

## THE SURVEILLANCE PROGRAM WITH ATTENDANCE SYSTEM

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### ABSTRACT

This report is based on the development of the Surveillance System. Basically, Surveillance means to keep an eye or watch on a particular person or a group of people. Especially, it is done to watch behavior, movements, or activities information for controlling, managing, etc.

This Project is consists of two main areas of interest, that is Motion Detection and Face Recognition based Attendance System. Face recognition is one of the most used biometrics. Despite having low accuracy while compared to iris recognition and fingerprint biometrics, it is used widely due to its contactless process. Motion Detection is the process of detecting a change in an object according to its surroundings. Motion Detectors are widely used in home and personal security devices. It will be impossible to have a security system without motion detection. In an empty office or home, when their supposed to be no one in the area, Motion Detection can be used to mark out the things or movements of any person and can alert the guard.

**Keywords:** Face Detection, Face, Attendance, Face Recognition, Database, OpenCV, Motion, Motion Detection.

### I. INTRODUCTION

The method of keeping manned security is too old and placing a CCTV camera above the door cannot be a safe option for us in today's time. When technology is growing at a good pace everywhere, there will be good and useful solutions to our modern problems are being prepared. The working and meaning are very clear as we hear THE SURVEILLANCE PROGRAM. As the word surveillance is derived from the French word i.e., "Sur" means "From Above" and "Veilance" means "to watch".

We developed this system keeping some of the main factors in mind like a System with low cost, easy to use and maintain, and less man effort at offices and other places. This system will provide the monitoring system with motion detection technology and face recognition based attendance updation.

The surveillance system is specially designed to increase the security of the area. Every workspace or office are obliged to provide full security to their employees and other valuable things in the office. And using any manpower or CCTV will not help to do that because it cannot stop that crime at the spot. But if the stranger will be stopped at the main entrance of the work area. Then it will be very effective.

But what if anybody who does not belong to the workplace cannot enter the area. Our Surveillance program will not allow any stranger to walk in the workplace. If he\she is a valuable employee of the company or office, then this program will allow access to the work area.

The marking of attendance in the logbooks is too hassle and long work. It can be difficult to maintain such registers with a large strength of people at work or organization. So, this system will detect and recognize the face of the person and if the person is available in the records or database, his/her attendance will be marked or updated in the database. It will show the full detail of the employee stored in the database. The Face Recognition process uses OpenCV technology and images of the person as the training and testing data. Maintaining attendance will be easy and hassle-free. Face recognition has set an important biometric feature, which can be easily acquirable and is non-intrusive. Face recognition based systems are relatively oblivious to various facial expression. Face recognition system consists of two categories: verification and face identification. It compares face image against the images in the system. Face Detection is getting famous these days. It will be a full contactless process. The employee just has to stand for a few seconds in front of the camera and then the system will scan the face of an individual and mark attendance. It will help to stop the unknown identity outside the office and save employees from further problems like theft or steal or any other crime.

Admin or the security guard cannot look at the cameras every time constantly. Motion Detection is used to mark out the changes in the frame or the movements in the camera image to get alerted and stop the crime

from happening. During the lunch hours or at night, there are no people present in the office or school. There are many valuable items, papers, etc. present in the office. So, to protect its 24X7 monitoring system is added to the Surveillance Program with motion detection technology.

There is one another feature of the program is that if there is any new employee in the office, the admin can add his\her details and the face images in the database, so from the next time system will recognize the person and mark its attendance on its own. The collection of face data or images is done using OpenCV and the layout is implemented using Tkinter Python. All the basic information like Name, Phone, Email, Address, and Designation will be stored in the MySQL database.

## II. PROPOSED SOLUTION

This surveillance program is basically used to increase security at the office premises or any organization. It will also detect any movement in the area where the camera has been installed. It will also mark the attendance of an employee and also show its details. The admin can add the details and collect the face data images of new employees in the company for the further recognition of a face.

This system can also be used in schools or colleges. Maintaining the attendance of students in logbooks can be difficult. There will be a vast chance of proxies. This system will help teachers or faculty to manage attendance easily, and mark only those students who are present in the school or college.

Motion Detection can be used at the places to monitor the area from the surveillance room and mark the suspicious movements in the silent areas.

There are four main modules that are:

1. Login Module
2. Monitoring Module
3. Attendance Module
4. Add New Employee

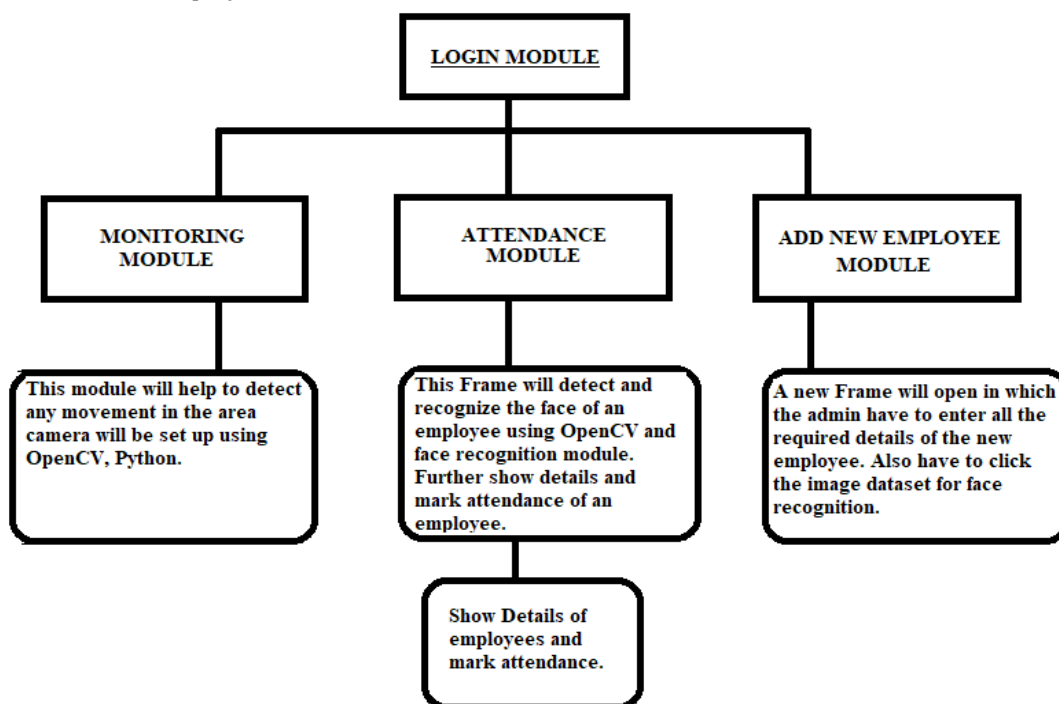


Fig.-1: Flow of the model

### Login Module

In this module, it will take the username and password as input from the admin. Then, the program will check for the record in the database and if the details matched. It will grant access to the mainframe. This module can only be used or handled by the admin only.

This Module includes one important function if somebody forgot his\her password, He\she can retrieve that by entering a phone number.

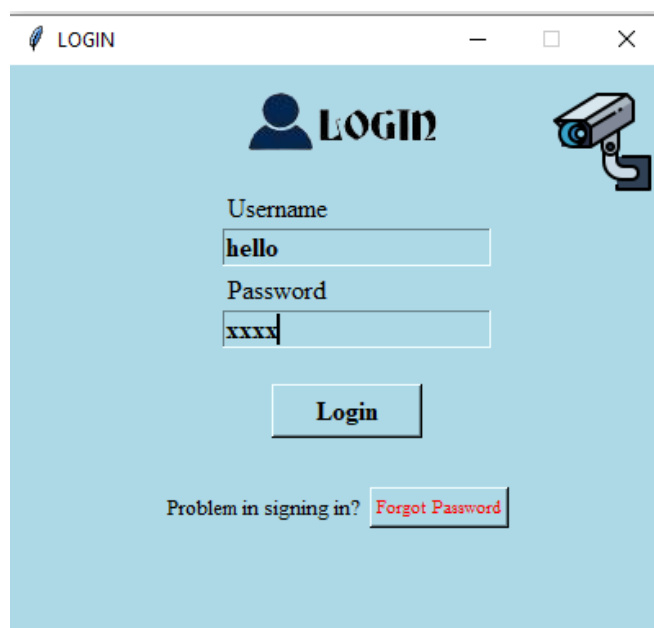


Fig.-2: Login Page

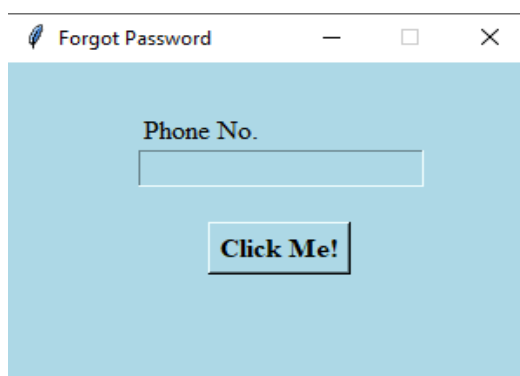
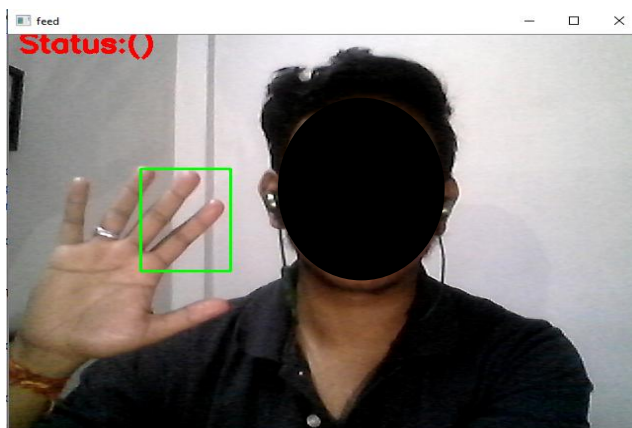


Fig.-3: Forgot Password

### Monitoring Module

In this module, the admin can monitor or watch the respective areas from the CCTV. The main function is to detect the movements or any motion in the area when there is nobody present in that area.

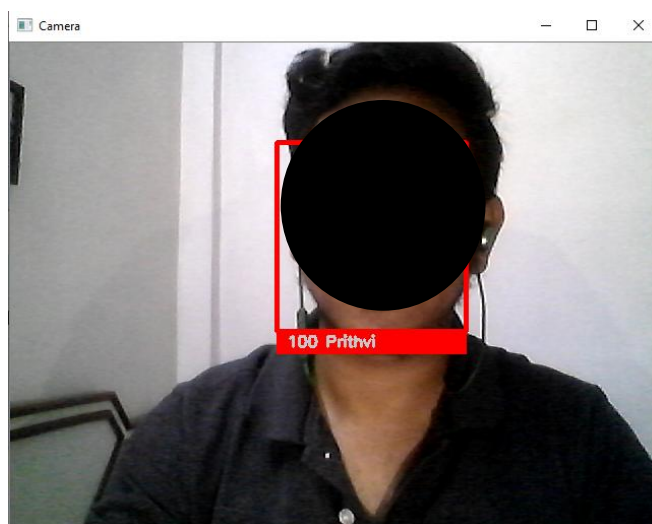
This technology is implemented using OpenCV python. Firstly, it will open the camera, and then with the help of read () function, it will read two frames. One is the current frame and the other is the previous one. Then by matching it, if any difference comes out, the program will make a rectangle surrounding that area using rectangle () function.



**Fig.-4:** Detecting Motion

**Face Recognition**

This module is the most important part of the project. Face recognition is a method of identifying or verifying the identity of an individual using their face. We will use two main modules for this project, and they are called Face Recognition and OpenCV.



**Fig.-5:** Recognizing the face

Firstly we load the data set and face recognition. Face encoding converts the face into matrix form. Then we detect the faces from external video or image and compare the face encodings to the data set we already have, if we found any match, then it will return true otherwise False.

This Module also includes the attendance system which will mark the attendance of an individual if he\she is already registered in the dataset. The face recognition system will detect the face of an individual and then with the help of their Id's, the system will mark their attendance in the database.

|   | empid | empname | Date     | Time     | On_Time_or_Late |
|---|-------|---------|----------|----------|-----------------|
| ▶ | 100   | Prithvi | 11/26/20 | 03:21:55 | on time         |
|   | 100   | Prithvi | 11/30/20 | 04:09:25 | on time         |

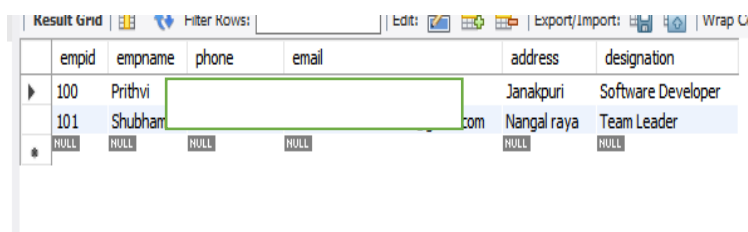
**Fig.-6:** Attendance Database

If an Individual comes before 10:30 AM, then he\she will be marked on time in the database. But if an individual will come after 10:30 AM, he\she will be marked late in the database. As you can see in the above photo, the time and date stamp of that moment will get stored in the database with the Id and name of the employee. This system can be very useful at the places like offices, schools, colleges and etc. It is easy to install system.

### Add New Employee Module

This module can be useful to enter the details of an employee and collect the dataset for face recognition. There Is the validation of every field in the form. Like if the admin enters wrong phone no or email then the program will show a warning that correct your email and phone no. If admin left any field empty, then the program will show the prompt that enter correct name or address or designation. There is another button called "Open Camera". That button is used to click 8-10 pictures of the employee and save it in a dataset.

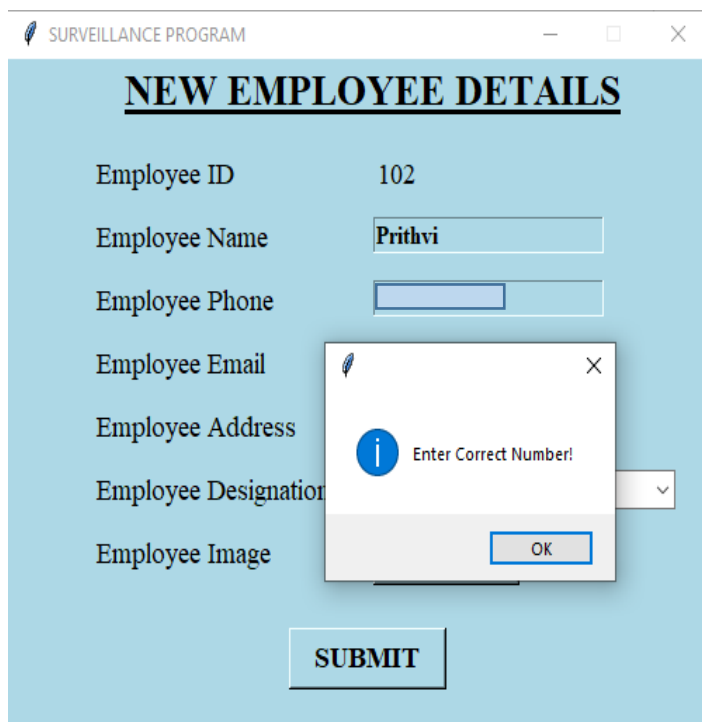
Submit button will upload all the details in the database.



| empid | empname | phone | email | address     | designation        |
|-------|---------|-------|-------|-------------|--------------------|
| 100   | Prithvi |       |       | Janakpuri   | Software Developer |
| 101   | Shubham |       | .com  | Nangal raya | Team Leader        |
| NULL  | NULL    | NULL  | NULL  | NULL        | NULL               |

Fig.-7: Database of the employee details

There are some of the screenshots of the frame for better understanding.



**NEW EMPLOYEE DETAILS**

Employee ID: 102

Employee Name: Prithvi

Employee Phone:

Employee Email:

Employee Address:

Employee Designation:

Employee Image:

**SUBMIT**

**Warning Dialog:** Enter Correct Number! (OK)

Fig.-8: Warning to enter correct number

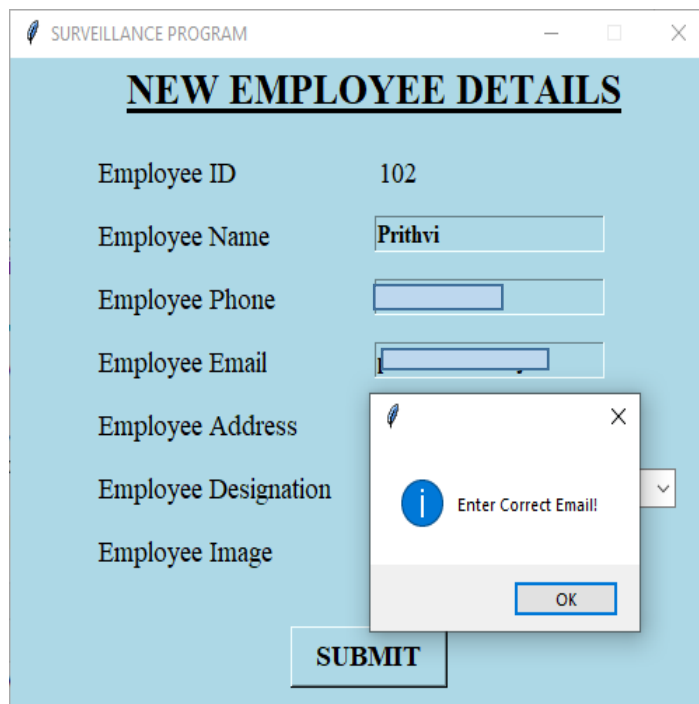


Fig.-9: Warning to enter correct email

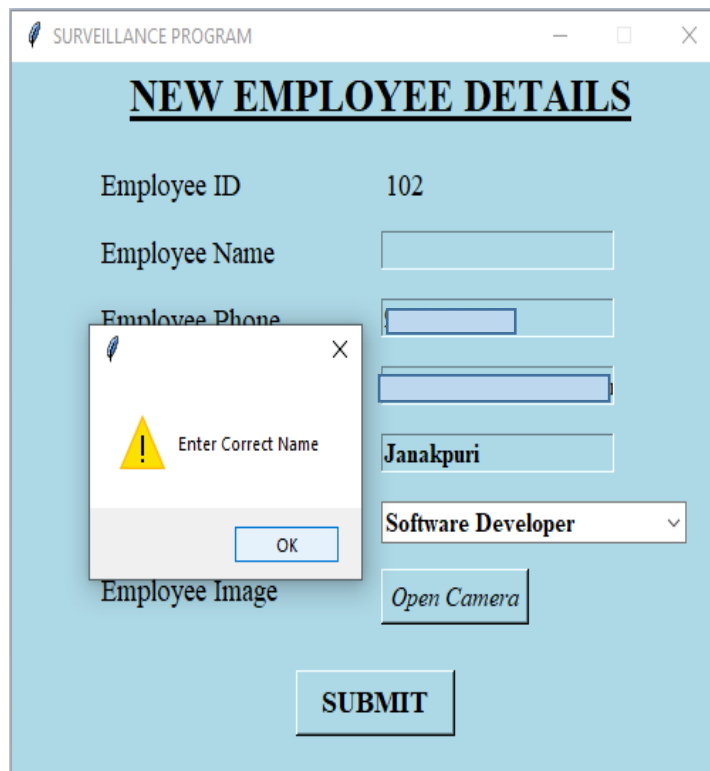


Fig.-10: Warning to fill name field

### III. HARDWARE AND SOFTWARE REQUIREMENT

The following specifications that are required for project to run on any device are mentioned below:

#### Hardware Requirements –

Processor: Intel Core i5 5th Gen

System Type: 32-bit or 64-bit OS

RAM: 4 GB

OS: Windows 7, Windows 10

#### Software Requirements –

Front-End Technologies: Tkinter (Python Module)

Backend Technologies: Python, OpenCV, SQL

### IV. RESULT AND DISCUSSION

The user can interact with the system using a GUI. The user will be mainly provided with three different options such as Add new Employee, Attendance, and Monitoring. The user is supposed to enter all the details in the Add new employee frame or otherwise the model will raise a prompt with the faulty field name. There is a button named "Open Camera" on the frame. After clicking on that button, the webcam will be started and will click 8-10 images with an interval of some milliseconds. The images will be stored in the dataset folder and the name of the image will be the id and the name of the employee. For example Name of the employee is "PRITHVI DEV" and the ID will be "100" then the name of the image will be "100 PRITHVI" followed by the number of images.

The Second Option is the Attendance Module. In this, the user will click on the Attendance module button, the webcam will be launched, and will get your face location on the frame and try to recognize the face. By clicking the "Q" key on the keyboard, a new frame will open and it will show all the details of the employee. A new Frame will include a button named "Mark your Attendance" to mark the attendance of the employee in the database.

The third and last module will be the monitoring module. After clicking on the button "Monitoring Module" the webcam will be launched and will start detecting the movements. The motion detected will be highlighted using a rectangle until the "Q" key pressed on the Keyboard.

### V. CONCLUSION

This System aims to build an effective security solution to enhance the protection of valuables. The proposed system will be able to mark the attendance via face ID, will be able to detect movements while monitoring the area, and will be able to add the details of the new employee or the person. There is a major role of the webcam as the recognition or face and motion detection will be done via webcam. The attendance will be working in a way that initially the model will detect your face and then try to recognize it. If the face exists in the database the attendance will be marked in the system.

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