

# Mini Project

## Face Recognition Based On Attendance System



Batch-16

Guide :

Mrs. Ragini Patil

Team Members :

B Mahesh 20R21A0566

M Adarsh 20R21A0590

Md Musharruf 20R21A0598

N Dhanush 20R21A0599

N Durga sai 20R21A05A0

# CONTENTS

- INTRODUCTION
- ABSTRACT
- LITERATURE SURVEY
- PROBLEM STATEMENT
- EXISTING SYTEM
- SPECIFIC OBJECTIVES
- PROPOSED SYSTEM
- SYSTEM ARCHICTECTURE
- FUNCTIONAL REQUIREMENTS
- NON-FUNCTIONAL REQUIREMENTS
- SYSTEM REQUIREMENTS
- UML DIAGRAMS
- FRONT-END DESIGN
- BACK-END DESIGN
- RESULT
- TIME PLAN OF THE PROJECT
- FUTURE SCOPE
- CONCLUSION
- REFERENCES

# INTRODUCTION

- Traditional attendance is Mark manually by teachers and they must make sure correct attendance is marked for respect to student.



- This whole process waste some of lecture time and part of current information is missed due to fraudulent and proxy cases.

# Abstract

- We are living in a world where everything is automated and linked online. The internet of things, image processing, and machine learning are evolving day by day. Many systems have been completely changed due to this evolve to achieve more accurate results. The attendance system is a typical example of this transition, starting from the traditional signature on a paper sheet to face recognition. This Project proposes a method of developing a comprehensive embedded class attendance system using facial recognition with showing whether the face of the person is the student for that specified class or not. The system is based on the Haar Cascade Classifier which is to be implemented on python language and using computer/laptop camera for the input image of the students or a normal outer camera can also be used which has to be connected to the system which is programmed to handle the face recognition.



# Literature Survey

EXISTIG SYSTEM	FEATURES	BENEFITS	LIMITATIONS
Automated attendance management system using face recognition by Amena Khatun	Use Eigen Faces for Recognition	Low accuracy	Multiple faces not recognized
Face recognition system by nevon	Stores the faces that are detected and automatically marks attendance	Used for security purposes in organizations	Does not recognize properly in poor light
Student attendance system in classroom using fac recognition technique by Shreyak Sawhney	Face detection, preprocessing, feature extraction and classification stages	Medium accuracy	Requires high definition camera and masked faces were not recognized

# PROBLEM STATEMENT

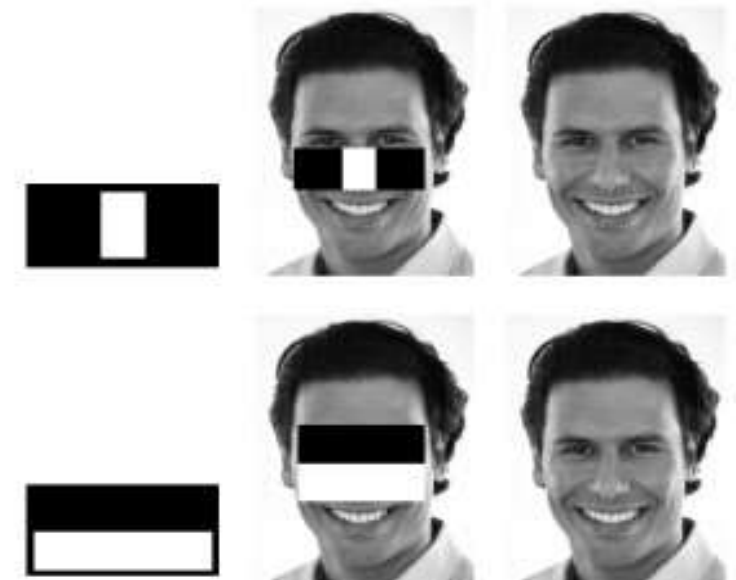
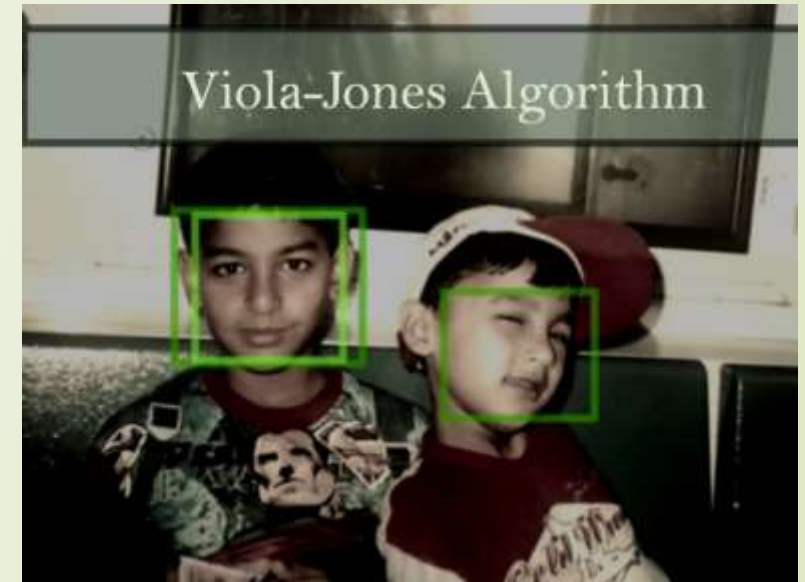
Maintaining the attendance is essential in every foundation for checking the performance of students as well as employee. Each organization has its own technique. Traditionally student's attendance is taken physically on attendance register or sheet, given by the employee in class. These stamping techniques are repetitive and tedious. Physically recorded participation can be effortlessly controlled.

Besides, it is exceptionally hard to confirm one by one student in a substantial classroom environment with disseminated branches whether the verified students are really reacting or not.

# Existing System

In the last twenty years, the computer-based facial recognition field has expanded rapidly. Several algorithms have been introduced and improved to the point where computers can rival humans in accuracy of facial recognition.

one of the algorithm used in face recognition is viola jones. Viola-Jones algorithm is a machine-learning technique for object detection. first detect smaller features of a human face in that image and if all of those features are found then the algorithm predicts that there is a face in that image or sub-image



## SPECIFIC OBJECTIVES

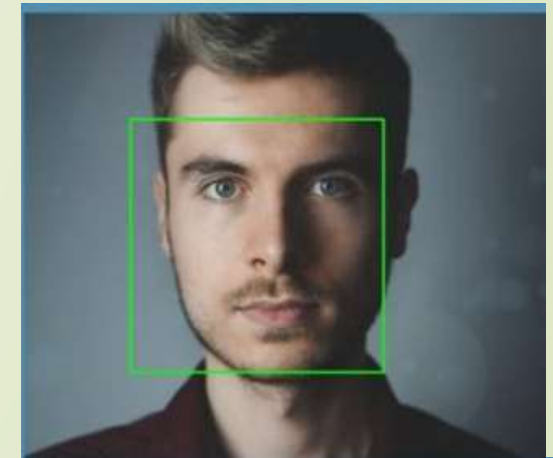
This system aims to build a class attendance system which uses the concept of face recognition as existing manual attendance system is time consuming and cumbersome to maintain. And there may be chances of proxy attendance. . It is also an extra burden to the faculties who should mark attendance by manually calling the names of students which might take about 5 minutes of entire session.

Thus, the need for this system increases. This system gaining more popularity and has been widely used. It will detect faces via webcam and then recognize the faces. After recognition, it will mark the attendance of the recognized student and update the attendance record. It also aims at eliminating human errors and proxy in recording the attendance of the student.

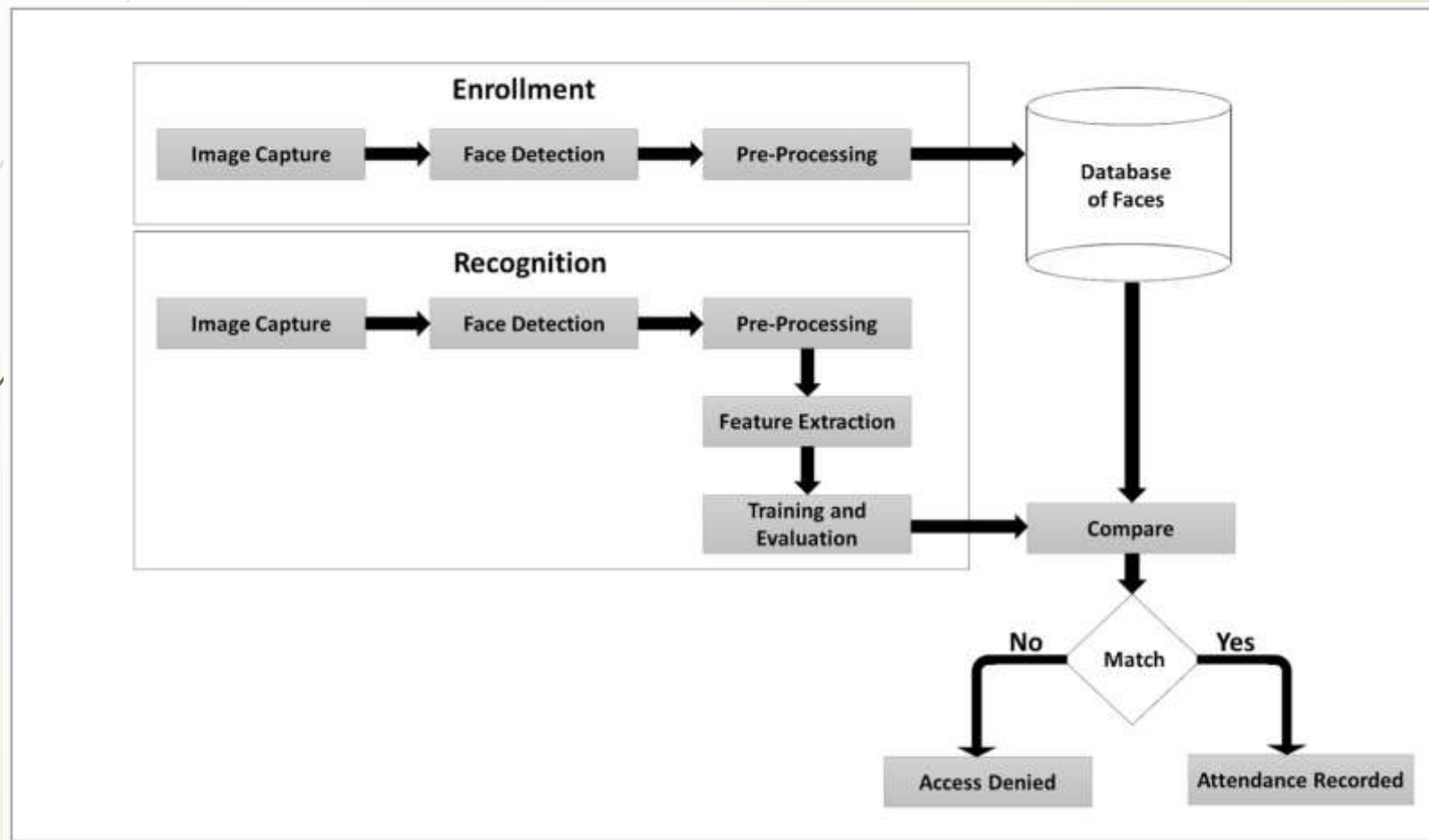


# Proposed System

- The proposed methodology starts with the registration of students into the system. Following methodology has few main stages such as capturing images, pre-processing of the images, Haar Cascade classifier is used for face detection, developing a dataset of images and the further process of face recognition.
- In our proposing system we are using opencv, Face Recognition libraries.
- Libraries : OpenCV Haar Cascade Face Detection, Dlib HOG Face Detection, Face Recognition.



# SYSTEM ARCHITECTURE



# Functional Requirements

- ☐ A user must be able to manage student records.
- ☐ Only an authorized user must be able to use the system.
- ☐ System must be attached to wireless camera and face recognition should be smooth.
- ☐ It should be able to handle 'gif' and 'jpeg' images..
- ☐ Extracts the eye features efficiently.

# Non-Functional Requirements

- ☐ The GUI of the system will be user friendly.
- ☐ The data Will be shown to the user will be made sure that it is correct and it is available for the time being.
- ☐ System will be flexible to change.
- ☐ This system will be extended for the change and to the latest technologies.
- ☐ Efficiency and effectiveness of the system will be made sure.
- ☐ Performance of the system will be made sure.
- ☐ The system should perform its process with accuracy and precision to avoid problems



# SYSTEM REQUIREMENTS

## SOFTWARE NEEDS

PYCHARM IDE, PYTHON LIBRARIES, MICROSOFT EXCEL



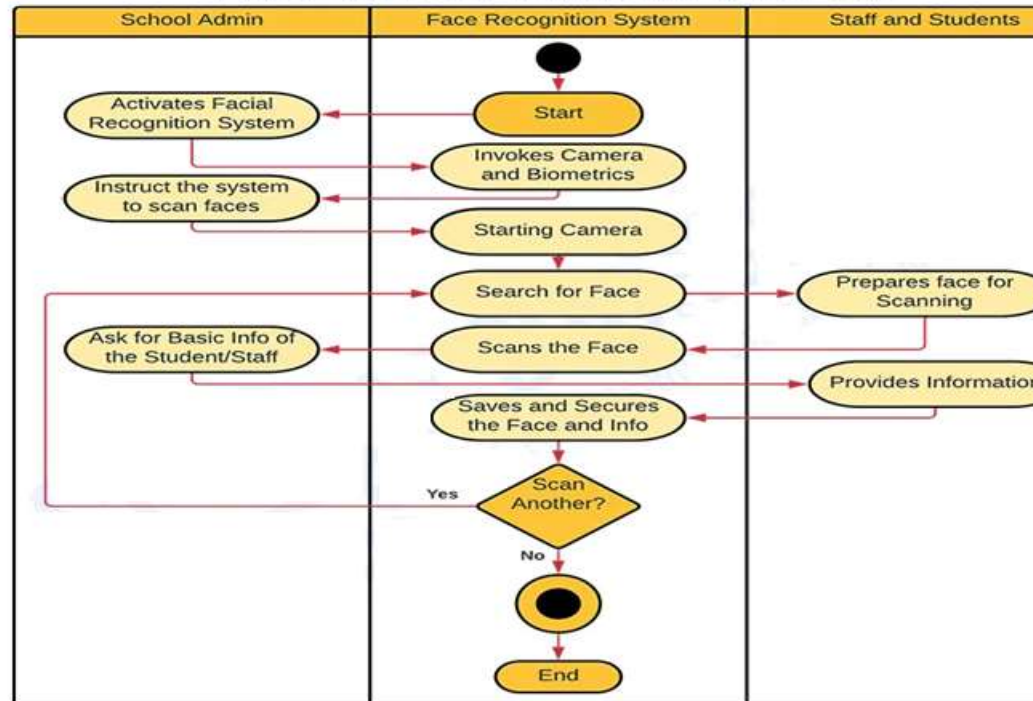
## HARDWARE NEEDS

LAPTOP / Computer with minimum of 4GB Ram. IP Camera /  
Web Camera

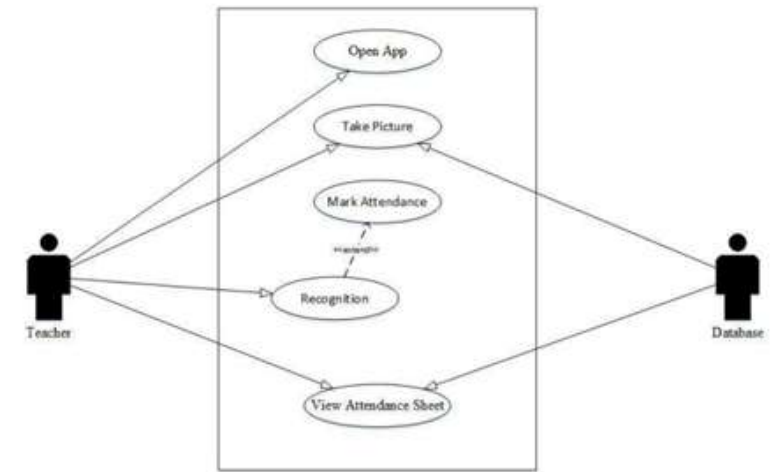


# UML DIAGRAMS

## FACE RECOGNITION SYSTEM

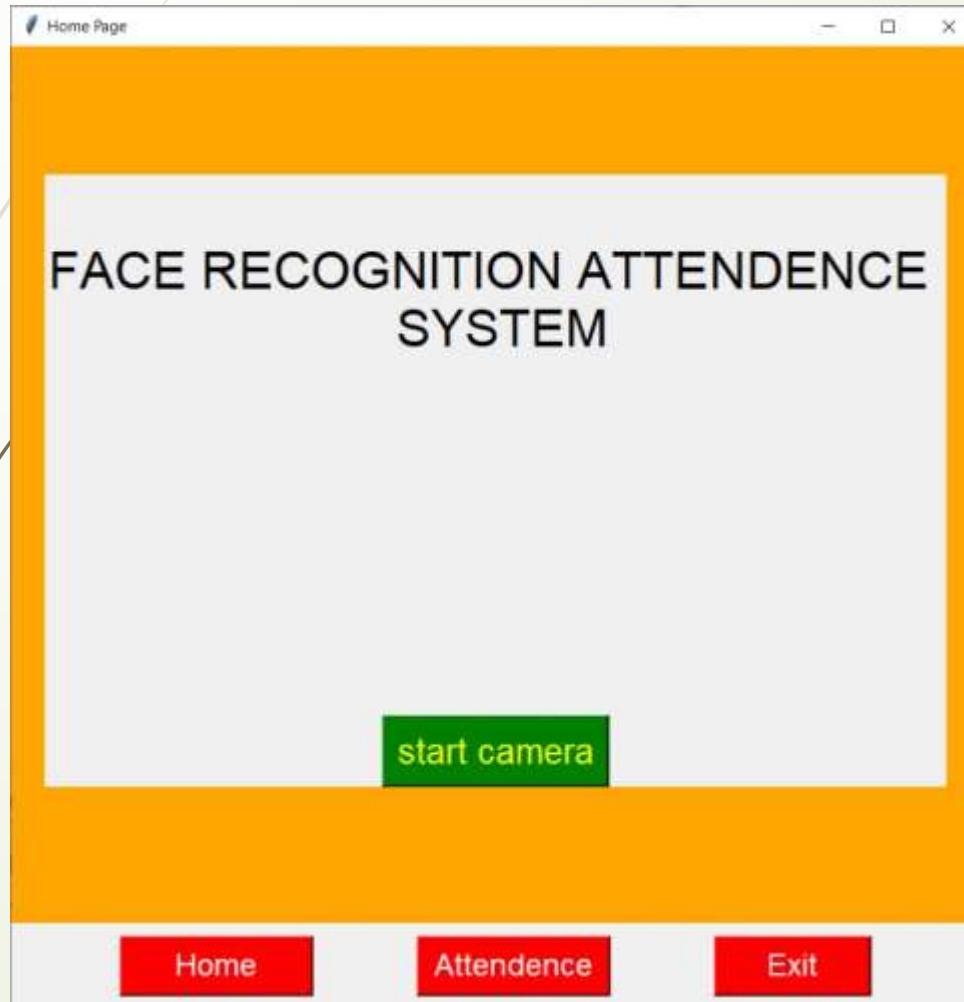


## ACTIVITY DIAGRAM



## Use Case Teacher Module

# FRONT - END DESIGN





# BACK - END DESIGN

```

v FACE_RECOGNITION
  > _pycache_
  > .idea
  > images
    > Adarsh.jpeg
    > Dhanush.jpeg
    > Durga.jpeg
    > Mahesh.jpeg
    > Musharraf.jpeg
  > python-del
  > venv
  > Attendance.csv
  > main.py

main.py
1 import cv2
2 import numpy as np
3 import face_recognition
4 import os
5 from datetime import datetime
6 import tkinter as tk
7 from tkinter import *
8 from PIL import Image, ImageTk
9
10 def startCamera():
11     # pass
12     path = 'images'
13     images = []
14     classNames = []
15     myList = os.listdir(path)
16     print(myList)
17     for cls in myList:
18         crntImg = cv2.imread(f'{path}/{cls}')
19         images.append(crntImg)
20         classNames.append(os.path.splitext(cls)[0])
21     print(classNames)
22     def findEncodings(images):
23         encodeList = []
24         for img in images:
25             img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
26             encode = face_recognition.face_encodings(img)[0]
27             encodeList.append(encode)
28         return encodeList
29     encodeListKnown = findEncodings(images)
30     print("Encoding Complete...")
31     def markAttendance(name):
32         with open('Attendance.csv', 'r+') as f:
33             myDataList = f.readlines()
34             nameList = []
35             for line in myDataList:
36                 entry = line.split(',')
37                 nameList.append(entry[0])
38             if name not in nameList:
39                 now = datetime.now()
40                 dtString = now.strftime('%H:%M:%S')
41                 f.writelines(f'\n{name},{dtString}')
42     cap = cv2.VideoCapture(0)
43     while True:
44         success, img = cap.read()
45         imgs = cv2.resize(img, (0,0), None, 0.25, 0.25)
46         imgs = cv2.cvtColor(imgs, cv2.COLOR_BGR2RGB)
47         faceCrntFrme = face_recognition.face_locations(imgs)
48         encodeCrntFrme = face_recognition.face_encodings(imgs, faceCrntFrme)
49         for encodeFace, faceLoc in zip(encodeCrntFrme, faceCrntFrme):
50             matches = face_recognition.compare_faces(encodeListKnown, encodeFace)
51             faceDis = face_recognition.face_distance(encodeListKnown, encodeFace)
52             # print(faceDis)
53             matchIndex = np.argmin(faceDis)
54             if matches[matchIndex]:
55                 name = classNames[matchIndex].upper()
56                 # print(name)
57                 y1,x2,y2,x1 = faceLoc
58                 y1,x2,y2,x1 = y1*4, x2*4, y2*4, x1*4
59                 cv2.rectangle(img, (x1,y1), (x2,y2), (0,255,0), 3)
60                 cv2.rectangle(img, (x1,y2-35), (x2,y2), (0,255,0), cv2.FILLED)
61                 cv2.putText(img, name, (x1+6, y2-6), cv2.FONT_HERSHEY_COMPLEX, 1, (255, 255, 255), 1)
62                 markAttendance(name)
63         cv2.imshow('webcam', img)
64         if cv2.waitKey(1) & 0xFF == ord('m'):
65             break
66     ndow = Tk()
67     ndow.geometry("750x750")
68     ndow.title("Home Page")
69     inFrame = Frame(ndow, bg='orange')
70     ipe1 = tk.Frame(mainFrame)
71     _lb = tk.Label(ipe1, text="FACE RECOGNITION ATTENDANCE \n SYSTEM\n\n\n\n", font=("Bold", 30)).pack(pady=50)
72     _btn = tk.Button(ipe1, text="start camera", font=("Bold", 20), bg="green", fg="yellow", command=startCamera).pack(side=tk.BOTTOM)
73     ipe1.pack(pady=100)
74     ipe2 = tk.Frame(mainFrame)

```



# RESULT

Home Page

FACE RECOGNITION ATTENDENCE SYSTEM

Register

start camera

Home

Attendance

Exit

Attendance Sheet

Name	Time	Date
MAHESH	02:13:17	2022-12-10
DURGA	02:13:25	2022-12-10

Open File  
C:/Users/mdmus/PycharmProjects/face\_recognition/Attendance.csv

Load File

Browse A File

Home

Attendance

Exit

» Attendance - Excel

File Home Insert Page Layout Formulas Data Review View Help Tell me

A1 X ✓ fx Name

	A	B	C	D	E	F	G	H
1	Name	Time						
2	MUSHARRUF	11.45.24						
3	DHANUSH	11.45.56						
4	ADARSH	11.46.14						
5								
6								
7								
8								
9								
10								

Attendance (+)

Ready Accessibility: Unavailable

## Time plan

S.No	TASK ACHIEVED W.R.T TIME	TIME TAKEN
1.	Choosing the Title of project in Technical Domains.	Week-1
2	Literature survey on project	Week-2
3	Literature survey and gathering data on existing data and also identifying software and hardware tools for the project.	Week-3
4	Analyzing the identified problem and proposing the proposing the new system.	Week-4
5	Library identification for face detection and studying about opencv Haar Casades and Dlib and installing python IDE.	Week-5
6	Learning about the methods for pre-processed face data set	Week-6

S.No	TASK ACHIEVED W.R.T TIME	TIME TAKEN
7.	Learning about feature extraction and classification	Week-7
8.	Real –time face detection with IP camera.	Week-8
9.	Finding functional and non functional requirements	Week-9
10.	Working on system architecture and flow of project	Week-10
11.	Automatic entry of registered student's detail in Excel sheet. Attendance report Generation.	Week-11
12.	Testing the system	Week-12



# FUTURE SCOPE

- The future scope of the project can be integrated with the hardware components for example GSM through which a monthly list of the defaulter students can be sent to the mentor . Additionally, an application can be developed to help students to maintain a track of their attendance. It can also be used in offices where a large group of employees sit in a hall and their attendance will be marked automatically by capturing a video but for this the accuracy of the recognition needs to be improved.

# CONCLUSION

- This system aims to build an effective class attendance system using face recognition techniques. The proposed system will be able to mark the attendance via face Id. It will detect faces via webcam and then recognize the faces. After recognition, it will mark the attendance of the recognized student and update the attendance record.

# REFERNECES

1. Hapani, Smit, et al. "Automated Attendance System Using Image Processing." 2018 Fourth International Conference on Computing Communication Control and Automation (ICCUBEA). IEEE, 2018.
2. Akbar, Md Sajid, et al. "Face Recognition and RFID Verified Attendance System." 2018 International Conference on Computing, Electronics & Communications Engineering (iCCECE). IEEE, 2018.
3. Okokpujie, Kennedy O., et al. "Design and implementation of a student attendance system using iris biometric recognition." 2017 International Conference on Computational Science and Computational Intelligence (CSCI). IEEE, 2017.
4. Rathod, Hemantkumar, et al. "Automated attendance system using machine learning approach." 2017 International Conference on Nascent Technologies in Engineering (ICNTE). IEEE, 2017.
5. Lukas, Samuel, et al. "Student attendance system in classroom using face recognition technique." 2016 International Conference on Information and Communication Technology Convergence (ICTC). IEEE, 2016.
6. <https://becominghuman.ai/face-detection-using-opencv-with-haar-cascade-classifiers-941dbb25177>

# Thank You