

PROJECT REPORT

ON

**DESIGN OF SMART ATTENDANCE MANAGEMENT SYSTEM USING  
FACE RECOGNITION**

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## ABSTRACT

*The management of the attendance is a great work-load on the teachers when it is done manually. To resolve this problem, smart and auto attendance management system is being utilized. This technology gained massive attention due to its training techniques that is HOG. This paper discusses the successful implementation of face recognition using HOG and machine learning. Last few minutes are wasted in taking attendance of students, thus to make effective use of time this project will automatically take attendance of students present in class with the help of HOG Method. An excel sheet will be generated which will record name, time and date to record the attendance. By referring all journals and research papers it is concluded that the project will get higher accuracy by using Haar Cascade Classifier and to mark attendance automatically HOG method must be used in the process. An excel sheet will be generated which will record name, time and date to record the attendance. To maintain a discipline and let students grasp utmost knowledge in schools, colleges and universities the attendance system was introduced. There are two conventional techniques to mark attendance of students in a particular class. One of them is by calling the roll number and the second is to take students sign on a piece of paper against their roll number. Hence there was a need to evolve this system in such a way that it could become user friendly, less time consuming and efficient. This is an automated system to assist the faculty in taking attendance of the whole class without any disturbance or time waste. The idea can encompass a large number application one of which include face identification, it will help save time and efficiently identifies and eliminates the chances of proxy attendance. The proposed system can be implemented in any field where attendance system is present and plays a vital role. In addition, as the project objectives and the design criteria all met, it's greatest to say this project is an engineering solution for all university and colleges to track and manage the attendance. Smart attendance management systems using fingerprint or smart card attendance systems have almost become the standard. Still, a recent pandemic outbreak has brought to light the problem of solutions that require physical contact. Artificial Intelligence-based attendance systems are contactless technologies that eliminate any material connection between the machine and the person because they use smart attendance systems using face recognition. We can better understand how a smart attendance management system can improve the safety and efficiency of buildings, schools, etc. when we know how the technology works.*

# 1. INTRODUCTION

In today's world, time is the most important and valuable thing. Hence it can be very costly for us to waste it on something which takes 10 minutes while doing it manually and can be done without wasting a single second with some smart techniques. Attendance of students in class can be done in two ways. i) Manual Attendance System ii) Automated Attendance System [1]. In case, if number of students are high then it becomes very difficult for the teachers to mark the attendance of the students. Thus in such cases automated attendance system becomes very effective as well as time saving for both teachers as well as students. The management of the attendance is a great work-load on the teachers when it is done manually. To resolve this problem, a smart and auto attendance management system is being utilized. This technology gained massive attention due to its training techniques that are HOG. This paper discusses the successful implementation of face recognition using HOG and machine learning. As the last few minutes are wasted in taking attendance of students, thus to make effective use of time this project will automatically take attendance of students present in class. Hence we used the HOG Method. The management of the attendance can be a great burden on the teachers if it is done by hand. To resolve this problem, a smart and auto attendance management system is being utilized. But authentication is an important issue in this system. The smart attendance system is generally executed with the help of biometrics. Face recognition is one of the biometric methods to improve this system. During this era of technology and automation we are still using the same old ways of classroom management. The most important thing in classroom is attendance which is directly linked to the academic performance of the students. Recently, some of students are busy with better during lectures only when there is massive classroom control (Research Gate, 2018). The more efficient the attendance system the more is class participation and learning. In the past we were using techniques like roll numbering calling and signing against a particular roll number. These methods carry a high chance of proxy and are time consuming. We came across the idea of automating this process to through modern day technologies to get a well maintained and disciplined classroom. Facial recognition system along with suitable hardware and software will help meet the goals of this project. Facial recognition system is a derived innovation of image processing. Image processing deals with the extraction of needy data that can be related to digital image and in technology advancement it plays a unique role. Our core focus will be on receiving digital images and then making use of programs and algorithms to get useful Information out of it. As the pictorial information is fed the image processing work on it and make it useful human interpretation. Being a prime feature of biometric verification, facial recognition is being used enormously in several such applications, like video monitoring and CCTV footage system, interaction between computer & humans and access systems

present indoors and network security. By utilizing this framework, the problem of proxies and students being marked present even though they are not physically present can easily be solved. The main implementation steps used in this type of system are face detection and recognizing the detected face. This paper proposes a model for implementing an automated attendance management system for students of a class by making use of face recognition technique, by using Eigenface values, Principal Component Analysis (PCA) and Convolutional Neural Network (CNN). After these, the connection of recognized faces ought to be conceivable by comparing with the database containing student's faces. This model will be a successful technique to manage the attendance and records of students. The applications of image processing are vast and can be applied in most scenarios where imaging data could be related to pre-determined algorithms. It was an advanced application of image processing and also is the core basis for our project. Our facial structure was a typical example of a multidimensional structure and need some recognition from advanced computational analysis.

The applications of image processing are vast and can be applied in most scenarios where imaging data could be related to pre-determined algorithms. It was an advanced application of image processing and also is the core basis for our project. Our facial structure was a typical example of a multidimensional structure and need some recognition from advanced computational analysis.

### **What is a Facial Recognition Attendance System?**

Simply put, a face recognition attendance system makes use of facial recognition technology. Fingerprint scanning systems are almost the standard for attendance systems but recent struggle with the pandemic has brought forth the issue with systems that require physical contact.. It is much easier to understand how attendance systems with face recognition can make buildings and premises safer and efficient if we know how the technology works.

### **How Facial Recognition Works?**

A facial recognition software captures and compares patterns on a person's face and analyses the

details to identify and verify the individual. While the underlying system is complex, the whole technology can be broken down into three steps:

- a. Face Detection: An essential step is locating human faces in real-time
  - b. Transform Data: Once captured, the analogue facial information is transformed into a set of data or vectors based on a person's facial features
  - c. Face Match: The system matches the data above with the one in the database for verification
- Almost every big tech company including Amazon, Google, Microsoft, and Cisco is leading the effort to make face recognition more mainstream. There are many reasons to adopt the technology.

### **Advantages Of Using Face Recognition Attendance System**

Apart from being efficient, self-managed, and highly scalable, these systems offer unmatched advantages.

#### **a. Automated Time Tracking System**

Entry and exit time monitoring done manually or with other biometric systems can be fully automated with facial recognition attendance systems. There is no need for human intervention or physical validation as the system's advanced algorithms can locate and identify faces autonomously. It is effortless to track time for employees with facial recognition.

#### **b. Cost-Effective**

A facial recognition attendance system can save business resources by automatic employee time tracking. A solution like Truein can be used on mobile devices making it more affordable for small-scale and medium businesses. Irrespective of the business size, such an attendance system can:

- Increase employee productivity by 10%
- Cut administrative costs by 5-10%
- Save 15% supervision time, helping supervisors with attendance control

The cost savings are even higher as data received from the face recognition-based employee attendance system is in real-time and valid.

#### **c. Touchless Sign In System: A Post Pandemic Requirement**

Pandemic like Covid 19 can be better managed by minimizing physical contact in public places and work environments. Post pandemic there has been a significant increase in demand and adoption of contactless technologies. The industry has recognized the benefits of facial recognition and the

adoption of attendance systems likewise. Workplaces and multi-tenant environments can greatly reduce the frequency of contact between individuals, thus minimizing the risk of virus transmission.

#### **d. Facial Recognition With Ageing Changes and Accessories**

Face recognition attendance systems are not dependent on a few facial features but they are highly robust and identify a face on several data points. Therefore, these systems can screen for face masks and identify people without removing the mask or any change of facial attributes like beard, specs etc. It is a major advantage over any other biometric system as employees don't have to take off their masks. Modern-day attendance systems use highly accurate face recognition algorithms that can also track changes in facial attributes like glasses, beards, hats, etc.

#### **e. More Accurate and Better Worker Attendance**

Industrial floor time frauds are common worldwide and one of the most common work ethics violations. While a vast majority of workers are honest, but the nuisance of buddy punching cannot be ruled out. Teaming up with staff members or security personnel, some workers skip work and still get paid. Such time fraud is not only detrimental to companies but is also unfair towards honest contributing workers. With a face recognition attendance system, the entire environment is automated. You won't just take the attendance but also automatically record the entry-exit time of the employees. It also adds to the security of the workplace as the system can recognize who left the designated area and when accurately.

#### **f. The Ubiquity Of Cameras On Mobile Devices**

Systems like Truein make use of mobile devices for time and attendance using facial recognition. Nearly all smartphones, tablets, and laptops have built-in front-facing cameras. This implies there is no need for any additional hardware to implement a facial recognition attendance system. This is cost-effective and convenient as compared to other biometric systems like fingerprint scanners. As every employee is already accustomed to the use of the front-facing camera on their mobile device, there is no need for any training or orientation for work-from-home employees. These systems have intuitive UI, easy for anyone to use.

#### **g. Easy To Manage**

As compared to manual attendance systems, AI-based attendance systems are highly automated. These systems store and update day-to-day records in real-time. From maintaining daily attendance to preparing high-accurate timesheets of individual employees, facial recognition attendance systems are programmed to handle it all on a very large scale. Imagine handling a large crowd of 10,000 people without any fuss and recording the attendance in an organized manner. Such is the efficiency of AI

facial recognition systems.

## **h. Smart Integration**

Integrating a face recognition attendance system with any other HRMS or Payroll system is quite easy. As these systems are modular and highly customizable, the time-in time-out and date formats can be customized to be compatible with other systems implemented in an organization. It makes organizing data a lot easier. Also, the time zone settings can be easily changed as per geo-location that making it possible to use software worldwide without any additional requirement. A company with geographically distributed offices can implement GPS based attendance system for attendance monitoring in all the offices.

Face detection is the fundamental step of face recognition process. Haar Cascade Classifier is the algorithm used for face detection. This classifier is then used to extract features from images. Histogram of Oriented Gradient (HOG) is used in image processing as well as computer vision to extract the features [2]

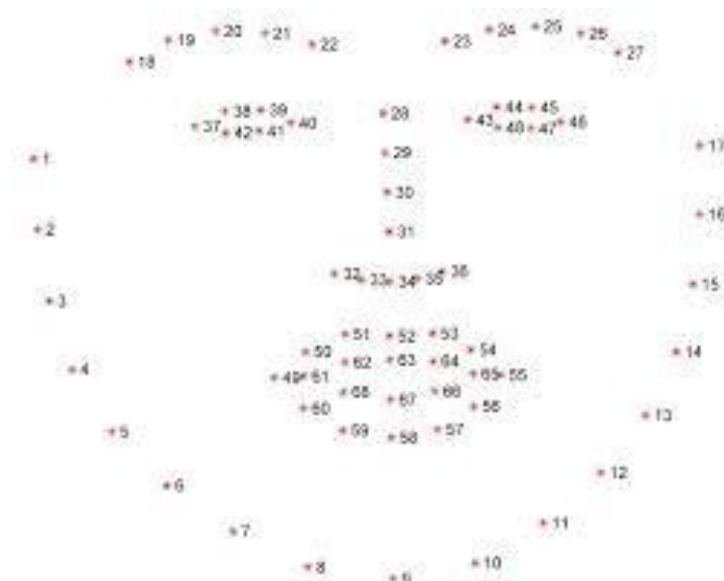


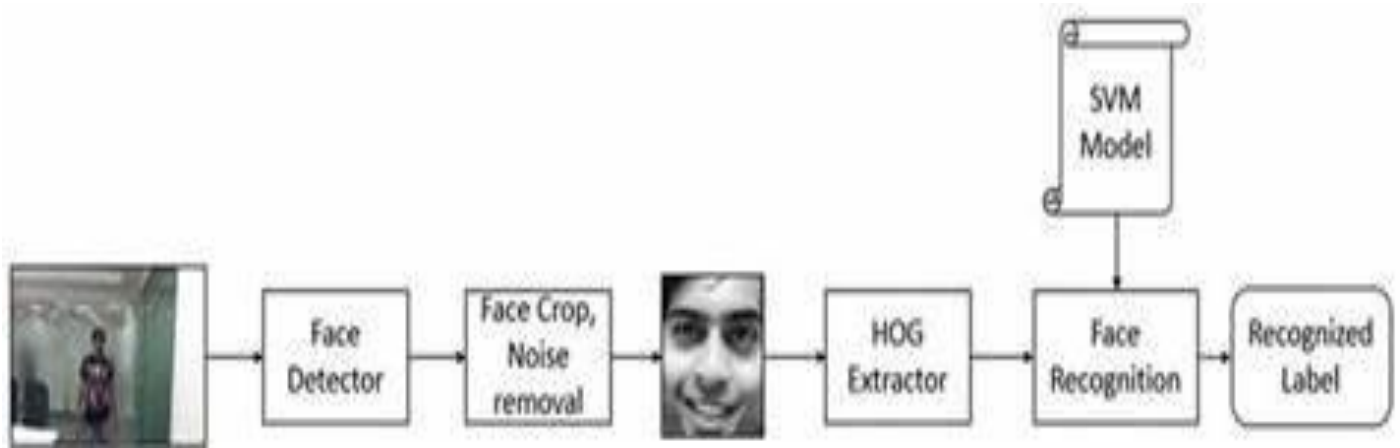
Fig. 1 Landmarks present on the face

HOG method :-

HOG is a simple and powerful feature descriptor algorithm. It is not only used for face detection but also used in object detection. HOG is helpful in object detection as object shape is characterized using



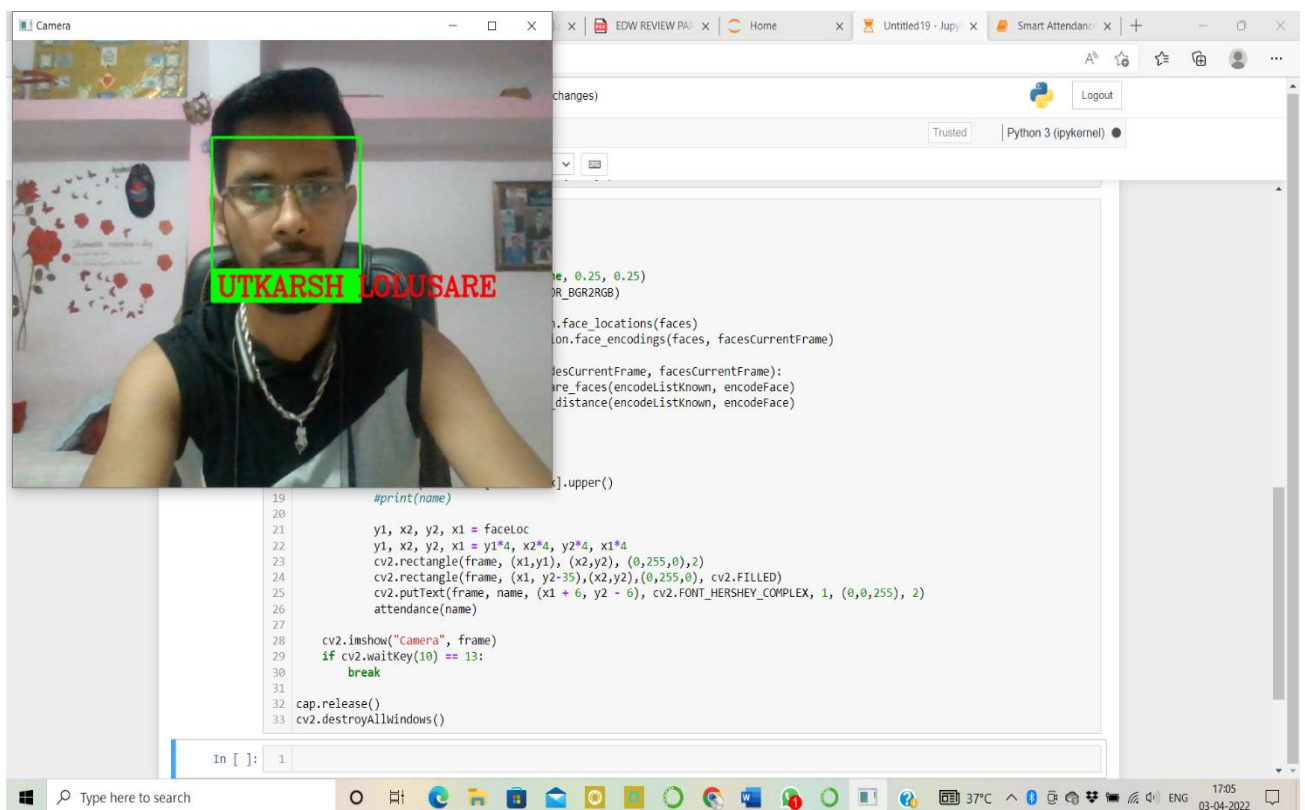
the local intensity gradient distribution and edge direction [3]. The HOG features are widely use for object detection. HOG decomposes an image into small squared cells, computes an histogram of oriented gradients in each cell, normalizes the result using a block-wise pattern, and return a descriptor for each cell [3].



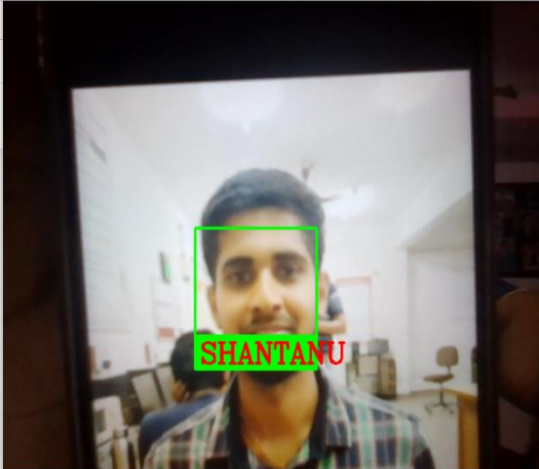
Following steps are involved in this process:

- a. Image acquisition: Image is acquire using a high picture quality camera which is placed in the to take the image of students. This image is given as an input to the system [5].
- b. Dataset Creation: Dataset of students is created before the recognition process. Dataset was created only to train this system. As we have created a dataset, face recognition is applied to each face to compute 128-d facial features and store in 'images' file to recall that face in recognition process. This process is applying to each image taken during registration [5].
- c. Face Detection and Extraction: Face detection is important as the image taken through the camera given to the system, therefore we apply face detection algorithm to identify the human faces in that image. We have used HOG method to detect human faces in given image [5].

- d. **Face Positioning:** There are 68 specific points in a human face also called landmarks as shown in Fig 1. The main function of this step is to detect landmarks of faces and to position the image. A python script is used to automatically detect the face landmarks and to position the face as much as possible without distorting the image [5].
- e. **Face Encoding:** Once the faces are detected in the given image, the next step is to extract the unique identifying facial feature for each image. Basically, whenever we get localization of face, the 128 key facial point are extracted for each image given input which are highly accurate and these 128-d facial points are stored in data file for face recognition [5].
- f. **Face matching:** This is last step of face recognition process. We have used the one of the best learning techniques which is highly accurate and capable of outputting real value feature vector. Our system ratifies the faces, constructing the 128-d embedding (ratification) for each. Internally compare face's function is used to compute the Euclidean distance between face in image and all faces in the dataset as shown in Fig 2. If the current image is matched with the 60% threshold with the existing dataset, it will move to attendance marking [5].



Camera



SHANTANU

```
In [*]: 1 cap = cv2.VideoCapture(0)
2
3 while True:
4     ret, frame = cap.read()
5     faces = cv2.resize(frame, (0,0), None, 0.25, 0.25)
6     faces = cv2.cvtColor(faces, cv2.COLOR_BGR2RGB)
7
8     facesCurrentFrame = face_recognition.face_locations(faces)
9     encodesCurrentFrame = face_recognition.face_encodings(faces, facesCurrentFrame)
10
11     for encodeFace, faceLoc in zip(encodesCurrentFrame, facesCurrentFrame):
12         matches = face_recognition.compare_faces(encodeListKnown, encodeFace)
13         faceDis = face_recognition.face_distance(encodeListKnown, encodeFace)
14
15         matchIndex = np.argmin(faceDis)
16
17         if matches[matchIndex]:
```


Python 3 (ipykernel)

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Camera



NILESH

```
In [*]: 1 cap = cv2.VideoCapture(0)
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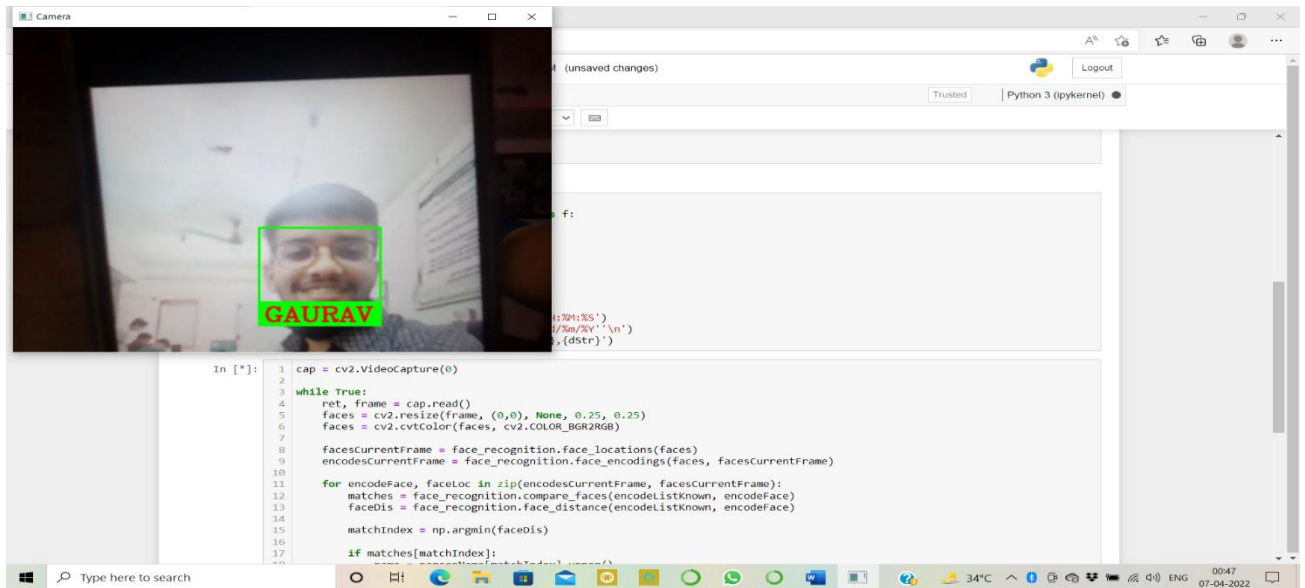


Fig 2: Detected faces of the students

- g. Attendance Marking: Once the face is identified with the image stored, python generate names of present students and return that, when data is returned, the system generates attendance table which includes the name, date, and time. And then passes the data to python to store the table into an excel sheet automatically which is named as “Attendance.csv” [5].
- h. Generating an excel sheet: Finally, we will have to generate an excel sheet so that the attendance of the students will be present there [5].

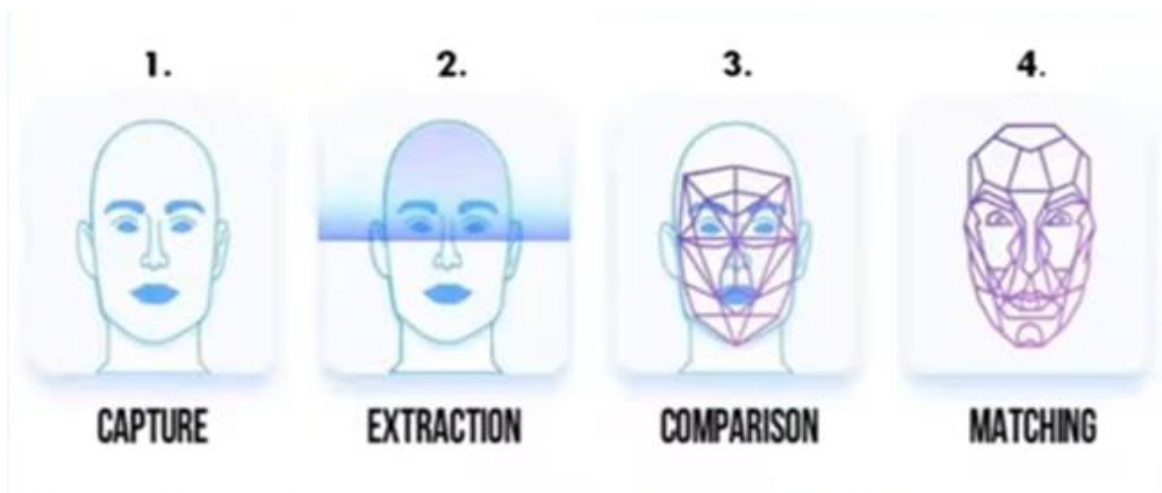


Fig 3: Four stages of Operation

## 2. LITERATURE SURVEY

Plenty of research has been conducted so far on the various available methods for implementation of an effective attendance monitoring system. These methods vary in terms of the types of input method used, the types of data processing employed and the controllers used to implement the systems. In this section looking for the various available solution with the advantages and disadvantages of each system. First system, “Attendance System Using NFC Technology with Embedded Camera on Mobile Device” (Bhise, Khichi, Korde, Lokare, 2015). Near field communication is a type of short distance wireless communication that takes place between two devices, one active and the other passive. The two devices are basically inductor coils which can respond to an electromagnetic induction. The active device is utilized to produce an electromagnetic field of a given radius and strength. Which used to implement an attendance system. In a school setting for example, students can be given NFC tags that are uniquely programmed with their unique identification numbers. Upon attending the classes, the lecturers bring the NFC readers and a student is required to swipe their NFC tags near the reader, say the lecturers’ phone. This information is then transmitted to the school database to mark the attendance of the student. However this system is vulnerable to impersonation where one person can sign in for someone else. The other related systems that use biometrics (Fingerprint recognition RFID, etc) to identify end user are time management systems used in many colleges, institutions and schools. However, these system introduce further privacy concerns. These systems are also subject to physical damage from their users.

Therefore they need additional maintenance costs. The idea proposed by us, Removes physical access from anyone to the automated system.

- a. **Title:** Face Recognition for Automated Attendance using HOG & Machine Learning (2021)

**Published In:** Conference paper NED University of Engineering and Technology. (Research gate)

**Technical Analysis:** HOG and machine learning. With the help of HOG models, one can achieve high-performance levels in recognizing human faces and analyzing facial features, even in scenes containing complex backgrounds.

- b. **Title:** Smart Attendance System Using Deep Learning Technique (2021)

**Published In:** Turkish Journal of Computer and Mathematics Education. (Science Research Society)

**Technical Analysis:** Give the methods and findings of the paper

- c. **Title:** Real-Time Smart Attendance System using Face Recognition Techniques (2020)  
**Published In:** Amity University Uttar Pradesh, Noida (IEEE)  
**Technical Analysis:** HAAR Cascade algorithm and ML.  
Principle Component Analysis (PCA) and Convolutional Neural Network (CNN).
- d. **Title:** Smart Attendance Management System Using Face Recognition (2018)  
**Published In:** European Union Digital Library (EAI Endorsed Transactions)  
**Technical Analysis:** Histogram of Oriented {HOG} and gradient method. It uses face recognition concept to mark the attendance of student and make the system better.

### 3. PROPOSED WORK

To maintain the attendance record with day-to-day activities is a challenging task. The conventional method of calling the name of each student is time consuming. Thus, by using the same technique we will develop the system which will maintain the attendance record with day-to-day activities is a challenging task.

### 4. METHODOLOGY

The first step involved is the camera which is used to take photographs to generate dataset. Then it will be converted and saved in a file. By using HOG algorithm this dataset is trained to detect faces. The next step involves the creation of bounding box because of which faces will be detected in real time video analysis. Following it images will compared with the images present in the dataset. The faced will be matched and recognized by which it will mark the name date and time of a particular student.

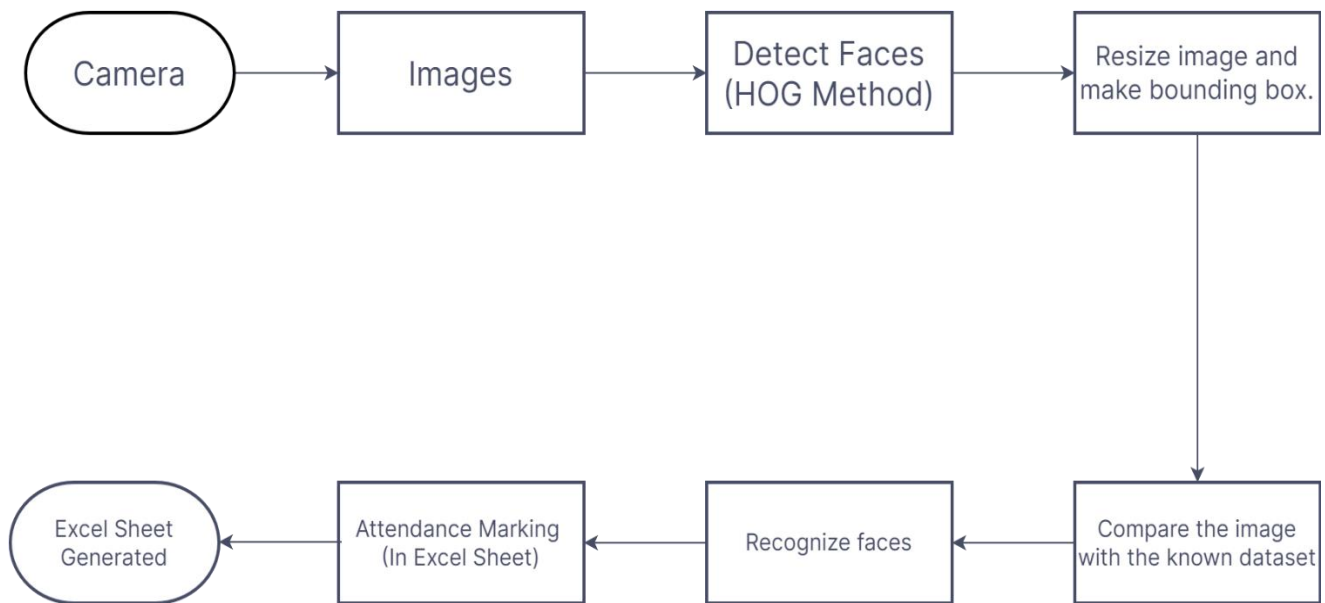


Fig.3: Flow chart of Implementation of Human Face Detection and recognition System and marking attendance [4]

The main objective of this project is:

- ❖ The objective of the project is to create an automated system for human face recognition in a real time background for an organization to mark the attendance of the student present.
- ❖ To reduce manual efforts.
- ❖ Minimize the time needed for labeling attendance and maximize the time needed for an actual method of instruction.
- ❖ Build an automated system to increase the accuracy of existing system.

### Algorithm:

INPUTS: Faces of students at Entrance, Inside Classroom.

OUTPUT: Automatic Marking of the attendance.

PROBLEM DESCRIPTION: Recognition of faces and marking attendance accordingly.

Step I: Commence

Step II: Enrolment of students' details in the student database.

Step III: Setup a camera outside the classroom. Students' face will appear in the camera.

Step IV: Face Detection

Step V: Face Recognition by comparing the students' face with images in the student database.

Step VI: IF: student is present in database.

ELSE: Go back to Step 2.

Step VII: Camera installed in the class is used to check the presence of the student in the class.

Step VIII: Mark the attendance in the attendance database.

Step IX: End

Code:

```
import cv2
import numpy as np
import face_recognition
import os
from datetime import datetime

path = 'photos'
images = []
personName = []
myList = os.listdir(path)
print(myList)
for cu_img in myList:
    current_Img = cv2.imread(f"{path}/{cu_img}")
    images.append(current_Img)
    personName.append(os.path.splitext(cu_img)[0])
print(personName)

def faceEncodings(images):
    encodeList = []
    for img in images:
        img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
        encode = face_recognition.face_encodings(img)[0]
        encodeList.append(encode)
    return encodeList

encodeListKnown = faceEncodings(images)
print("All Encodings Complete!!!")

def attendance(name):
    with open('Attendance.csv', 'r+') as f:
        myDataList = f.readlines()
        nameList = []
        for line in myDataList:
            entry = line.split(',')
            nameList.append(entry[0])
```



```

    if name not in nameList:
        time_now = datetime.now()
        tStr = time_now.strftime('%H:%M:%S')
        dStr = time_now.strftime('%d/%m/%Y'\n')
        f.writelines(f'{name},{tStr},{dStr}')

cap = cv2.VideoCapture(0)

while True:
    ret, frame = cap.read()
    faces = cv2.resize(frame, (0,0), None, 0.25, 0.25)
    faces = cv2.cvtColor(faces, cv2.COLOR_BGR2RGB)

    facesCurrentFrame = face_recognition.face_locations(faces)
    encodesCurrentFrame = face_recognition.face_encodings(faces, facesCurrentFrame)

    for encodeFace, faceLoc in zip(encodesCurrentFrame, facesCurrentFrame):
        matches = face_recognition.compare_faces(encodeListKnown, encodeFace)
        faceDis = face_recognition.face_distance(encodeListKnown, encodeFace)

        matchIndex = np.argmin(faceDis)

        if matches[matchIndex]:
            name = personName[matchIndex].upper()
            #print(name)

            y1, x2, y2, x1 = faceLoc
            y1, x2, y2, x1 = y1*4, x2*4, y2*4, x1*4
            cv2.rectangle(frame, (x1,y1), (x2,y2), (0,255,0),2)
            cv2.rectangle(frame, (x1, y2-35),(x2,y2),(0,255,0), cv2.FILLED)
            cv2.putText(frame, name, (x1 + 6, y2 - 6), cv2.FONT_HERSHEY_COMPLEX,
                        1,(0,0,255),2)
            attendance(name)

    cv2.imshow("Camera", frame)
    if cv2.waitKey(10) == 13:
        break

cap.release()
cv2.destroyAllWindows()

```

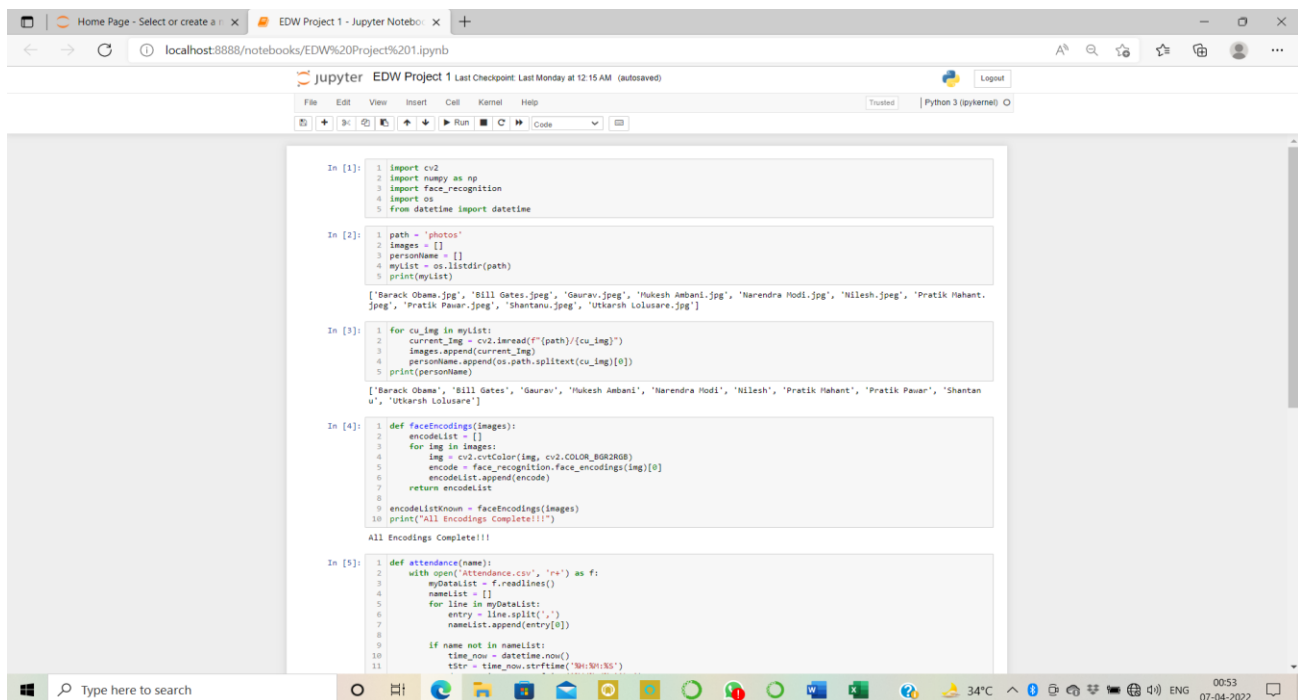
Now, here are some advantages of face recognition:

- Automated Time Tracking System.
- Cost-Effective.
- Touchless Sign in System: A Post Pandemic Requirement.
- Facial Recognition with Ageing Changes and Accessories.

- More Accurate and Better Worker Attendance.
- The Ubiquity of Cameras on Mobile Devices.
- Easy To Manage.

## 5. RESULTS AND DISCUSSION

By referring all journals and research papers it is concluded that the project will get higher accuracy by using Haar Cascade Classifier and to mark attendance automatically HOG method must be used in the process. An excel sheet will be generated which will record name, time and date to record the attendance. The proposed automated attendance system using face recognition is a great model for marking the attendance of students in a classroom. This system also assists in overcoming the chances of proxies and fake attendance.



```

In [1]: 1 import cv2
        2 import numpy as np
        3 import face_recognition
        4 import os
        5 from datetime import datetime

In [2]: 1 path = 'photos'
        2 images = []
        3 personName = []
        4 mylist = os.listdir(path)
        5 print(mylist)

['Barack Obama.jpg', 'Bill Gates.jpeg', 'Gaurav.jpeg', 'Nukesh Ambani.jpg', 'Narendra Modi.jpg', 'Nilesh.jpeg', 'Pratik Mahant.
.jpg', 'Pratik Pawar.jpeg', 'Shantanu.jpeg', 'Utkarsh Lolusare.jpeg']

In [3]: 1 for cu_img in mylist:
        2     current_img = cv2.imread(f"{path}/{cu_img}")
        3     images.append(current_img)
        4     personName.append(os.path.splitext(cu_img)[0])
        5     print(personName)

['Barack Obama', 'Bill Gates', 'Gaurav', 'Nukesh Ambani', 'Narendra Modi', 'Nilesh', 'Pratik Mahant', 'Pratik Pawar', 'Shantan
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In [4]: 1 def faceEncodings(images):
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        5         encode = face_recognition.face_encodings(img)[0]
        6         encodeList.append(encode)
        7     return encodeList
        8
        9 encodeListKnown = faceEncodings(images)
        10 print("All Encodings Complete!!!")

All Encodings Complete!!!

In [5]: 1 def attendance(name):
        2     with open('Attendance.csv', 'r+') as f:
        3         myDataList = f.readlines()
        4         nameList = []
        5         for line in myDataList:
        6             entry = line.split(',')
        7             nameList.append(entry[0])
        8
        9         if name not in nameList:
        10             timeNow = datetime.now()
        11             tStr = timeNow.strftime('%H:%M:%S')

```

```

In [5]: 1 def attendance(name):
2       with open('Attendance.csv', 'a+') as f:
3           myDataList = f.readlines()
4           nameList = []
5           for line in myDataList:
6               entry = line.split(',')
7               nameList.append(entry[0])
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9       if name not in nameList:
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13          f.writelines(f'{name},{tStr},{dStr}')

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7
8           facesCurrentFrame = face_recognition.face_locations(faces, facesCurrentFrame)
9           encodesCurrentFrame = face_recognition.face_encodings(faces, facesCurrentFrame)
10
11          for encodeFace, faceLoc in zip(encodesCurrentFrame, facesCurrentFrame):
12              matches = face_recognition.compare_faces(encodesListKnown, encodeFace)
13              faceDis = face_recognition.face_distance(encodesListKnown, encodeFace)
14
15              matchIndex = np.argmin(faceDis)
16
17              if matches[matchIndex]:
18                  name = personName[matchIndex].upper()
19                  #print(name)
20
21                  y1, x2, y2, x1 = faceLoc
22                  y1, x2, y2, x1 = y1*4, x2*4, y2*4, x1*4
23                  cv2.rectangle(frame, (x1,y1), (x2,y2), (0,255,0),2)
24                  cv2.rectangle(frame, (x1,y2-35), (x2,y2), (0,255,0), cv2.FILLED)
25                  cv2.putText(frame, name, (x1 + 6, y2 - 6), cv2.FONT_HERSHEY_COMPLEX, 1, (0,0,255), 2)
26                  attendance(name)
27
28          cv2.imshow("Camera", frame)
29          if cv2.waitKey(10) == 13:
30              break
31
32          cap.release()
33          cv2.destroyAllWindows()

```

Fig. 4 Results of Codes in stimulation

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U
1	Name	Time	Date																		
2	UTKARSH LOLUSARE	16:54:54	03-04-2022																		
3	BARACK OBAMA	16:56:07	03-04-2022																		
4	BILL GATES	16:57:12	03-04-2022																		
5	MUKESH AMBANI	17:01:28	03-04-2022																		
6	NARENDRA MODI	17:01:45	03-04-2022																		
7																					
8																					
9																					
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29																					

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	Name	Time	Date																			
2	UTKARSH LOLUSARE	14:07:20	04-04-2022																			
3	SHANTANU	14:07:26	04-04-2022																			
4	PRATIK PAWAR	14:07:30	04-04-2022																			
5	GAURAV	14:08:03	04-04-2022																			
6	NILESH	14:09:26	04-04-2022																			
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Fig. 5: Result of Attendance of Student in Excel Sheet.

## 6. CONCLUSION AND FUTURE SCOPE

By referring all journals and research papers it is concluded that the project will get higher accuracy by using Haar Cascade Classifier and to mark attendance automatically HOG method must be used in the process. An excel sheet will be generated which will record name, time and date to record the attendance.

This system can be operated for 2D images as well so, it may be possible to mark the attendance by a photo. Thus to overcome this issue we can convert it in such a way that it should only detect 3-D images and mark the attendance in the same way.

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