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A PATH FOR HORIZING YOUR INNOVATIVE WORK

ADVANCED REAL TIME HOME SECURITY SYSTEM BASED ON RASPBERRY PI

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Abstract- Advanced Real Time Home Security System Based on Raspberry Pi uses Raspberry Pi controller to which the camera is interfaced for monitoring. Here the camera will continuously capture the images and these images are compared with the reference image in the controller. If there is any difference in the captured image and the reference image then a message will be sent to the user and at the same time the difference images are also sent. Now after getting the SMS user will check the images and if he feels that anything wrong is going on then he can raise the alarm. It may happen that user doesn't see the message or there may be network error or no internet connectivity, in such cases if the controller found any differences in the images then it will wait for some time and then it will raise the alarm.

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



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INTRODUCTION

Now a day's, uncontrolled threat-of-thefts are making people to worry about their valuables. So there is a necessity of continuous surveillance of their offices Surveillance systems have become more purposeful in common life using real time observations. Whether the person is residing in his house or out of it, the monitoring system should be active enough to notify the person. Monitoring real time data is very complex. To overcome the difficulties of surveillance through CCTV footages, Raspberry Pi is minicomputer which is intelligent enough to capture the footages, Advance real time Surveillance using Raspberry Pi allows user to work with images or video streams from Raspberry Pi camera. The camera can also detects the human interference through surveillance and notifies it to the user. The Raspberry Pi board contains many features like camera connector, Ethernet port, GPIO pins for interfacing sensors and switches, USB ports to connect to external devices(like keyboard, mouse, Wi-Fi adapter etc, The HDMI port is used to interface to monitors (like LCD screens, projectors, TVs). All these are embedded on a single board. The Raspberry Pi has no internal storage and built-in operating system and hence it requires an SD card preloaded with a version of the Linux Operating System.

I. PROPOSED SYSTEM

In Advanced Real Time Home Security System Based on Raspberry Pi a python script is used to analyze the images, it will continuously take images through camera and compare it with the previous frame. If there is any difference between last frame and the current frame then snapshots generation will begin and a message is sent to the user. After receiving the message user will check the images on his mobile unit and now the user has the option of customizing the action and does the needful. It may also be possible that when the message arrives user will be busy and is unable to read the message and reply at that time. So in this case the processor will wait some time for the feedback and if the feedback is not received in predefined interval then it will raise the alarm.

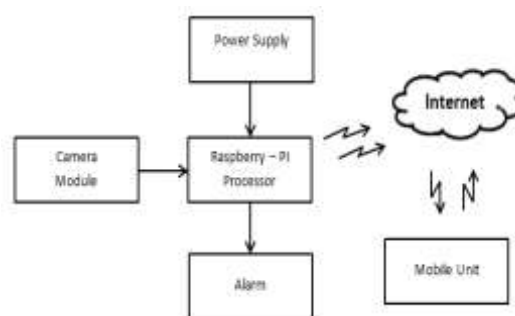


Figure 1: Proposed block diagram of Advance Real Time Home Security System Based on Raspberry Pi

[1] III. HARDWARE DESCRIPTION

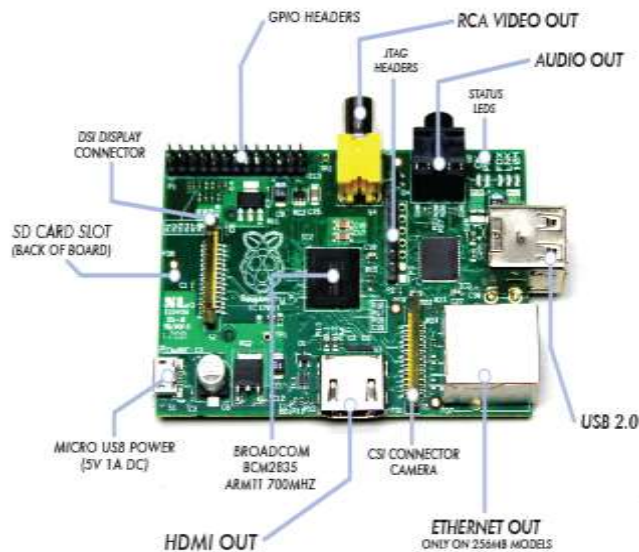


Figure 2: Raspberry Pi B+ Board [12]

A 1.1: Raspberry Pi B+ Board

The Raspberry Pi has no internal mass storage or built-in operating system and hence it requires an SD card preloaded with a version of the Linux Operating System. This system proposed here uses Raspberry Pi Model B+, shown in Fig2 this model board consist of microcontroller kit with in-built ARM11 processor provided with internet/Ethernet connectivity, dual USB connector, 512MB memory and supports Linux operating systems like Raspbian, Pidora, Raspbmc etc. [1, 2, 3]

A 1.2 Raspberry Pi B+ Board Advantages

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 videos without lagging. It has a low price relatively as compared to machines in the market and can serve as a server for light traffic such as web traffic or DNS servers or NTP servers, which can run on low power also for example it can be powered by portable batteries which can act as UPS (uninterrupted power supply), when there is a power cut and notify about the power cut to the network administrators.[15]

A 1.3. Raspberry Pi B+ Board Disadvantages

Although Raspberry Pi can perform discrete tasks, it has some limitations due to its hardware. Firstly, it cannot run x86 operating systems such as Windows and some Linux distributions. Secondly, it cannot run applications, which require high CPU utilization. "Model B took 107ms to complete one calculation of the purely synthetic prime number test; a mid-range desktop Core 2 Duo ES400 took only 0.55ms." [2] Hence we can state that it can be used for Specific purposes [14, 15]

B. Raspberry Pi Camera Module

High definition camera module compatible with the Raspberry Pi model shown in figure3 . The camera Provides high sensitivity, low crosstalk and low noise image capture in an ultra-small and lightweight design. The camera module connects to the Raspberry Pi board via the CSI connector designed specifically for interfacing to cameras. The CSI bus is capable of extremely high data rates, and it exclusively carries pixel data to the BCM2835 processor [16].



Figure 3: Raspberry Pi Camera Module [14]

C. Advantages of Raspberry Pi Camera module

- 1080p video recording to SD flash memory cards.
- Simultaneous output of 1080p live video via HDMI, while recording.
- Removable lens.

- Adapters (see below) for M12 (S-mount), C-mount, Canon EF, and Nikon F mount lens interchange.
- In-camera image mirroring.
- Higher-resolution still-image capture (2592 x 1944 native resolution, 5 megapixels) (although, see below regarding the real performance)
- Open-source, modifiable software for many (but not all) aspects of camera control, image capture, and image processing
- A second camera module may be attached by adding a Raspberry Pi compute module I/O board.
- Underlying Linux-based microcontroller with capabilities for HTTP service of images, Ethernet and WiFi connectivity, etc., which provide an instant LAMP capability.[18]

CONCLUSION

Advanced Real Time Home Security System Based on Raspberry Pi is proposed this provides real time images and videos with low-cost and efficient monitoring system that is capable of capturing images and transmitting it on mobile unit via internet . This system can be useful for home as well as for Industrial security system. 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.

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