

# RESEARCH PAPER ON FACE DETECTION AND RECOGNITION USING OPENCV AND PYTHON\*

BY

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## ABSTRACT

*In this digital age, the face recognition system plays an important role in almost every field. Face recognition is one of the most widely used biometrics. It can be used for security, authenticity, identification, and has many benefits. In addition to the low accuracy compared to the known iris and finger recognition, it is widely used due to its contact and non -contact mechanism. In addition, the face recognition system can also be used to mark attendees at schools, colleges, offices, etc. The program aims to create a student visit system that uses the concept of face recognition as the current student attendance system is time consuming and difficult to maintain. And there may be a chance for a proxy to exist. Therefore, the need for this program is increasing. The program consists of sections with data structure, face detection, facial recognition, retrieval of attendees. Database is created by images of students in the classroom. Face detection and identification were performed using the Haar - Cascade and Local Binary Pattern Histogram algorithm respectively. Faces are available and monitored in class live streaming video. Attendees will be referred to the appropriate category at the end of the session.*

## KEYWORDS

Recognition, OpenCV, Python, AI.

## 1 Introduction

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So it is a technique in which detecting/identifying of a human face using their individual faces. That can be used in real time or that can be used in photo & video or in a real-time machine. So for building this project we used a simpler and easy method in machine learning. With the help of these technologies we can say that, it can easily detect a human face with the help of Data Set in similar matching appearances, and with the help of Python and OpenCV in Deep Learning, it is the most efficient way to detect/identify a person's face.

This is useful in many field such as school, college and university as a authentication system or can be used as a biometric that is used for identification as well as for authentication purpose which make the work more effortless. The most useful place where facial recognition is what matters is the biometrics used for validation purpose. A process that simplifies the task. Facial recognition is one of the most widely used technologies or programs out there has the ability to perform tasks such as having records provided by the dataset or the database in many places such as the school and college attendance programs, can also help catching thieves or terrorists, can help in the safety of the common people and the much-needed security places in all the country, we can say best for authentication purpose. Face recognition can be used by government to verify voter lists same as using the ID no malpractice happens like change photo in id and putting different name, locate missing people, find population or census, migration process, to provide security for internet scams that protect Ecommerce and is widely used in the medical and health care areas. This brings the highest demand or real-time facial recognition system of multi-person use by government and government. Providing such great programs will be easy to get into several jobs.

The main purpose or intent of this paper is to provide either create a program that will use a computer camera or a system that will be able to recognize and recognize a person's face or the face of the person using the tool in the called OpenCV as the language of the Open Face and Python program in depth a learning environment.

## **2.EXISTING SYSTEM**

Many applications have shown good results of the linear projection appearance-based methods such as principal component analysis, independent component analysis linear discriminate analysis and linear regression classifier.

Due to large or very big difference in some conditions like illumination conditions, then facial expression and other factors so, these methods may fail to accept the represent the faces. This is happened due to a main reason that is the face patterns lie on a complex nonlinear and non-convex manifold in the high-dimensional space.

The word illumination is nothing but the light condition then the other reasons are, we can say it may happens due to variety of poses. Face recognition is highly sensible to pose variations. That can be movement of head or different camera position can cause change of facial lecture and it may generate a wrong result.

It can also happened due to occlusion that mans face as beard or cause of accessories that we are wearing (for example it can be goggles, cap , mask etc..)

The main aim or plan of this project is to solve the issues come across in the old attendance system. In this project a smart device with a smart camera is developed to be capable of recognizing the identity of each individuals and eventually records down the data into Database system. Here it will be recorded automatically on an excel sheet.

Many attendance management system that exist nowadays are lack of efficiency and information sharing, therefore in this project those limitations are overcome and also further refined.

The impact will be more punctual on attending classes. This is due to the attendance of a specific student can only be taken privately where any absentees will be noticed by the system. This can not only trained students to be punctual as well as avoids any immoral ethics such as signing the attendance for our friends

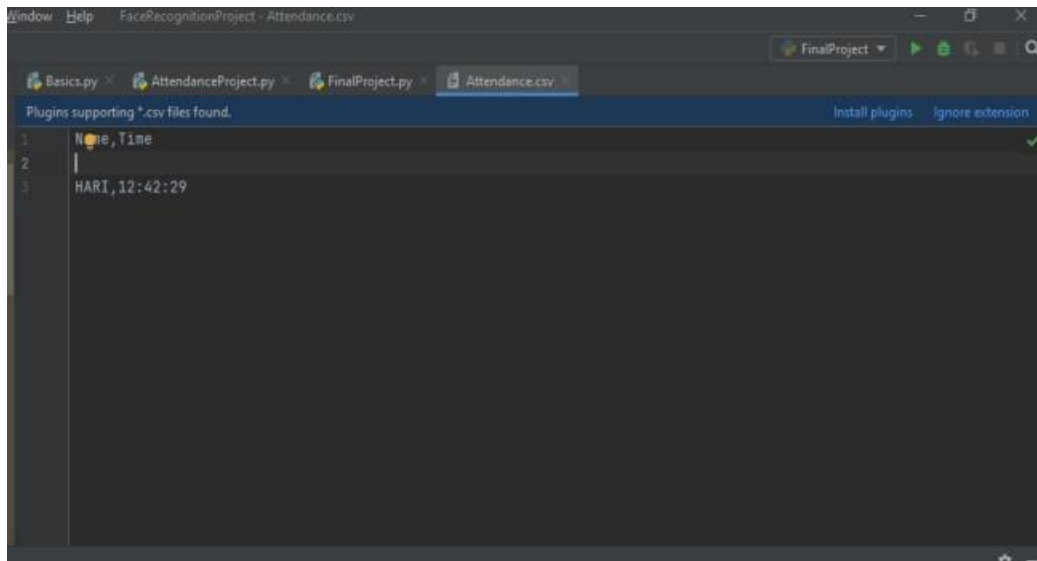


Fig 1.1 Marking Attendance

### 3.PROPOSED SYSTEM

The method proposed in my project is marking attendance using face recognition technique. The attendance is recorded by using camera that will stream video of students, detect the face

in the image or in real-time and compare the detected face with the student Database/Dataset and mark the attendance. Simultaneously attendance gets marked in an excel sheet.

The project has 2 main components

Development of face recognition and Development of attendance system

Face recognition is carried out using machine learning and the basic pipeline used for it is as following. Find face in an image then analyse facial features and compare against know faces and make a prediction.

So, for creating this program first of all we will have to create a file for data sets to compare and analyze. Image quality becomes favorable or matching when various procedures will take place in facial recognition program and all the functions are performed using python queries, input will be taken and compared from the file that is from the database to be found. There it will be the correct formatting in the system where they will check whether face is matching or not, each face embedding will take place. Then all the required information methods, information's and techniques of the identification process of a person's face from a given image of a database. The provided file will be created with a python command as we said. We can increase the size or open an image at close range the result you want, we are doing it to get a clear image and it help in analyze image from dataset easily. Existing Distribution and OpenCV libraries will enhance the effect or effects on the face awareness system.

The benefits of my project that is the face recognition program will be immediate processing, automated ownership and privacy violation, big data storage, good results, improved security, authenticity facial recognition of students in schools and colleges, employees in corporate offices, turn on smartphone and much more day by day.

There are a few distractions in this system that include cost overruns, or funds, excellent high definition cameras are needed, because poor image quality can reduce the performance of this system, image size will be important because it becomes harder to do see faces with thumbnails, also even if we wear some accessories like googles etc it may effect, also the face angles can limit reliability of face recognition, large storage is required this program has been successfully implemented.

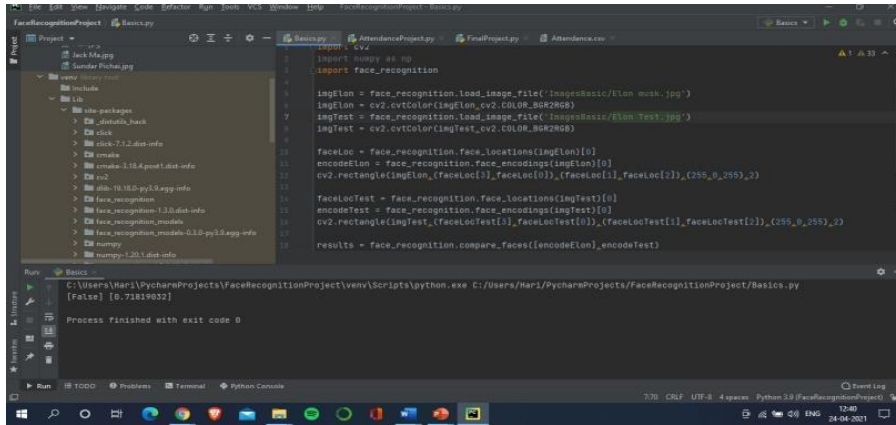


Fig 3 Basic.py

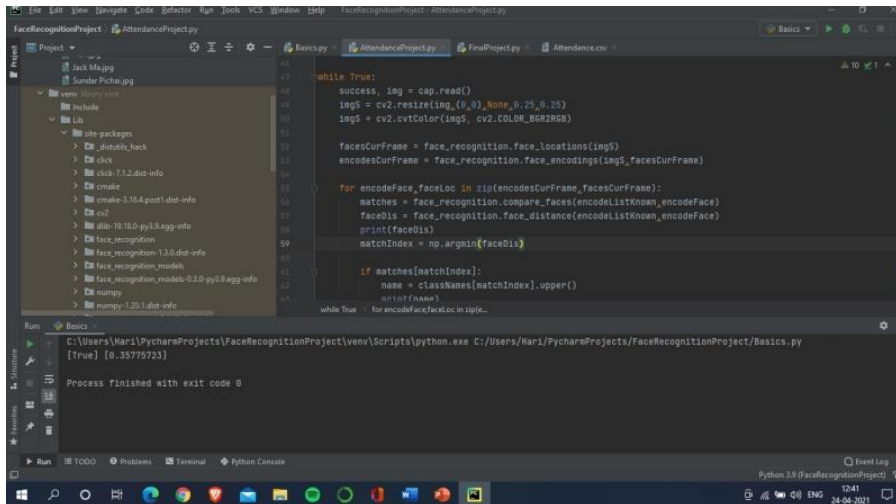


Fig3.1 Attendance.py

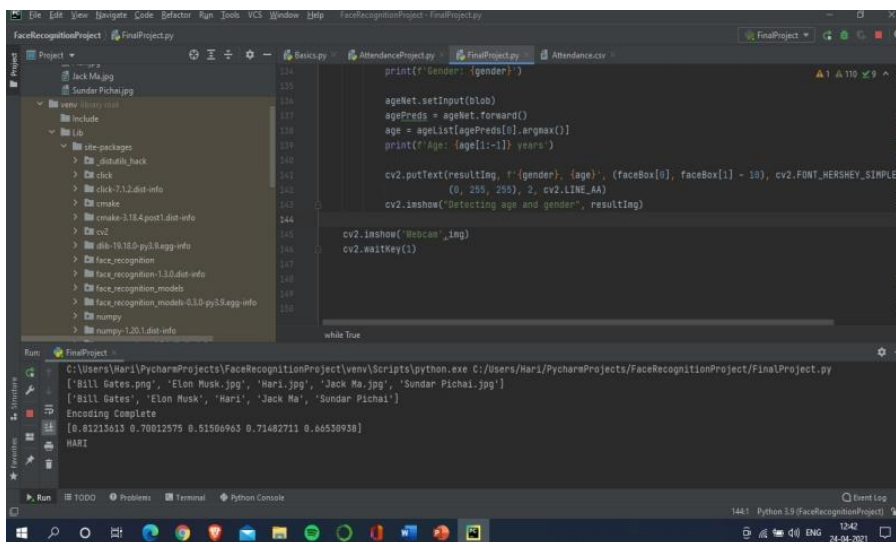


Fig3.2 Finalproject.py



- Time saving
- Easy to manage

## 5.2 DISADVANTAGES

- In wrong hands cause in privacy breach
- Low reliability
- Lack of regulation

## 6 RESULT

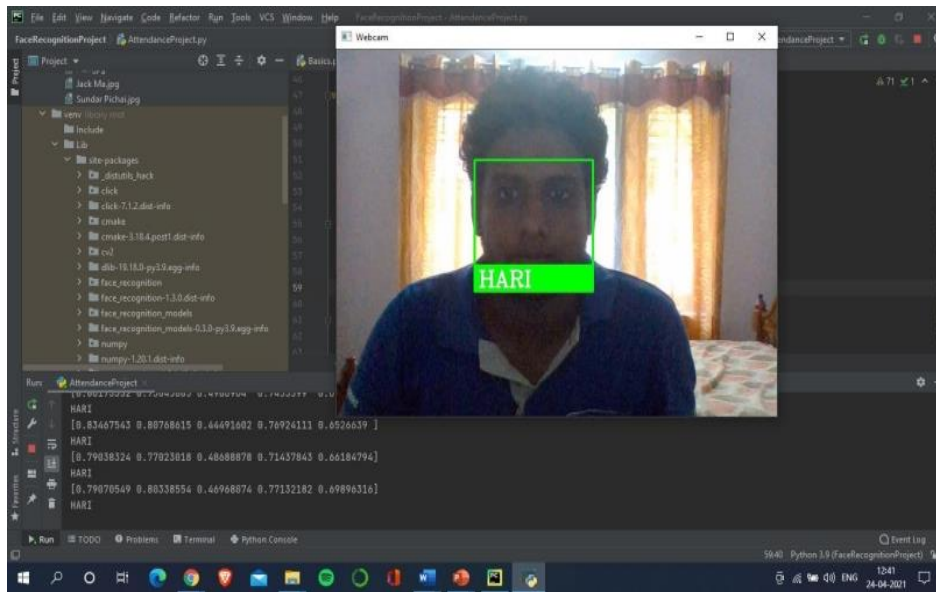


Fig 6 Face Recognition

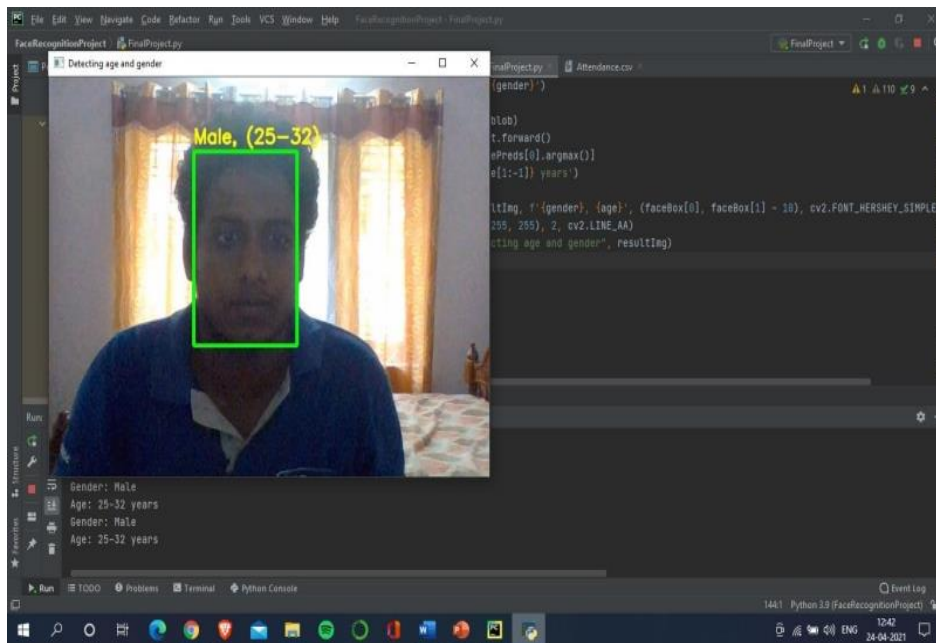


Fig6.1 Gender and Age recognition along with Face Detection

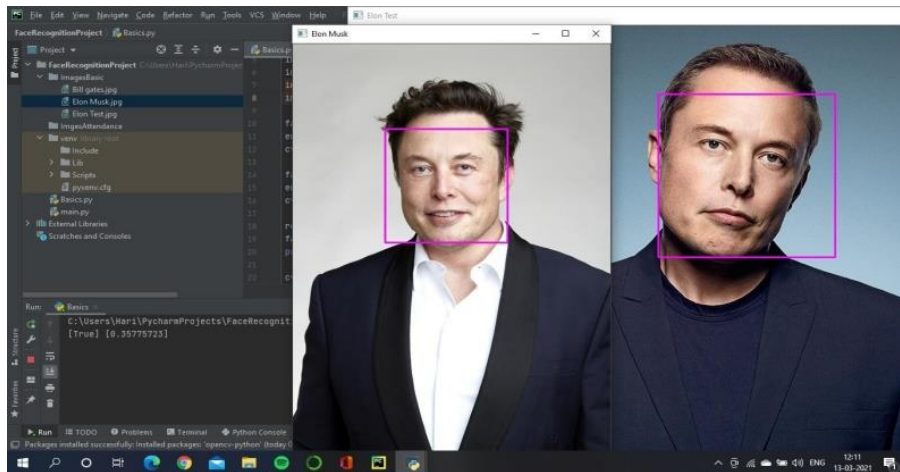


Fig 6.2 Detecting Face from Image and Recognizing Face

## 7. CONCLUSION

Every technology that comes for the first time has many flaws and disadvantage. But all of this get rectified slowly and steadily with time.

The proposed system is user friendly and cost effective. For various purpose with the help of python and OpenCV we can design face recognition also python programming and OpenCv make it easier and handy tool.

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