A
Project Report on

"*Smart Attendance Monitoring System*"

Submitted By

Mr. Omkar Sunil Basargi - 2019BTEEN00073.
Mr. Nikhil Nivrutti Nirmal – 2019BTEEN00074.
Miss. Prithvi Vijay Lokhande – 2019BTEEN00090.
Mr. Sachin Dhondiram Kshirsagar – 2019BTEEN00066.

CLASS: T.Y. ELECTRONICS

Under the guidance of

Mr.R.G.Mevekari

Department of Electronics Engineering

WALCHAND COLLEGE OF ENGINEERING, SANGLI

(Government-Aided Autonomous Institute)

2021-2022

Contents

Acknowledgement

I would like to express my gratitude to Mr.R.G. Mevekari Sir who has given us opportunity to do this wonderful project on the topic water level indicator.This helped us in doing lot of research and from that we got more knowledge. I would also like to thank my all the teammates for their sincere coordination and who worked hard to complete this project and make it a success.

Abstract

This project talks about marking attendance automatically. Attendance plays a very important role in every professional field such as college, universities, school, offices etc. Conventional method of marking attendance by calling roll no. is time consuming. So the basic idea for this project come for saving time. Our project is based on face detection . The information of all students in the class is captured and stored and when the face of the individual student matches with the one stored in the database then attendance is recorded.

Introduction

Marking attendance and giving attendance both the processes play very important role in educational as well as any professional organization. It is very important to keep constant and regular record of each and every person in an organization. As in conventional method this process is very time consuming and consumes lots of energy, So to overcome this problem we come up with a solution "Smart Attendance Monitoring System".

In this system the device is used to scan and analyze image of human faces. We are Familiar with this technique as it is also available in our smart phones to unlock our phone using face . The concept of machine learning is also used to identify different faces. Hence this project will be very beneficial for all organizations where marking attendance is very important.

- **Motive and Objective**

The Objective of the project is to make an Attendance System that will record the attendance by recognizing the face of an individual. The main purpose of this project is to develop a technology which is highly secure and to implement it easily in school, colleges, hospitals and many other work areas. By the end of this project, we'll have sufficient knowledge regarding Python language, Face Recognition etc.

Pre-requisites:

1. Python

Python is a high level computer programming language which is used for various purposes. In python there are n number of libraries which helps developer to create software, building websites.

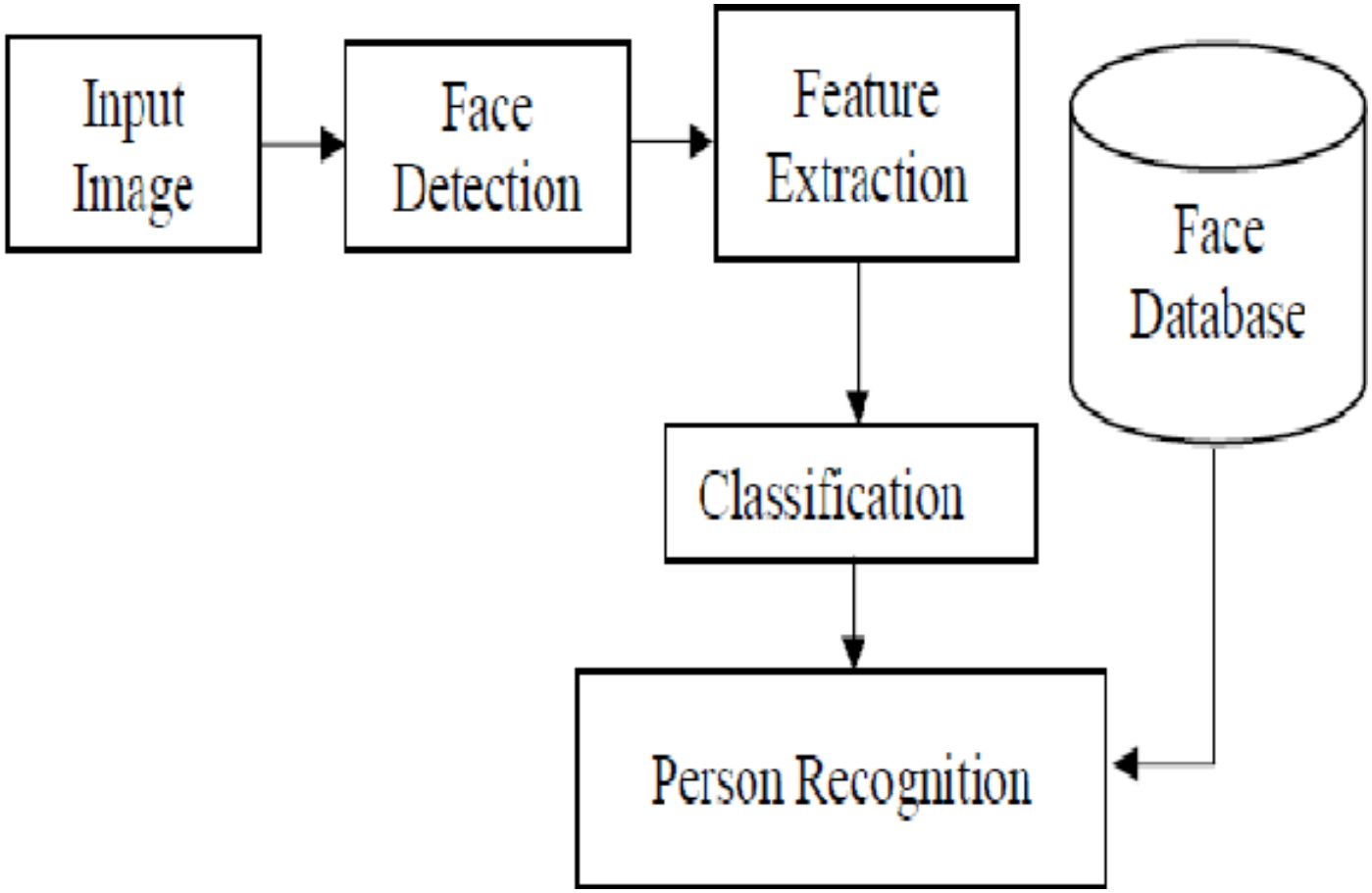
2. OpenCV

OpenCv is very famous library due to its computer vision.Previously it was written in C or C++ but now it is also available in python. It uses machine learning algorithm which helps in face recognition.

3. Face recognition

It is used to detect faces and also compares them with the data stored in computer to find match for the purpose of recording attendance.

Block Diagram :



Working :

Facial recognition has been implemented using artificial intelligence in which various faces are compared to check whether any match is found.

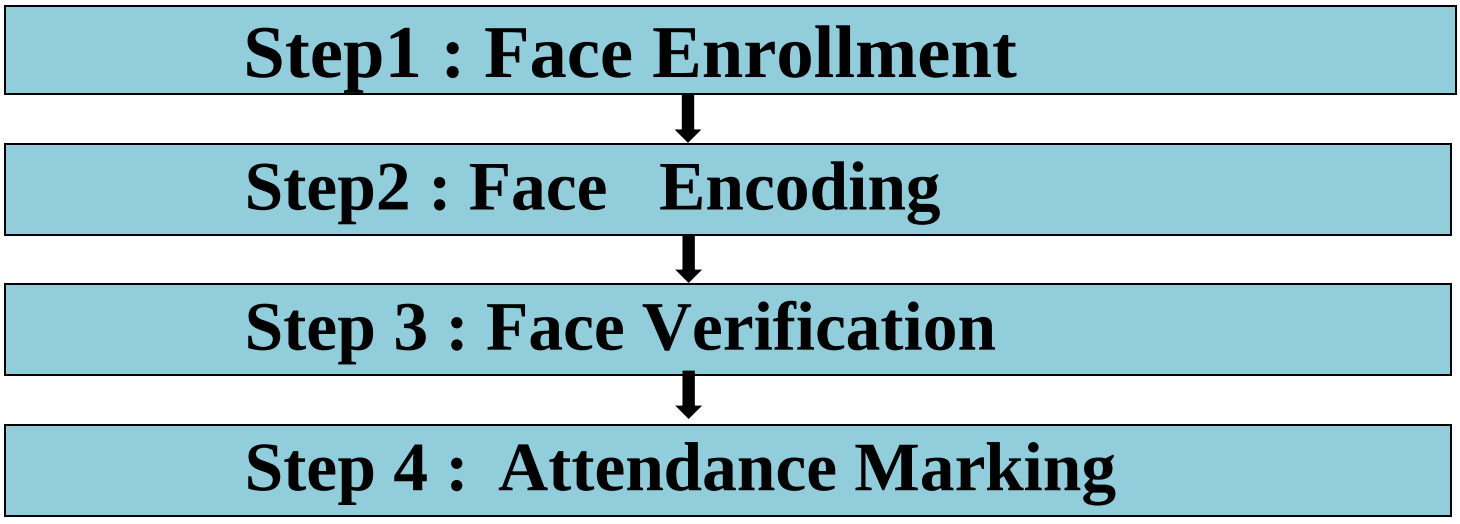
The main steps involved are as follows :

Step 1: Face Enrollment

Step 2: Face Encoding

Step 3: Face Verification

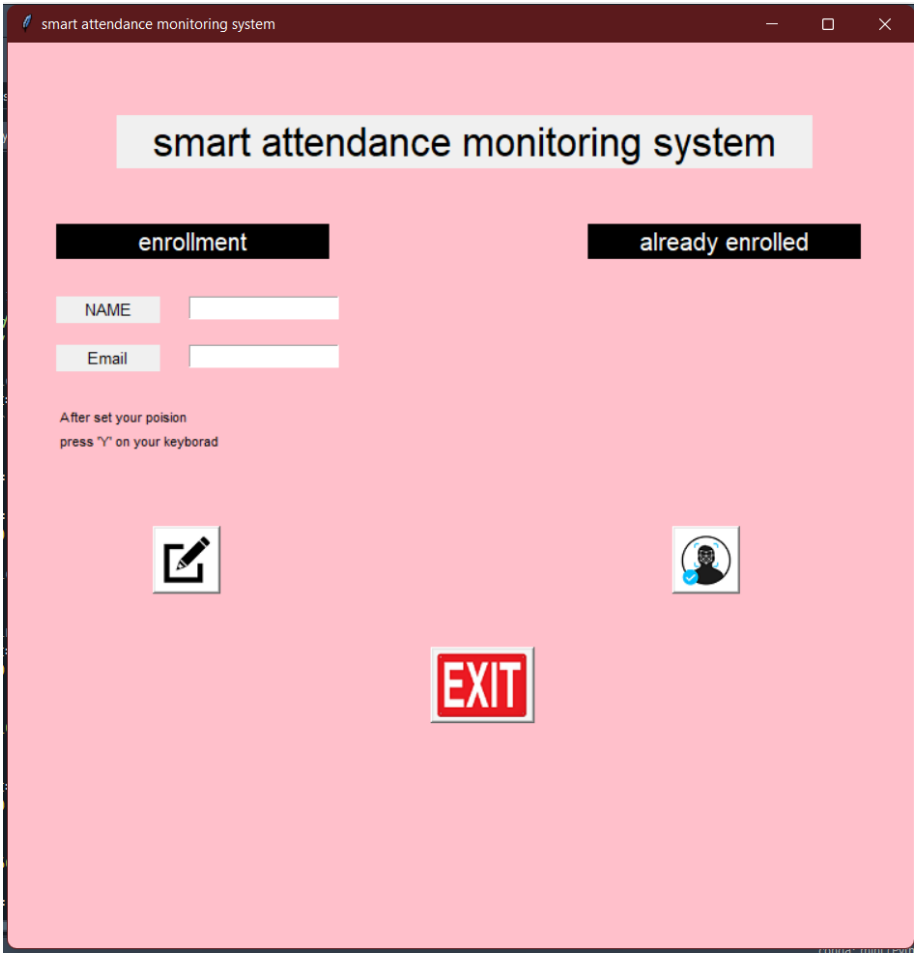
Step 4: Attendance Marking



Flow Diagram

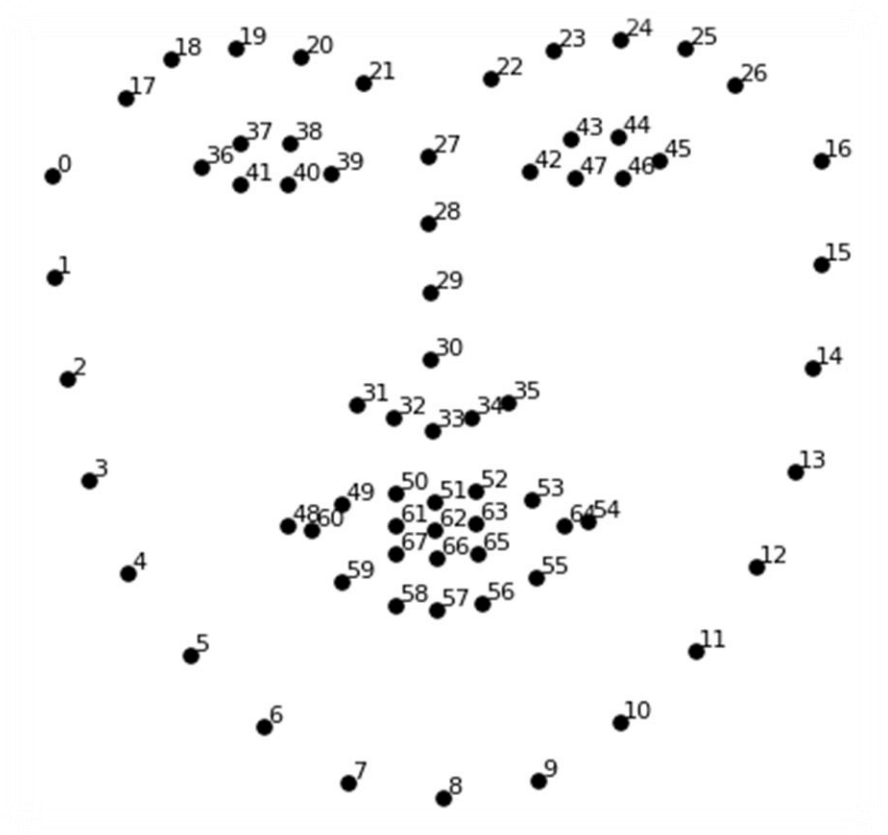
Step 1: Face Enrollment

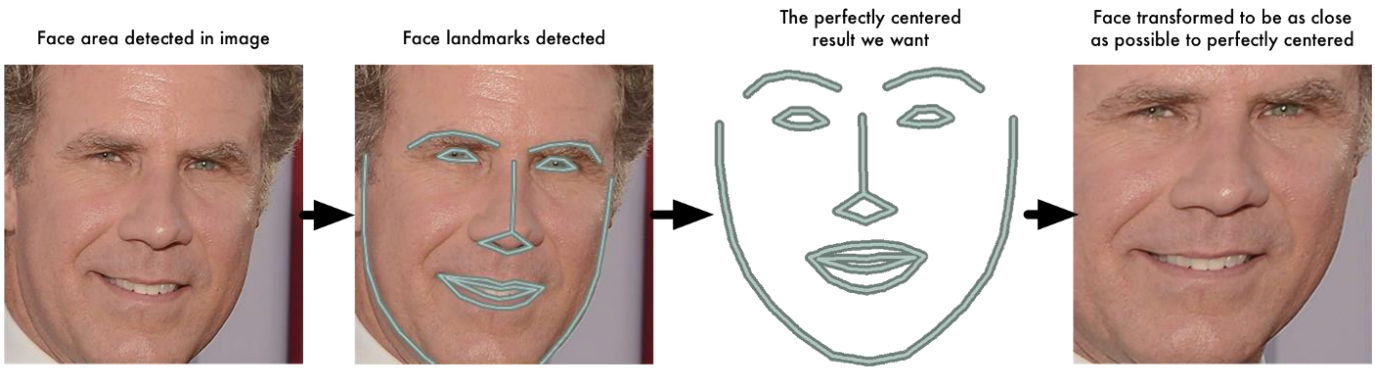
In this user is requested to enroll his/her name and then face. After successful capture of image (user's face) he/she is asked for Email Id for the OTP. After successful enrollment user get notification on his mobile through Email.



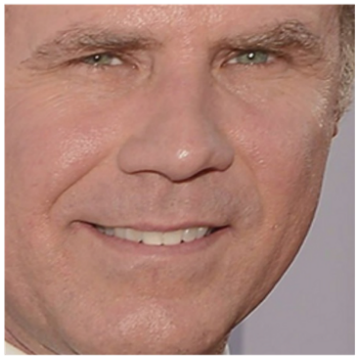
Step 2: Face Encoding

After successful registration by User the image is successfully stored in a image folder .This image is converted from jpeg format to text format .In encoding folder this txt file is saved with the name provided by user.





Input Image

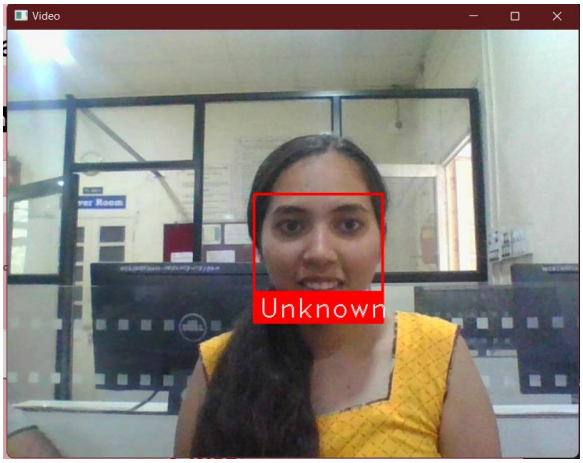


128 Measurements Generated from Image

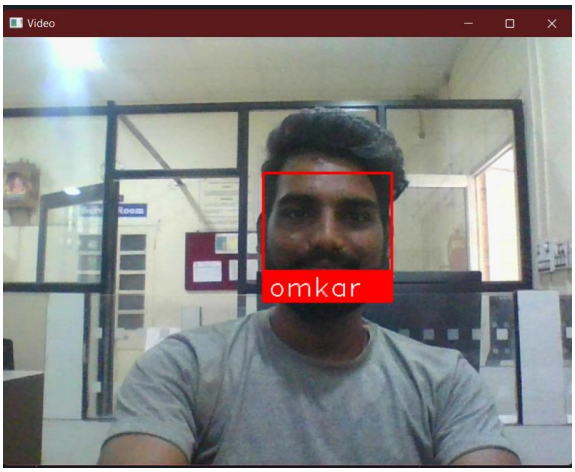
0.097496084868908	0.045223236083984	-0.1281466782093	0.032084941864014
0.12529824674129	0.060309179127216	0.17521631717682	0.020976085215807
0.030809439718723	-0.01981477253139	0.10801389068365	-0.00052163278451189
0.036050599068403	0.065554238855839	0.0731306001544	-0.1318951100111
-0.097486883401871	0.1226262897253	-0.029626874253154	-0.0059557510539889
-0.0066401711665094	0.036750309169292	-0.15958009660244	0.043374512344599
-0.14131525158882	0.14114324748516	-0.031351584941149	-0.053343612700701
-0.048540540039539	-0.061901587992907	-0.15042643249035	0.078198105096817
-0.12567175924778	-0.10568545013666	-0.12728653848171	-0.076289616525173
-0.061418771743774	-0.074287034571171	-0.065365232527256	0.12369467318058
0.046741496771574	0.0061761881224811	0.14746543765068	0.056418422609568
-0.12113650143147	-0.21055991947651	0.0041091227903962	0.089727647602558
0.061606746166945	0.11345765739679	0.021352224051952	-0.0085843298584223
0.061989940702915	0.19372203946114	-0.086726233363152	-0.022388197481632
0.10904195904732	0.084853030741215	0.09463594853878	0.020696049556136
-0.019414527341723	0.0064811296761036	0.21180312335491	-0.050584398210049
0.15245945751667	-0.16582328081131	-0.035577941685915	-0.072376452386379
-0.12216668576002	-0.0072777755558491	-0.036901291459799	-0.034365277737379
0.083934605121613	-0.059730969369411	-0.070026844739914	-0.045013956725597
0.087945111095905	0.11478432267904	-0.089621491730213	-0.013955107890069
-0.021407851949334	0.14841195940971	0.078333757817745	-0.17898085713387
-0.018298890441656	0.049525424838066	0.13227833807468	-0.072600327432156
-0.011014151386917	-0.051016297191381	-0.14132921397686	0.0050511928275228
0.0093679334968328	-0.062812767922878	-0.13407498598099	-0.014829395338893
0.058139257133007	0.0048638740554452	-0.039491076022387	-0.043765489012003
-0.024210374802351	-0.11443792283535	0.071997955441475	-0.012062266469002
-0.057223934680223	0.014683869667351	0.05228154733777	0.012774495407939
0.023535015061498	-0.081752359867096	-0.031709920614958	0.069833360612392
-0.0098039731383324	0.037022035568953	0.11009479314089	0.11638788878918
0.020220354199409	0.12788131833076	0.18632389605045	-0.015336792916059
0.0040337680839002	-0.094398014247417	-0.11768248677254	0.10281457751989
0.051597066223621	-0.10034311562777	-0.040977258235216	-0.082041338086128

Step 3: Face Verification

The enrolled image is compared with the live image of the user with the help of camera. If both the images matches upto 95% then the user name is displayed on the screen and attendance is marked. Else ,image doesn't match with our database then the "unknown" message is displayed on the screen.



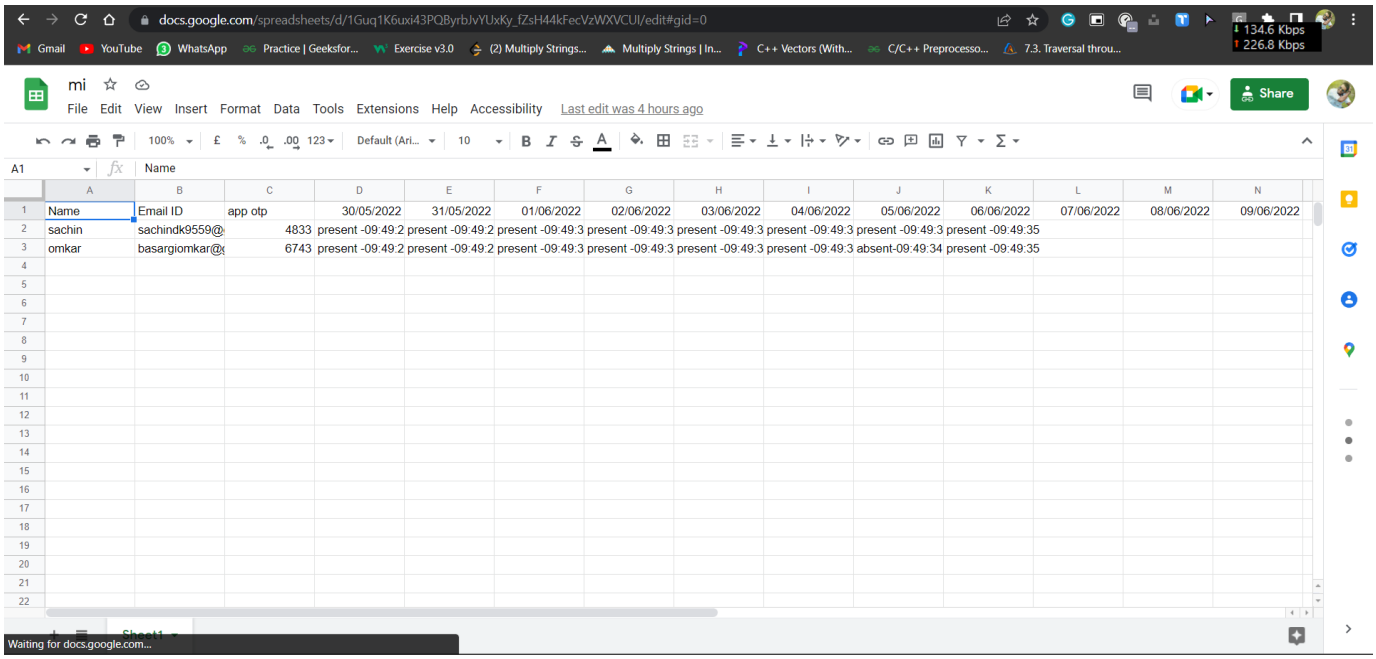
Unknown face



Enrolled face

Step 4: Attendance Marking

If both images are matched then it will check whether you are on correct time or not as per time given by higher authority.If you are late than expected time then the attendance is marked as absent else present is marked in spreadsheet.



Advantages

1. The main advantage is that it is time saving method.

2. It includes faster processing.

3. Automatic identification of various faces, large data can be stored, highly secure, real time detection of face, used in phone unlock and various activities in our daily lives.

Disadvantages

1. Few disadvantages are that the costing will be very high due to requirement of High definition cameras which are very expensive and using low definition cameras will reduce the efficiency of the system.

2. Image size will play important role as, if the size of image captured is small then it becomes difficult to recognize small images.

Applications:

1. Save Money

As accurate attendance is marked so exact record of each employee is captured by the system. This will help in correct distribution of salary according to their attendance. This will eventually help in saving money.

2. Better efficiency = Higher Productivity

Taking attendance of each and every employee is very hectic ,time consuming and full time duty. For performing this work a separate employee needs to be hired and further there in no guarantee that exact attendance will be recorded.
Using Smart attendance monitoring system provides us the facility of 100% accuracy and no need to hire a separate employee for that work. Hence it improves overall efficiency and leads to increase in productivity.

Conclusion:

Face detection systems are found in many top industries and companies where recording attendance of employees is mandatory. Use of Python programming along with anaconda, spyder, OpenCv (for face recognition), tkinter(for graphical interface) etc, make it easier which can be made by anyone according to individual's requirements.

References:

- https://opencv.org/
- https://en.wikipedia.org/wiki/OpenCV
- https://face-recognition.readthedocs.io/en/latest/readme.html
- https://github.com/ageitgey/face_recognition