Low Cost Real Time Monitoring Using Raspberrpi

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Abstract— **Raspberry Pi which follows Motion Detection Sensor Program written in Python as a default. In addition, the system uses the PIR sensor to detect motion which significantly decrease storage and save investment. The motion detection is being implemented on Raspberry Pi. The streaming can be viewed from any web browser, even from mobile in real-time. By using PIR sensor we can reduce the memory storage, this allows the system to analyze incoming images from cameras, and recognize when movement occurs. Then automatically sends alert to our mobile through GSM. And then, the video system can collect the data using IP address and store the most importance items for the administrators review. Mainly it can be used for security purposes.**

KEYWORDS: - **Raspberri, PIR sensor, GSM (Global System for Mobile communications)**

I. INTRODUCTION

Now a days we are facing many security issues .This system can overcome the security issue as well as storage issue. Raspberry Pi which follows Motion Detection Sensor Program written in Python as a default. In addition, the system uses the PIR sensor to detect motion which significantly decrease storage and save investment. The motion detection is being implemented on Raspberry Pi. It has been widely used in many fields like security, banking, and home. Regular video surveillance can generally achieve certain distance monitoring by using the PC as a monitor. But the Low Cost Real Time Monitoring system is introduced to overcome the week points of the Traditional video surveillance systems, such as expensive cost and Memory usage.

The proposed system is implemented using the tiny super computer called Raspberry Pi. Here we are using PIR sensor for Motion Detection which is used to save the memory as well. Instead of using the regular wireless CCTV surveillance cameras, customers can now go for inexpensive security systems with the Raspberry Pi.IP cameras can serve better as they can send and receive data via network and internet based on internet protocol. Also resolution clarity of IP cameras is better when compared with CCTV cameras.

II. METHODOLOGY

In this project we have used two main technologies.
- PIR Module
- GSM Module

A. PIR Module

A passive infrared sensor (PIR sensor)is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. PIR sensors used to detect the motion, almost always used to detect whether a human has moved in or out of the sensors range. PIRs are basically made of a pyroelectric sensor which can detect levels of infrared radiation. Everything emits some low level radiation, and the hotter something is, the more radiation is emitted. The sensor in a motion detector is actually split in two halves. The reason for that is that we are looking to detect motion not average IR levels. The two halves are wired up so that they cancel each other out. If one half sees more or less IR radiation than the other, the output will swing high or low.

The main reasons for choosing PIR Sensor is
- Can detect any motion object.
- They Consumes low power.
- Low Of Cost.
- Pretty Rugged.
- They have a wide lens range.
- They are easy to interface with.

B. GSM Module

In this project we have used GSM Module.GSM module sends data via SMS. Global System for Mobile Communication (GSM) can be used to send and receive SMS or make/receive voice calls. GSM Modem is built with Dual Band GSM/GPRS engine. The baud rate can be configurable from 9600-115200 through Attention (AT) command. The GSM/GPRS Modem is having an internal TCP/IP stack which enables to connect it to the internet via GPRS. GSM module sends data via SMS to users. It establishes serial communication with the microcontroller. The Transmitter and Receiver pins of GSM modem are connected to the UART of the microcontroller.
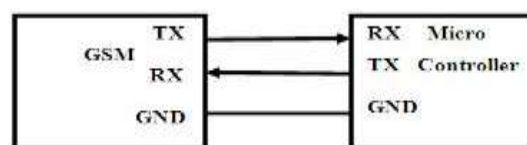

Figure1. Serial Communication between GSM modem and Microcontroller
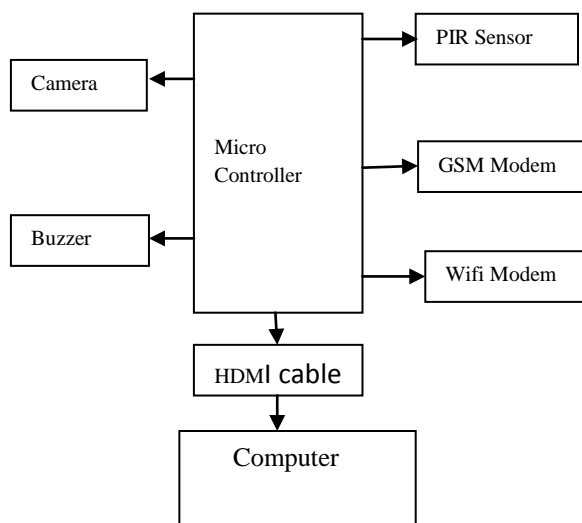
III.   BLOCK DIAGRAM OF THE SYSTEM

Figure 2. Block diagram of hardware

- *Raspberry Pi:* Raspberry pi is a tiny super computer capable of performing various functionalities.
- *GSM Modem***:** GSM module sends data via SMS to user.GSM module sends sms alert through GSM network to anywhere in the world**.**
- *PIR SENSOR:*PIRs are basically made of a pyroelectric sensor which can detect levels of infrared radiation. Everything emits some low level radiation, and the hotter something is, the more radiation is emitted.
- *USB Camera***:** USB Camera captures the image and sends it to the USB Port of the Raspberry Pi board.
- *BUZZER***:** A Buzzer or beeper is an audio signaling device, which may be mechanic or electromechanical. Typical uses of buzzers and beepers include alarms and timers
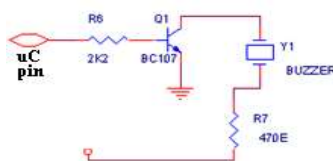

FIGURE3.Buzzer Schematic Diagram

IV. HARDWARE IMPLEMENTATION

- o   Power supply
- o   Keypad
- o   PIR Module

Power Supply: Power supply is an electronic circuit which is designed to allow a constant DC voltage.

Keypad: In this switch pad we have four switches which perform the negative logic i.e. as the switch is pressed the supply which is given will be grounded. And as the switch is open the supply passes through the resistor of 10k then it passes to the J2 microcontroller. The controller takes the i/p and performs the operation as per the program written in the controller.
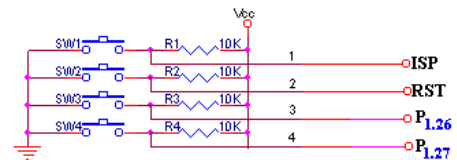

FIGURE4.Keypad schematic diagram

PIR SENSOR: A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view.
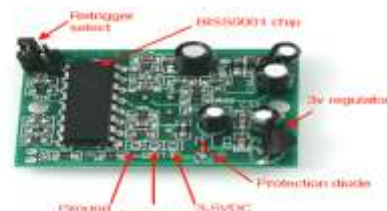

FIGURE5.PIR MODULE

V.   RESULTS

Figure 3 shows entire hardware of the system which includes microcontroller, sensor, GSM module and required devices. In this system, Whenever the PIR sensor detects a motion, and then it will automatically capture the video and images. After that an alert will be sent to our mobile through GSM. By using certain IP address we can access the data from any device from anywhere.

Figure6.Overall setup of the system

Figure7.Result in the system

VI. CONCLUSION

In this paper, Motion Detection algorithm to decrease storage usage based on Raspberry Pi single board computer was proposed in this paper.

From this paper, I want to conclude that Low cost real time monitoring system is a secure system and will be used for security purposes. Due to the use of PIR sensor, the streaming will be done if it detects any object otherwise it will be in sleep mode which leads to the reduce of memory. We can get this at low of cost when compared to the other surveillance systems. Due to the use of buzzer and sms alert, we can be alert at anytime. It is mainly used to avoid the fitting and for security purposes at low of cost.

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