

**CLASS ATTANDANCE SYSTEM BASED ON FACIAL RECOGNITION
BY**

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This Report Presented in Partial Fulfillment of the Requirements for the
Degree of Bachelor of Science in Computer Science and Engineering

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APPROVAL

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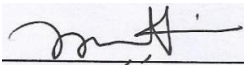
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DECLARATION


We hereby declare that, this project has been done by us under the supervision of **Mr. Saiful Islam, Senior Lecturer, Department of CSE** Daffodil International University. We also declare that neither this project nor any part of this project has been submitted elsewhere for award of any degree or diploma.

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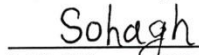
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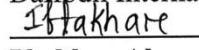


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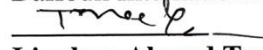
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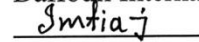
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ABSTRACT

The easiest technique to separate each other's personality by the face. Face acknowledgment is an individual distinguishing proof framework that utilized individual facial qualities to recognize an individual's character. The human face affirmation system is basically in two-organize, for example, facial discovery and the other is facial acknowledgment. The stage is then created as a model of replication and facial acknowledgment models just as created by one of the many propelled inquire about biometrics innovations. There are numerous kinds of systems that are currently prominent with cutting edge face recognition examples, for example, Eigen faces, angling strategies, and the viola-jones calculation. Viola-jones calculation gives higher exactness than different methods. Human Face Recognition Using Open CV Hidden Markov Model (HMM) of this undertaking with face acknowledgment method. The necessities components of this venture are Open CV, Django, My SQL, and python. For this venture, we utilize a few catchphrases, for example, face acknowledgment, Viola-jones, My SQL, python, Open CV. For more expansion, there is an enormous number of utilizations from this facial acknowledgment venture, this undertaking can be broadened that various parts and sizes can be recognized in various pieces of the face.

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CHAPTER 1

INTRODUCTION

1.1 Introduction

Face affirmation structures are a bit of facial picture planning applications and their criticalness as an investigation locale is extending starting late. Face affirmation systems are regularly applied and supported for a person's affirmation and reconnaissance cameras in metropolitan life. The inspiration driving the class enrollment is to count the number of understudies and solicitation understudies to go to class on the calendar, to improve the idea of training. Starting late, with the improvement of significant learning, face affirmation has made unbelievable achievements, which prompts another point of view to handle the issue of class bolster selection. In order to extra time, we have a plan to count the number of understudies therefore reliant on face affirmation. For the most part, a face affirmation structure ought to be presented in a specific stage, since the web application is definitely not hard to make, and need a camera, so we pick web as a phase for face affirmation.

1.2 Motivation

In most learning foundations, understudy attendances are physically taken by the participation sheets gave by the division. The understudies sign in these sheets or educators move call names which are then filled or physically marked in to a PC for future check examination. A couple of understudies normally sign for their missing associates. This strategy is dull and depleting task. This procedure additionally makes it hard to pursue the investment of individual understudies in an enormous homeroom condition. In this endeavor, we propose the course of action and utilization of a face recognizable proof and affirmation framework to along these lines see understudies taking off to an area in an investigation lobby and stamp their support by observing their appearances.

1.3 Objectives

Facial recognition is widely used due to its advantage and its future scope. The benefits of the facial recognition system are that it is most comfortable for user and unique identify system. Such things are needed in the case of security purpose in

government offices, banks or ATM Booth etc. And now a day's facial recognition systems serve better than other biometric strategies, so they wanted to be used it for surveillance for criminals, suspected terrorists, or looking for missing cars and bikes.

1.4 Expected Outcome

The outcome of face detection auto attendance system is given below:

- Detect multiple faces at a time
- Recognize faces accurately
- User-friendly system for both students and teachers
- Save identified faces and also take attendance into a database

1.5 Report Layout

Chapter 1: Introduction

In this part, we have discussed the motivation, targets and foreseen the aftereffect of the errand.

Chapter 2: Background

We talk about the establishment conditions and hardware nuances of our endeavor. We moreover talk about the related work, comparative examinations, degree of the issue and challenges of the endeavor.

Chapter 3: Requirement Specification

This area is about the necessities like the use case model of the endeavor and their delineation, the reasonable social database model, and the structure essentials.

Chapter 4: Design Specification

In this part, we discussed all of the plans of the endeavor.

Chapter 5: Implementation and Testing

This part contains the use of the collaboration structure and UX, execution of essentials, testing utilization and test outcomes of the endeavor.

Chapter 6: Conclusion and Future Scope

We talked about the end and the degree for further improvements.

CHAPTER 2

BACKGROUND

2.1 Introduction

The face recognition enrollment system is a very well-designed web-based system. In this chapter, we will feature the necessary information about our system. And also depict all the current research business related to our thought. We will find the strength and weaknesses of this research work.

We will find the difference between them and our research work and also talk about their limitations. This system is open for personal use.

Lastly, we will describe the challenges of our research work.

2.2 Related Works

A couple of figuring's and facial affirmation strategies have been made by past experts. This fragment is discussed that rapidly:

- Face distinguishing proof and affirmation for modified interest structure using Artificial Intelligence thought.
- A class collaboration enrollment system was subject to confront affirmation.
- Development of a face acknowledgment framework.
- A bimodal biometric understudy participation framework.

2.3 Comparative Study

We will compare our research work with another research works which done before.

We study that papers and learn about them. And also compare their methods with our methods.

- “Face identification and acknowledgment for programmed participation framework utilizing Artificial Intelligence idea" this paper utilizing Viola-Jones face discovery; Local Binary example calculation for face acknowledgment and Yale database procedures are utilized which give them 83.2% effectiveness.”
- “A class investment enlistment framework dependent on face acknowledgment” in that paper they work in a low light capturing image and

recognize them. In their methods they can achieve more than 90% accuracy under illumination.

- “Development of a face recognition system” in this paper they are using MATLAB environment and it gives more than 90% accuracy. This percentage is lower if “person is not recognized”.
- “A bimodal biometric student attendance system” in this paper they are using MATLAB for facial biometric attendance. And it gives minimum 87.83% accuracy.

2.4 Scope of the Problems

There have a lot of methods to solve that. But in the market some poor types of software are available. And face recognition is a trending topic nowadays. It has a lot of opportunities in future. And our system can manage a lot of data at a time and it is user-friendly.

2.5 Challenges

Our project "Class Attendance System Based on Facial Recognition" will highly be challenging for us. To implement this system, first, our face must be properly identified by the system after that it connect with the servers and pass the correct attendance information.

Time:

It was a difficult challenge because this is the main part that must be completed in our project. And we are just a beginner in these topics. So, we need a lot of time to solve this problem. We will share our time and separation of the task work to finish the whole venture.

Requirement:

The most important challenge was to recognize a face that was trained first. Then the identifying face shows the person's information correctly and for this reason, we need to find out the appropriate face features algorithm.

Skills for the Project:

A project sometime requires some skills and problem-solving capabilities. So, we needed some skill and we achieved that skill to complete our project and we discussed all the issues and decided to do the right thing.

CHAPTER 3

REQUIREMENT SPECIFICATION

3.1 Introduction

In the past part, we outline different systems and strategies for recognizable proof and acknowledgment of the face. Each technique has a few limits. The accompanying regions are offered visual perception for personality and acknowledgment frameworks. All conspicuous evidence or affirmation advancements work using the going with four stages:

- **Catch:** A physical or social model is gotten by the system during Enlistment and moreover in unmistakable verification or affirmation process.
- **Extraction:** Exceptional data is expelled from the model and a format is made.
- **Comparison:** The arrangement is then differentiated and another model.
- **Match/non-coordinate:** The system picks if the features expelled from the new Samples are a match or a non-arrange.

3.2 Requirement Collection and Analysis

There are two main types of face Recognition Algorithms:

- **Geometric** – this calculation centers at recognizing highlights of a face.
- **Photometric** – a factual methodology that distils a picture into qualities and contrasting esteems with formats with wipe out differences.

It ought to anyway be noticed that the current face acknowledgment methods are not (100%) effective at this time. Run of the system efficiencies extends between 40 - 60%.

The PC based facial affirmation industry has made various accommodating degrees of progress in the earlier decade. In any case, the necessity for higher exactness remains. Through the confirmation and obligation of industry, government appraisals, and dealt with rules bodies, improvement and progress will continue, expanding present desires for face-affirmation advancement.

The Viola-Jones Algorithm:

The Viola-Jones calculation for face discovery was proposed by Viola and Jones (2001) as referenced in the writing audit. This estimation starting now and into the foreseeable future has been comprehensively used by masters for face revelation. It has demonstrated the most effect contrasted with different techniques with quick recognitions because of its wide use in authentic applications.

The Viola-Jones computation works with a full point of view on frontal faces. The issue comes when appearances are tilted or on either side yet can be adjusted as has been executed with reference to Open Cv.

The Viola-Jones Algorithm checks a sub-window in order to perceive faces over an information picture. The standard procedure for picture getting ready with this count is to rescale the pointer and run it ordinarily through the image instead of rescaling the information picture which results in continuously computational time. Each time the rescaled identifier is run against a data picture, the size of the image changes each time.

1	1	1
1	1	1
1	1	1

Input Image

1	2	3
2	4	6
3	6	9

Integral Image

Figure 3.1: Integral Image

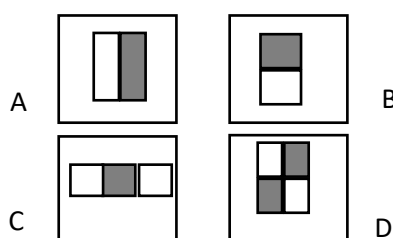


Figure 3.2: Different types of Features

The pixels are inside rectangular features of unpredictable sizes which can be handled inconsistent time. The given sub-window is analyzed by the Viola-Jones using features of in any event two square shapes different reference bunches.

The features are as showed up in Figure 3.2 where the ensuing worth is controlled by subtracting the sum of the square shapes from the entire of the Diminish square shapes. (Viola-Jones 2001).

The affirmation part of the structure has been realized using Hidden Markov Model with Singular Value Decomposition (SVD). The use of this has been established on the information collected during the composting review. The inspiration driving why HMM with SVD coefficients was considered is an immediate consequence of the mind-boggling results procured by realizing these computations together as taught by inquisitive about. Their results were the motivation to consider these estimations for this bit of the system. As this zone of study is so far constant research, this computation has been completed contrastingly and evaluated in like way.

Hidden Markov Models (HMM):

This is a direct instrument that chooses a progression of events (recognitions), without the state of the model where the gathering experienced to make the event. (MATLAB R2018a Documentation). In HMM, in perspective on a progression of discernments, the course of action of states can be envisioned. Other research portrays the HMM as a positive game plan of states with each state related to a multidimensional probability dispersal. The probability that directs these states are change probabilities and with the related probability, discernment can be made. The planning and testing of the photos for affirmation are performed in the recognition vector space (Miar-Naimi and Davari 2008). The image is ordinarily addressed in the 2D matrix. In the structure, the use of a one-dimensional model of HMM is used to allocate face.

The face is exhibited in one-estimation with seven states. The state in a progressively clear Markov chain is unquestionable to the onlooker yet in HMM, the state is concealed, with the yield of the state made evident to the observer. The 7-domain of HMM happens through and through the face and identifies with the head, sanctuary, eyebrows, eyes, nose, mouth, and jaw. These states will be improved with the difference in going with parts that are relied upon to complete an HMM (Miar-Naimi and Davari 2008).

- The number of states (N) of the model.

- The number of perceptions.

- A set of progress probabilities.

3.3 Use case Modeling and Description

3.3.1 General Overview

This system starts with taking photos of the users. It detects the faces and extracts it into grayscale. After that it load training set data and train the recognizer, and after that recognizer start detection. If a recognizer match with training set data then it updates this person's attendance sheet otherwise it gives some message.

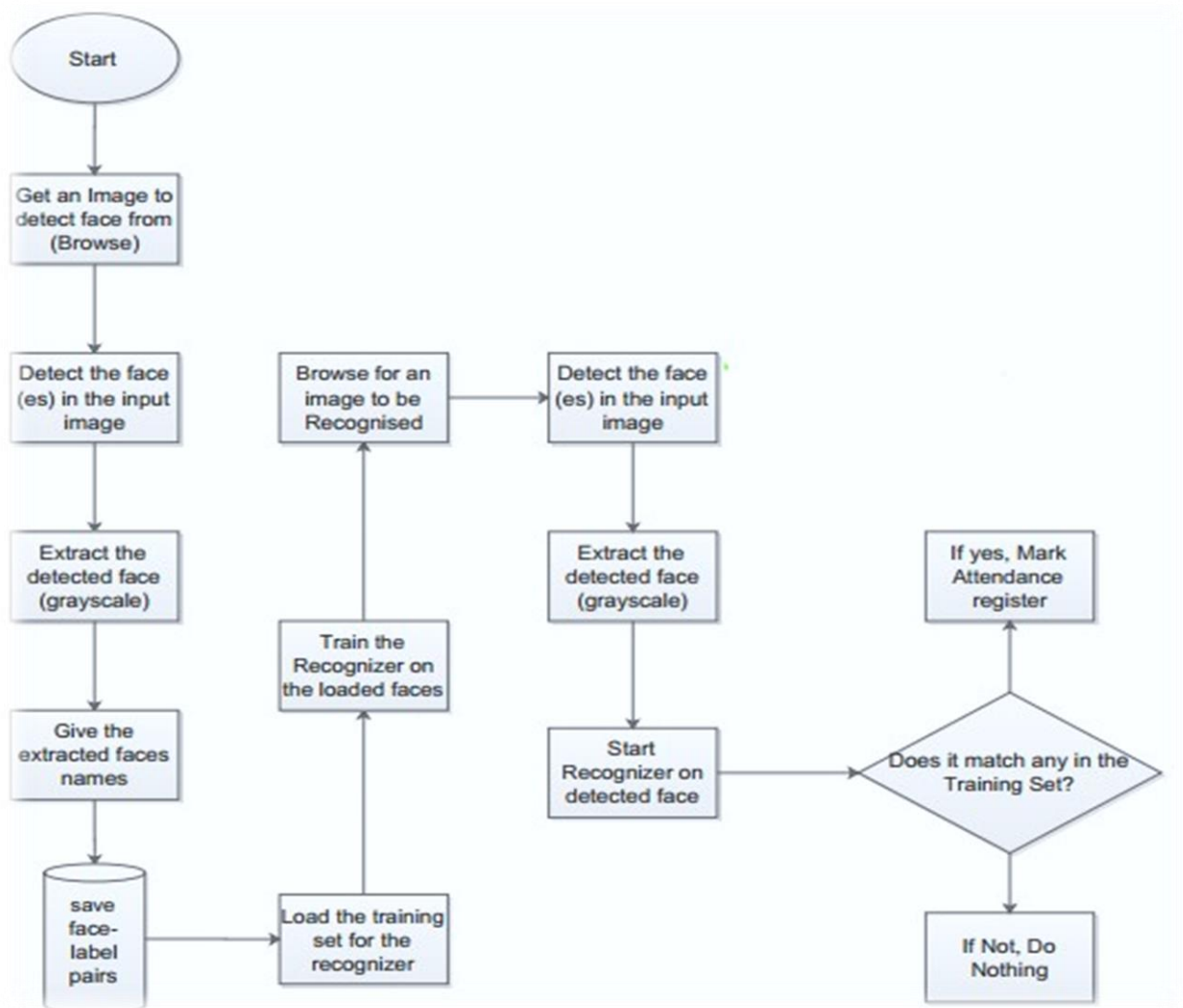


Figure 3.3: Sequence of Attending Class System

3.3.2 Use Case Diagram

This diagram shows overall use cases used in facial recognition auto attendance system.

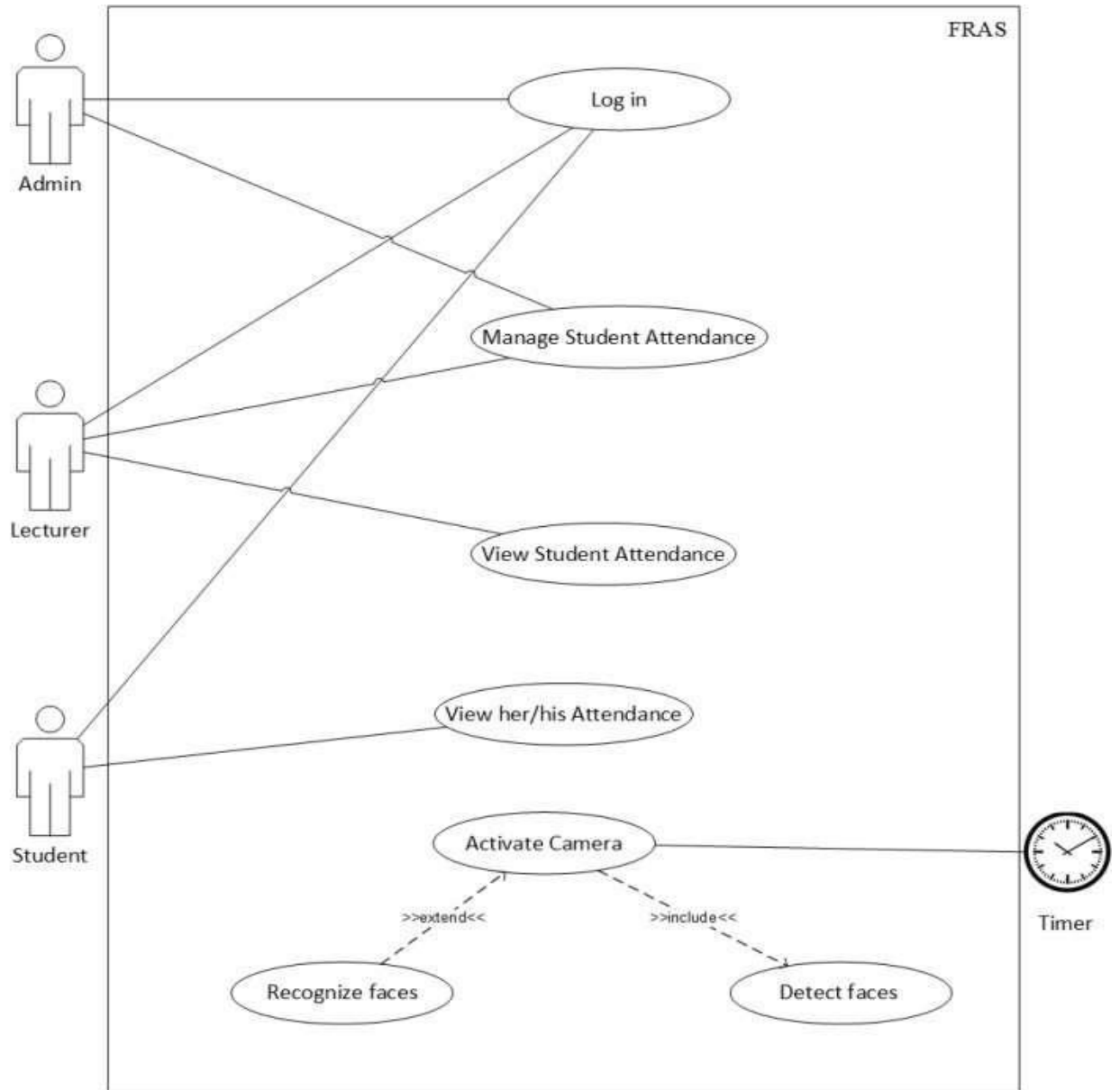


Figure 3.4: Use Case diagram

3.4 Logical Data Model

Logical Steps of Store Faces to a Database

- Detect and extract a face
- Label the extracted face
- Insert the extracted face label pair to the faces database

Faces Database Editor:

The faces database editor adds faces in the training set. The image is acquired from the highlighted box number 1 as shown in Figure 3.4 and displayed as-is on step 2 on a picture box. The Regions of Interest (ROI) i.e. faces in the image will then automatically be detected by drawing a light green rectangular box. In step 3 we give the extracted grayscale face from the image a face label and then add them to the training set. In step 4 we can then modify the face label pairs in the event they were wrongly captured or even delete the faces if they are not as per the standards. Finally, step 5 prepares us for the recognition stage.

The figure below shows the logical design and implementation of these systems:

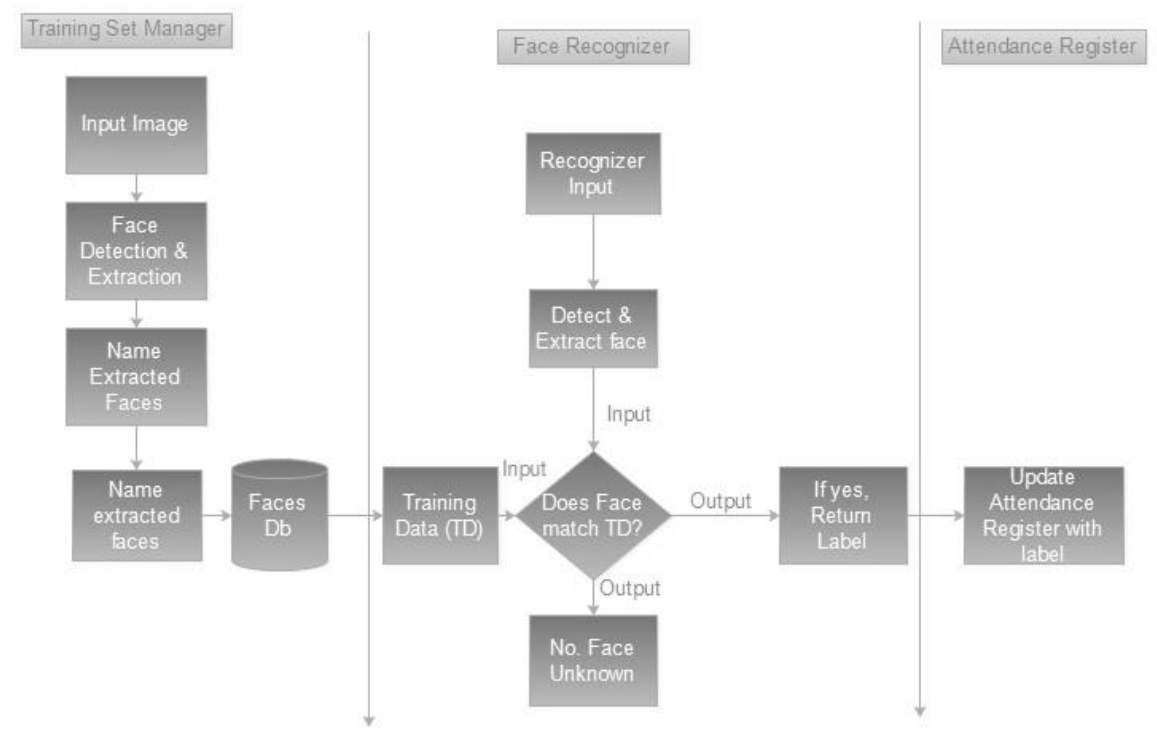


Figure 3.5: The logical design of attendance system

3.5 Design Requirement

This stage will talk about the different instruments that are utilized to accomplish the task objectives and goals.

Functional Requirements:

Useful prerequisites are including that the framework will require so as to convey or work. On account of this undertaking, it was essential to assemble a few necessities that will be expected to accomplish the goals set out beforehand.

- Capture face pictures by means of webcam or outer USB camera.
- A proficient HD Camera
- Faces on a picture must be identified.
- The countenances must be recognized in bounding boxes.
- Compute the complete participation dependent on distinguished countenances
- Crop the all-out number of countenances identified.
- Resize the edited countenances to match faces the size required for acknowledgment.
- Store the edited appearances to an organizer.
- Load faces on a database.
- Train faces for acknowledgment.
- Perform the acknowledgment for appearances put away on a database.
- Compute acknowledgment pace of the framework.
- Perform acknowledgment in a steady progression for each face trimmed by Face Detector.
- An instructor ought to be informed if any face isn't coordinated with prepared information.

Non-Functional Requirements:

Non-useful necessities are a set of prerequisites with explicit criteria to pass judgment on the activity of the framework. All the more explicitly:

- The client will think that it's extremely advantageous to take photographs.
- The framework is extremely secure.
- The framework will have a reaction time of 10 seconds.
- The framework must be quick and dependable.

CHAPTER 4

DESIGN SPECIFICATION

4.1 Front End Design

The fundamental fascination of this application is its front-end structure. This is the method for collaboration between the clients and the servers. Front-end configuration is otherwise called customer side advancement. We made an easy to understand front-end plan for all clients. Furthermore, this internet browser is responsive for any gadget, so any one from any gadget effectively handles this emphasis.

4.1.1 Registration Page

Teachers and students both first need to register here. Registration parts are divided into 3 parts. The first one is for their personal information registration; the second one is for their educational background and the third one is for recognition image collection.

4.1.1.1 Personal Information Form

Admin or department can edit this information and they give all data into the system. It takes all personal data given to that institution to recognize them. Student gives their Personal Information, Educational Information & his/ her recent image for registration in our system.

The screenshot shows the 'Digital Classroom System' interface. At the top, there is a navigation bar with 'Notification', a search box, 'Settings', and 'User profile'. Below this, a sidebar on the left contains 'Registration', 'Teacher', and 'Student' options. The main content area is titled 'Registration' and has two tabs: 'Teacher' and 'Student', with 'Student' selected. The 'Student' registration form is divided into three sections: 'Personal Information', 'Educational', and 'Image For Recognition'. The 'Personal Information' section includes fields for Name, ID, Birth of date, Gender, Father's Name, Mother's Name, Contact, Email, Address, Nationality, Blood Group, and Religion. The 'Image For Recognition' section features a large empty box labeled 'Profile Picture'. A 'Save' button is located at the bottom of the form.

Figure: 4.1 Personal Information Form

4.1.1.2 Educational Information Form:

To track their present educational background this system need their past educational history.

For example, we would like to store his/ her all educational Background.

The screenshot displays the 'Educational Information Form' within a 'Digital Classroom System' interface. At the top, there is a navigation bar with 'Digital Classroom System', a 'Notification' bell icon, a search bar, and links for 'Settings', 'User profile', and an information icon. A left sidebar contains 'Registration', 'Teacher', and 'Student' options. The main form area has 'Teacher' and 'Student' role buttons, with 'Student' selected. Below these are three tabs: 'Personal Information', 'Educational' (active), and 'Image For Recognition'. The 'Educational' tab contains several dropdown menus: 'Department' (Computer Science and Engineering), 'Program' (B.Sc in CSE), 'Level' (1), and 'Term' (3). To the right of these is a red header for 'Available Courses' above a large empty white box. A 'Save' button is located at the bottom center of the form area.

Figure: 4.2 Educational Information Form

4.1.1.3 Image for Recognition:

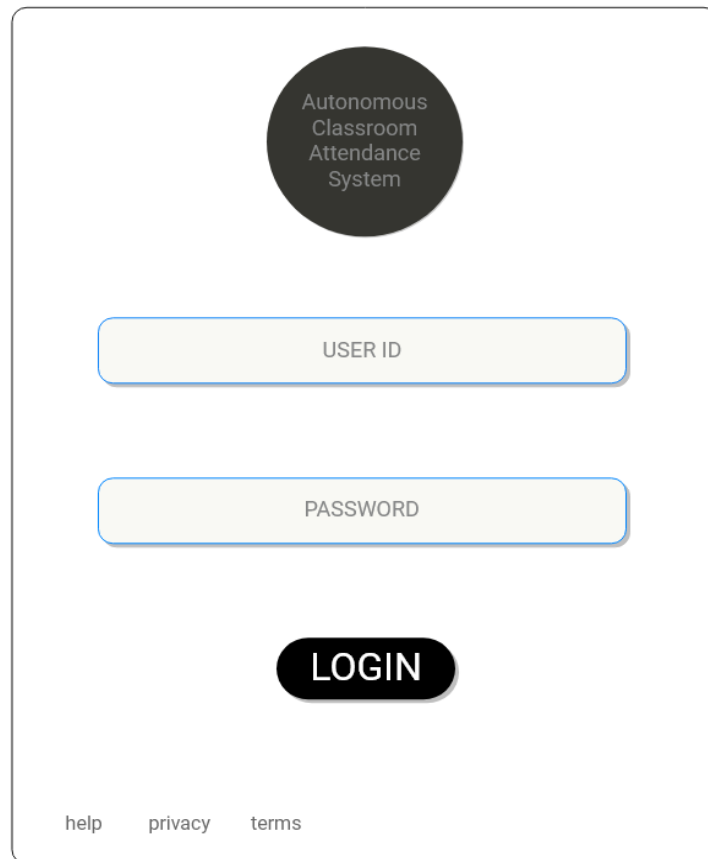
First time registration this system need capture students all possible side face image. For facial recognition this part is mandatory. This images are trained by our system to recognize them.

The screenshot shows a web interface for a Digital Classroom System. At the top, there is a navigation bar with 'Digital Classroom System', a notification bell, a search bar, and links for 'Settings', 'User profile', and an information icon. On the left, a sidebar contains 'Registration', 'Teacher', and 'Student' options. The main content area is for a 'Student' registration. It features a 'Teacher' button (disabled) and a 'Student' button (active). Below these are three tabs: 'Personal Information', 'Educational', and 'Image For Recognition'. The 'Image For Recognition' tab is active and displays a 3x6 grid of empty image boxes for capturing multiple side-face views. A 'Save' button is located at the bottom center of the form.

Figure: 4.3 Capturing Image Form

4.1.2 Login Page

After registration of teachers or students, they can access to their system using their id and password. They find a login page to access there.



Autonomous
Classroom
Attendance
System

USER ID

PASSWORD

LOGIN

[help](#) [privacy](#) [terms](#)

Figure: 4.4 Login Page

4.1.3 Teacher Page

4.1.3.1 All Class Attendance Graph

Teacher can see all present student's data per class in one section. He can easily access all his subject per section in one page. He update some information here. If some difficulties occur, he also can update sheet manually. And he also find out the average number of regular student in his class.

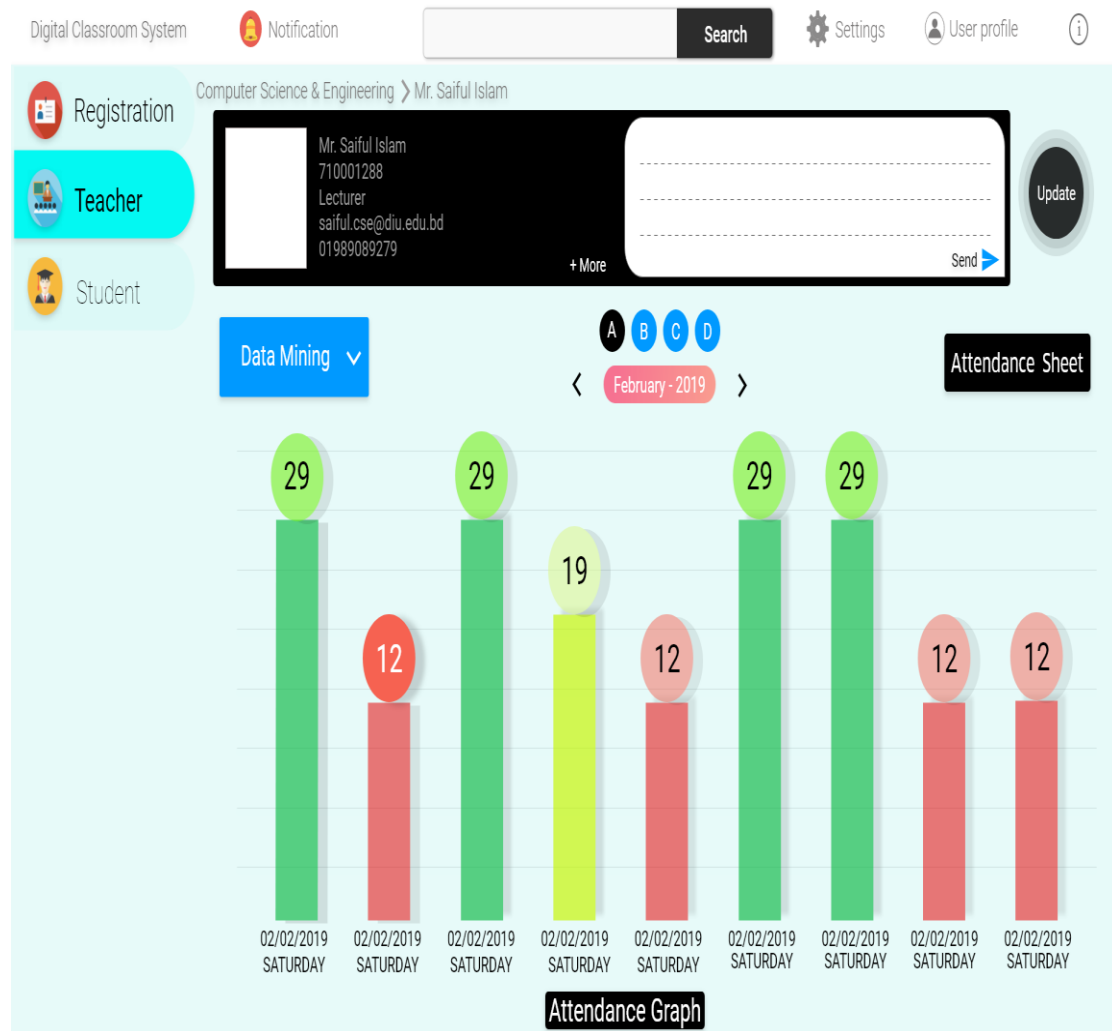


Figure: 4.5 Teacher Page

4.1.3.2 Attendance Sheet Modify

Teacher can manually change attendance sheet if any problem occurs. He also find out poor attendance student and their details to consult them.

		Total Class		Total Students		ID: 710001288 (Lecturer) Name: Mr. Saiful Islam	
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
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	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
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	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details
	Lingkon Ahmed Tomal	:::	152-15-6011	:::	Present - 73%	:::	Details

Figure: 4.6 Attendance Page for Teacher

4.1.4 Student Page

4.1.4.1 All student data per Subject

Everyone find out all students list using this system. It is protected for user defined. Teacher can see all their student but students only see their classmate.

The screenshot displays the 'All Student Page' in a Digital Classroom System. The interface includes a top navigation bar with 'Digital Classroom System', 'Notification', a search bar, 'Settings', 'User profile', and an information icon. A left sidebar contains 'Registration', 'Teacher', and 'Student' options. The main content area features a red filter bar with dropdown menus for 'Computer Science & Engineering', 'B.Sc', 'Level - 1 :: Term-1', 'A', and 'Introduction to Bio Informatics'. Below the filter bar is a table of student records, each with a profile icon, name, and ID number. The table is filtered to show students in the 'Computer Science & Engineering' subject, 'B.Sc' program, 'Level - 1 :: Term-1', 'A' grade, and 'Introduction to Bio Informatics' course. The student 'Md. Moynul Hasan Shohagh' is the only one with a unique ID (152-15-5982), while others have IDs starting with 710000633 or 710001060.

Profile Icon	Name	ID
	Md. Moynul Hasan Shohagh	152-15-5982
	Lingkon Ahmed Tomal	152-15-6001
	Abu rahad	710000633
	Abu rahad	710000633
	Akhter Hossain	710000607
	Abu rahad	710001060
	Abu rahad	710000633
	Lingkon Ahmed Tomal	710000633
	Lingkon Ahmed Tomal	710000633
	Lingkon Ahmed Tomal	710000607
	Lingkon Ahmed Tomal	710001060
	Lingkon Ahmed Tomal	710000633
	Lingkon Ahmed Tomal	710000633
	Lingkon Ahmed Tomal	710000633
	Lingkon Ahmed Tomal	710000633
	Lingkon Ahmed Tomal	710000633

Figure: 4.7 All Student Page

4.1.4.2 Subject wise attendance performance

Student can find out their attendance performance per subject.

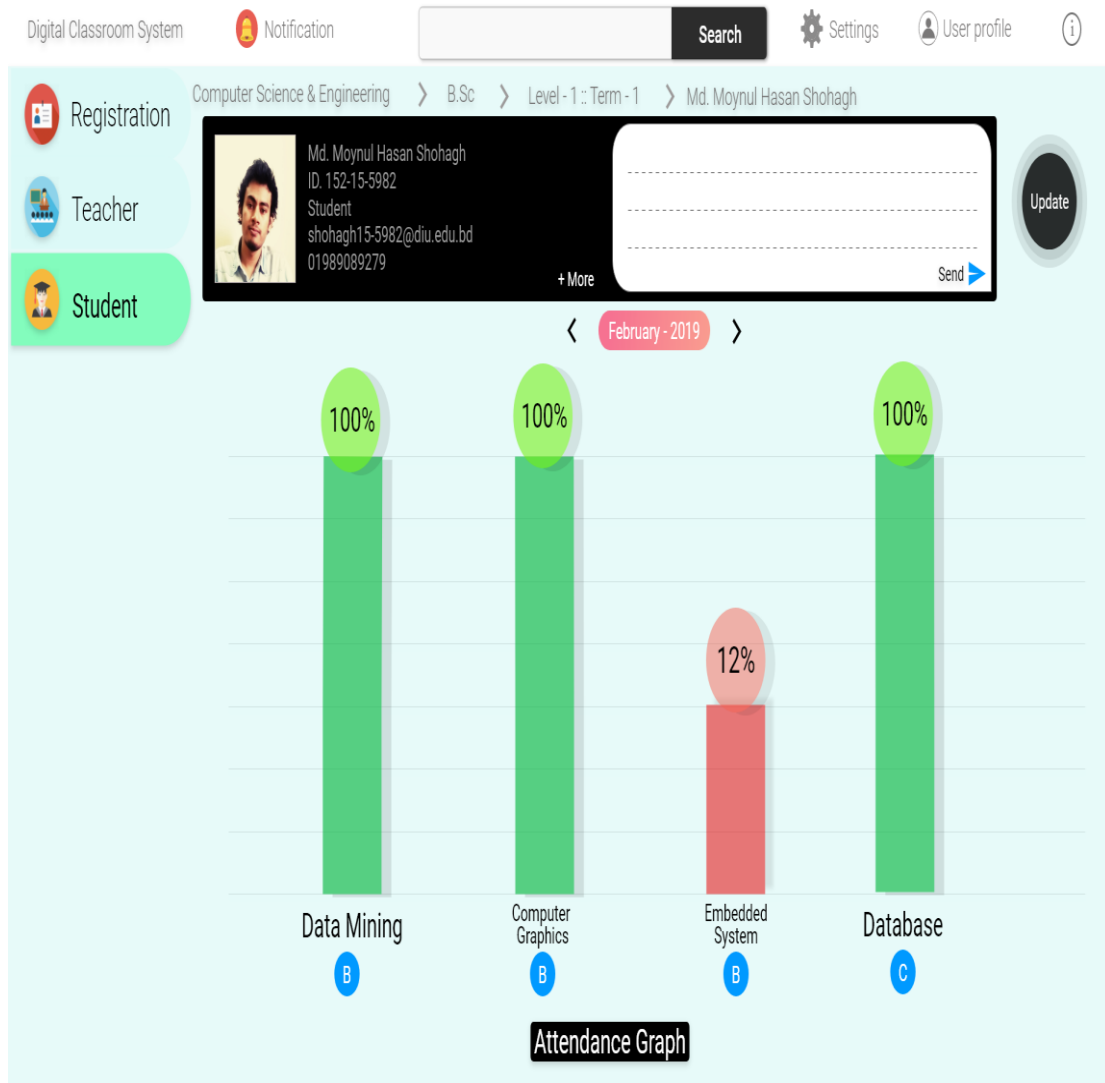


Figure: 4.8 Attendance performance page

4.1.4.3 Attendance Sheet View

Every student can see details of their attendance performance like, that day this student absent or present and data collect should be face recognition or manually. And students also find out their average performance.
















		Data Mining ▾	A ▾	40	73%	27%	 ID. 152-15-5982 Name: Md. Moynul Hasan Shohagh
				Total Class	Present	Absent	
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Manual ▾		
	19-02-2019	⋮	Absent ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		
	19-02-2019	⋮	Present ▾	⋮	Face Recognition ▾		

Figure: 4.9 Attendance sheet page for student

4.2 Back End Design

In this system we write python code for facial recognition and Open CV can easily detect and recognize multiple faces.

4.2.1 Create Dataset

We create some data set to capturing 20 image from video surveillance and enter 5 data that represent this person's information. Then this value automatically insert into our database.

```
createdataset.py - E:\imageProcessing\recognitionWithDb\createdataset.py (3.7.4)
File Edit Format Run Options Window Help

import cv2
from pip._vendor.distlib.compat import raw_input
import mysql.connector

mydb = mysql.connector.connect(host="localhost", user="root", passwd="", database="facebase")
mycursor = mydb.cursor()

cam = cv2.VideoCapture(0)
detector = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')

def insertOrUpdate(id,name,age,roll,gender):
    # sql="select * from student where id="+str(id)
    # if sql:
    #     res=mycursor.execute(sql)
    #     #
    #     # isRecordExist=0
    #     # if res:
    #     #     for row in res:
    #     #         isRecordExist=1
    #     #         if(isRecordExist==1):
    #     #             sql="UPDATE student SET Name=' "+str(name)+" ' WHERE id="+str(id)
    #     #         else:
    #     #             sql="INSERT INTO student(id,name) Values("+str(id)+',' "+str(name)+' " )"
    #     #             sql = "INSERT INTO showinfo_student(uniqueId,Name,Age,Roll,Gender) Values("+str(id)+',' "+str(name)+' ', "+str(age)+' ', "+str(roll)+' ', "+str(gender)+'")"
    #     mycursor.execute(sql)
    #     mydb.commit()

id = raw_input('Enter Your id :')
name = raw_input('Enter Your Name :')
age = raw_input('Enter Your Age :')
gender = raw_input('Enter Your Gender :')
roll = raw_input('Enter Your Roll :')
insertOrUpdate(id,name,age,roll,gender)
sampleNum = 0
while (True):
    ret, img = cam.read()
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    faces = detector.detectMultiScale(gray, 1.3, 5)
    for (x, y, w, h) in faces:
        cv2.rectangle(img, (x, y), (x + w, y + h), (255, 0, 0), 2)
```

Figure: 4.10 Create Data set code using python

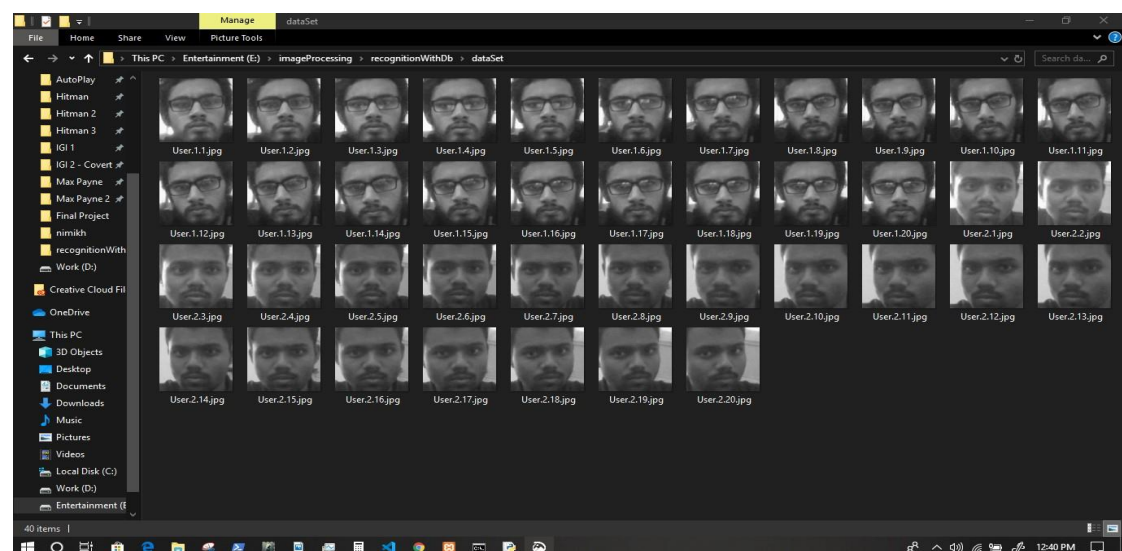


Figure: 4.11 After Capturing Image

4.2.2 Train Dataset

After analyzing this image it trained data set and create a YAML file.

```
trainer.py - E:\imageProcessing\recognitionWithDb\trainer.py (3.7.4)
File Edit Format Run Options Window Help

import cv2,os
import numpy as np
from PIL import Image

#recognizer = cv2.createLBPHFaceRecognizer()
recognizer = cv2.face.LBPHFaceRecognizer_create()
detector= cv2.CascadeClassifier("haarcascade_frontalface_default.xml");

def getImagesAndLabels(path) :
    #get the path of all the files in the folder
    imagePath=[os.path.join(path,f) for f in os.listdir(path)]
    #create empth face list
    faceSamples=[]
    #create empty ID list
    Ids=[]
    #now looping through all the image paths and loading the Ids and the images
    for imagePath in imagePath:
        #loading the image and converting it to gray scale
        pilImage=Image.open(imagePath).convert('L')
        #Now we are converting the PIL image into numpy array
        imageNp=np.array(pilImage,'uint8')
        #getting the Id from the image
        Id=int(os.path.split(imagePath)[-1].split(".")[1])
        # extract the face from the training image sample
        faces=detector.detectMultiScale(imageNp)
        #If a face is there then append that in the list as well as Id of it
        for (x,y,w,h) in faces:
            faceSamples.append(imageNp[y:y+h,x:x+w])
            Ids.append(Id)
    return faceSamples,Ids

faces,Ids = getImagesAndLabels('dataSet')
recognizer.train(faces, np.array(Ids))
recognizer.save('trainer/trainer.yml')
```

Figure: 4.12 Training data set code

4.2.3 Detect Faces

Using YAML file it detect faces from video surveillance.

```
detector.py - E:\ImageProcessing\recognitionWithDb\detector.py (3.7.4)
File Edit Format Run Options Window Help

import cv2
import mysql.connector

recognizer = cv2.face.LBPHFaceRecognizer_create()
recognizer.load('trainer/trainer.yml')
recognizer.read('trainer/trainer.yml')
cascadePath = "haarcascade_frontalface_default.xml"
faceCascade = cv2.CascadeClassifier(cascadePath);

mydb = mysql.connector.connect(host="localhost", user="root", passwd="", database="facebase")
mycursor = mydb.cursor ()

attendance=0

def getProfile (id):
    sql = "select * from showinfo_student where uniqueId=" + str(id)
    mycursor.execute (sql)
    res = mycursor.fetchall()
    profile=res
    for row in res:
        profile=row
    return profile

cam = cv2.VideoCapture(0)
font = cv2.FONT_HERSHEY_SIMPLEX
fontscale = 1
fontcolor = (255, 255, 255)
while True:
    ret, im =cam.read()
    gray=cv2.cvtColor(im,cv2.COLOR_BGR2GRAY)
    faces=faceCascade.detectMultiScale(gray, 1.2,5)
    for (x,y,w,h) in faces:
        cv2.rectangle(im, (x,y), (x+w,y+h), (255,0,0),2)
        id, conf = recognizer.predict(gray[y:y+h,x:x+w])
        profile=getProfile(id)
        if (profile != 0):
            cv2.putText(im, str(profile[2]), (x, y+h+30), font, fontscale, fontcolor)
            cv2.putText(im, str(profile[6]), (x, y + h+60), font, fontscale, fontcolor)
            attendance=(profile[4])
            attendance += 1
            sql = "UPDATE showinfo_student SET Attendance= " +str(attendance)+" WHERE uniqueId="+str(id)
            mycursor.execute(sql)
            mydb.commit()
            mydb.commit()
        cv2.imshow('im',im)
        if cv2.waitKey(0) & 0xFF==ord('q'):
            cv2.destroyAllWindows()
            break
    cam.release()
```

Figure: 4.13 Detect Face Code

And we also use My SQL database cross platform program to save all system data. All pictures, basic information of both students and teachers data are save into this database. And update attendance of students to our data base.

4.3 Implementation Requirements

When we started with this project it was very hard and new content to us. And it seems too much challenging and difficult for us.

To read all this paper we want to make a project that can be very easy to use and very light in weight. So we need better cameras to take better image quality. And we need data connection with this system because of web based cross platform system.

And the database needs proper guidance because the redundant data make the Data Base heavier.

CHAPTER 5

IMPLEMENTATION AND TESTING

5.1 Implementation of Database

Using My SQL data base we create, insert and update our real time data.

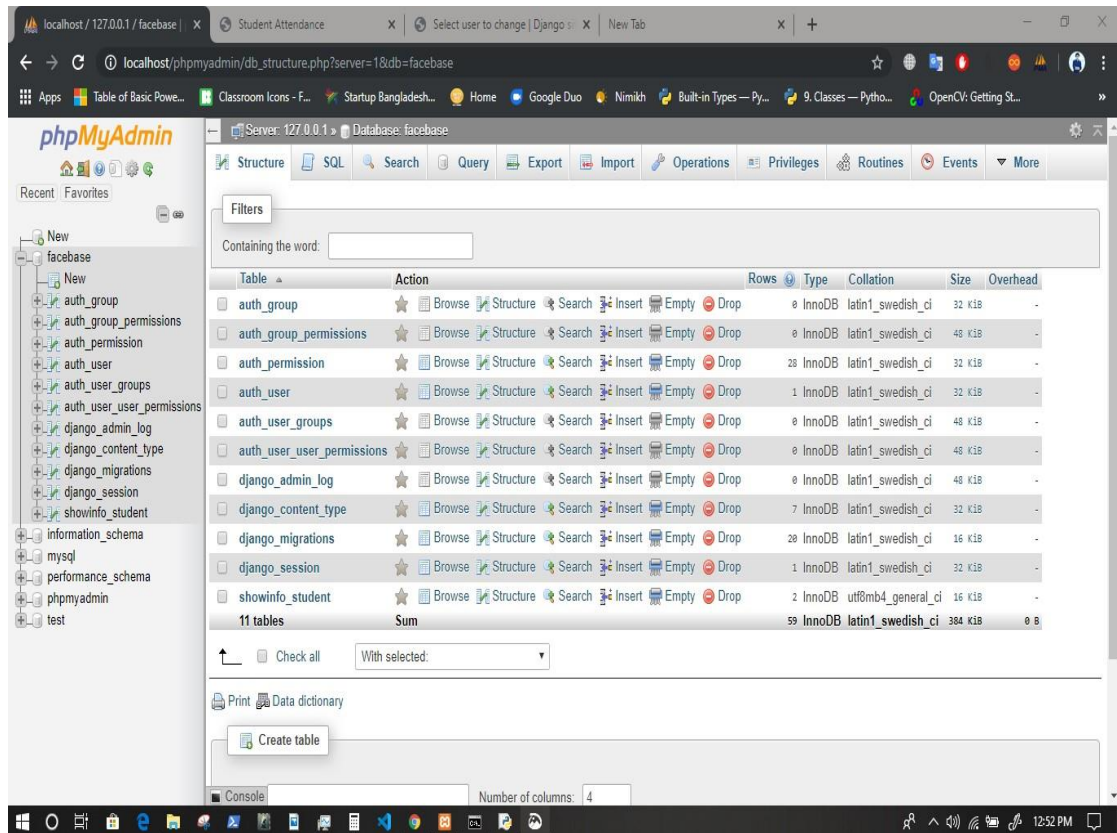


Figure: 5.1 Database Design

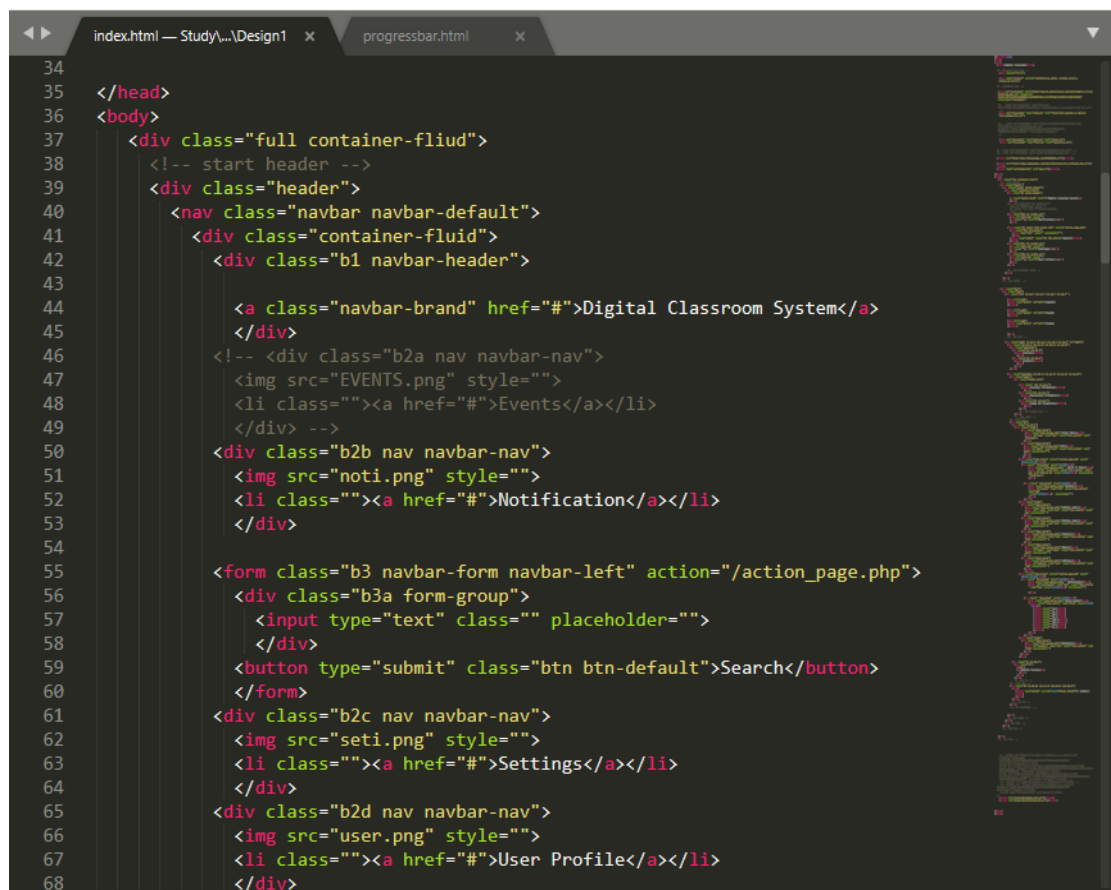
5.2 Implementation of Front-End

Because of the electronic framework, we utilized HTML, CSS, JavaScript for front end structure. Each page on the web that we visit is constructed utilizing an arrangement of discrete guidelines, consistently. Our program making an interpretation of this code into something we can see on our screens and even communicate with.

HTML and CSS are really not in fact programming dialects; they're simply page structure and style data. In any case, before proceeding onward to JavaScript, we have to know the essentials of HTML and CSS, as they are toward the front of our site page and application.

HTML

This gives the essential structure of our destinations, which is improved and altered by different innovations.



```
34
35 </head>
36 <body>
37 <div class="full container-fluid">
38 <!-- start header -->
39 <div class="header">
40 <nav class="navbar navbar-default">
41 <div class="container-fluid">
42 <div class="b1 navbar-header">
43
44 <a class="navbar-brand" href="#">Digital Classroom System</a>
45 </div>
46 <!-- <div class="b2a nav navbar-nav">
47 
48 <li class=""><a href="#">Events</a></li>
49 </div -->
50 <div class="b2b nav navbar-nav">
51 
52 <li class=""><a href="#">Notification</a></li>
53 </div>
54
55 <form class="b3 navbar-form navbar-left" action="/action_page.php">
56 <div class="b3a form-group">
57 <input type="text" class="" placeholder="">
58 </div>
59 <button type="submit" class="btn btn-default">Search</button>
60 </form>
61 <div class="b2c nav navbar-nav">
62 
63 <li class=""><a href="#">Settings</a></li>
64 </div>
65 <div class="b2d nav navbar-nav">
66 
67 <li class=""><a href="#">User Profile</a></li>
68 </div>
```

Figure: 5.2 HTML Code

CSS

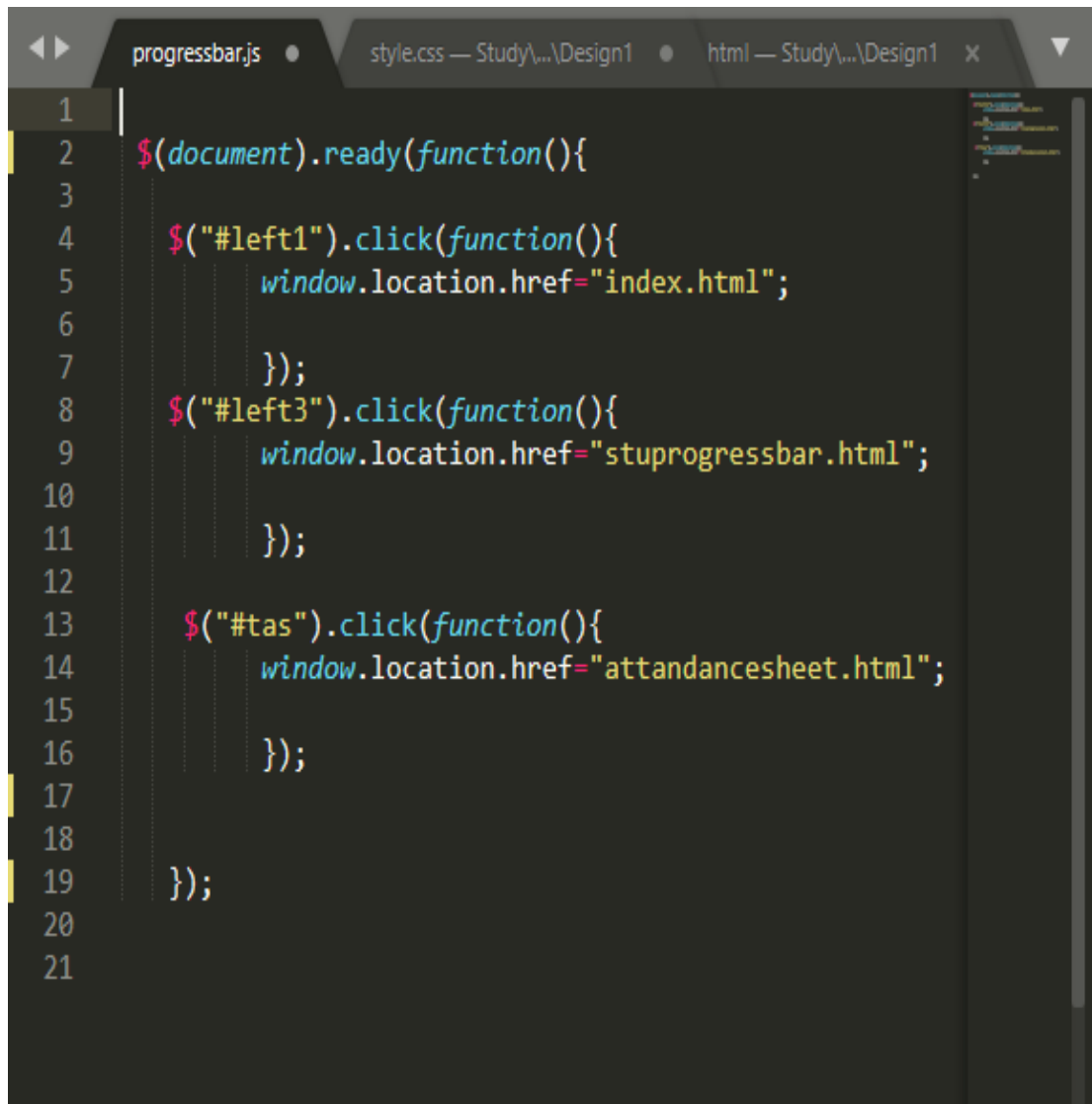
This language is used to control presentation, formatting and layout.

```
style.css — Study\...\Design1 — Study\...\Design1 x
1  |.navbar{
2     height: 43px;
3     margin-bottom: 0px;
4     border-radius: 0px;
5  }
6  .navbar li a{
7     padding-bottom: 0px;
8     font-size: 12px;
9  }
10 .navbar-brand{
11     height: 42px;
12 }
13
14 .b1{
15     width: 25%;
16 }
17 .b1 a{
18     padding-left: 30px;
19 }
20 .b2a{
21 }
22
23 .b2a img{
24     margin-top: 2px;
25     margin-left: 20px;
26     width: 30px;
27     height: 30px;
28     position: absolute;
29     top: 0px;
30     z-index: 1;
31     text-align: center;
32 }
33
34 .b2a li{
```

Figure: 5.3 CSS Code

JavaScript

This language is used to control all behavior of different elements.

A screenshot of a code editor window with a dark theme. The editor shows a JavaScript file named 'progressbar.js'. The code is as follows:

```
1
2 $(document).ready(function(){
3
4     $("#left1").click(function(){
5         window.location.href="index.html";
6
7     });
8     $("#left3").click(function(){
9         window.location.href="stupprogressbar.html";
10
11    });
12
13    $("#tas").click(function(){
14        window.location.href="attandancesheet.html";
15
16    });
17
18
19 });
20
21
```

The editor interface includes a top bar with file names: 'progressbar.js', 'style.css — Study\...\Design1', and 'html — Study\...\Design1'. A line number gutter is on the left, and a scrollbar is on the right.

Figure: 5.4 JavaScript Code

5.3 Implementation of Interactions

5.3.1 Detect Face

After detect face it show name and id of students and also update attendance sheet.

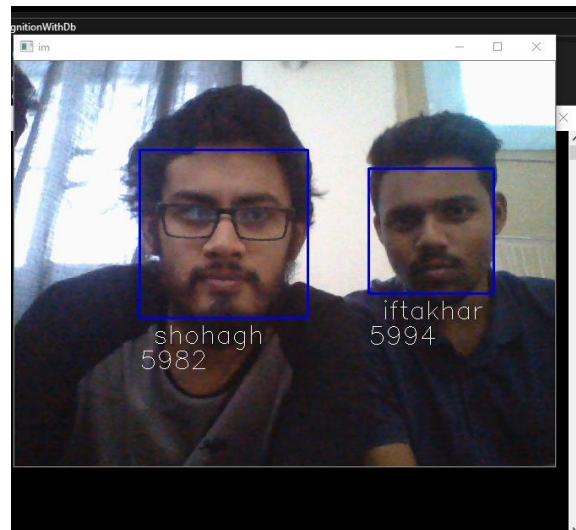


Figure: 5.5 Detect Face

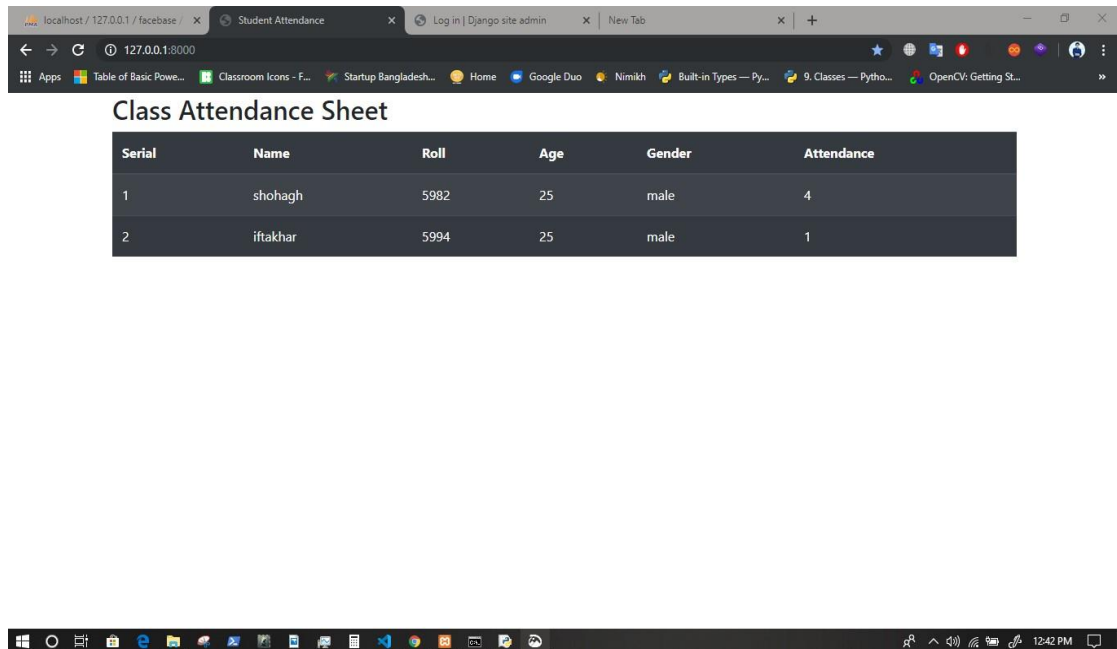


Figure: 5.6 Update attendance system

5.3.2 Super Admin Panel

After sign up of Super admin can edit, update, and delete any data from data base.

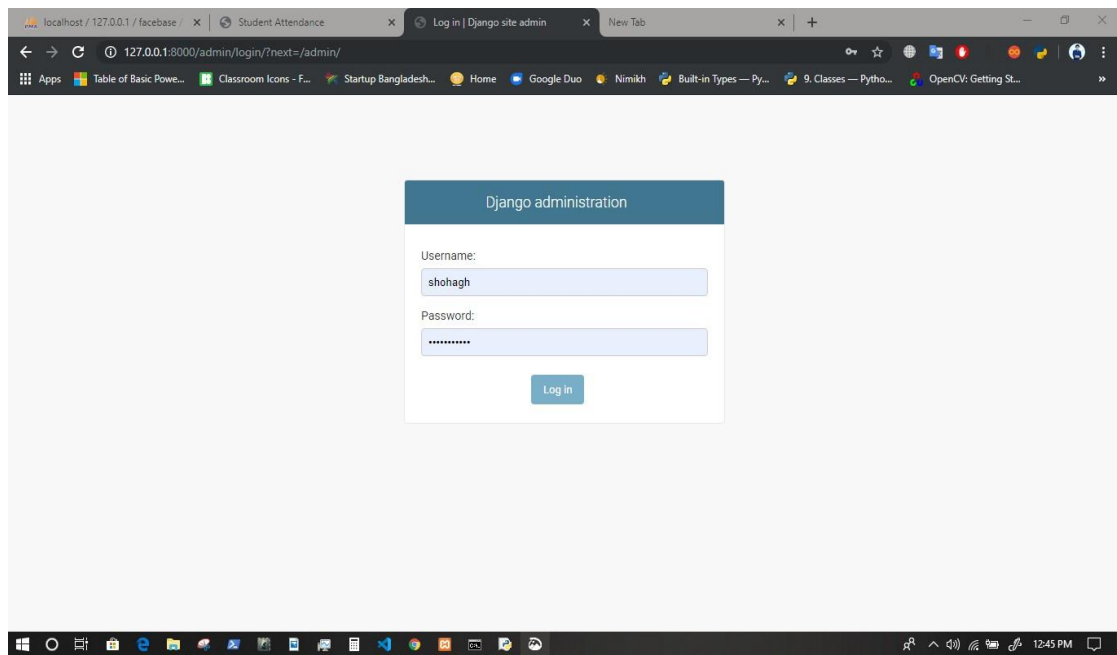


Figure: 5.7 Super Admin Sign up

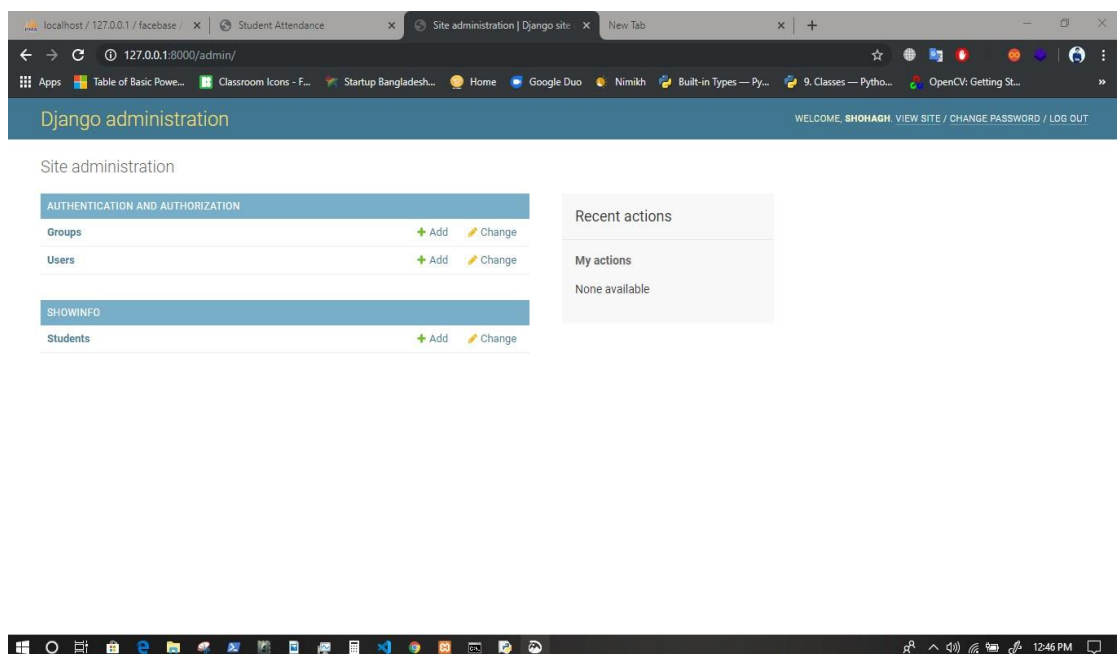


Figure: 5.8 Super Admin Panel

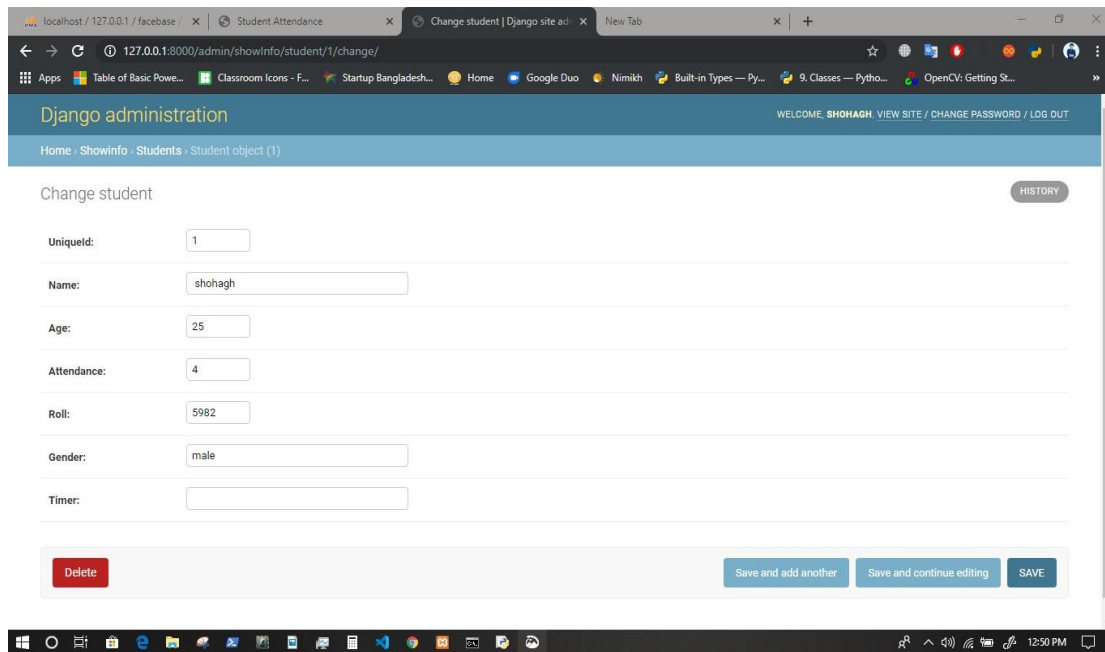


Figure: 5.9 Super Admin Edit

5.4 Testing Implementation

The testing of the actual system was exceptionally fascinating. We attempt various appearances to break the system or discover the limitations of the system. For testing the result we give 500 pictures for one individual user face and it gives a good outcome. Our system can detect multiple faces at a time. It also can complete a few activities with the recording.

- Recognize multiple faces at a time
- Give name to the attendance sheet
- Easy access for registered user
- Add new user
- Easily update user profile
- Delete noisy image from database
- Shows message to teacher for unknown person
- Shows percentage of users attendance performance

5.5 Test Results and Reports

Test results of this system gives positive answer. It also need more work with interaction of various format and updating its accuracy level of detection. Without some difficult situation it gives almost accurate output.

CHAPTER 6

CONCLUSION AND FUTURE SCOPE

6.1 Discussion and Conclusion

The whole venture has been created from the prerequisites to a total framework close by assessment and testing. The framework created has accomplished its point and goals. We can say that our endeavor will be construed that a reliable, secure, brisk and capable class interest the board system. The face area and affirmation structure will extra time, decrease the hour of work done by the association.

During the improvement of the framework, we face numerous issues and research on these issues and attempting to tackle it. Likewise, we have discovered that face location calculations deal with changes to brightening, picture goals, and so forth as of now notice is as yet progressing examination to pictures of uncontrolled foundations. Notwithstanding, the following test for future work and research is to execute a system that can achieve tip top on such pictures.

The calculation used to decide the rate likelihood creates distinctive rate scores each time. This is on the grounds that the rate created is a rate to show to what degree the in all likelihood succession of states concurs with the arbitrary grouping. The arbitrary succession will be that of the information picture and the in all likelihood grouping is that from the yield picture. Notwithstanding the way that it doesn't change the general degree of affirmation, it was unfeasible to tell the customer at what rate they could pick a face is a face. The principle way out was to finished a test on all of the five data pictures and in any event with three matches, the client can affirm a face, in view of the yield match showed one next to the other. Lastly, there was an acknowledgment exactness of around 87% in the face discovery framework.

6.2 Scope for Further Developments

Increasingly definite research is required on a venture in that capacity. The techniques utilized could be joined with others to accomplish extraordinary outcomes. Various techniques have been executed in the past as indicated by the writing audit. But in future we think added some new features that were given below:

- It could likewise incorporate including a few well-organized participation registers for each class and the ability to produce month to month participation reports and consequently email them to the suitable staff for the survey.

- We also think that the classroom's light and fan are also controlled by an image recognition system.

Reference

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- [7] Ayan Seal, Debotosh Bhattacharjee, Mita Nasipuri, Dipak Kumar Basu: "Thermal Human Face Recognition Based on Gappy- PCA" *Proceedings of the 2013 IEEE Second International Conference on Image Information Processing*, pp. 557-600, September 2013.

APPENDIX

Appendix A: Project Reflection:

Protect reflection is the main theme of this appendix. This one kind of our dream project. We tried hard to make this project successful. We try our best to make this GUI user friendly.

YML: It utilizes a book record and sorts out it into a configuration which is Human-clear. YML might be utilized with numerous foundations of programming dialects, for example, PHP, Python, Ruby, Perl, Javascript among others. "database.yml" is a regular model when YAMML is utilized by Ruby on Rails to associate with a database.

Django: Introduction. Django is an open-source python web structure utilized for fast advancement, down to business, viable, clean plan, and verifies sites. ... It deals with a ton of issue associated with the web improvement; empowers clients to concentrate on creating parts required for their application.

Haar cascade classifier: Haar Cascade is an AI object location calculation used to recognize protests in a picture or video and dependent on the idea of highlights proposed by Paul Viola and Michael Jones in their paper "Quick Object Detection utilizing a Boosted Cascade of Simple Features" in 2001.

Day by day people are very busy in their daily life, they need everything faster than faster. And this system give them accurate result with more comfortable environment.

Appendix B: Related Issues:

Gathering pictures for our undertaking we needed to go to our section to catch the pictures of our friends. They were well disposed and accommodatingly however to support us.

We needed to gain proficiency with different algorithm and procedures to make our thoughts and research work effective. Ensuring quality of image and reduce illumination effect were very challenging for this project.

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