



# Security Systems using Image Processing

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**Abstract:** This project describes a security camera which can be used in any organisation or at home. It is very suitable for remote monitoring of confidential area. The idea behind developing this system is that there are many security systems which contain CCTV with much functionality which continuously capture the video and leads to wastage of memory. We are going to develop this system because the previous security systems only capture video which will be used as evidence after the attack is done but the system which we are going to introduce will not only capture the video but also take appropriate action to prevent the attack. So basically the system keeps a track /log of all the activities. i.e. it detects motion of all objects and other purpose of the security system is that we can store the images of authorised users in the database and the moment the camera will detect any unknown user whose details aren't stored in the database, it will buzz out a sound to alert the authorities and if known user is spotted it will let us know with its name in replica of how the name is been made known to the database.

**Keywords:** remote monitoring, authorised

## I. INTRODUCTION

Nowadays, the evolution of technology-based systems has drastically increased over the past few years. As the technology grows, it is no surprise that most of the work that was done by humans will be taken over by machines. Although many people believe that this will make everyone to be lazy, it is an undeniable fact that this is for the betterment of humankind. Consequently, they have to confront this technology every day, which undoubtedly affects their lifestyle from the way they live until the way they work or relax. The convenience that technology provides them is the most common reason for their willingness to get it to affect their daily lifestyle to such extent. Building management is one particular area where the technology is slowly taking over the responsibilities, which belong to a human. Many corporate buildings have an integrated automation system, which controls their power management, ventilation, security and other operations, often with less or no involvement of human. Here in our domain we focus on security systems which will help humans overcome the problem of security even when away from home or in various organisations. Computer Vision (CV) is a term used in AI industry in the field of understanding images by a machine. In other words, a machine is able to detect and recognise a specified image pattern or even is able to create one. From autonomous cars, security systems through text recognition CV is used widely.

## II. RESEARCH METHODOLOGY

### 2.1 Surveying Existing System

Subsequent to experiencing a portion of the project with respect to usage of Security system, it was found that this idea is searched a lot among students and is a mainstream idea which is still in advance. Current system includes the motion detection and face detection using the OpenCV module. There also exists a database with the details of known users of any particular organization for which the system has to be used.

### 2.2 Main body

This project discusses about handling the security of a particular zone by alarming the authorities on detection of any unknown person. The admin of the system handles the database in which the details of authentic users is stored. Project can also be used to detect the exact motion of humans in the frame of the camera.

### 2.3 Objective

The objective of the project is to design a security system which will help its users to keep a track of motion of humans and to let them know of the activities performed by various individuals in the domain under the camera. It also focuses in restricting the allowance of unknown users in a particular area.

**III. IMPLEMENTATION**

Computer Vision (CV) is a term used in AI industry in the field of understanding images by a machine. The use of CV in our project is for face and motion detection. Our security system performs two functions, they are as follows:

1. Trace movement.

1.1 Description:

It will trace the movement of the human in frames and let us know of the exact movements of the human.

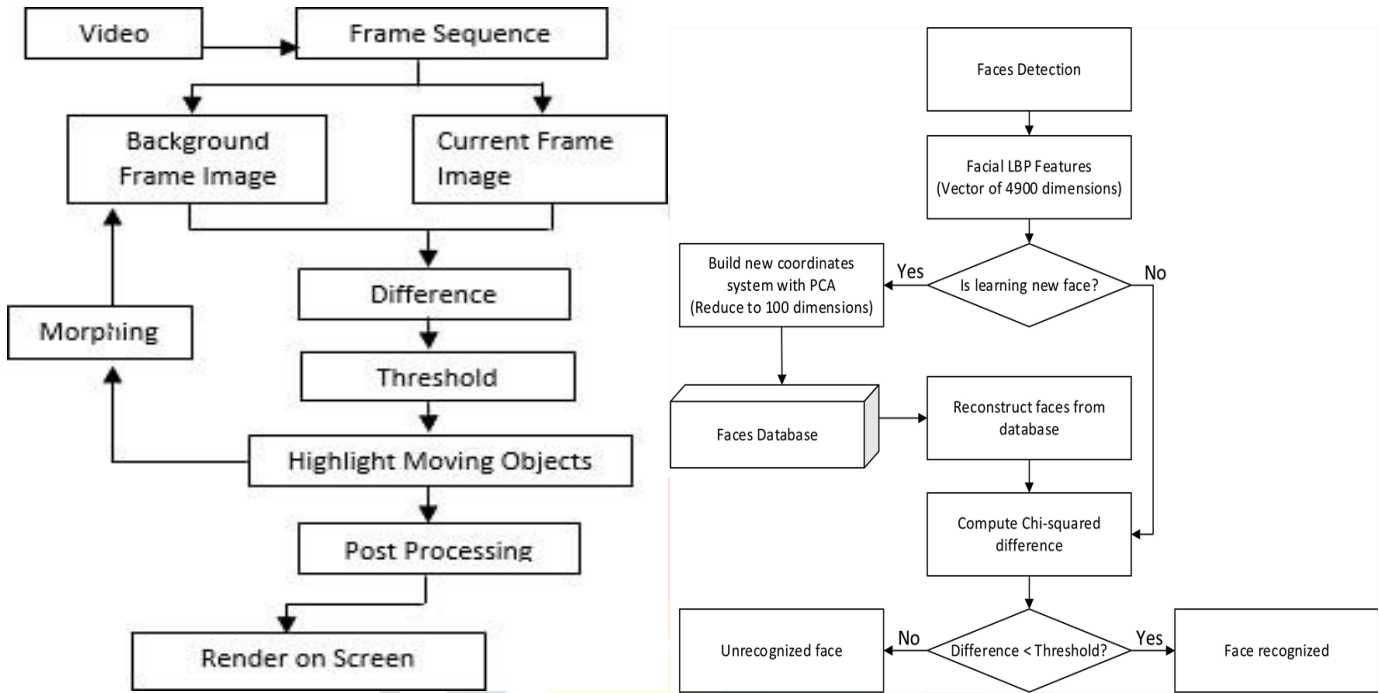
1.2 Uses: Can be used to trace the actions of humans in a particular surrounding

Example: To keep a track of actions of employees in an organisation, to keep a check on home when away from it.

2. Prevent unknown person from entering any area

2.1 Description:

This type of security camera will prevent the entrance of an unknown person in a particular surrounding. The faces of known people of the surrounding area will be stored in the database, and if the camera detects an unknown person it will be buzzard.



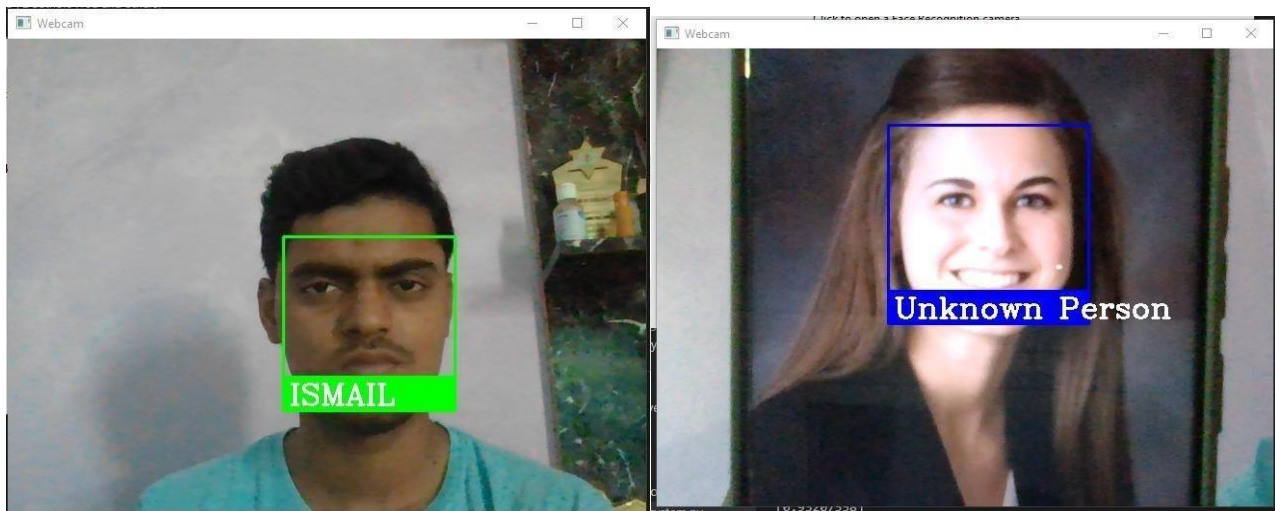
## 2.2 Uses:

Can be used to keep privacy within an area by preventing unknown users' entrance. Example: To keep a track of actions of employees in an organization, to keep a check on home when away from it.

## IV. RESULTS AND DISCUSSION

### 4.1 Result:

Thus we have studied the above research paper and also gone through many articles about projects on Security Systems. From the above study and the Literature review we have come across many terminologies of Security systems and various modules used in it like tkinter and OpenCV. We have done complete study of detecting motion, detecting authentic authorities through python using opencv module. We have created our interface using tkinter module and then connecting it with various Python files related to security system.



### 4.2 Future Scope:

Many organizations can use our security system to detect motions of some employees of whom the organization wants to keep a track of and also using the facial images that the owner provides, the system will be able to recognize those faces and it can differentiate between familiar faces and unfamiliar faces. During a burglary, the system easily recognizes the burglar because of his unfamiliar face and automatically triggers the alarm. In confidential areas like military, this camera can be used for allowance of only authentic people in the premises and to alert the military on detection of any unknown person trying to enter the premises. Camera can be installed at home also to keep a track on activities when away from it.

### 4.3 Uses:

Electronic security relates to leveraging innovation in defensive holding by anticipating unapproved access to individuals and property. The electronic security systems are broadly utilized within corporate workplaces, commercial places, shopping centers and etc. These systems are also used in railway stations, public places and etc. The systems have profoundly welcomed since it might be worked from a remote zone. And these systems are also utilized as access control systems, fire recognition, and avoidance systems, and attendance record systems. As we know that the crime rates are increasing day by day so most people are usually not feeling comfortable until they provide a sure for their security either it may be at the office or home. So we should choose a better electronic system for securing purposes.

## II. CONCLUSION

In this work, a security system with OpenCV implementation has been successfully developed. The system composed of software implementations to form an effective motion detection and face detection mechanism. This OpenCV motion detection system was shown to be more effective than the PIR motion detection system, with a passing rate average of 100% against 76% based on the three experiments conducted. Moreover, a variety of enhancements could be made to this system to achieve greater accuracy in sensing, detection, and alert notification, such as:

i. Integrate with Global System for Mobile communications (GSM) technology for Short Message Service (SMS) based alert. Notification through email is will definitely receive a slow response/feedback from user or respective person especially during a dangerous situation. Using the GSM-based technology, user or respective person can send/receive response even faster which can be very effective to handle dangerous situations.

ii. Integrate Deep Learning algorithm to the system. The facial characteristics of a person will differ from time to time. Thus, it will be troublesome for the user to keep updating the latest facial images of the familiar faces. Using Deep Learning algorithm, a collection of data from the owner's smartphone such as captured images and videos is used to train the system automatically to recognize familiar faces. This will further improve the rate of detection and accuracy of the system to make it more robust.

**VI. REFERENCES**

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