

MOTION ACTIVATED RECORDING CAMERA FOR SURVEILLANCE IN STRONG ROOM

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Abstract

In the present world with the vast usage of IoT (Internet of Things), the demand for a surveillance system has become an important necessity to home residents, buildings and other important premises. In olden days, surveillance system was affordable only by the rich. Now, it is seen almost everywhere. This project deals with a system where tight surveillance is required. The motion sensor, thermal sensor, biometric sensor, GSM module, vibration sensors etc., are accompanied with Raspberry- Pi. The Raspberry Pi is used to operate and control the motion detectors, distance of the intruders and video cameras for remote sensing and surveillance. The cameras automatically start recording video and the raspberry pi device will send an alert via email and SMS to the managers' computer or mobile devices. It is a cost-effective solution, customizable and is implemented in museum's store room/s. Museums require a tight surveillance to keep their artifacts safe. In order to do so, this system is effective in meeting the requirements.

Keywords- Surveillance System, Raspberry Pi, Raspberry Pi Camera, PIR sensor, GSM module, Vibration sensor, Biometric sensor.

1. INTRODUCTION

In view of the rise of criminal cases in World, surveillance system has been considered as an important facility in today's life. The surveillance comes from a French word which denotes as "watching over". Since CCTV camera is costly because of the use of the continuous usage of computer and power. It requires more memory for the continuous recording and also require a person in charge to monitor all the unauthorized activity carefully. To get the better of this problem, a motion sensor is used Which is helpful in reducing power consumption.

That is, camera module is activated only when motion is detected and an Android application is used to get the message notification in presence of unauthorized person [1]. Nowadays, security system such as CCTV has proven to be most widely used for security purpose in residential places because of their easy maintenance. These system (CCTV) needs to be continuously monitored every time. The smart house security system is a mobile web-based application which is an evolution of the existing system which will allow the user for monitoring and controlling their house using mobile. Raspberry pi is a small, credit-card sized single-board computer, low cost that can be

plugged into computer monitor or TV or a display module can be directly interfaced to the Pi module (refer the Raspberry Pi datasheet). It provides a low cost platform for interconnecting any electrical/electronic devices [2]. The Raspberry pi which has the capability of becoming a camera security system using its own camera board, also contains software which will enable the pi's sensor to detect motion and the python script that will direct the pi to send notification to the concerned person. Raspberry pi which is a cheap, effective component can accept several programming languages including python [3]. ARM based Real Time video monitoring; it uses some embedded chips and programming techniques. Raspberry pi plays important role in the system. Video data collected by the Linux system is processed, compressed and transferred by processing chip. Further it is sent to client. This Real Time video monitoring system is used to overcome the complex structure, poor stability and cost expensive. It can be used in many fields and also in long distance transmission [4]. The complete focuses of continuous home security and that security framework is named as Raspberry PI and open CV. This open CV helps in sending warnings to the clients.

Sensors are initiated so that it informs presence of unknown person in absence of owner at home. The security framework makes use of open CV [5]. In this paper we structure and execute a home installed reconnaissance framework with ultra-low alarm control.

Customary observation frameworks experience the ill effects of a superfluous misuse of intensity and the weaknesses of memory conditions in the nonattendance of attack. In this plan we utilize Pyro electric Infrared sensors (PIR) and weight sensors as the alarm bunch in windows and entryways where an interloper must pass through. These low-control ready sensors wake up the MCU (Miniaturized scale Controller Unit) which has controlled the executives for the ultrasonic sensors and PIR sensors inside. This state progress technique spares an enormous number of sensors required for the alarm control we likewise utilize the Greater part casting a ballot Instrument (MVM) to deal with the sensor gatherings to upgrade the likelihood of different sensors detecting. After the MCU sends the sensor sign to the installed framework, the program begins the Internet camera. Our detecting test shows that we decrease the framework's capacity consumption.[6].

2. LITERATURE SURVEY

PragathiUkey, Anitha Shinde composed a paper on "Advancement of Shrewd Home security framework utilizing Raspberry-Pi" .As per overview there exists numerous such frameworks that could control home machines. Every framework has its own special component. The model depicts the work performed in venture. Raspberry Pi itself go about as a minicomputer. Plan and usage of low, brilliant and constant checking of home security utilizing R-Pi. Most Raspberry Pi framework handles movement recognition and face identification that give insurance to potential wrongdoing. R-Pi permits live observing for clients from wherever in world.

Adimulam Padmanabham composed a paper on "An IOT Approach for Movement Recognition utilizing ARM-Put together Framework with respect to Chip" Web of Things (IOT) is the social occasion of billions of end things or gadgets, from the pocket-sized of hugely equipped associated hubs or a superior host or cloud stage, keenly coupled and interoperating with servers and administrations. In The wake of Quick moving world, checking has gotten a fundamental basic. The fundamental reason for this postulation is movement recognizing utilizing Raspberry pi which runs on Casing Contrast Calculation, camera catches the movement when there is a distinction between present edge and past casing, at that point this picture is moved to a particular organizer in the Raspberry. Further the picture is sent from Raspberry pi to Dropbox naturally or order line interface. Utilizing this innovation, we can share our connection to multi clients enabling them to get to the picture at whatever point they need.

Swapna Jadhav composed a paper on "Keen Movement recognition Framework Utilizing Raspberry Pi" In reconnaissance, CCTV is exorbitant in light of the utilization of PC. It saves a lot for consistent chronicle and expect labor to identify unapproved movement. In any case, contrasted with the current framework, Raspberry Pi framework is a lot less expensive with better goals and low power utilization include. Here, pyro-electric infrared (PIR) sensors are utilized as a

basic however influential individual's nearness trigger. This framework is reasonable for little close to home territory reconnaissance i.e. individual office lodge, bank storage space, stopping passage. At whatever point movement is distinguished through PIR sensor inside the room, the picture is caught through camera and incidentally put away in Raspberry Pi module.

Internet of Things based application can be utilized remotely to see movement and get notices if movement is identified. Framework works independent without the PC once customized. Savvy reconnaissance and Observing Framework utilizing Raspberry pi and Android Creator Priya Patel Here savvy reconnaissance framework worked by means of android gadget by proprietor remotely just as locally. IOT application for remote controlling is utilized; framework will send the pop-up message to android gadget when an interruption is identified inside the room. It is required to create and execute and moderate minimal effort web-camera based reconnaissance framework for remote security checking. Approved client can access to their checking framework remotely by means of web with the utilization a cell phone and screen the circumstance on application. This whole work is done on Raspberry pi with Raspbian working framework ported on it. On this framework has the ability to screen an area away from the reconnaissance region through android gadget. It likewise comprises two sections.

- 1) Local Access: If individual is associated with the nearby server same as the framework, he can control the Raspberry pi and screen the territory in type of picture/video through android application.
- 2) Remote Access: Regardless of whether client with android gadget is away from the framework yet associated with the different web plan at that point controlling of Raspberry pi is conceivable with the IOT application named Dataplicity.

3. FLOWCHART:

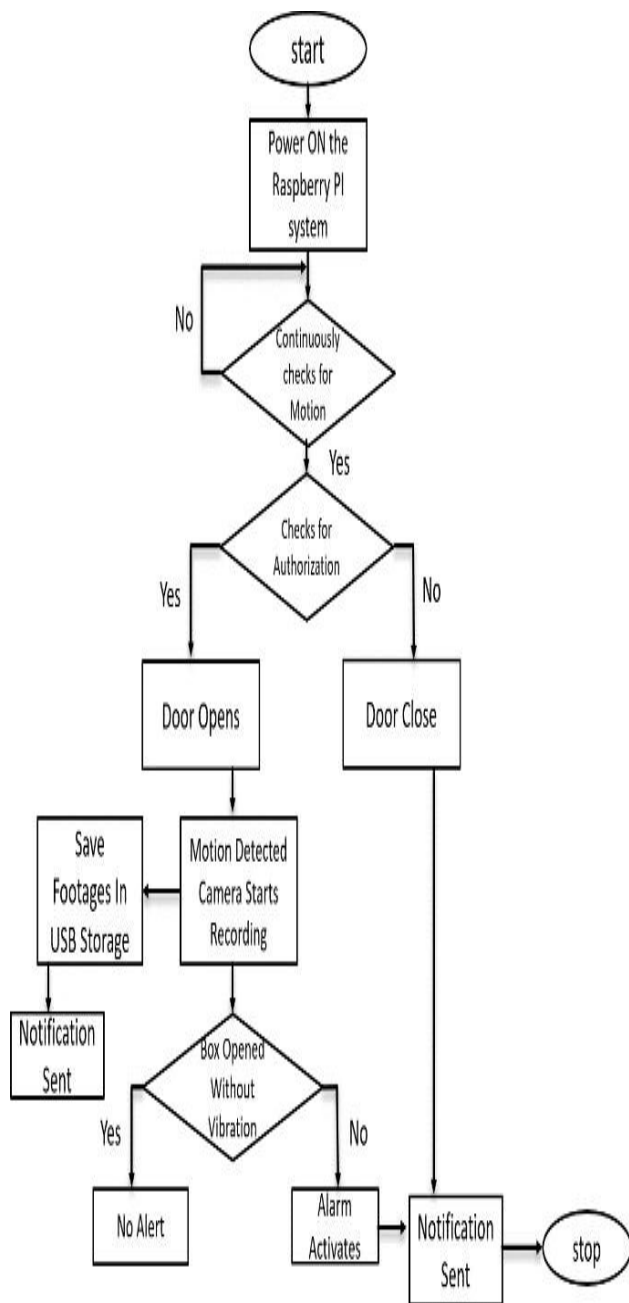


Fig 3.1

The flowchart (Fig: 3.1) is explained in different cases:

Case 1- Authorized person access with fair biometrics:

In this case, if an authorized person enters the store room with right biometrics, PIR sensor detects the motion and the Raspberry-pi enables the camera module. The camera module starts recording and will save the footage in the Pi which can be later transferred to USB storage.

The alarm system will not be activated. The GSM module will send a text notification to the person in charge. If the authorized person's biometrics doesn't match (for ex: If the authorized person press wrong finger on the biometric sensor plate or trying to access in wet hands), the system gives three chances failing which the alarm

system activated and alerts the control room. A notification is sent to the person in charge.

Case 2- Unauthorized person access with false biometrics:

In this case, when an authorized person tries to enter the museum's store room with false biometrics, the PIR sensor detects motion, enables camera module which starts recording. Simultaneously, alarm system is activated and alerts the control room. The GSM module will send an alert notification. The person in charge will take action accordingly.

4. PROPOSED METHODOLOGY :

- Initially, power on the raspberry pi system. The motion sensor or PIR sensor continuously keep checking for motion. If any motion is detected then the LED will glow and camera starts capturing and simultaneously starts recording. If no motion is detected then it again checks for the motion. (fig:3.1)
- The footage will be recorded and is stored in USB storage.
- A monitor is placed in the control room to monitor any suspicious activities.
- Buzzer is connected to raspberry -pi. It alerts the control room if any suspicious activity takes place.
- A GSM module is connected to Raspberry-pi. This module sends an SMS notification to the manager who is in charge of the museum or any other authority of the museum.

5. CONCLUSION:

The ultimate aim of the paper is to design a security system using Raspberry Pi. Surveillance system provides an efficient way for monitoring suspicious activities. The system is low cost and easy to maintain and upgrade. However, energy consumption is more as the system is continuously ON. It can be used for Spy purposes at Museum strong rooms, Bank lockers. Another application is to provide information to the user about what is happening in surveillance area by notification.

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