essay on "An Attendance Marking System Based on Face Recognition" They describe their method for recording attendance in this publication. They use techniques like Face Recognition, Automatic System, Histogram Oriented Gradient, and AMS.
- viii. Ibidunmoye E.O., Adetunmbi A.O., Olabode O.O., and Akinduyite C.O. (2013) [8]“Fingerprint-Based Attendance Management System” The fingerprint-based attendance management system utilised in a university context is described in this study. This system's two components are enrollment and authentication. At enrolment, a user's fingerprint is obtained, its unique characteristics are retrieved, and the data is stored in a database with the user's identification as a template for the subject. The distinctive features known as minutiae points were extracted using the Crossing Number (CN) technique, which separates the ridge endpoints and



bifurcations from the skeleton image by examining the local neighbourhoods of each ridge pixel using a 3 x 3 frame. Microsoft's C# on the .NET framework was utilised to implement the fingerprint-based attendance management system.

- ix. Hameedur Rahman<sup>3</sup>, Pakiza Bano<sup>2</sup>, and Sidra Tasleem - 2020 [9] The "Student Attendance Management System Based On Face Recognition" This system will save student face photos in a database, mark students' attendance automatically, and then save the outcome in the database. The attendance will be kept in a time and date-specific database. This system's five main components are as follows: (1) The student will first log in using their username and password. (2) Following this, students can automatically register their attendance using face recognition (an picture is already stored in the database). (3) The lecturer can view attendance and grant students permission to attend. (5) After logging in, the administrator can register students, save student photos in a database, and train a model.
- x. x. Penta Maddu Kamaraju and Anil Kumar, both of 2014 [10] The paper "Wireless Fingerprint Attendance Management System" describes the design process for a wireless fingerprint attendance system based on Zigbee technology. The system has a terminal fingerprint capture module and a computer-based attendance management module. It can do automatic operations like gathering, processing, wireless transmission, matching, and attendance management of fingerprint data.

## CHAPTER- 3

### DEFINITION OF THE PROBLEM AND OBJECTIVES

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#### 3.0 Problem Identification

The procedure of taking attendance might be made easier and paperless with the use of this technology. Additionally, administrators can have secure access to student data and take attendance with ease.

#### 3.1 Purpose and Goals

##### 3.1.1 Purpose

- To improve the time management through this
- To save the paper by going paperless
- To Improve existing system
- To save data of student and can be accessible at any time.

##### 3.1.2 Goals

- To recognize or verify a person from a digital photograph using a mobile application that maintains the information in a database for real-time use.
- The objective of this project is to develop a system that will make it easier and more automatic to track and record student attendance using facial recognition technology.
- Safety of data of student is very important and through this we can do.

#### 3.2 Requirements for Hardware and Software

##### 3.1.3 Software Required

- 1). Python

- 1) Technology: Kotlin
- 2) IDE: Android Studio.
- 3) Database: Mongo dB
- 4) Library: Dlib

#### **3.1.4 Hardware- Required**

➤ **Hardware needs to:**

➤ **1 system in the configuration shown:-**

- 1) Dual-core processor running at 2.2 GHz
- 2) 20 GB on the hard drive.
- 3) RAM: 4GB
- 4, UPS, keyboard, mouse, and monitor

## CHAPTER-4

### SYSTEM -DESIGN

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#### 4.1 System: Design

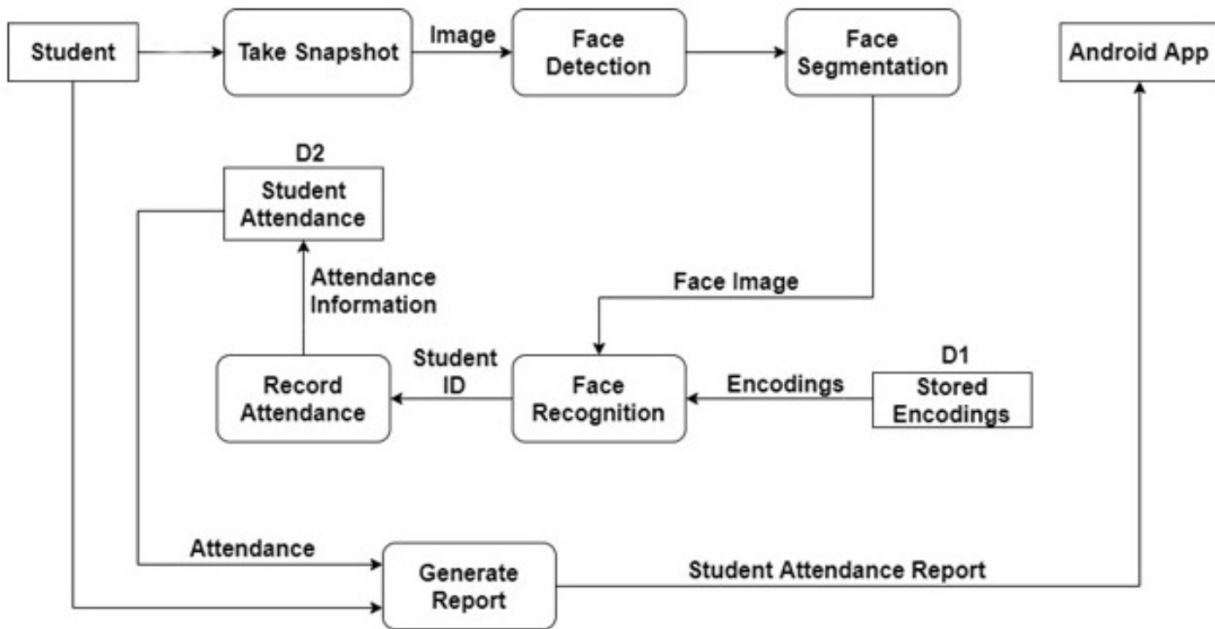


Fig 1.1 system: -design

## 4.2 UML-: Diagram

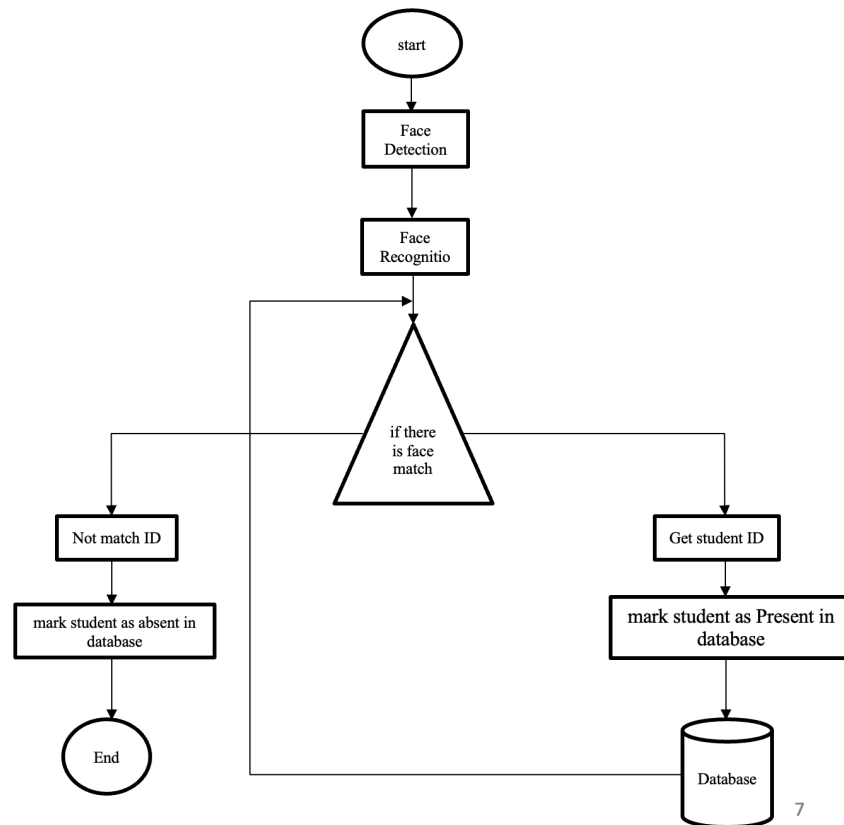


Fig 1.2 UML-: diagram

#### 4.2.1 Data flow diagram:-

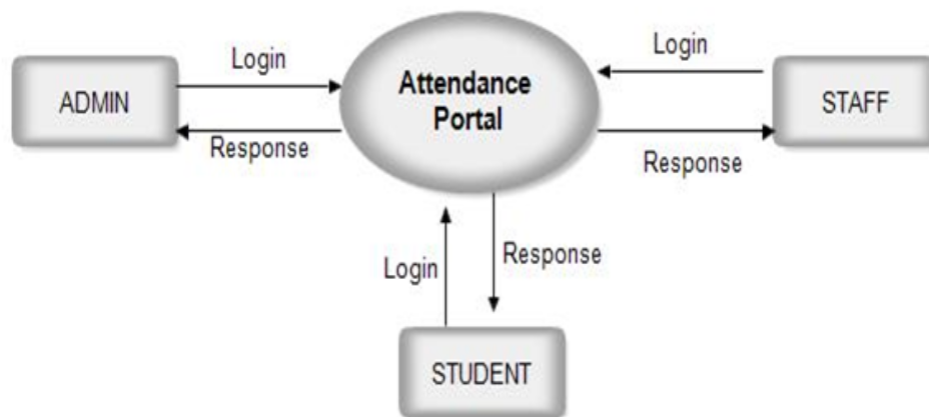


Fig 1.3 Dfd level-0

#### 4.2.2 USE-CASE -diagram

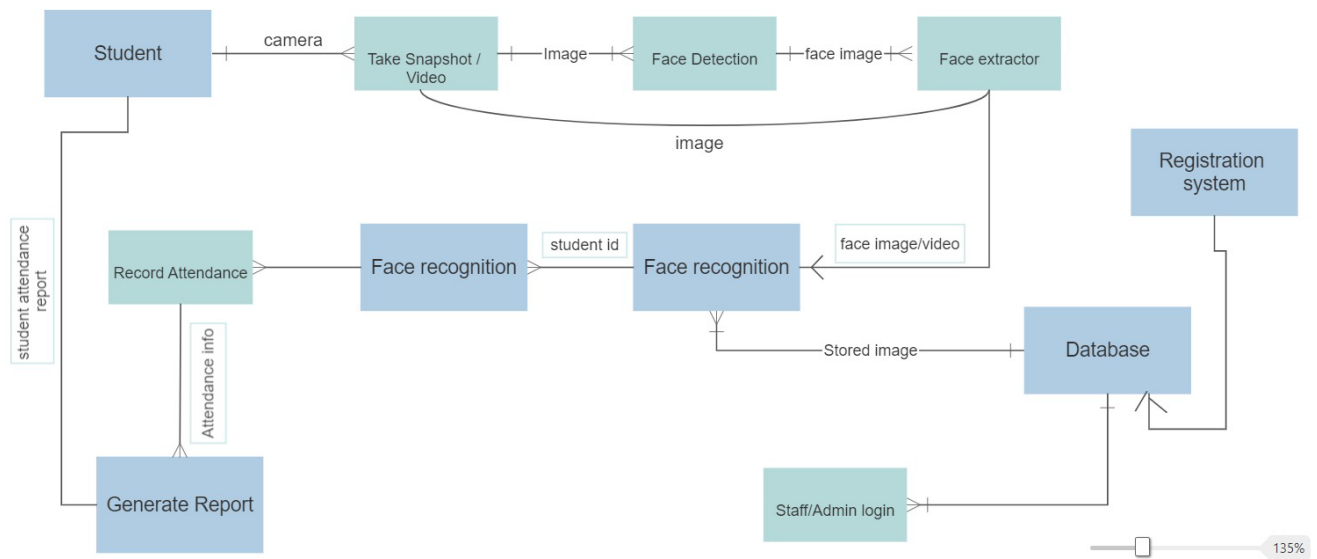


Fig.1.4 Use Case Diagram

#### 4.2.3 Sequence-:Diagram

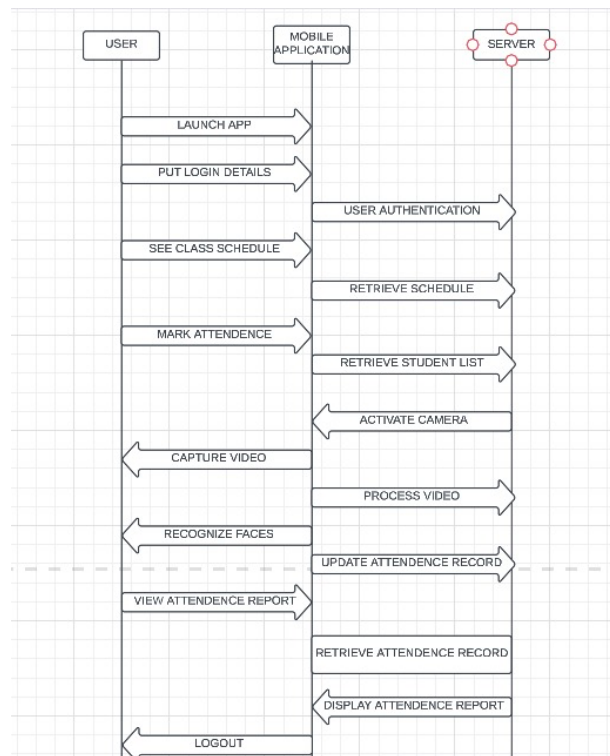


Fig.1.5 Sequence Diagram

#### 4.2.4 Activity Diagram

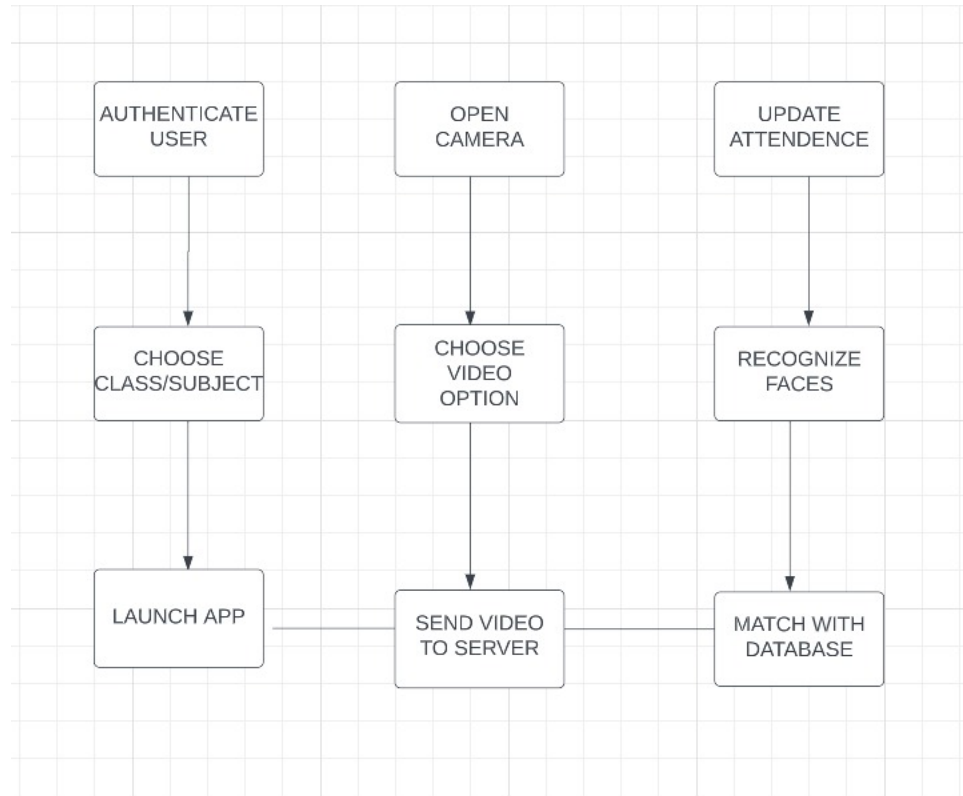


Fig.1.6 Activity Diagram



#### 4.2.5 Database Structure

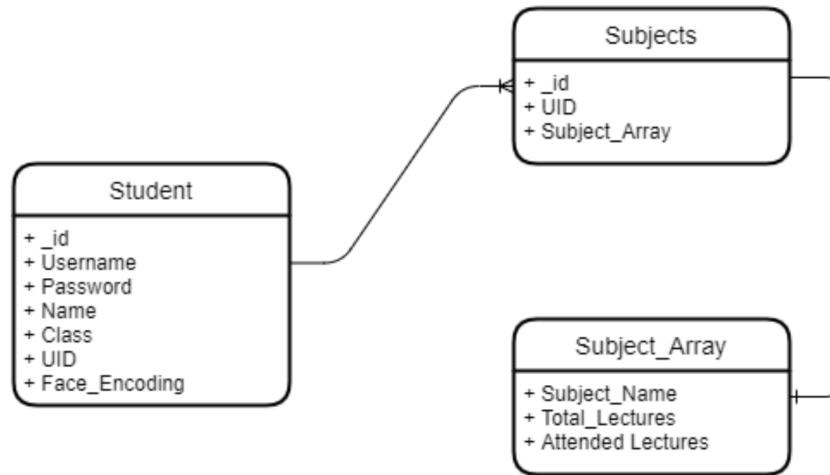


Fig. 1.7 Database- Diagram

## 4.2.6 Package -Diagram

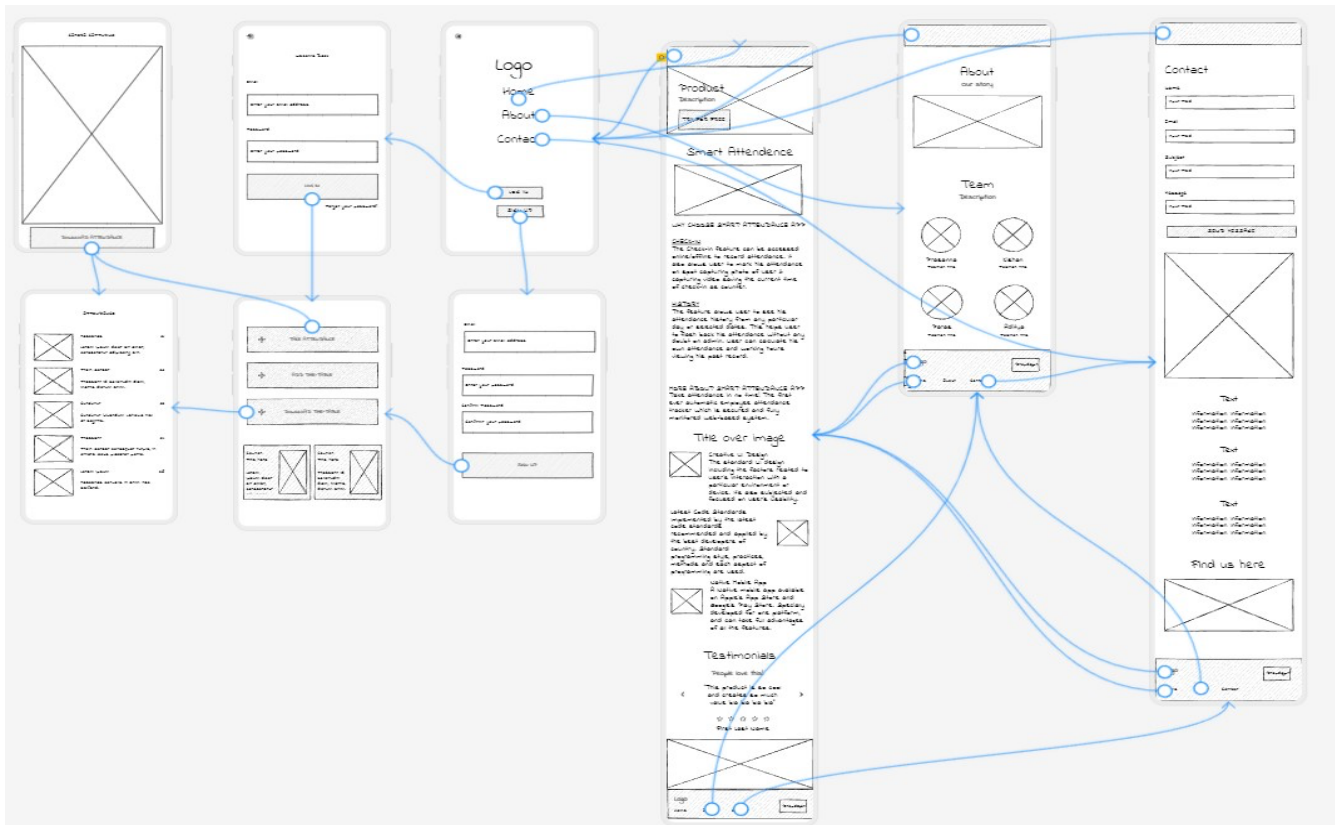


Fig.1.8 Package- Diagram

## CHAPTER 5

### IMPLEMENTATION

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#### 5.1 IMPLEMENTATION METHODS

##### 1. Existing System

| Author & Year                                 | Technology   | Proposed System  |
|---|--|--|
| Sutar and others (2022)                       | QR code and Android  | Make a system whereby students can scan a QR code to gain credit for each lecture [11].  |
| 2021, Chandramoui and others                  | Face Recognition, Internet of Things, and NVIDIA Jetson Nano | The Haar classifier identifies faces, the LBPH algorithm recognizes them, the histogram is compared to the dataset, and attendance is marked [13]. |
| (2021) Kumar and Kumar                        | Android, Server, and GPS                                     | The position of students is determined by GPS utilizing mobile devices; this is regarded as the key to recording attendance [12].                  |
| Susanto and others (2021)                     | Face Recognition on Android                                  | Making an Android application that uses OpenCV for speed detection and recognition. Facial detection will include the LBPH Histogram [8].          |
| Jumoke Soyemi and Folasade O. Isinkaye (2020) | Face Recognition, Android                                    | The Android operating system was developed using the Viola-Jones object identification framework and Eigen faces.                                  |

Every organization, regardless of size, needs an attendance tracking system to manage tasks and projects effectively. Management needs documentation of each student's time and attendance in order to control variations and discrepancies throughout the organization.

In today's fiercely competitive environment, automation significantly enhances all technologies.

In this case, the smart attendance management system with facial recognition capabilities represents a substantial improvement over the inefficient and time-consuming manual attendance tracking method for a group of students.

Automatic facial recognition is a dependable biometrics technology for image processing, security systems, and human-machine interfaces.

A smart attendance system with a modern facial recognition technology, which can be used to automatically detect human faces by capturing the current date, time, and location, is a real-time way to controlling students' daily activities.

The Smart Attendance Management System is made up of four active participants and one cooperating system. both the student whose attendance is being taken and the lecturer who will take it.

The admin will have easy access to the entire system. The Smart Attendance Management System initially looks at a picture of the student taken by the camera.

Processing this image reveals the student's registration status; if not, inquiries regarding the student's cellphone, residence, roll number, and PRN number are made.

This information is saved in the database and retrieved as necessary. As a result, employing machine learning to analyze images to identify people is accurate.

## 5.1 Algorithms

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### Algorithm 1: Smart Attendance System

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Step 1: Start

Step 2: Image upload to database

Step 3: create account.

Step 4: if you already created account then it automatically redirects user to LOG IN page.

Step 6: Scan the image of student by clicking on start button.

Step 7: It automatically scan the image and verify the student image to the database.

Step 8: If student match to the database, then it will mark the attendance.

Step 9: mark the attendance of student in Excel sheet.

Step 10: Users can Download that Excel sheet of Marksheet anytime.

Step 11: Stop

## **Implementation Tools**

To implement our project, we have used various APP technologies.

### **FRONTEND: -**

JAVA

### **BACKEND: -**

Java

python: - For ML recognizing the student.

### **DATABASE: -**

Mongo dB

### **LIBRARIES: -**

Dlib

### **API: -**

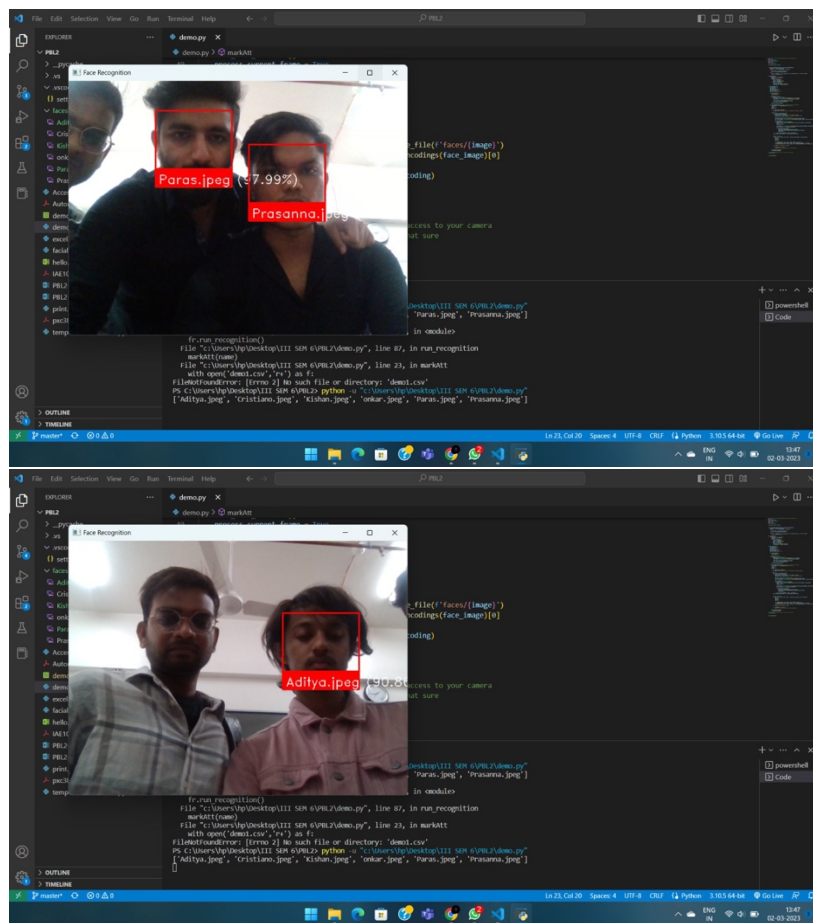
Flask

## CHAPTER:-6

### CONCLUSION AND RESULTS

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The suggested system is based on Java, and machine learning is done in Python using Android Studio as the IDE. The suggested technique is put through a number of tests, including those listed below, to determine the legitimacy of the system. The photographs from the accessible datasets are being used by the system to evaluate.



Images of student detection are exhibited in Figure 13(a), and the datasets are shown. Images demonstrating the identification of students are taken from live-streamed recordings taken by our camera.

we have seen that app is capturing the image by clicking the start button and verifying the students to the database where already image of student uploaded.

Furthermore, we can see that how easy to use this and how users easily can access and download the attendance of student.

Subject wise attendance users can create and take attendance according to that. how convenient this is.

Users can access from any device from anywhere by using his/her credential id.

this way college and student attendance can maintain for a long time.

data of student can be secure, and time can also be saved.

Another advantage of our technology is its transparency, which prevents anyone other than users from accessing or making changes to the Excel sheet.

Our system accuracy is more than 95 percent which is very good in comparison with other existing system.



## **CHAPTER 7**

### **CONCLUSION AND FUTURE SCOPE**

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In Conclusion, we can say that we have tried to create a better platform to solve the problem of this age old fashion taking attendance using our app system.

Looking into the future we can say in our system we have used very emerging technology which can enhance the performance of today's working culture and increase the productivity.

It could be the game changing system which can save a lot of time of users.

Population is growing very fast so we need this type of system which can take the lead in this era and work according to this.

We will improve this system by adding some emerging technology in future which it can work according to the system in this era and make some impact in this world.

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## Test Cases

| Sr No. | Test cases              | Actual outcome  | Expected outcome  | Result |
|--------|-------------------------|---|---|--------|
| 1      | Start Button            | It starts the Phone camera for capturing photo for image detection              | It should start the capturing photo for image detection         | Pass   |
| 2      | Create account          | It pops out the create account on screen  | It should display on screen to create account                   | Pass   |
| 3      | Log In                  | It pops out the view screen to log in   | It should display on screen to log in                           | Pass   |
| 4      | Select subject          | It pops out the window which is used to display to select subject               | It should display the screen to select                          | Pass   |
| 5      | Download File           | It pops up to download the file   | It should download file   | Pass   |
| 6      | Click Button            | After clicking on this button the message box comes which displays the message. | It sends the message to the users                               | Pass   |
| 7      | Proceed button          | It opens the window to select file from any folder and send to users            | It should send to users   | Pass   |
| 8      | Click on capture button | Multiple image can be Captured in this folder                                   | It should start clicking the images from ongoing videos         | Pass   |
| 9      | Update                  | It is updating the information in the database                                  | It should update the info in database                           | Pass   |
| 10     | Log out                 | It will log out the user  | It should log out the users if users want to log out after use. | Pass   |