

AN IOT APPROACH FOR MOTION ACTIVATED SECURITY CAMERA AND SURVEILLANCE SYSTEM

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Abstract: Internet of things is the communication of anything with any other thing, the communication mainly transferring of usable data, for example a sensor in a room to monitor and control the temperature. It is estimated that by 2020 there will be about 50 billion internet-enabled devices. Motion detection surveillance technology came about as a relief for the generally time-consuming reviewing process that a normal video surveillance system offers. It has gained a lot of interests over the past few years. In recent times we tend to use a number of surveillance systems for monitoring the targeted area. This requires an enormous amount of storage space along with a lot of human power in order to implement and monitor the area under surveillance. This is supposed to be costly and not a reliable process.

IndexTerms - Raspberry Pi (RP), Passive Infrared (PIR) sensor, Internet of Things (IOT), Face Recognition, Motion Detection, Smart Door Unlock, Haar Classifier.

I. INTRODUCTION

The purpose of this survey paper is to present the motion activated security camera and surveillance system currently available over the world. Nowadays, technology plays an essential role in our life in which different domain of interests are taking advantages of technology. Recently, computers and smart phones have significantly contributed our daily life where numerous computations and adjustments are being accomplished by such technologies. Securing homes has become one of the concerning issues that facing many people. With the expanded duration of leaving the home due to work, study and other duties, homes are being more vulnerable for several threats especially being burgled. Such concept aims to turn the home into a smart home in which different tasks especially monitoring can be performed remotely. Monitoring and controlling some tasks outside the house would have the ability to provide maximum safety. Recently, electronic door lock systems are one of the most popular security systems that is being installed for many residents and business places.

II. LITERATURE SURVEY

Naser Abbas Hussein et al, authors explained the brief description of proposed smart door system followed by the operation of the Raspberry Pi module in designing, the keypad door lock, and the camera module has been provided. Smart digital door lock is a system to monitor and control several devices in the home. The smart digital door lock system operates over internet network by using raspberry pi3. Captured face is compared with database, if both matches then the door is opened. Smart door lock is one of the most popular digital consumer devices because of the user convenience and affordable price. In actuality, it is replacing a lot of conventional types of locks [1].

Shaik Anwar et al, explained IOT based smart home security system that was implemented on a Raspberry pi development board in Linux environment, which supports SMTP, TCP/IP, HTTP. SSH is a secure protocol and the most commonly used to administrate and communicate with Linux servers. SSH Client is implemented on android platform using java script on JDK and Eclipse IDE. This paper presents the design and the implementation of an interactive Smart home security system with Email alert, Web enabled video streaming and remote control of voice alert and door accessing system using smart phone [2].

Neha Gaba et al, explained that identification and tracking of object is an important factor in analysis of video in a surveillance system. A series of techniques for detection of motion have been design and developed in the past decade. One of the most recent and relevant high precision techniques being temporal differencing, which is considered to be most advanced of all. The temporal differencing technique employs pixel-by-pixel difference between consecutively incremental frames, thereafter the threshold is decided based on averaging of differences to establish the foreground object. The presented paper describes an algorithm-based framework which is capable of producing background with almost null noise pixels. It also overcomes the trails of artificial "ghost" [3].

K.N Karthick Kumar et al, explained that to improve the calculation of motion activated security systems, it is isolated into two sections motion detection and motion recognition Raspberry Pi camera catches the picture and uses foundation subtraction calculation to recognize movement. The principle of PIR sensors is based on the fact that everything emits a small amount of infrared radiation. The system is also equipped with a remote monitoring facility. To enable remote monitoring, it is must to configure the Wi-Fi router. In conclusion, PIR motion sensors and camera modules are cost-effective surveillance mechanism [4].

Shakthi Murugan.K.H et al, explained that security automation system work by a custom-made Raspberry Pi will be fixed at the surveillance area which controls for the video camera. The system consists of a monitor, Raspberry Pi, GSM Modem, HD camera, VGA converter, connectors, key board, mouse and connectors. The GSM modem is connected to the system by means of a USB port present in the Raspberry Pi. The USB port act as alert systems. Open Computer Vision is a library function that enables real time video and image processing enabling the computer to see. By using the intelligent surveillance system, we can reduce the video storage system for a huge extent since it will store the video only if it detects any motion and also it reduces the cost of the entire system [5].

Ansari et al, explained IOT approach to security systems aims to simplify motion detection and the interface to be user friendly, which would send prompt notifications when motion is detected. The Raspberry Pi being small as a credit card server still has the capabilities of working as a normal computer it can play 1080p resolution without lagging. Although Raspberry Pi can perform discrete tasks, it has some limitations due to its hardware. As the user would also get a notification of the motion detection, so they can login remotely to the Raspberry Pi and check live output from the camera. By enhancing the capabilities of these technologies and integrating them, motion detection system can be introduced and contribution made to the current security system [6].

Li Fang et al, explained the task of a motion detection surveillance system is to detect a “region of interest” present in a “region of awareness”, where the region of awareness, or the field of view, is defined as the “portion of environment being monitored”. Method for motion detection can be categorized into two main classes, i.e. pixel-based and region-based algorithms. An 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 preset in the system [7].

Nizar Zarka et al, explained that foreground region extraction can be detected using background subtraction method. An updated background image over time is subtracted from current acquired frame. Background Model Initialization: The Highest Redundancy Ratio (HRR) algorithm considers that pixel intensity belongs to the background image only if it has the highest redundancy ratio among intensity values of the pixel taken from a training sequence. Object Detection: Determining an accurate position of objects in the foreground pictures is a basic task of any tracking system; in order to achieve this aim efficiently represent the 2D image of foreground by its 1D projections histogram over the horizontal and the vertical axis. The method for human detection tracking via star skeleton model is described as part of a surveillance system. This system uses an adaptive background model robust against long-term changes, illumination changes and repetitive clutter motion in the scene [8].

Myrala Nalini et al, explained that hard-wired security and surveillance systems use wires installed inside the walls, attics, crawl spaces, and underground to connect the sensors to a central controller. A remote access system provides the capability to monitor and control a home security system from a location away from the home. If there is no intruder, the sensing device which continuous to work and consumes much power. To meet the increased requirements of the IEA we have to reduce the standby power of each electrical apparatus to less than 1 Watt. This project is effective in providing enough security as long as the password is not shared. In future this can be provided maximum security by the enhancements in order to completely satisfy user's needs [9].

N. Sugumaran et al, explains that the smart surveillance monitoring system deals with the design and implementation of Smart surveillance monitoring system using Raspberry pi and PIR sensor for mobile Raspberry pi and PIR sensor for mobile devices. The proposed home security system captures information and transmits it to the respective mail using the internet. It can also find the number of persons located with the help of the Infrared sensor. 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. [10]

III. CONCLUSION

According to this survey, we understand that the existing system has some problems like capturing of images in dark environment and limitation on range of capturing the image and also requires some of resources that cause system costly. The IOT based surveillance system has been aimed to design in such a way that it can fulfil the needs of the user for particular surveillance area. It has countless applications and can be used in different environments and scenarios.

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