

Smart Camera Surveillance System Monitoring Based Internet of Things

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Abstract : *Smart camera has been used for surveillance system for many places. Internet of things is the communication of anything with any other thing, the communication mainly transferring of useable data, for example a sensor in a room to monitor and control the temperature. This paper aims to describe a security alarm system using Internet of things which helps to monitor and get alarms when motion is detected and sends photos and videos to a cloud server. The photos and videos are sent directly to a cloud server, when the cloud is not available then the data is stored locally on the Raspberry Pi and sent when the connection resumes. Therefore, advantages like these make this application ideal for monitoring homes in absence. The purpose of the project is to make a system, which would detect and take snapshots and videos of the motion when detected and upload to an external server. The major use of the 'Motion Detection' is at homes, buildings and also for surveillance for security for example of server rooms.*

Keywords: *Rasperrybi, Internet of things, PIR sensor, camera, Python, GSM board*

1. INTRODUCTION

There has been a growing interest in the society and industry for making sensor-based systems that enhance the safety and efficiency of human inhabited environments. Enhanced situational awareness is one of the key issues in developing intelligent infrastructures for safer environments. The situational awareness discussed in this paper means representation, modeling, and recognition of semantic context of events occurring in the monitored environment with respect to the activities of persons and unauthorized activities in terms of their sizes, spatial distributions, velocities, relative configurations, traffic flow, recent history, near future anticipation, etc. In order to develop automatic situational awareness system, it is important to understand how people interact with each other and with the environment. It will be useful to detect, represent and estimate what kinds

of events are occurring or about to occur in the monitored site. Pedestrian safety and crowd behavior analysis are good examples. In this chapter, It presents a methodology for IOT-based analysis of human interactivity with other persons and unauthorized actions enhanced situational awareness. This paper addresses issues and challenges in video surveillance. There are several definitions of the Internet of Things (IOT). One that is salient for how the term is currently in use is provided by the U.S. National Intelligence Council: "The "Internet of Things" is the general idea of things, especially everyday objects that are readable, recognizable, locatable, addressable, and controllable via the Internet - whether via RFID, wireless LAN, wide-area network, or other means." A key point is that while the most familiar Internet-connected devices are computers such as laptops, servers, smartphones, and tablets (e.g., iPads, etc.), the IOT concept is much broader. One way of characterizing the IOT is by market segment where there are three main categories: monitoring and controlling the performance of homes and buildings, automotive and transportation applications, and health self-tracking and personal environment monitoring. Some of the basic IOT applications underway in the connected home and building include temperature monitoring, security, building automation, remote HVAC activation, management of peak and off-peak electricity usage, and smart power meters. Worldwide smart power meter deployment is expected to grow from 130 million in 2011 to 1.5 billion in 2020. Some of the many automotive and transportation IOT uses include the Internet-connected car (syncing productivity, information, and entertainment applications), traffic management, direction to open parking spots, and electric vehicle charging.

2. RELATED WORK

Passive Infrared Motion Sensors Signal Processing for Ambient Assisted Living Applications This paper introduces a new approach to the signal processing algorithms applied for the data provided

by passive infrared (PIR) motion sensors used in Ambient Assisted Living Applications (AAL). In AAL, PIR sensors are deployed differently than in the typical security applications and different results are expected by the users from the sensors. In security applications, it is required to inform the security system as soon as possible about any movement in the observed area, while in ALL applications the system and at the end the users are interested the intensity of the movement in a given time frame (typically several seconds to a minute). In addition, the developed sensor node demonstrating the approach provides extended features such as two PIR sensors with different field of view, temperature, contact, and battery voltage measurements.

Automatic Room Light Intensity Detection and Control Using a Microprocessor and Light Sensors. In this paper proposes a design using both a microprocessor and light sensors for automatic room light detection and control. Our design, the HLCM (Home Light Control Module) which will be installed in every light fixture of a family, is made up of four blocks: the pyro electric infrared (PIR) sensor circuit, the light sensor circuit, the microprocessor and the RF module. By using the PIR sensor circuit, the HLCM detects if a human body enters the detection area or not. If there is no human body present, all controlled lights are turned off. If there is, the HLCM detects the light intensity under the environment and maintains sufficient light by controlling the number of lights. We have also integrated an RF module to transmit and receive the data from each HLCM so we can control different lights indifferent regions. The result of using the HLCM shows that the total power consumption can be reduced.

3. SYSTEM ANALYSIS

3.1 Existing System

Surveillance plays a crucial role in day-to-day life. A typical surveillance system continuously monitors its vicinity and stores the surveillance data locally. This may end up in lots of memory and energy wastage. Moreover, the surveillance records are under security threat, when the surveillance system is seized or damaged by the intruders. In this paper, a new design for surveillance using smartphone along with the passive infrared (PIR) sensor and the microcontroller unit (MCU) is proposed. The PIR sensor is attached to the smartphone through the MCU to detect motion. When the motion detected the smartphone camera switch ON and OFF the process and the just notify the SMS alert and monitoring process. In Existing system they had used Microcontroller for Arduino board because

they had used just camera ON and OFF process only not using real time capture image.

3.1.1 Problems in previous system

It can't monitoring the person detected face and object and its Possible to create the copy layer of finger of the actual individual and access the system.

3.2 FEATURES OF PROPOSED SYSTEM

Motion detection surveillance technology gives ease for time-consuming reviewing process that a normal video surveillance system offers. By using motion detection, it save the monitoring time and cost. It has gained a lot of interests over the past few years. The system uses GSM/GPRS technology, so we can use long haul communication for the monitoring section. The system can be applied in real time. It offers privacy on both sides since it is being viewed by only one person.

4. SYSTEM DESIGN AND IMPLEMENTATION

4.1 Proposed system design

In this system, a proposed motion detection surveillance system, through the study and evaluation of currently available different methods. The proposed system is efficient and convenient for both office and home uses as a smart security system technology. The proposed system consists of Raspberry pi, PIR sensor, USB Camera, Buzzer, and GSM/GPRS Module. The PIR sensor is used to detect the humans. Whenever a motion is detected by the sensor, the sensed signal is send to the Raspberry pi. Then the Raspberry pi activates the USB camera interfaced to it. The USB camera captures the picture and send to the Raspberry pi. Then the Raspberry pi sends the signals to the GSM/GPRS module. The GSM/GPRS module then sends the captured picture as an E-mail to the registered E-mail ID using internet. The buzzer also gets activated when the motion is detected. Efficient and convenient motion detection surveillance is proposed in this work. The system captures images only when the motions exceed a certain threshold that is present in the system. It thus reduces the volume of data that needs to be reviewed and is therefore a more convenient way of monitoring the environment, especially with the increasing demand for multi-camera. Also, it helps to save data space by not capturing static images which usually do not contain the object of interest. It is applicable for both office and home uses. After successfully

implementing the project, it can be apply for the motion detection for smart security system which would be very much helpful in auto theft detection for security purpose. It can also be useful in bank, museum and street at mid-night. It improved the alert system, instead of alarm It can use SMS alert, email alert with the moving object. Figure 4.1 describes Motion detection sensor technologies give ease for time-consuming

reviewing process that a normal video surveillance system offers. By using motion detection, it save the monitoring time and cost. PIR sensor values 1 or 0. PIR sensor without interface values always 1.If the sensor interrupted the values changed into 0. The proposed system is efficient and convenient for both office and home uses as a smart security system technology.

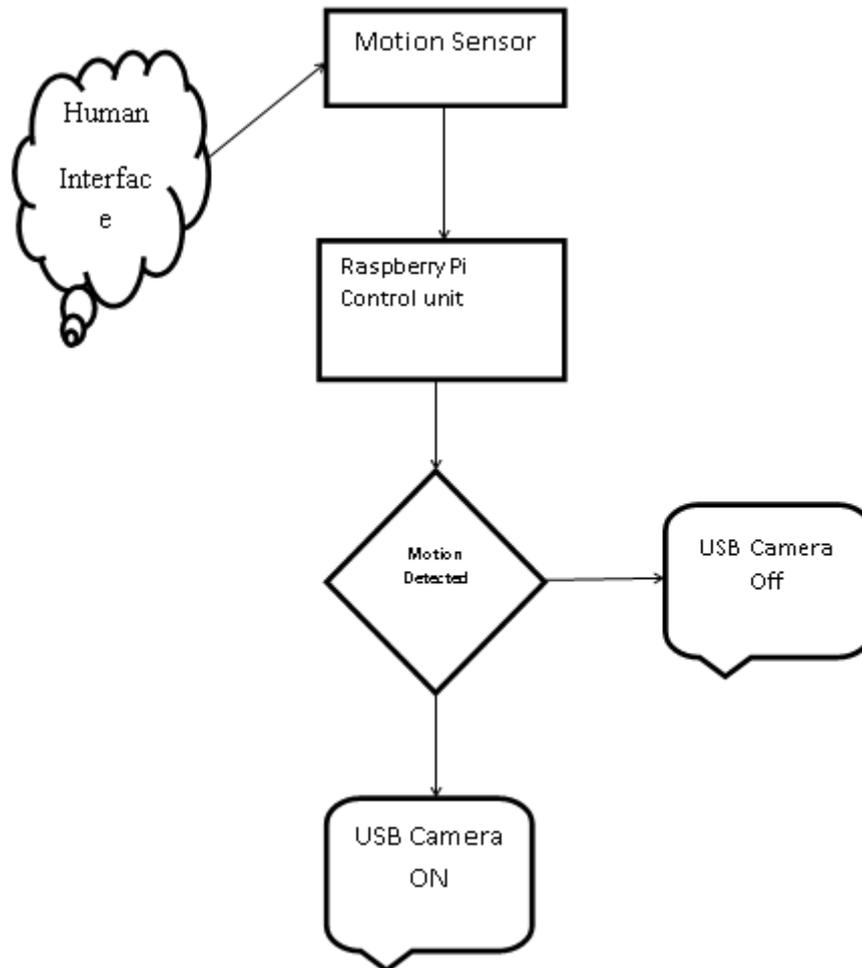


Figure 4.1 Motion detection System Architecture

4.2 Software design

4.2.1 Python

Python is an open source programming language made to both look good and be easy to read. Python is an interpreted language. Interpreted languages do not need to be compiled to run. A program called an interpreter will run python code on any kind of computer it can run on itself. This means if the programmer needs to change the code they can quickly see the results. This also means

Python is slower than a compiled language like C, because it is not running machine code directly. Python has a very easy to read syntax. The combined effect makes Python a very easy to read language. Python is a multi-paradigm programming language object-oriented programming and structured programming are fully supported, and many language features support functional programming and aspect-oriented programming (including by meta programming and metaobjects (magic methods)). Many other paradigms are

supported via extensions, including design by contract and logic programming.

4.3 Implementation set up

Raspberry pi activate the database management system. In this process we already stored the authorized person image into database. In this project consists of Raspberry pi, PIR sensor, USB Camera, Buzzer, and GSM/GPRS Module. The PIR sensor is used to detect the humans. Whenever a motion is detected by the sensor, the sensed signal is send to the Raspberry pi. Then the Raspberry pi activates the USB camera interfaced to it. The USB camera capture the picture and send to the Raspberry pi.

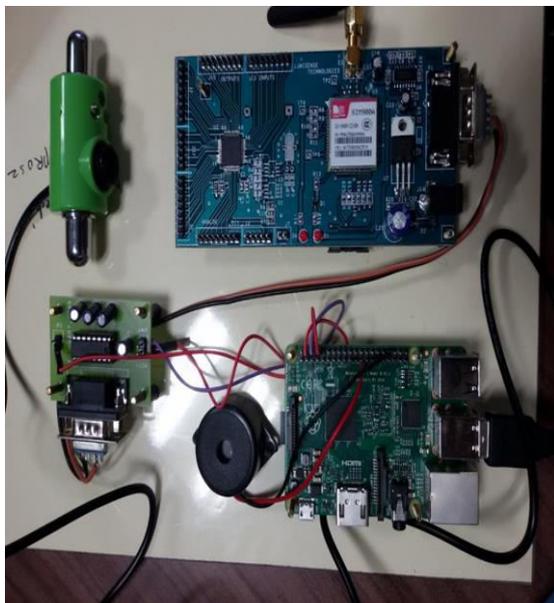


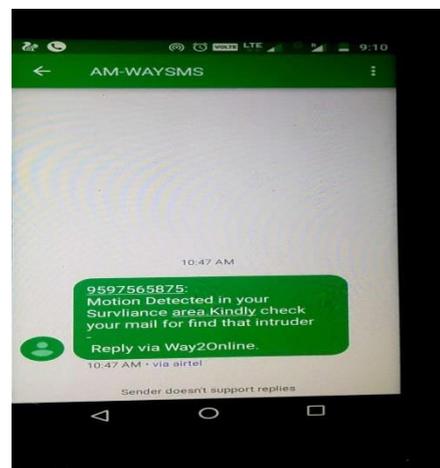
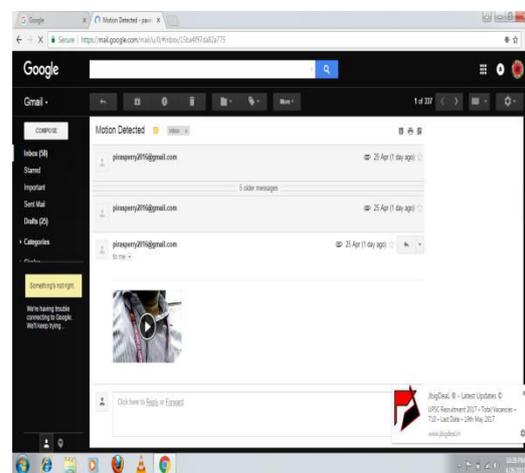
Figure 4.2 Experimental set up

Then the Raspberry pi sends the signals to the GSM/GPRS module. The image matched output values 1 otherwise it's denoted by 0, when the values 0 that person is unauthorized. The mail & SMS are activated in IoT board. The IoT board are connected in network connection. We already register the Mobile number and mail ID into IoT board, when the database output values 0 automatically trigger the mail & SMS. The GSM/GPRS module then sends the captured picture as an E-mail to the registered E-mail ID using internet. The buzzer also gets activated when the motion is detected. Efficient and convenient motion detection surveillance is proposed in this work. The system captures images only when the motions exceed a certain threshold that is present in the system. It thus reduces the volume of data that needs to be reviewed and is therefore a more

convenient way of monitoring the environment, especially with the increasing demand for multi-camera. After successfully implementing the project, it can be apply for the motion detection for smart security system which would be very much helpful in auto theft detection for security purpose, it improved the alert system instead of alarm it can use SMS alert, email alert with the moving object.

OUTPUT SCREENSHOT

Any motion detected the buzzer triggered, small video send through mail and also send sms



CONCLUSION

Motion detection is the process of detecting a change in the position of an object relative to its surroundings or a change in the surroundings relative to an object. Motion detection can be achieved by either mechanical or electronic methods. When motion detection is accomplished by natural organisms, it is called motion perception. The major use of the 'Motion Detection' is at homes, buildings and also for surveillance for

security for example of server rooms. Motion detection refers to the capability of the surveillance system to detect motion and capture the events. Motion detection is usually a software-based monitoring algorithm which, when it detects motions will signal the surveillance camera to begin capturing the event. Henceforth, by enhancing the capabilities of these technologies and integrating them, we hope to introduce the 'Motion Detection' system and to contribute to the current security system. Almost everyone has an Internet connection at home and all the members in the family are away during the day, as security systems are not affordable this system would be great alternative to implement.

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