**CHAPTER I**

**INTRODUCTION**

**1.1 General Background**

The demands on video surveillance systems are rapidly increasing in the present day. In the past, security systems had to be monitored by a guard who was locked away in a room all day watching the monitors to make sure that nothing would happen. The other option was to come back and review the footage but damage could have happened. Therefore, researchers and scientists had to come up with ways of overcoming that and thus improving security at large.

Commercial spaces, universities, hospitals, casinos and warehouses require video capturing systems that have the ability to alert and record beside live video streaming of the intruder. The advancements in video surveillance technology have made it possible to view your remote security camera from any internet-enabled PC or smartphone from anywhere in the word. This encompasses the use of CCTV (DVRs) systems and IP cameras. This technology is awesome but its cost of implementation has proven to be an impediment especially for a small home application.

This new arising technology related to security provides a comfortable and safe environment for small homes. The various objectives of the system are to detect an intruder, take an image of the intruder and also convey an alert message to the facility owner.

The system to be designed cannot wholly replace the role of CCTV and IP surveillance cameras especially in large commercial set ups but will make it easy for low income home owners to monitor their homes at a very affordable price. In addition to the fact that the one can use their personal computers, the camera to be used in this case is relatively cheap compared to the others. The whole security system circuitry is simple and easy to implement.

Image processing is a term which indicates the processing on image or video frame which is taken as an input and the result set of processing is may be a set of related parameters of an image. The purpose of image processing is visualization which is to observe the objects that are not visible. Analysis of human motion is one of the most recent and popular research topics in digital image processing. In which the movement of human is the important part of human detection and motion analysis, the aim is to detect the motions of human from the background image in a video sequence. The process of object tracking is segmenting a region of interest from a video frames and keeping track of its motion and position.

**1.2 Problem Statement**

The need to develop a cost effective surveillance system through innovative technology immensely influenced the development of this project. This project will design and implement a security system on the owner`s computer. The system should be able to detect the face by activating a camera to take frames of video and then send an alert to the facility dedicated through voice output to the owner.This provokes the recognition of the person in front by face recognition and public monitoring along with the retrieval of unique ID provided by the time of training and background verification of the suspect status of that particular person then alerting that dedicated person through speech/audio by the speakers.

The cost of installation of any security system depends on several factors. First, the type of camera being used is of great consideration. A typical digital camera e.g. CCTV and IP camera with an LCD costs about US $ 45 (different brands can differ on prices) while using the PC together with its camera module is estimated at less than others, maybe it won’t cost if one possess PC and a webcam of its own.

Another aspect of this project is to present an idea of monitoring and tracking of an intruder through the use of a camera. Any object passing through the field of view of camera will be detected.

**1.3 Overall Objective**

The main aim of this project is to design and develop a security system that includes features such as Image processing (Face detection) and Speech processing (Information about the individuals) and speech recognition to inform facilitate about the pre-authorized persons. The system is to be based on audio inputs and outputs which are the information and commands . The software part of the system is instructed in Python language with the help of Open CV library and Speech Recognition library and Gtts library.

The specific objectives are:

* To study how a normal Personal computer can be programmed so as to be able to give the information about the authorized person
* To develop and build a prototype of the surveillance system using Face detection algorithms.

**1.4 Scope of the project**

This project is focused on developing a surveillance system that detects faces of human and to respond speedily by capturing an image and relaying it to an administrator device through the internet platform. The system will require personal computer or laptop, camera along with Internet connection. It will come up with an implementation of a surveillance system which presents the idea of monitoring the public with their Unique ID or name retrieval.

It will therefore use these systems together with a suitable program script to accomplish a real time surveillance system as desired. This will reduce the man power required for the surveillance.

**1.5 Justification**

The security system to be designed in this project can be used extensively to monitor facilities in home. We shall be able to monitor the public with the help of Unique ID. It will not replace the use of CCTV and camera surveillance systems but reduce the cost of implementation of a basic security system. This thus will enable 24 X 7 monitoring in home.