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Real Time Embedded Network Video Capture And SMS Alerting system

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Abstract — In This paper, Network video capture system using Raspberry pi is presented. This application system captures video, shares among networked systems and also alerts the controlling person with short message service alarm as required by the client. This system works in a real time environment and is supported by Raspbian. This system provides low cost and high effective intelligent monitoring system like in elevators, home security systems etc with low power consumption. Unlike other embedded systems this real time system provides client video monitor with the help of Raspberry pi.

Keywords - Raspberry pi, Raspbian, real time environment, Client video monitor

I. INTRODUCTION

Recent years monitoring facilities are necessary and useful for our daily life to make ourselves secure. From small firms to many large companies some kinds of video capturing's have introduced to keep their security. In this paper video surveillance system [3] is designed bases on real time operating system i.e Raspbian. The video data collection and sharing are designed with RASPBERRY PI processor and Ethernet controller.

The video data collection is designed with the capability of both wired and wireless internet accesses. The new version of our surveillance system will be powerful and useful for several kinds of clients. So one can say this system is client security oriented system. In this paper it is introduced new surveillance system that captures video, shares through wired or wireless internet access and alerts the controlling person through short message service [2]. This short message service is accompanied by Global system for mobile communication module.

The rest of paper is organized as follows: in section II, The main architecture of the video capturing and alerting system. In section III and IV, its hardware design and software design are described in detail. Finally Results and Conclusion are made at the end of the paper.

II. MAIN ARCHITECTURE OF THE VIDEO CAPTURING AND ALERTING SYSTEM

The network video surveillance system mainly consists of video capture system based on Raspberry pi, Ethernet interfaces for wired and wireless internet accesses, Fire sensor, PIR sensor and Global system for mobile communication module. This capturing and alerting system is a real time system based on RT Raspbian.

GSM module is interfaced for alerting the controlling person from the client. Live video can be viewed in the sharing network from the IP of the pi: 8080.

The video also recorded for the given duration when the sensors interfaced with the PI is sensed and it is stored in the memory of the RT RASPBERRY PI.

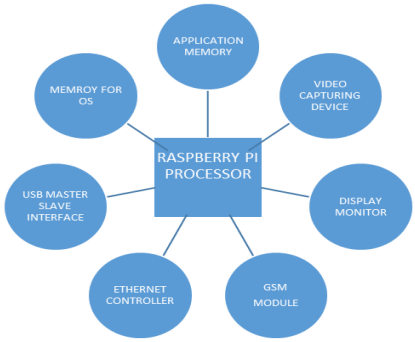


Figure: 1 Diagram of system Architecture

III. HARDWARE DESIGN

In this paper it is considered RASPBERRY PI processor module, which has on board peripherals. It is an SOC chip based on RASPBERRY PI with low power, high performance, very suitable for embedded product development. The application system hardware uses external peripherals GSM modem, RGB web camera, Fire Sensor, PIR sensor, and also standalone PCs for loading real time operating system, for loading applications and to see the captured video through wired or wireless internet access.

The structure of Raspberry pi board is as shown in the figure 2

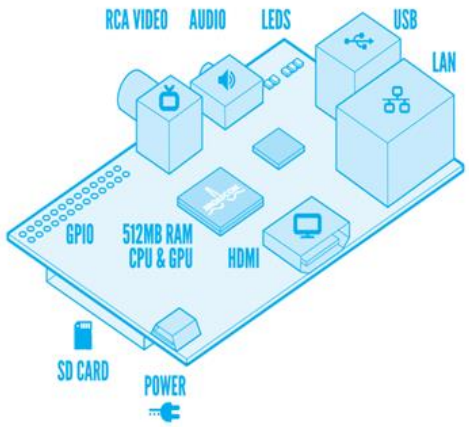


Figure: 2 Diagram of Raspberry Pi Structure

Extra Hardware You Will Need:

The Raspberry Pi board contains a processor and graphics chip, program memory (RAM) and various interfaces and connectors for external devices. Some of these devices are essential, others are optional. RPi operates in the same way asa standard PC, requiring a keyboard for command entry, a display unit and a power supply. It also requires 'mass-storage', but a hard disk drive of the type found in a typical PC is not really in keeping with the miniature size of RPi. Instead we will use an SD Flash memory card normally usedin digital cameras, configured in such a way to 'look like' a hard drive to RPi's processor. RPi will 'boot' (load the Operating System into RAM) from this card in the same way as a PC 'boots up' into Windows from its hard disk.

IV.SOFTWARE DESIGN AND DEVELOPMENT

The application system uses a real time operating system Raspbian. Here we have used windows operating system .To activate RASPBERRY PI board support package in a real time environment the operating system installation must. The following instructions are

The windows users.

Download the Raspberry Pi operating System

The recommended OS is called *Raspbian*.

The Default username and Password is Pi ,raspberrypi.

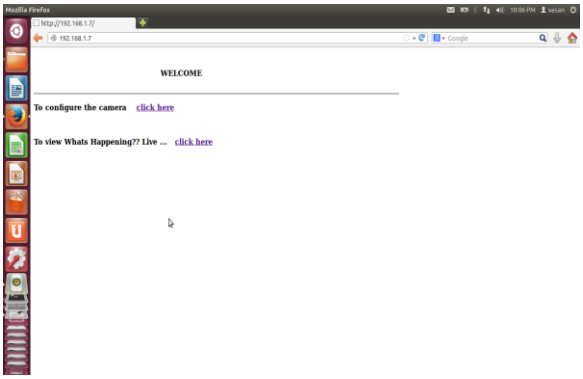
Startx is the command for GUI of PI.Raspberry Pi uses Linux Kernel.In this paper the codings are done in Shell scripting,in order to reduce the complexity of coding.

V. Process

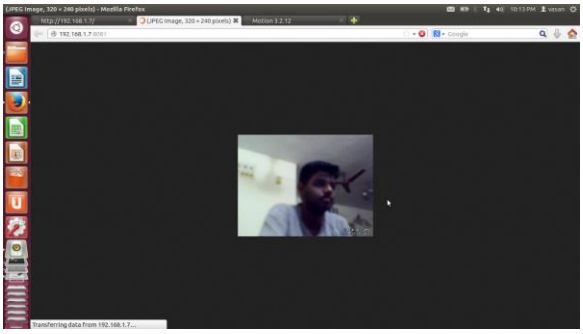
Once RGB web camera is connected through master USB interface to Raspberry pi , make COM port settings in the hyper terminal window and after that dump '/bin' file into RASPBERRY PI board, one has to set the following IP address: 192.168.0.200Subnet mask: 255.255.255.0 Gateway: 192.168.1.1 After these settings the captured video will be displayed onthe Display of the RASPBERRY PI board[3]. Later if one enters 192.168.0.100in the internet explorer browser address bar ,gets the camera captured real time video on the networked systems supported by Ethernet controller. Later if any abnormal situation arises at the client, one can send message through short message service with the help of GSM module.

VI. OUTPUT

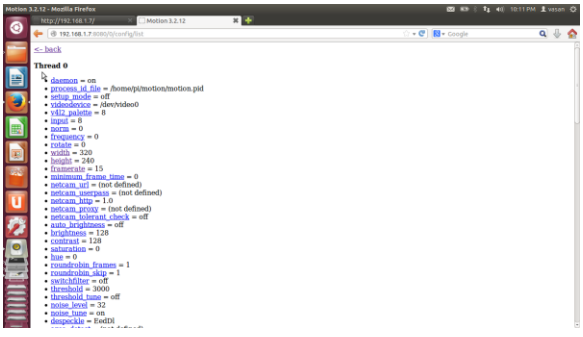
HTML PAGE



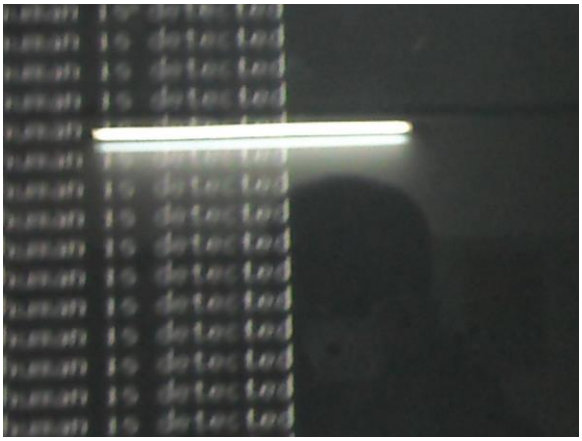
LIVE STREAMING



HTML PAGE TO CONFIGURE CAMERA



Output when human is detected



VII. CONCLUSION

An Embedded network video capture and SMS alerting system has been introduced in this paper. It provides remote monitoring facilities and some characteristic properties are illustrated to be useful in the applications. The system performance has been explained in relation to the response speed of captured video display at the client, transferred video display at the controlling person and alert through GSM from client. With our surveillance system not only remote monitoring but also by the SMS alerts, controlling action will be taking place in lesser span. Thus our application system provides better security solutions. And in future we can also connect display systems through wireless network connections like wi -fi, wi- max, etc.

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