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RASPBERRY PI BASED HOME SECURITY SYSTEM

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Abstract- Raspberry Pi Based Home Security System is proposed in today's world Security is a prime concern of life. Everyone wants to be as much secure as possible. Knowing that our home is protected provides peace of mind both when we are away and when we are at home. People rely on machines due to increasing busy schedules to support them in this modern world. In every area the need for intelligence to these machines. Here the case is with home security. The method proposed here provides security from theft using cloud computing. Cloud computing provides on demand services. Most of the organization is running on cloud due to reliability, scalability, high performance and low band width. Here a GSM and a buzzer is interfaced with controller that is connected to Raspberry Pi. The Raspberry Pi sends data to cloud and the data can be taken from cloud as and when required.

Keywords: Raspberry Pi, Cloud Computing, Security, SMS.

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INTRODUCTION

In today's world security is of prime concern. Everybody needs home security. Knowing that the home is protected provides peace of mind to one both whether one is away or at home. Many a times we come across CCTV cameras for security purpose. But, the disadvantage of a CCTV camera is it stores the recorded video in the hard disk which is at the theft site. So there is a possibility of getting damage or theft of hard disk. Here we have made the project that stores data on cloud server if there is any difference between the reference image and captured image.

Motion detection plays vital role in the world of automation. Detecting the changes in the real-time video stream is useful for wide variety of applications involving artificial intelligence. Motion detection refers to the process of determining the displacement of objects in a scene relative to the observer or camera. In many real environments, the motion is caused by both interesting and uninteresting motion. Advance Surveillance using Raspberry Pi is a collection of libraries and software that allows user to work with video and images or video streams that come from cameras. It detects the human interference through surveillance and notifies [6] it to the concern person Presently the internet things are being used in the fields of building, automobiles, security surveillance, management, art homes, , agriculture health care. The system has an advantage of low-cost computing device where there is less energy consumption and limited impact to the environment. To automate objects refers to the idea of devices and appliances working by themselves acting upon the command of user. In the present age, technology has become an integral part of everyone's lives to such an extent that smart phones and internet are common necessity for every application.

Video Surveillance is the most important intelligent thing as a part of security related issue as it works as a monitoring and self-management system. The complex video analysis required Cloud based solutions [26], as to satisfy the requirement of storage and processing. The proposed solution is, identifying storing and managing the video information from camera and data delivery efficiency to the number of users through internet, load-balancing and fault tolerance fashions. In view of Cloud Computing and Internet of Things paradigm, Internet of Things paradigm is both Dynamic and Global Networked Infrastructure oriented, Manages self-configuring nodes (things) with high Intelligence. It generally contains small objects (things) with a limited Memory storage and Computing capacity, and is characterized by real world with consequential issues regarding Privacy, Performance, Scalability and Reliability. Whereas Cloud Computing is a vast with unlimited capabilities virtually considering storage and computation power globally. This technology solved most of the Internet of Things issues partially.

II. PROPOSED SYSTEM

The design methodology of cloud based home security system consist of smart monitoring system contents Raspberry Pi, Cloud Computing, GSM Module, Camera, Mobile Terminals.

In smart monitoring system a camera will capture the image after each pre-defined set point and sends it to Raspberry Pi. The Raspberry Pi will compare this image with the reference image in Python open CV. If there is any difference in the current image and reference image a message will be sent to user through GSM and the Pi will start uploading images to cloud server. At the same time a message signal is also sent to the user indicating that there is something wrong.

Now the user will check the images that are stored on cloud and may decide whether to ring the alarm. Suppose it may happen that user has not read the message then the Pi will wait two min. for the reply. If it gets reply then its ok otherwise it will ring the alarm.
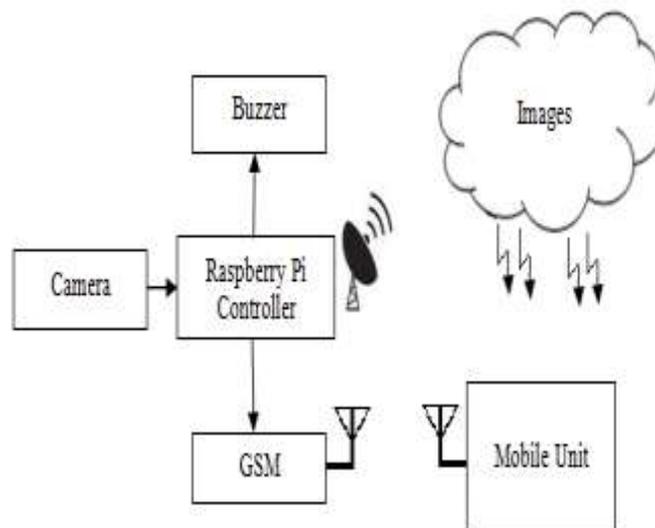
[1] Figure 1: Proposed block diagram of Cloud Based Home Security System

[2] III. SOFTWARE & HARDWARE DESCRIPTION

Open CV: Open Source Computer Vision Library is an open source computer vision and machine learning software library. The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms. These algorithms can be used to detect and recognize faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images together to produce a high resolution image of an entire scene, find

similar images from an image database, remove red eyes from images taken using flash, follow eye movements, recognize scenery and establish markers to overlay it with augmented reality, etc. It has C++, C, Python, Java and MATLAB interfaces and supports Windows, Linux, Android and Mac OS. Open CV leans mostly towards real-time vision applications and takes advantage of MMX and SSE instructions when available.

The Raspberry Pi has features of A 900MHz quad-core ARM Cortex-A7 CPU, 1GB RAM Like the (Pi 1) Model B+, it also has 4 USB ports, 40 GPIO pins, Full HDMI port, Ethernet port, Combined 3.5mm audio jack and composite video, Camera interface, Display interface, Micro SD card slot, Video Core IV 3D graphics core
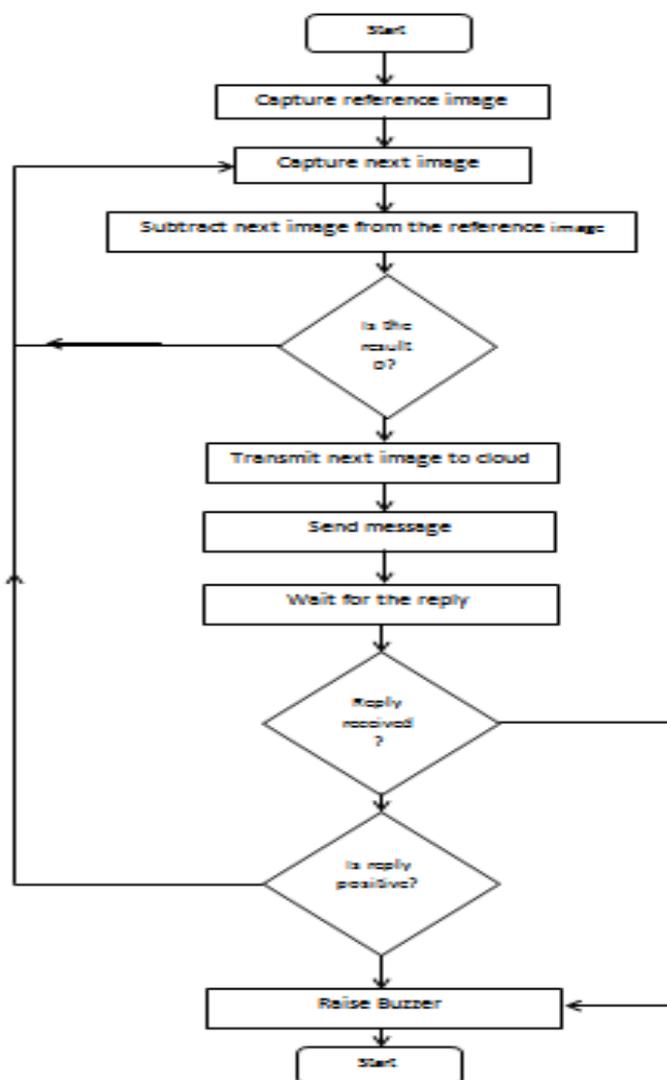
IV. FLOW CHART

Figure 2: Flow Chart of Program

Conclusion

Raspberry Pi Based Home Security System is proposed in this we designed and implemented a low-cost and efficient monitoring system that is capable of capturing images and transmitting it on cloud if there is any difference between the reference image and the captured image. It is advantageous as the modern CCTV surveillance systems stored the data in hard disk that can be stolen. Also in CCTV surveillance system a person is needed to monitor if there is any difference in image.. Another advantage of this system is that because of its small size and portability, it can be placed in any kind of surrounding for surveillance. One of the major advantages of this project is that the costing is very less. Areas where movement is restricted such in banks, this kind of surveillance and monitoring systems can be implemented.

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