

# **“Surveillance SPY ROBOT”**

## **PROJECT REPORT**

**SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE  
AWARD OF DIPLOMA  
IN  
COMPUTER TECHNOLOGY/ENGINEERING**

### **SUBMITTED BY**

**Ahirrao Pankaj Dnyaneshwar-01                  Bhandari Vardhaman Sunil-04**  
**Bhor Aniket Vijay-05                  Godalkar Vishal Santosh-19**  
**Barmecha Jai -23**

**GUIDE  
MR. N.B. Nake**



**DEPARTMENT OF COMPUTER ENGINEERING/TECHNOLOGY  
GOVERNMENT POLYTECHNIC, AHMEDNAGAR**

**(2022-23)**

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## **CERTIFICATE**

This is to certify that

<b>Ahirrao Pankaj Dnyaneshwar-01</b>	<b>335201</b>
<b>Bhandari Vardhaman Sunil-04</b>	<b>335204</b>
<b>Bhor Aniket Vijay-05</b>	<b>335205</b>
<b>Godalkar Vishal Santosh-19</b>	<b>335219</b>
<b>Barmecha Jai -23</b>	<b>335223</b>

of final year Computer Engineering/Technology students have submitted their project report on

### **“Surveillance SPY ROBOT”**

during academic session 2022- 2023 as a part of project work described by Government Polytechnic, Ahmednagar for partial fulfillment for the Diploma in Computer Engineering in the fifth semester.

The project work is the record of students own work under my guidance and to my satisfaction.

(Mr. N. B. Nake )

**Guide**

(Mr. S. D. Muley)

**Head**

(Department of Computer Engineering  
/Technology)

(Mr.B.M.Kardile)

**Principal**

**Government Polytechnic, Ahmednagar**

## **ACKNOWLEDGEMENT**

I would like to place on record my deep sense of gratitude to **Prof. N. B. Nake , Dept. of Computer Engineering** for his generous guidance, help and useful suggestions.

I express my sincere gratitude to **Prof. S. D. Muley, Head of Dept. of Computer Engineering/Technology**, for his stimulating guidance, continuous encouragement and supervision throughout the course of present work.

I am extremely thankful to **Prof. B. M. Kardile, Principal, Government Polytechnic, Ahmednagar** for providing me infrastructural facilities to work in, without which this work would not have been possible.

(Students Name and Signature)

Ahirrao Pankaj Dnyaneshwar

Bhandari Vardhaman Sunil

Bhor Aniket Vijay

Godalkar Vishal Santosh

Barmeche Jai

## **ABSTRACT**

A robot is an integration of mechanics, electronics and software. Robot is a kind of machine that performs very complex & multiple tasks by the instructions that is stored on a programmable device automatically or by giving instructions externally. It needs an interfacing device such as Bluetooth, Wi-Fi, ZigBee etc. SPY robot is all about developing a wireless surveillance robotic vehicle which can navigate through obstacles with the help of sensors, embedded system and its programming.

It will be able to capture the footage or pictures of area with its camera eye and send them back using wireless transmission technology such as Bluetooth. Spy robot can be controlled with the help an app of Android phones. Rasberry-Pi based microcontroller is used for instruction processing and giving proper instructions. Bluetooth technology is used to interface between Rasberry-Pi and Android.

**Keywords – Surveillance, Raspberry-Pi.Microcontroller, SPY Robot, Wireless Camera, Bluetooth, IOT.**

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# CHAPTER 1

## INTRODUCTION

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### 1.1 Overview:

The main goal of this project development for mobile operated spy robot using Raspberry-pi microcontroller. In this spy robot, the camera was used to operate the vehicle, which acquires and sends video to mobile. The movement of vehicles is controlled by a microcontroller and camera. Our idea is to make a robot to tackle the hostage situation & the worst conditions which cannot be handled by a human being. The hostage humans are moved out from direct exposure to potentially dangerous situations. The robotic system can perform many security and surveillance functions more effectively than humans.

### 1.2 Need for system:

The spying robot as its name suggests is the one used for the purpose of spying on enemy territories. Its need can be At the time of war where it can be used to collect information from the enemy terrain and monitor that information at a far secure area, and safely devise a plan for the counter-attack. Time-saving

- Intelligence
- Sense Perception
- Scalability
- Increased productivity
- Constant availability and flexibility
- Sustainability
- Survival Rate Is High In Any Hazardous Situation.

### 1.3 The main objective of the Study :

1. To design a robot for military application with live video streaming.
2. To achieve the surveillance of human activities using spy robot.
3. The ability to move in complex environments
4. Detecting and reporting anomalies in the environment

#### **1.4 Summary:**

It can be summary for Chapter 1:

We have many kinds of Spy Robot in our Surrounding like GLADIATOR,ATLAS. For this project we choose Raspberry-pi Based Spy Robot. Our Spy Robot is Efficient and Easy to Handle. It Increases the Productivity by keeping an eye on the enemy territory.

## CHAPTER 2

### LITERATURE SURVEY

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#### 2.1 Overview of existing systems:

We are familiar with many existing SPY Robot like ATLAS, GLADIATOR. The spy robot is basically of spherical type and its movement achieved using the concept of pendulum rotation, Raspberry-pi and Bluetooth technology. The robot uses two motors: servo motor and DC motor for rotation. The wireless camera system used gives the audio and video information to the remote station. As these SPY Robot are using Artificial Intelligence hence the result that they are providing are highly accurate and efficient. These SPY Robot can help to reduce human effort . By keeping an eye on enemy and saving the peoples life from the dangerous or forbidden places.

#### 2.2 Limitations of existing systems:

There are several challenges in the existing systems. They are listed in the following:

- i. Time consuming for Live Streaming.
- ii. Costly.
- iii. Lack of Security of data.
- iv. Range of the Robot.
- v. Not Flexible with all the smart Phones Only a particular smart phone whose Ear Piece Is attached can only be used.

### **2.3 Problem Identification:-**

There are many projects which are similar to this or related in some way. The design, functions and capabilities of the robot is inspired from these works. Spy robots already do exist commercially that are used extensively in military operations, which are very expensive. Hence we are decide to make a SPY Robot in low cost with efficient and powerful.

### **2.4 Requirement Specification:**

#### **A) Functional Requirements-**

The main function of Spy robot is to roam around high sensitive region and provide video information from the required environment to the remote monitoring station. In this project, one can control the robot using Bluetooth reducing human effort. The user can continuously monitor the surrounding activities of robot location with live video streaming using wireless camera from the robot. This robot is modeled with Raspberry Pi microcontroller which control the robot behavior. The proposed spy robot is used to find smugglers infiltration, Detecting Obstacles, Survive in hazardous environment, Travel in Forbidden Places ,etc.

#### **B) Non Functional Requirements-**

Non-Functional Requirements are the characteristics or attributes of the system that are necessary for the smooth operation of the system. Those requirements are listed below.

- The system should perform the process accurately and precisely to avoid problems.
- The system should be easy to modify for any updates. Any errors or bugs that are identified should be easy to mend.
- The system should be secure and maintain the privacy.
- The system should be easy to understand and use.
- Execution of the operation should be fast.

**SPY Robot provide a wide variety of services. These include:**

Tracking locations of terrorist organizations and then plan an attack at a suitable time.

- At the time of war where it can be used to collect information from the enemy terrain and monitor that information at a far secure area, and safely devise a plan for the counter-attack.
- Making surveillance of any disaster-affected area where human beings can't go.
- Provide live streaming

## **2.5 Summary:**

Summary of Chapter 2 :

As per our SPY Robot, we can retrieve the images and live video which is Live Streamed by the robot on a smart phone. SPY Robot assists the military and emergency situations. We can detect the obstacles in the way of SPY Robot and can search for the enemies. Making surveillance of any disaster-affected area where human beings can't go. It can survive in any dangerous situation that can occur anytime.

## CHAPTER 3

# PROPOSED DETAILED METHODOLOGY

### 3.1 Problem Statement:

There are various types of situation where a person cannot go to check or help or to take a specific action. At those points if we can use the robots then we can solve any problems or save lives. For this we have to design a system in which we can receive signals and give it to controller by decoding it so that controller can drive the robot and there must be a transmitter (mobile phone) which can send the commands to the robot. So we are designing a system in which we can send commands wirelessly by using mobile phone and that will be received by the robot system and as per the commands robot will be driven.

### 3.2 Architectural Design Specification:

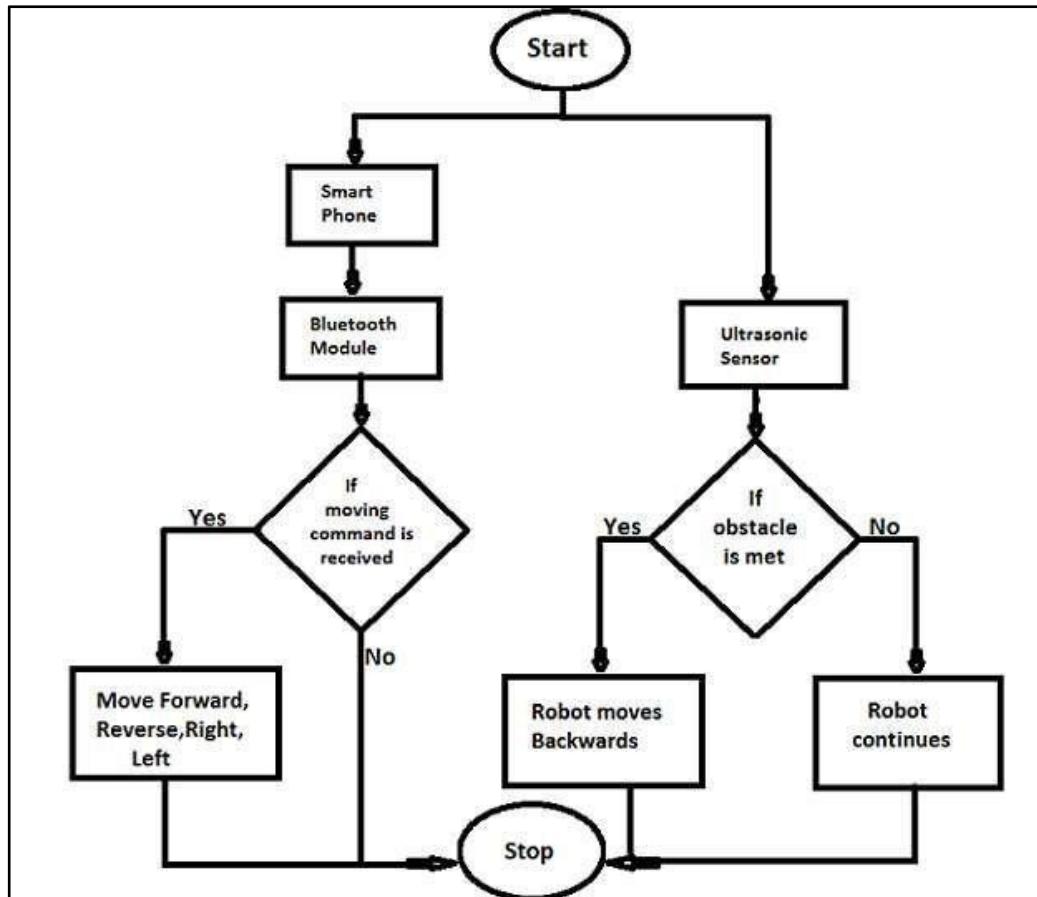


Figure 3.1 Architectural Design Specification of project

### 3.3 Life Cycle Model:

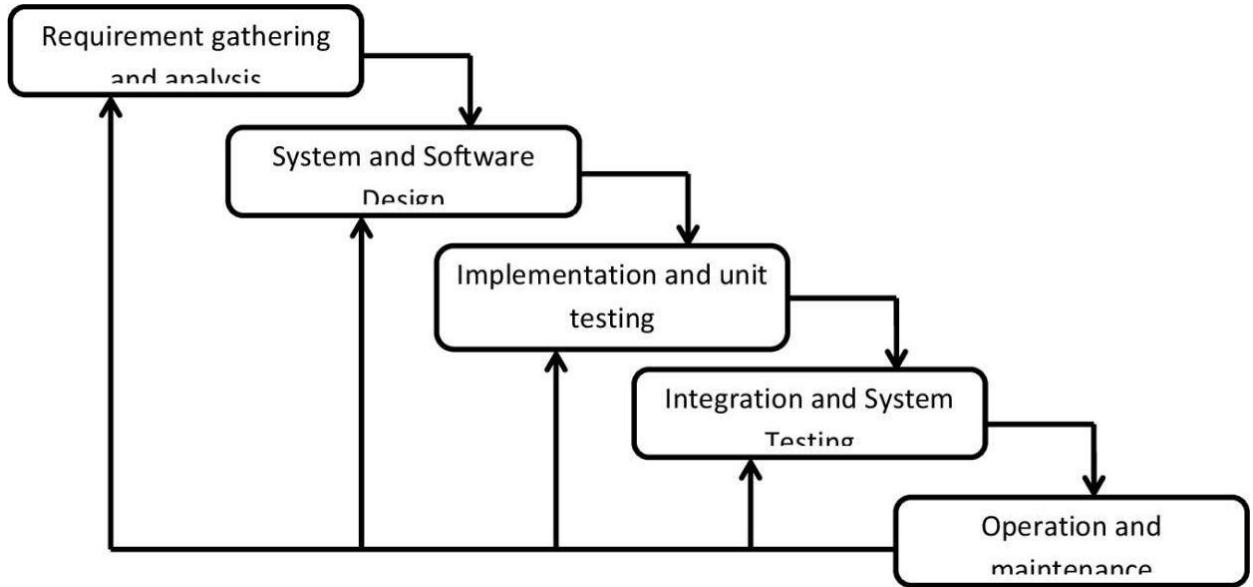


Figure 3.1: Life Cycle Model of the project.

### USE CASE DIAGRAM:

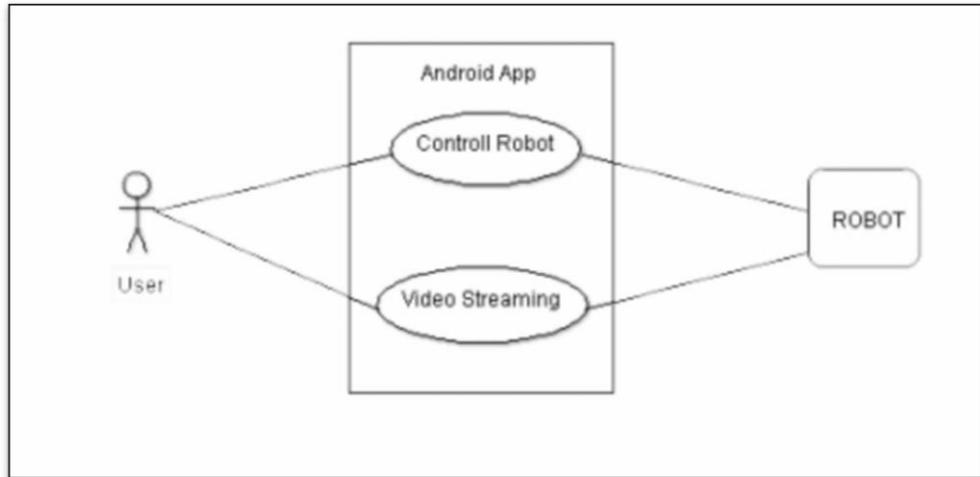
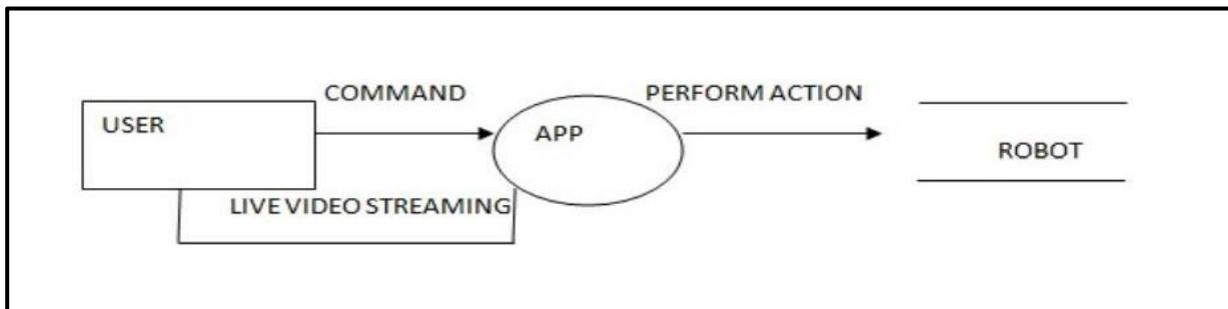


Figure 3.2: Use case diagram of the project.

In this Project user can see live streaming on his android phone and also control spy robot by phone. He can have access of changing the direction of spy robot.

## DATA FLOW DIAGRAM-

### DFD Level 1 :-



### DFD Level 2 :-

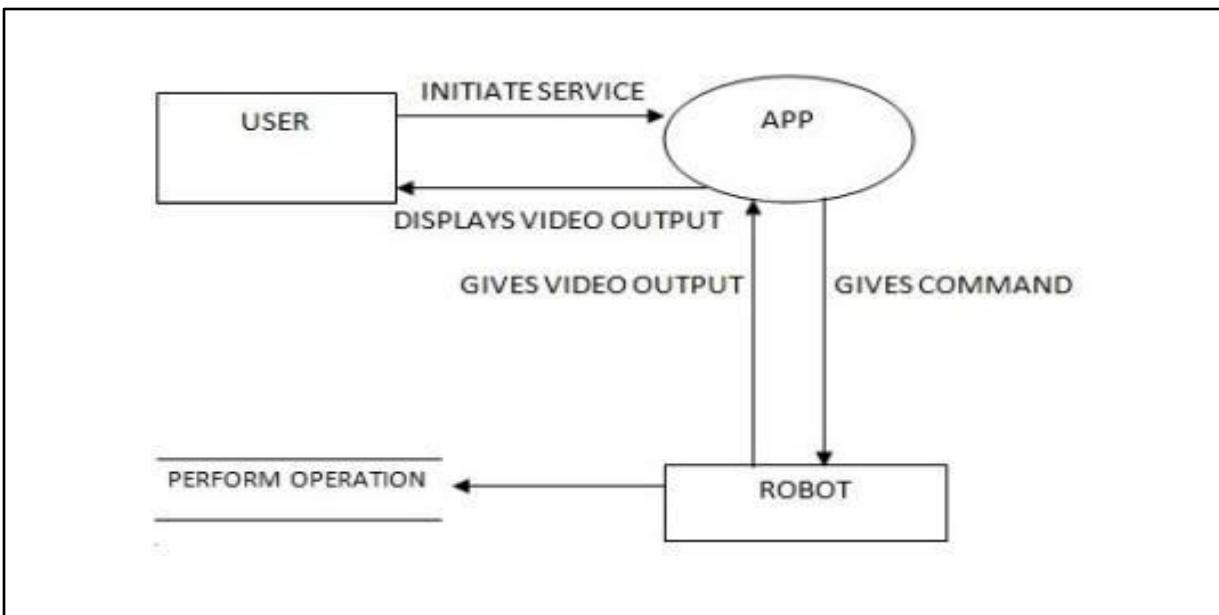


Figure 3.3: Data Flow Diagram of the Project.

## COMPONENT DIAGRAM-

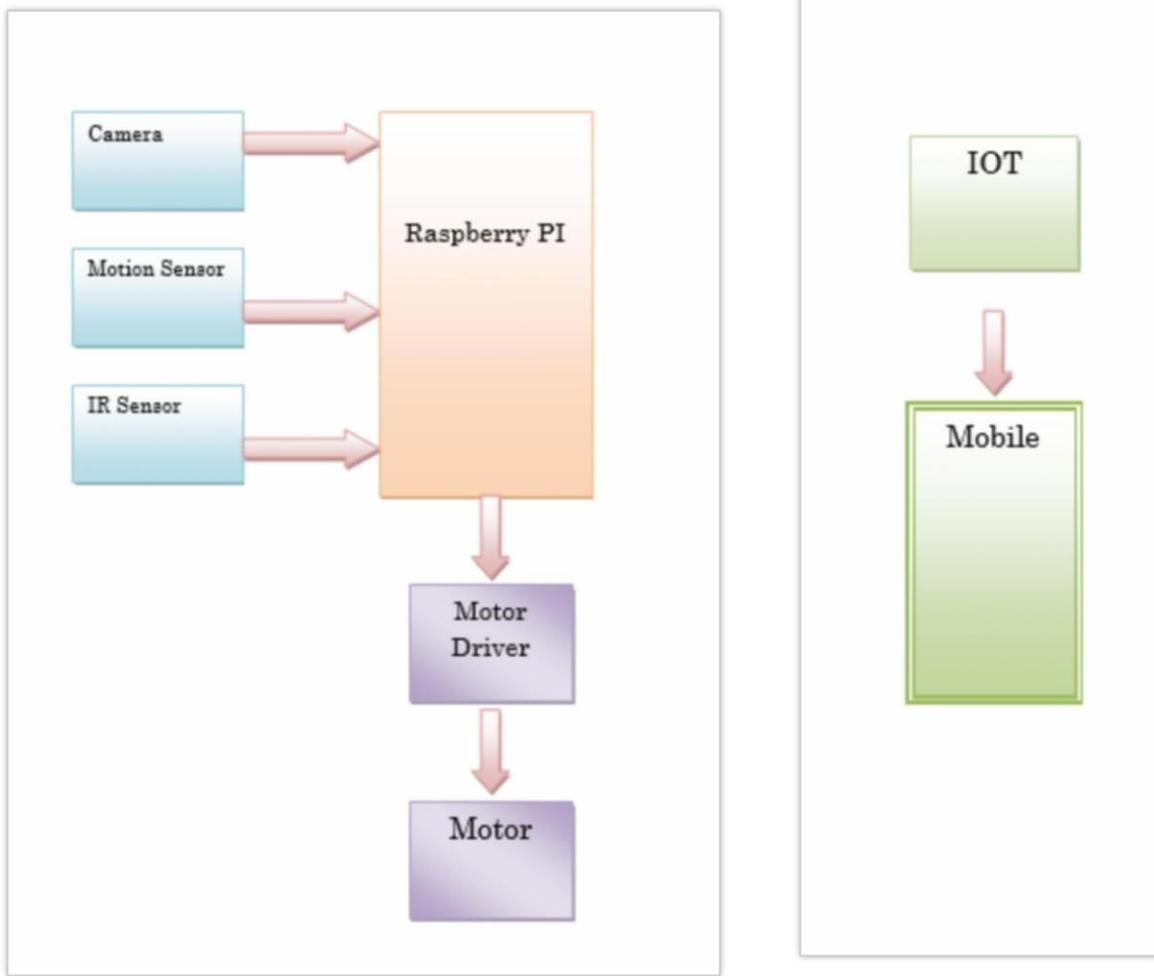


Figure 3.4: Component Diagram of the project.

The main component here is the Raspberry-pi. It provides the control over the SPY Robot movement.

### **3.4 Programming languages & Development tools:**

For implementing this project, we will you following programming/scripting languages and development tools:

#### 1.4.1 Programming languages:

1. Python
2. C

#### 1.4.2 Development tools

1. VS code
2. Pycharm

### **3.5 Action Plan:**

<b>Sr. No.</b>	<b>Point to be covered</b>	<b>Planning Date (Week wise)</b>
1	Working on reviewing the requirement analysis	01/02/23 to 12/02/23
2	System/project design process	13/02/23 to 19/02/23
3	Implementation of the proposed system	20/02/23 to 26/02/23
4	Implementation of the proposed system (continue)	27/02/23 to 05/03/23
5	Implementation of the proposed system (continue)	06/03/23 to 12/03/23
6	Testing: Unit, Integration, and system testing	15/03/23 to 31/03/23
7	Report writing	01/04/23 to 16/04/23
8	Report Writing (continue)	17/04/23 to 30/04/23
9	Report Finalization discussing with guide	01/05/23 to 10/05/23

### **3.5 Team Structure:**

Members Of The Team:-

- Ahirrao Pankaj Dnyaneshwar. (Team Leader)
- Bhandari Vardhaman Sunil.
- Bhor Aniket Vijay.
- Godalkar Vishal Santosh.
- Barmecha Jai.

### **3.6 Summary:**

Summary of chapter-3:

Thus we have designed a smart surveillance system capable of recording video and transmitting to any portable device like smart phones and laptops. It is advantageous as it offers quick transmission of the video through Internet of Things. Necessary action can be taken in short span of time in the case of emergency such as the presence of the unwanted people in war areas who are not allowed in such areas can be determined by the PIR sensor which sends a signal to the Raspberry Pi when a human-being is in the ambience of the Robot. In turn, the Pi triggers the camera immediately to capture an image and send it to the web page. The PIR sensor and proximity sensors are activated depend on external stimuli via Internet of Things. The control room collects this information for later reference.

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