Review Paper on Surveillance System for Indian Military

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Abstract – *This work proposes the surveillance of Military area for security purpose. In the first part of the paper, introduction of the system is explained. In the second part of the paper application need and literature review described. The third part of the paper presents theoretical model of a system is well explained. In the same, software programming for the system is described. In the fourth part of the paper, the conclusion of the system is explained.*

Key Words: Raspberry Pi, Python.

1. INTRODUCTION

Surveillance is nothing but monitoring the behavioral activities for human and not only human being but for animals also. The surveillance is nothing but monitoring the activities which are not expected for military observatories. The system is developed without any physical quittance and can be monitored by keeping a good distance of the object.

2. LITERATURE REVIEW

In this paper 'Motion Detection' system and to contribute to the current security system is introduced. This system would be an alternative for expensive security systems being used in the present day. This system does not require any special modifications to the infrastructure where installation is required and can be implemented without any hassle.

This paper deals with the design and implementation of Smart surveillance monitoring system using Raspberry pi and PIR sensor for mobile devices. It increases the usage of mobile technology to provide essential security to our homes and for other control applications. The proposed home security system captures information and transmits it to the respective mail using the internet. Raspberry pi operates and controls motion detectors and video cameras for remote sensing and surveillance, streams live video and records it for future playback. It can also find the number of persons located with the help of the Infrared sensor. For example, when motion is detected, the cameras automatically initiate recording and the Raspberry pi device alerts the owner of the possible intrusion having a smart phone. Raspberry- Pi has two main components interacting with each other [1].

In this paper Raspberry Pi board is used which is a credit-card sized computer. It functions almost as a computer. There are various surveillance systems such as camera, CCTV etc., In these types of surveillance systems, the person who is stationary and is located in that particular area can only view what is happening in that place .Whereas, here, even if the user is moving from one place to another, he/she can keep track of what is happening in that particular place. Also another advantage is that it offers privacy on both sides since it is being viewed by only one person .The other major advantage is that it is a simple circuit .the operating system used here is Raspbian OS. Raspbian OS has to be installed so that the image can be transmitted to the Smartphone.

Fig - 1: Connection of USB Camera with Raspberry Pi

The Connection diagram of the system is shown in figure 1[2].

The Figure 2 gives a brief idea as to how the project "Automatic surveillance system using raspberry pi and Arduino" works. Initially the password is predefined. When the device is switched on, it resets the system. Now the user is prompted to enter the password. The user enters the password through a keypad which is read by the arduino. Now the entered password is checked with the predefined password. If the password matches, then the servo motor deflects and the door unlocks else it send the command to raspberry pi. The rapberry pi capture the image and send it to email of authorized person.

Here keypad was used to enter the password which is predefined. The arduino takes the password and chek it then takes the decision. The voltage converter converts 5v to 3.3v why means the arduino output is 5v but the raspberry takes 3.3v only. The raspberry captures the picture by using web cam and sends it to authorized person through email based on arduino signal [4].
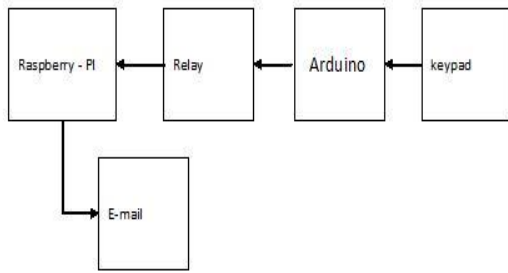
Fig - 2: Block diagram of proposed system

The main objective behind this paper is to develop a cost effective easy to control surveillance vehicle through remote desktop for the implementation of military purpose. Since the risk factor in military border is too high causing threats to the lives of soldiers at time patrol by both climatic conditions and enemy nation which needs a replacement, that is done effectively by the surveillance vehicle that comprises the Raspberry Pi (small single-board computer), pi camera and sensors**.**

This project's main functionality is to deal with tough situations where human beings cannot handle situations like darkness, entering narrow and small places and detecting hidden bombs etc. Such hostile situation is occurring day by day in different parts of the world through terrorist attack or in natural catastrophes. This designed system is connected to a remote computer wirelessly through which the whole controlling of the system response is done. The project is also designed to search invisible metal stuffs from where people are not capable to reach and it is so designed to work in environment where visible light will not be available.

The proposed system consist of two units mainly a robotic unit and a remotely control unit. The robotic unit is consisting of the webcam, sensors and the heart of the project, raspberry pi along with the PCB containing motor driven IC and voltage regulator circuitry. The rest of the paper is organized as follows: we review the related works in Section II. Section III presents about the surveillance robot in detail. Section IV, presents the conclusion and future work of the paper [13].
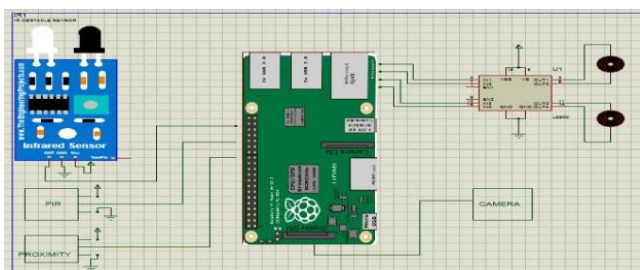

Fig - 3: system design

Going through various literatures for development of surveillance system is paid a less attention. Hence an effort has been taken to develop a surveillance system which is cost effective and may be useful for Indian Army purpose.

3. Proposed System

The proposed Model of the system is shown in figure 4.This system requires a power supply of 5V. A simple mobile charger can be used to give the supply. Display unit is connected to the board. Another block is of PIR sensor which is used to sense the living object passing nearby its range. The range of sensor is about 5m.The infrared rays coming from the living body falls on the sensor and gives the output accordingly. Camera used is of high resolution connected, which captures the images of living objects when signal received from the Raspberry pi-3 board.
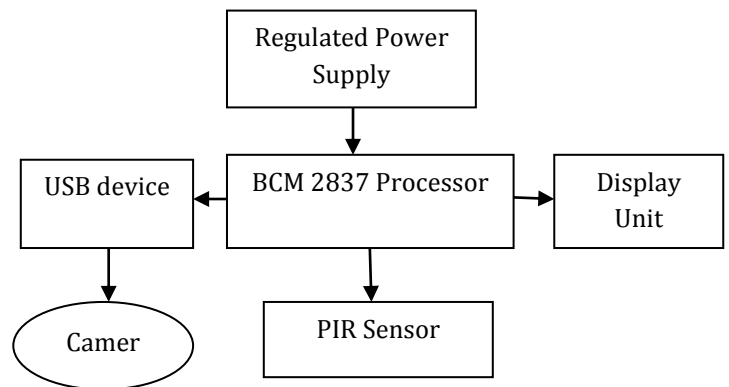

Fig - 4: Blok Diagram

The project consists of Raspberry Pi-3 model, PIR sensor, Camera, mouse, key board and monitor. Here PIR sensor is used to sense the living object moving around its periphery gives signal to the camera to capture the image. Camera used is the 1280x1024 resolutions.

Fig - 5: System Development

Raspbian software is used to run the Raspberry Pi board. The standard procedure is used to install the board.

when any living object passes nearby area of sensor. The infrared coming from living objects senses. In this coding different types of Libraries are imported. GPIO pin 17 and GPIO pin 4 is allotted to input and output respectively. The GPIO pin 17 is connected to Raspberry Pi-3 board gives the signal HIGH or LOW. It gives HIGH signal when living object

passes else gives LOW signal. When HIGH gives signal to camera, Camera captures the image of living object. Sends the mail of image captured with subject "unapproved movement detected on Border". If the signal from GPIO pin is LOW then sensor will be in off condition, then camera will not capture any image.

In this project Python language is used to write the program. Python is a simple language, easy to learn, case sensitive, easy to read and portable. To run this project the coding is done in the following manner.

Advantage of this project is it is sustainable at any critical conditions of environment i.e. cold and hot temperature. Also this project requires less power as it runs when there is any unapproved movement occurring. Also it maintains privacy at every side. Image will send to mail-id of control room with a fraction of time it is one of the most useful advantage of this project.

4. CONCLUSION

In this paper, the model of real time surveillance system is presented which is useful to monitor the remote areas or critical no mans lands areas where monitoring is tedious task due to number of problems like temperature conditions, living conditions, security problems for the Military etc. The benefit of this project is it saves money as well as time of the military. As it uses Raspberry Pi-3 board which is less costly as comparative to other boards. The sensor senses the living things and immediately sends the signal and camera captures the images sends to control room. So the immediate action can be taken against the unapproved movement occurring at the line of control.

It saves battery as the camera will on when the any living object moves from the sensor and captures the images and stores it or send to mail-id. It also requires less storage as it takes image when the living objects moves from nearby area on another time it will be off.

PIR sensor is used to sense the lively things and raspberry Pi is used for system development.

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