

# **GOVERNMENT POLYTECHNIC, PUNE**

(An Autonomous Institute of Government of Maharashtra)



## **DEPARTMENT OF COMPUTER ENGINEERING**

ACADEMIC YEAR 2020-21

**PROJECT REPORT ON**

**“FACE RECOGNITION BASED ATTENDANCE SYSTEM “**

SUBMITTED BY

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UNDER THE GUIDENCE

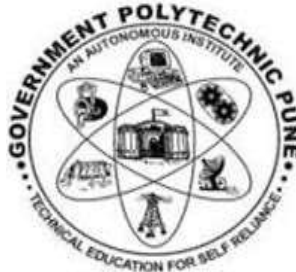
OF

**Prof. S.B.Nikam**

**(COMPUTER ENGINEERING DEPARTMENT)**

# GOVERNMENT POLYTECHNIC, PUNE

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## CERTIFICATE

This is to certify that

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Of class Third Year (2019-20) have successfully completed project on “**FACE RECOGNITION BASED ATTENDANCE SYSTEM** “ under the guidance of “**Mr. S.B.Nikam**” in parallel fulfillment of requirement for the award of Diploma in Computer Engineering from Government Polytechnic, Pune.

**Mr.S.B.Nikam**  
(Project Guide)

**Mr. U.V.Kokate**  
(H.O.D)

**Dr.V.S.Bandal**  
(Principal)

## **ACKNOWLEDGMENT**

The success of any project depends largely on the encouragement and guidelines of many others. This research project would not have been possible without their support. We take this opportunity to express our gratitude to the people who have been instrumental in the successful completion of this project.

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We express our sincere gratitude to our Guide, Mr. S.B.NIKAM for guiding us in investigations of this project and in carrying out experimental work. Our numerous discussions were extremely helpful. We are highly indebted to him for his guidance and constant supervision as well as for providing necessary information regarding the project & also for his support in completing the project. We hold him in esteem for guidance, encouragement and inspiration received from him.

We wish to thank our parents for financing our studies and helping us throughout our life for achieving perfection and excellence. Their personal help in making this report and project worth presentation is gratefully acknowledged. Last but not the least we thank the Almighty for continuous strength we were bestowed for completion of this project.

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## **ABSTRACT**

The purpose of this project is to build a face recognition-based Attendance monitoring system for educational institution to enhance and upgrade the current attendance System into more efficient and effective as compared to before. The current old system has a lot of disadvantages such as they are more time consuming , Proxy attendance done by students etc which makes it inefficient and inaccurate . The technology working behind will be the face recognition system. The human face is one of the natural traits that can uniquely identify an individual. Therefore, it is used to trace identity as the possibilities for a face for being duplicated is low.

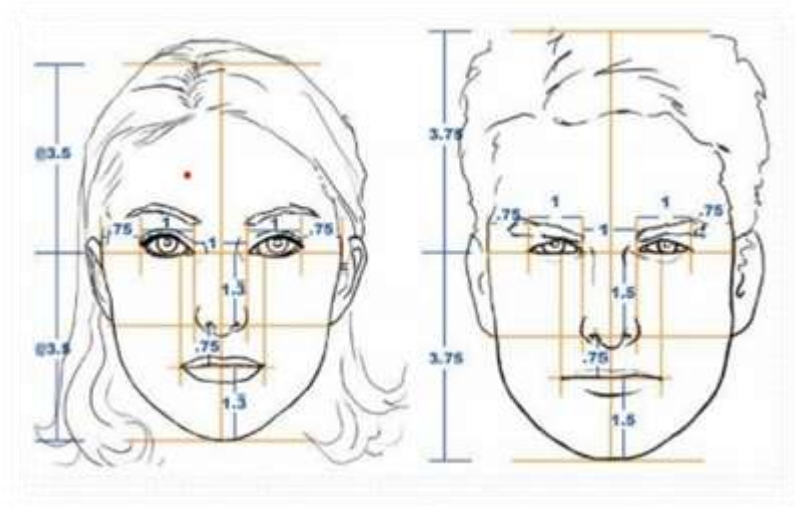
In this project, face databases will be created that will be used by face recognizer. Then, during the attendance taking session, faces will be compared against the database to seek for identity. When an individual is identified, its attendance will be taken down saving necessary information into an excel sheet. At the end of the day, the excel sheet containing attendance information regarding all individuals will be saved and an email will be sent to the absent students and their guardian that the student remained absent during that session .

# Introduction

## ➤ Overview :

This is a project about Facial Recognition-Based Attendance System for Educational Institutions.

In this chapter, the problem and motivation, research objectives, project scope, project contributions and the background information of the project will be discussed in detail



## ➤ What is the face recognition Based Attendance System ?

- Facial recognition is a way of identifying or confirming an individual's identity using their face. Facial recognition systems can be used to identify people in photos, videos, or in real-time.
  
- Facial recognition is a category of biometric security. Other forms of biometric software include voice recognition, fingerprint recognition, and eye retina or iris recognition. The technology is mostly used for security and law enforcement, though there is increasing interest in other areas of use.

## ➤ **Problem Statement and Motivation**

Problem Statement and Motivation According to the previous attendance management system, the accuracy of the data collected is the biggest issue. This is because the attendance might not be recorded personally by the original person, in another word, the attendance of a particular person can be taken by a third party without the realization of the institution which violates the accuracy of the data. For example, student A is lazy to attend a particular class, so student B helped him/her to sign for the attendance which in fact student A didn't attend the class, but the system overlooked this matter due to no enforcement practiced. Supposing the institution establish an enforcement, it might need to waste a lot of human resource and time which in turn will not be practical at all. Thus, all the recorded attendance in the previous system is not reliable for analysis usage. The second problem of the previous system is where it is too time consuming. Assuming the time taken for a student to sign his/her attendance on a 3-4 paged name list is approximately 1 minute. In 1 hour, only approximately 60 students can sign their attendance which is obviously inefficient and time consuming. The third issue is with the accessibility of those information by the legitimate concerned party. For an example, most of the parents are very concerned to track their child's actual whereabouts to ensure their kid really attend the classes in college/school. However in the previous system, there are no ways for the parents to access such information. Therefore, evolution is needed to be done to the previous system to improve efficiency, data accuracy and provides accessibility to the information for those legitimate party.

## ➤ **: Research Objectives**

Research Objectives In order to solve the drawbacks of the previous system stated in 1.1, the existing system will need to evolve. The proposed system will reduce the paperwork where attendance will no longer involve any manual recording. The new system will also reduce the total time needed to do attendance recording. The new system will acquire individual attendance by means of facial recognition to secure data accuracy of the attendance.



➤ **Project outcomes :**

- To develop a portable Smart Attendance System which is handy and self-powered.
- To ensure the speed of the attendance recording process is faster than the previous system which can go as fast as approximately 3 second for each student
- Have enough memory space to store the database
- Able to recognize the face of an individual accurately based on the face database.
- Allow parents to track their child's attendance
- Develop a database for the attendance management system.
- Provide a user-friendly interface for admins to access the attendance database andfor non-admins (parents) to check their child's attendance by mailing the attendance.
- Allow new students or staff to store their faces in the database by using a GUI
- Able to show an indication to the user whether the face- recognition process is successful or Not.

➤ **Need of face recognition Based Attendance System :**

➤ **Automated time tracking system**

Offices or workplaces or even just public places where the entry and exit times of employees or a person are strictly noted down will have a ready-made automated system to record the entry and exit time of each person for a given time. It won't even need the person to stop and click a photo, the software's are advanced enough to record the data from a continuous reel also. This means the flow won't get hampered, or you won't have to stop and smile or something like that. Just enter or exit the place effortlessly like you do everyday and boom! Your attendance will be recorded without any fuss!.

➤ **Cost-effective**

Since the whole process will be done by a computer, it means the total attendance registration and calculation will be automated and done by the system itself, therefore, saving us the money which would have been otherwise spent on the labor cost to do that.

➤ **Increased security**

Face recognition based attendance system won't just calculate attendance but also note down the entry and exits of visitors in the place. At times when there is a situation where the identity and time of entry and exit of a specific person need to be noted, this system would become handy as it will easily show you when he/she came in and what are the places he/she went to a very precise level. All of this means, you will have a much higher security level in your workplace.

### ➤ **Time saving**

The whole world is suffering from COVID19 and it is high time we must give heed to social distancing. Having a safe distance with others has become a necessity nowadays. Times like this can be problematic if you have manual attendance system, Having a Face recognition based attendance system will not only allow you to register the attendance of a person but also keep you at a safe distance from them as you can work remotely and still see who all are coming and going. This calls for the point that, this whole system is a much safer, time-saving, and faster method to record attendance.

### ➤ **Easy to manage**

Since the artificial intelligence based attendance system is fully automated, managing the records and keeping a track of day to day activities will become much easier than the manual system. Everything will be done by the system. Many software are programmed in such a way that it shows the exact time of how many hours or minutes a person worked on his/her desk in the day. All this is can be done on a very large scale. Just imagine, recording the activities of a large crowd of 200 people simultaneously without any fuss and recording it at the same time in an organized manner!. Such is the power of AI in face recognition.

## ❖ Project Plan :

### ➤ Project Schedule

Sr.No	Details of Activity	Planned start date	Planned Finish date	Name of Responsible Team Members
1	Discuss/finalize the topic	1-April	9-April	Sanket ,Shubham, Amaan , Pratik
2	Information collection(literature Review)	12-April	16-April	Pratik ,Shubham
3	Requirement Analysis	19-April	23-April	Amaan Sanket
4	Preparation and submission of proposal format	26-April	30-April	Amaan , Pratik , Shubham, Sanket
5	Choosing instructions(collection of data)	3-May	7-May	Amaan , Pratik , Shubham, Sanket
6	Coding and implementation	10-May	13-May	Amaan , Pratik Shubham, Sanket
7	Testing	17-May	21-May	Amaan , Pratik
8	Result and Conclusion	25-May	28-May	Shubham, Sanket, Amaan , Pratik
10	References	31-May	4-June	Shubham, Sanket Amaan , Pratik

### ➤ **Project scope:**

- The targeted groups of the attendance monitoring system are the students and staff of an educational institution.
- ▪ The database of the attendance management system can hold up to 2000 individual's information.
- ▪ The facial recognition process can only be done for 1 person at a time.
- ▪ An excel sheet is created which contains the student attendance and is mailed to the respected faculty.
- ▪ The project has to work under a Wi-Fi coverage area or under Ethernet connection, as the system needs to update the database of the attendance system constantly
- . ▪ The device on which the application is running is powered up by power bank to improve the portability of the application.

### ➤ **Project Risk :**

#### ➤ **Technical inaccuracies**

Facial recognition technologies promise accurate identification. However, numerous studies have shown that facial recognition technology is still vulnerable. The technology has still a long way to go before it can become completely reliable. The error identification rate has still not dropped down to an acceptable level. Accurate data generation and user recognition still prove to be major challenges in implementing facial recognition technology. Governments have already been utilizing technologies like AR for curbing and investigating criminal activities, and facial recognition can provide significant improvements in maintaining law and order. However, the technology is still in its infancy and has issues in differentiating people having similar facial

features. This poses a serious threat to individuals in situations regarding law and order situations. An identity mismatch can land an innocent citizen in trouble while letting a criminal go scot-free.



### ➤ Identity fraud

If facial data gets compromised, it poses huge threats to governments as well as ordinary citizens.

If the security measures employed with facial recognition technology are not stringent enough, hackers can easily spoof other peoples' identities to carry out illegal activities. This may result in huge financial losses if the data required for financial transactions gets stolen or duplicated.

Financial institutes employing facial recognition methods for providing financial services must ensure to provide strict security measures to protect user data. In the consumer electronics space,

mobile companies employing facial recognition technologies in mobile devices aren't foolproof

Apart from a few manufacturers, most facial recognition tools are nothing more than gimmicks. These systems can be fooled easily leading to compromise of user data. However, the instances of identity fraud are decreasing due to increasingly advanced security measures. Fooling a facial recognition system has become difficult, but it's still not impossible.

### ➤ **Unclear legal or regulatory framework**

There is a lack of detailed and specific information regarding the use of facial recognition technology among common citizens. Most countries have no specific legislation or rules that regulate the use of facial recognition technology. This legal loophole opens the door to abuse of the technology. Governments or business organizations can use the facial recognition data without the knowledge or consent of the people and use them in unapproved ways. Safeguarding of personal data has become a huge concern in today's day and age. Citizens have become aware of protecting their personal data and prevent its use and misuse in public. A proper regulatory framework needs to be employed by governments to safeguard the rights of the citizens.

Governments can enact laws and put ethical practices in place regarding facial recognition technology. This provides a sense of assurance to the citizens and decreases the chances of mistrust. Organizations can implement strict guidelines regarding the use of facial recognition technology at their workplace.

### ➤ **Unethical use**

One of the significant dangers of facial recognition is the unethical use of technology. Gathering facial data without consent is one thing. However, collecting information without the user even being aware raises a huge debate regarding the unethical use of the technology. Hidden cameras are being employed at various places without the user being aware. Such data can be exploited and can be used unethically, compromising the data of unaware citizens. This not only violates an individual's right to privacy but also infringes his right to information. For example, a pizza

delivering gendered advertising. Such instances can greatly harm the reputation of the firms carrying out such illegal activities.

Organizations must abstain from putting such practices in place which gather data without the knowledge of the concerned people. Facial recognition technology can be deployed selectively too. For example, it can be used to identify illegal citizens and refugees or racial profiling. Deployment of controversial facial recognition technology poses concerns regarding human rights. Thus, human rights should be of prime importance while implementing facial recognition technology.

#### ➤ **Data theft**

Facial recognition software depends on and generates a large amount of data. Storage of data becomes a major concern with this technology. However, the prevention of data theft is a bigger concern regarding technology. Database hacking can compromise the data of thousands, if not millions of people. There have been numerous instances of data theft from publicly accessible databases. Prevention of data theft should be one of the priorities while implementing facial

recognition technologies. Once the user data is compromised, it is compromised forever. This poses a significant threat as the data can be misused for a long period of time if the issue is not resolved.



## ❖ Requirement Analysis

### ➤ Hardware Requirements:

- Processor : Intel Dual Core or Advance.
- Hard Disk : Minimum 80 GB.
- Display : LCD/LED Colour.
- Accessories : Web Cam, Keyboard & Mouse.
- RAM : Minimum 1 GB.

### ➤ Software Requirements :

- Operating system : Microsoft
- Windows 7 or Higher Versions.
- Programming Language : “PYTHON”



- Database : Exel
- python 3.9.5,
- vscode ,



- visual studio - c++ developer kit,
- pip requirements.txt

## ➤ **Working :**

### ➤ **What is Face Recognition?**

Facial Recognition is a category of biometric software that maps an individual's facial features mathematically and stores the data as a faceprint. The software uses Deep Learning algorithms to compare a live capture or digital image to the stored faceprint in order to verify an individual's identity.

High-quality cameras in mobile devices have made facial recognition a viable option for authentication as well as identification. Apple's iPhone X, for example, includes Face ID technology that lets users unlock their phones with a faceprint mapped by the phone's camera. The phone's software, which is designed with 3-D modeling to resist being spoofed by photos or masks, captures and compares over 30,000 variables. Face ID can also be used to authenticate purchases with Apple Pay and in the iTunes Store, App Store, and iBooks Store. Apple encrypts and stores faceprint data in the cloud, but authentication takes place directly on the device.



### ➤ **Face Recognition using Python**

Faces are made of thousands of fine lines and features that must be matched. The face recognition using Python, break the task of identifying the face into thousands of smaller, bite-sized tasks, each of which is easy to face Recognition Python is the latest trend in Machine Learning techniques. OpenCV uses Machine Learning algorithms to search for faces within a picture.



### ➤ **Facial Recognition using Python Libraries**

The most popular and probably the simplest way to detect faces using Python is by using the OpenCV package. Originally written in C/C++, OpenCV now provides bindings for Python.

It uses machine learning algorithms to search for faces within a picture. Faces are very complicated, made of thousands of small patterns and features that must be matched. The face recognition algorithms break the task of identifying the face into thousands of smaller, bite-sized tasks, each of which is easy to solve, known as classifiers.

A face may have 5000 or more classifiers, all of which must match for a face to be detected. Since there are at least 5,000 or more tests per block, you might have millions of calculations to do, which makes it a difficult process. To solve this, OpenCV uses cascades.

The OpenCV cascade breaks the problem of detecting faces into multiple stages. It performs a detailed test for each block. The algorithm may have 30 to 50 of these stages or cascades, and it will only detect a face if all stages pass.

The cascades are a bunch of XML files that contain OpenCV data used to detect objects. You initialize your code with the cascade you want, and then it does the work for you. Since face detection is such a common case, OpenCV comes with a number of built-in cascades for detecting everything from faces to eyes to hands to legs.

You may use other alternatives to OpenCV, like dlib – that come with Deep Learning based Detection and Recognition models.

dlib as a code does the following:

1. Use MMOD (Deep Learning) algorithm to find face bounding boxes
2. Find facial landmark points (like eyes, nose, etc.)
1. Use the points to realign the face crops so that it is frontal.
2. Use a Deep Learning model to calculate embeddings from the face crop.

These embeddings are 128-dimensional vectors. Their nature is such that the same faces will end up closer to each other while different faces will end up far apart.

Also, you may use Dlib face detector in place of OpenCV. Then you can use Pre-trained model like from Facenet, to extract the feature from the face and create embedding for each unique face and assign a name to it. Both Dlib and Facenet score well on accuracy meter.

## ➤ **Open CV :**

Open CV (Open Source Computer Vision Library) is an open source computer vision and machine learning library. This was built to give a common structure for computer vision applications and to influence the use of machine interpretation in the commercial products like facial recognition which is extensively use in today's world. Open CV has more than 2,500 optimized algorithms. These algorithm can be used to detect and identify faces, objects, track moving objects in a video or in an image, follow eye movements etc.

Open CV has been written in C++ and has templated interface that work with STL containers (Standard Template Library: it is a set of C++ template classes to provide common programming data structure and functions like list, array, stack etc). Open CV has C++, Python, Java and Matlab interfaces and supports Windows, Linux, Mac OS and also Android

## ➤ **Haar Cascade:**

A Haar Cascade is a classifier which is used to detect the object for which it has been trained for. The Haar cascade is trained by superimposing the positive image over a set of images. This type of training is generally done on a server and on various stages. Better results are obtained by using high quality images and increasing the amount of stages for which the classifier is trained for. This cascade makes it easier to build a model. One just needs to pre-define the Haar cascade which are available on [github](https://github.com). Moreover one can make their own cascade file.

## ➤ **So, Let's Start :**

Before starting this, my suggestion is to break this project into different parts or do it in steps so that it becomes easy to understand. Therefore, I have divided this into 2 major parts so that it becomes easy and hassle free.

## ➤ First Part: (Data Collection)

The first and the major part is to collect samples of data on which this model needs to be trained

### Steps:

1. Defining Path : In this we first give the path of the file where the cascade file named “haarcascade\_frontalface\_default.xml” has been saved if you can download it from [github](#). This cascade file will help your model classify your facial expression and will help in recognizing the face for which it has been trained for.
2. Face Extraction : In this we basically convert the color of the captured images to gray because for many applications based on image processing, color information doesn’t help us identify important edges or other features. Also, for learning image processing, its better to understand multichannel processing rather than starting with full color imaging and missing all important insight that can learned from single channel processing. Moreover, in grayscale images, the watershed algorithm is fairly easy to conceptualize because we can think of the two spatial dimensions and one brightness dimension as a 3D image with hills, valleys, catchment basins, ridges, etc.
3. Multi Scaling : After the color transition we use detectMultiScale(), this basically detects objects of different sizes in the input image and the detected objects are returned as list of rectangle. This method has three main parameters which involves image, scale factor and nearest neighbors.
4. Cropping Image : this is the very crucial part as in this we just crop the image so that we could get the face of the object.
5. Reading : Now after cropping the face we start reading. One thing that you must have noticed is that I used two variables to unpack the read function. It is because, this function always returns two values one Boolean and second the coordinates .

6. Resizing and saving the Output : The resize function here resizes the cropped image into the desired set of frames, also declaring the location of the file where the training data is going to be saved (“cv2.putText” is used to add text on the screen along with the video and “cv2.FONT\_HERSHEY\_COMPLEX” is the name of the font used just like Arial etc)
7. Wait Key : This is a method which is used to kill the process if any key is pressed it only takes ASCII values here 13 is an ASCII value.
8. Releasing and Destroying the windows : This is probably the most important thing to do because this will destroy all the windows which are open during the process of capturing the data and if you do not use this the camera window will not shut down and you will have to restart the system all over again and in some cases restart doesn't even work.

➤ **Second Part (Training and Predicting the Data) :**

➤ **Training :**

In this part we will train the model on the data that we have collected and based on the training our model will predict (based on confidence), whether the user is the same user or its somebody else; same as any other face lock of a mobile phone.

Before beginning the training we first need to get the data from the output file and then convert it into grayscale. After this color transition we then append the data into train\_data.

The model which determines the face of the subject is already defined which is

“cv2.face.LBPHFaceRecognizer\_create()”. Therefore we use this as our primary model for training the sample data.

### ➤ **Predicting :**

This is the last and final step. In this we use test our model and calculate the confidence and based on this confidence we our model will determine and predict whether the user is the same for which the data has been trained or not. Few steps of this part are similar to the steps listed in part one(Defining path, Face Extraction, Multi scaling and Resizing). The only thing which is different is calculating confidence. First we set a threshold value, if our model predicts and the prediction value comes out to be less than the threshold value then only the confidence is calculated and If the value of confidence turns out to be greater than 80 then only the message “UNLOCKED” will pop otherwise the device will remain locked for every other faces.



## ❖ **SYSTEM DESIGN :**

The design part of the attendance monitoring system is divided into two sections which consist of the hardware and the software part. Before the software The design part can be developed, the hardware part is first completed to provide a platform for the software to work. Before the software part we need to install some libraries for effective working of the application. We install Open CV and Numpy through Python.

### **1 Hardware Development**

- Camera Module with good mega pixels.
- Power Supply Cable
- 16Gb Micro SD Card Class 10

### **2.Libraries Development :**

#### ➤ **Open CV” :**

Open CV (Open source computer vision) is a library of programming functions mainly aimed at real-time computer vision. The Open CV project was initially an Intel Research initiative to advance CPU-intensive applications, part of a series of projects including real-time raytracing and 3Ddisplay walls. The main contributors to the project included several optimization experts in Intel Russia, as well as Intel's Performance Library Team

#### ➤ **In the early days of OpenCV, the goals of the project were described as:**

- Advance vision research by providing not only open but also optimized code for basic vision infrastructure. No more reinventing the wheel.
- Disseminatevision knowledge by providing a common infrastructure that developers could build on, so that code would be more readily readable and transferable.
- Advance vision-based commercial applications by making portable, performance-optimized code available for free – with a license that did not require code to be open or free itself

➤ **Open CV's application areas include:**

- 2D and 3D feature toolkits
- Egomotion estimation
- Facial recognition system
- Gesture recognition
- Human–computer interaction (HCI)
- Mobile robotics
- Motion understanding
- Object identification
- Segmentation and recognition
- Stereopsis stereo vision: depth perception from 2 cameras
- Structure from motion (SFM)
- Motion tracking
- Augmented reality To support some of the above areas,

Open CV includes a statistical machine learning library that contains:

- Boosting
- Decision tree learning
- Gradient boosting trees
- Expectation-maximization algorithm
- k-nearest neighbour algorithm
- Naive Bayes classifier
- Artificial neural networks
- Random forest
- SVM

### **Versions of Open CV:**

- **Deep neural networks (DNN)**The first alpha version of Open CV was released to the public at the IEEE Conference on Computer Vision and Pattern Recognition in 2000, and five betas were released between 2001 and 2005. The first 1.0 version was released in 2006. A version 1.1 "pre-release" was released in October 2008.
- The second major release of the Open CV was in October 2009. Open CV 2 includes major changes to the C++ interface, aiming at easier, more type-safe patterns, new functions, and better implementations for existing ones in terms of performance (especially on multi-core systems). Official releases now occur every six months and development is now done by an independent Russian team supported by commercial corporations.
- In August 2012, support for Open CV was taken over by a non-profit foundation OpenCV.org, which maintains a developer and user site.
- On May 2016, Intel signed an agreement to acquire Itseez, a leading developer of Open CV

### **❖ Programming Language:**

There are bindings in Python, Java and MATLAB/OCTAVE. The API for these interfaces can be found in the online documentation. Wrappers in other languages such as C#, Perl, Ch, Haskell, and Ruby have been developed to encourage adoption by a wider audience. Since version 3.4, OpenCV.js is a JavaScript binding for selected subset of OpenCV functions for the web platform. Operating System Support: All of the new developments and algorithms in Open CV runs on the following desktop operating systems: Windows, Linux, macOS, FreeBSD, NetBSD, OpenBSD. OpenCV runs on the following mobile operating systems: Android, iOS, Maemo, BlackBerry 10. The user can get official releases from SourceForge or take the latest sources from GitHub. Open CV uses CMake. “3.2.2 NumPy” NumPy is a package that defines

a multi-dimensional array object and associated fast math functions that operate on it. It also provides simple routines for linear algebra and fft and sophisticated random-number generation. NumPy replaces both Numeric and Numarray.

**Example :**

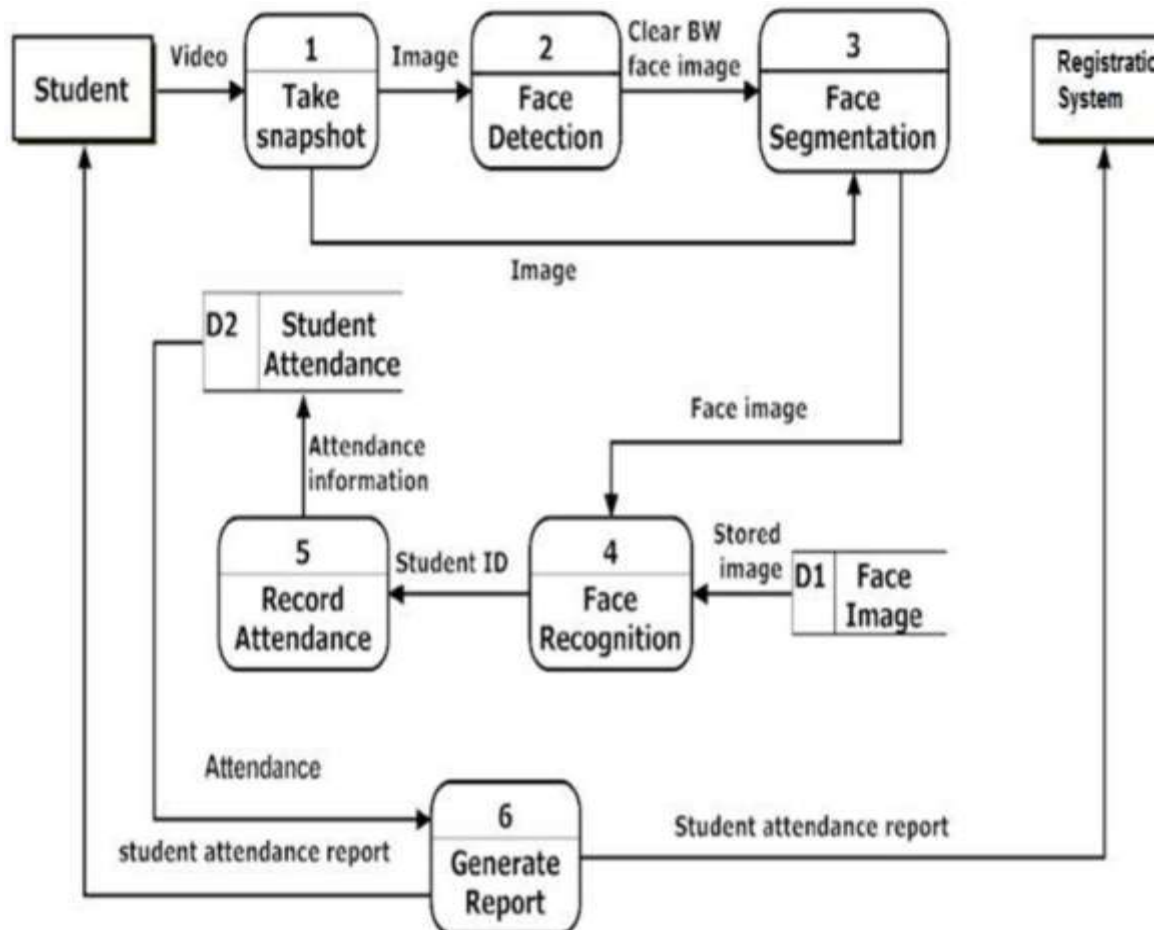
demonstrating NumPy:

```
from numpy import *  
from PIL import Image  
ar = ones((100,100),float32)  
ar = ar * 100 for i in range(0,100):  
    ar[i,:] = 100 + (i * 1.5)  
im = Image.fromarray(ar,"F")
```

The numpy namespace includes all names under the numpy.core and numpy.lib namespaces as well. Thus, import numpy will also import the names from numpy.core and numpy.lib. This is the recommended way to use numpy.

❖ Diagrams:

DFD (Data Flow Diagram) of project



### Testing :

Sr no.	Templates	Implementation
1.	Test Plan Identifier	Registration already registration Page. Testing Level Specific Test Plan: it will test at unit level.
2.	Introduction	The test plan is designed to prescribe the scope, approach, resources, and schedule of all testing activities of the project.
3.	Test Items	1) Register activity 2) Already Register activity
4.	Features to be tested	1. user to redirect to the register screen if not register 2. User can register by enter id and name
5.	Features not to be tested	1. checking of button click on take images 2. verification of id and name which will be saved or not. .
6.	Approach	The overall strategy of how the tests will be performed. 1. successful register after appropriate input 2. Register user if it will not recognize the face .
7.	Item pass/fail criteria	<p>TC-1: Check User Enter data Interface Input data :no Input data : Name And Id Expected Result: User interface should contain all expected components Actual Result :As expected Status: Pass</p> <p>TC-2 Check Name field with valid input Input data :Put correct Name Expected Result: User should register into attendance portal Actual Result: As expected Status: Pass</p> <p>TC-3 Check Id field with valid input</p>

**Input data :Put appropriate id**  
**Expected Result : User should register into attendance portal**

**Actual Result: As expected Status :Pass**

**TC-4 Check the button take image**

**Input data :Click on the take image for taking images of face**

**Expected Result: By clicking on take image webcam will be open and it will start taking images of face.**

**Actual Result :As expected Status :Pass**

**TC-5 Check the button save profile**

**Input data :Click on the save profile for saving the user enter data and image for register.**

**Expected Result: By clicking on save profile it will save and register the new entry.**

**Actual Result :As expected Status :Pass**

**TC-6 Check the button take attendance**

**Input data : Click on the take attendance for taking the attendance**

**Expected Result: By clicking on take attendance**

**Webcam will be open and it will detect the face and mark the attendance**

**Actual Result :As expected Status :Pass**

**TC- Check the attendance is marked in excel or not**

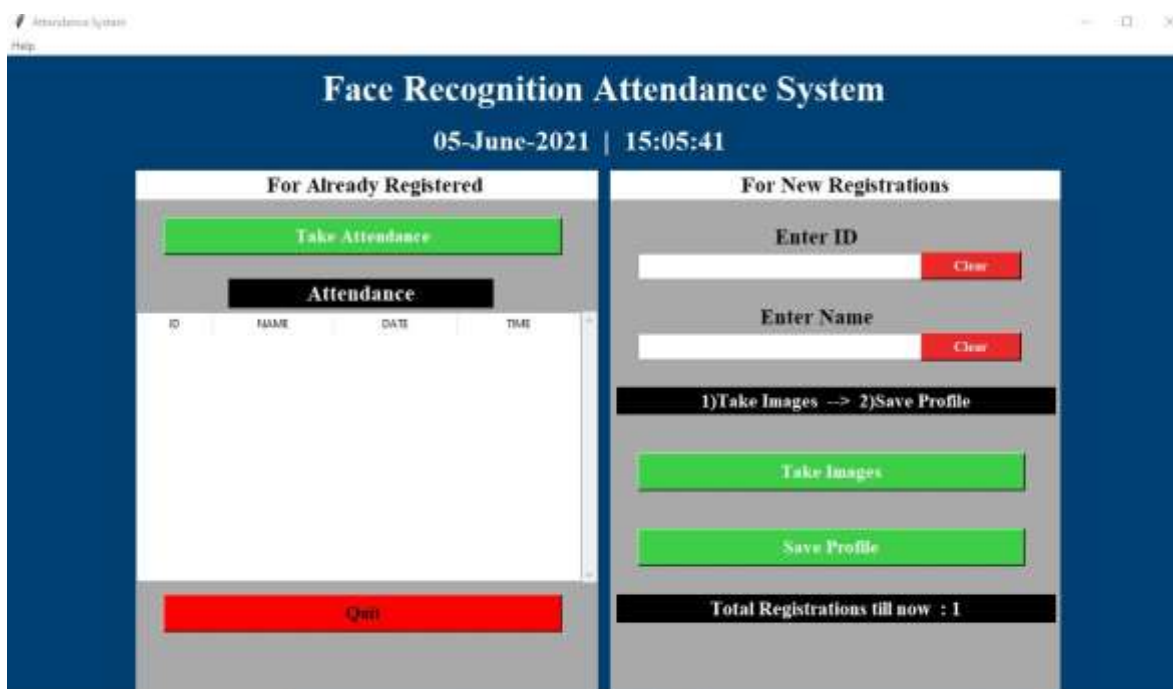
**Input data : no**

**Expected Result: in excel sheet you will be got the entry.**

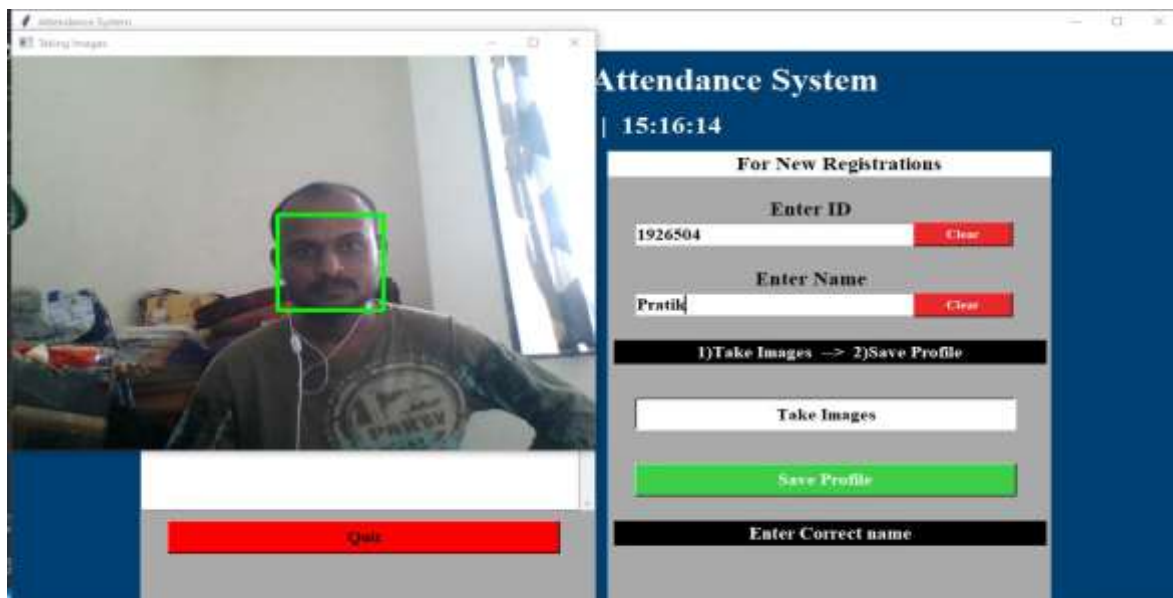
**Actual Result :As expected Status :Pass**

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Test image1 :



Test image2





Test image3

Attendance System

Help

# Face Recognition Attendance System

05-June-2021 | 15:18:05

**For Already Registered**

**Take Attendance**

**Attendance**

ID	NAME	DATE	TIME
----	------	------	------

**Quit**

**For New Registrations**

**Enter ID**

1926504 **Clear**

**Enter Name**

Pratik **Clear**

**Images Taken for ID : 1926504**

**Take Images**

**Save Profile**

**Enter Correct name**

Test image4:

Attendance System

Help

# Face Recognition Attendance System

05-June-2021 | 15:27:54

**For Already Registered**

**Take Attendance**

**Attendance**

ID	NAME	DATE	TIME
1926504	Pratik	05-06-2021	15:27:37

**Quit**

**For New Registrations**

**Enter ID**

1926504 **Clear**

**Enter Name**

Pratik **Clear**

**Profile Saved Successfully**

**Take Images**

**Save Profile**

**Total Registrations till now : 1**

## Training image 1 :



## Training image 2 :



### ❖ **Advantages:**

- **Automated time tracking system**
- **Cost-effective**
- **Increased security**
- **Avoid proxy attendance**
- **Time saving**
- **Easy to Manage**

### ❖ **Disadvantages :**

- **if in the wrong hands, it will be a disaster**
- **Data privacy breach**
- **Low reliability**
- **Lack of regulations in the in Face recognition systems**

### ❖ **Future Scope:**

- **Creating Online databases so that the college can directly access the records of attendance and can easily calculate the percentage of attendance .**
- **Adding facility of sending Emails and SMS to absent students and their Parents or guardians so that the parents or guardians are aware of what their kids are doing.**
- **Using raspberry pi and camera to create a compact face recognition attendance system that can be installed on walls or doors for offices , schools and colleges.**

## **Conclusion:**

- **Python** is really a powerful programming language for image acquiring and image processing.
- JPG is the format that should be used for image processing.
- Our face recognition system detects the faces in a picture taken by web-cam, and these face images are then checked with training image .
- It was a wonderful experience for our team working on this project , we learned a lot of new concepts and strategies , that made us a better engineer.
- Finally Our Team would like to thank **Prof .Shankar Nikam** for their kind help and valuable suggestions.

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