

# Smart Intruder Detection System

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**Abstract-** Using Internet of Things, Image processing and Mobile Computing, our project proposes security system. Over the past decade, the use of the smart intrusion technology along with the concerning security has been increased due to a variety of crimes and intrusion. Thus, in this system, we are concentrating on providing immediate notification to the users about the intruders along with the Image Processing techniques for intruder detection. Face detection and recognition using a Dot Projector will also be done in this project. For detection of an intruder, an Infrared Camera is used with dual channels to ensure image detection even in the dreary surroundings. In one channel, the image captured will be crosschecked with the database. Further, it will be preserved in the database if the interloper is new and if the user wants to and send it along with the notification which is its primary work and the other channel will provide live streaming. Median Filter will be applied to remove noise from the image and KL Transform Algorithm will be applied for compression of the image produced due to an infrared camera. An android application is deployed for user for Camera configuring and being notified remotely. This project also looks forward to providing intrusion detection for other kinds of objects. Therefore, this arrangement helps in raising protection and refuge.

**Keywords-** Camera, channel

## I. INTRODUCTION

The Earth is passing through a purplish patch of technology, where there is increasing demand of machinery and intelligence behind it. Every day there is been at least one new invention from people round the globe. This is making people easier to live life due to which there is been increasing demand of engineering science. In this 21st Century humans are surrounded with technology as they are the constituent of our day to day life cycle. With this we are always focusing on the safety and security for ourselves and our earned valuables respectively.

For own safety people have been spending money because that is the first thing. Then as for our valuables which we retain in our places, always want it to be secure. For this there are security systems implemented like CCTV camera for

surveillance which has continuous streaming for which you need to maintain an additional person for video surveillance as it is performed in opulent societies. This takes our unwanted time by continuously keeping watch along the sieve.

## MOTIVATION

A lot of times, we come to know about the incident after it has taken place. One of the recent incidents is that in spite of a CCTV being present in the society premises, one of the houses in my society was robbed by the thieves when the family was away and they came to know about the incident after returning home from the vacations.

Due to the various loopholes in the previous systems like unauthorized access and not getting notified instantly, we are motivated to develop this system through which we can come to know what is happening in and around the premises and would notify me via mail, SMS or notification as soon as the system detects any unwanted activity.

## PROBLEM DEFINITION

We take measures to prevent & protect our home and other important places from any incident like theft, fire, etc. While we are away for some reasons we expect that our house and belongings are safe. Most of the times we come to know about the incident after the damage has been done. We need to find a way to take care of what is happening around our property.

By providing the required system placed in their property and an application at user's fingertips which will make it easier for the users to manage and take care of their belongings.

## II. LITERATURE SURVEY

[2]. Security and surveillance to home internet based monitoring system. In this work, the proposed system is designed Linux OS via ARM-11architecture based RaspberryPi-3board.

The Raspberry Pi-3board via driving circuit (L293D) interfaced with motor to control the door at the same time as the camera is connected to the USB of Raspberry Pi- 3board.

[3]Nowadays people using technology to computerize in their tasks and to take into service for monitoring the CCTV or the IP camera for feed the intruders. The computerization put into operation here as healthy. A Cameras are present in particular place are greatly rampant, any person has to monitor and recorded the video.

The close watch practices that are becoming more common these days and estimated gratitude system is well-organized the same as healthy. The faces recognize automate the task of alert system via through the user mail, and the mobile declaration .There is no human in tervention is mandatory to alert the police. A raspberry module is projected the system uses, and a module of camera that fits in the CSI (camera serial interface) of the raspberry pi chip.

[5]The automated home Surveillance based System with Pyro electric Infrared Sensor Using GSM. The important security system in people life today’s as it protects the home from murders and theft, burglary, and has become routine in bigcities.

It is used in many places like bank locker room, store house, ATM, industrial or offices etc. By use of smart sensors based home security system designed like pyro electric infrared sensor (PIR), ultrasonic sensor to detect an intruder in home.

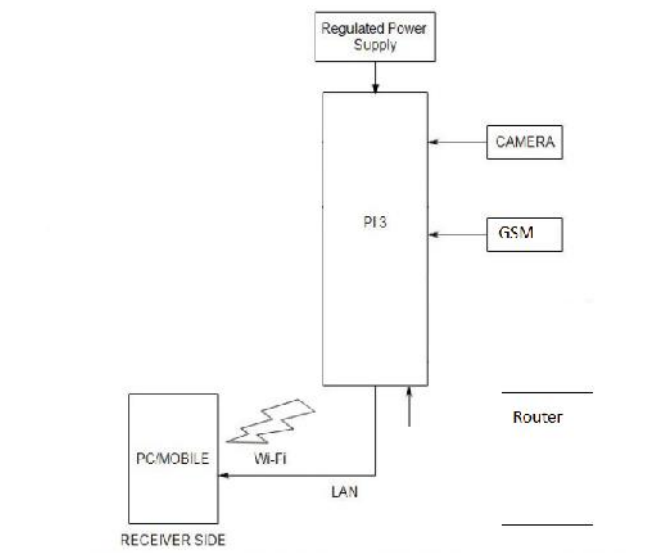
To detect movement of objects by using the PIR function and ultrasonic sensor is to detect changes in temperature of human in infra red radiation. These sensors are built in the order of microcontroller.

There is any unauthorized person detects the intrude is present, and the system is automatically sound a buzzer and sends SMS [5].After this, image by web camera capture and MCU (microcontroller unit) sends sensor signal to system.

**III. PROJECT DESCRIPTION**

Object detection is a process of finding specific object from grabbed frame/ camera such as moving and non moving objects. In today's society, having the ability to detect potential terrorism agents is crucial to safe and effective emergency response. Terrorists or persons intending to wreak havoc have many potential weapons in their arsenals.

Fortunately, as the war against terrorism has heated up there have been a number of advances in the field of terrorist object detection. Increasingly sophisticated and effective equipment is becoming available. As part of their training, emergency responders need to learn how to select and operate a variety of these detection devices. Using the proper detection devices, combined with accurate risk assessment, emergency responders no longer need to be making guesses, and can make informed decisions about personal protective equipment, rescue operations decontamination, and incident severity As complicated and scientific as these devices are, they are not able to interpret th Results. It is still up to a human to make decisions.Hence there arises the need for design of a system which not only detects any suspicious object but also help tracking of person possessing it without any need of any human intervention. The final detected object can not only be displayed but also stored for future reference.



**DESCRIPTION:**

**HDMI CABLE:**

HDMI stands for High Definition Multimedia Interface. It is used fortransmitting uncompressed data from a source device like a display controller. It isused for interfacing audio and video data to a compatible monitor or videoprojector.

**RASPBERRY PI 3:**

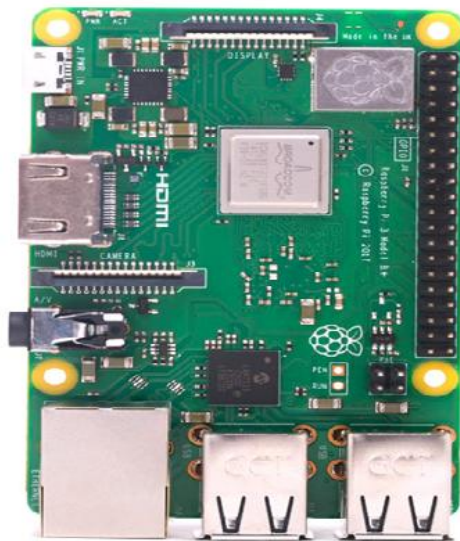
Raspberry PI 3 board is the main chip used, that has 1GHz single core CPUWith 1GB RAM. It has a mini HDMI port and micro USB OTG port. It iscompatible for interfacing camera.

**OPEN CV:**

OPEN CV stands for Open Source Computer Vision. It consists of many library programming functions that mainly focus on real time applications. Programming languages like Python are supported in this software.

**CAMERA:**

Here we use a 25 megapixel camera that focuses on plants for clear image. It is interfaced with the Raspberry PI zero board.

**RASPBERRY PI 3B**

- CPU: Quad-core 64-bit ARM Cortex A53 clocked at 1.2 GHz
- GPU: 400MHz VideoCore IV multimedia
- Memory: 1GB LPDDR2-900 SDRAM (i.e. 900MHz) USB ports: 4
- Video outputs: HDMI, composite video (PAL and NTSC) via 3.5 mm jack
- Network: 10/100Mbps Ethernet and 802.11n Wireless LAN
- Peripherals: 17 GPIO plus specific functions, and HAT ID bus Bluetooth: 4.1
- Power source: 5 V via MicroUSB or GPIO header
- Size: 85.60mm × 56.5mm
- Weight: 45g (1.6 oz)

**IV. SPECIFICATION****4.1 ADVANTAGES**

- It is relatively simple to understand
- It is a sequential model. Each phase is followed by the next in sequential order. In any phase, if you want to return back some earlier phase then you would have to go through the entire process again sequentially.
- It needs very few resources
- There is no scope of phase overlap here as you cannot proceed to the next phase the earlier phase.
- Detect intruder immediately
- Battery backup will run the system in case of power loss
- GSM and Wi-Fi module for notification will be alternatives
- Image processing will make sure the images sent are clear
- Infrared cameras will capture images even at dreary situations

**4.2 DISADVANTAGES**

- It is not very flexible
- It takes a lot more time
- No backtracking is allowed
- Revision is prohibited
- It is difficult to estimate time and cost
- Application
- The waterfall model is best suited for a less uncertain situation wherein you would need to plan out everything well in advance, for example, constructing a building

In case the camera gets blocked or covered by any means, it will not be able to capture images.

**V. CONCLUSIONS AND FUTURE SCOPE**

Our system would instantly notify the user about the in-house scenario along with the live streaming. The system incorporates security using IOT. The security module successfully sends notifications upon detecting intruder using wireless and wired techniques where owner further can take necessary actions thus enhance convenience and comfort, save energy efficiently and enjoy completely security.

**FUTURE WORK**

As an extension to our project, we propose a generic IoT framework and use cloud computing infrastructure for connecting and managing remote devices. In addition, we also plan to productize proposed home automation solution so that a greater number of people can use IoT in a smart environment.

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