

Design of Remote Video Monitoring and Motion Detection System Based on Arm-Linux Platform and Http Protocol With Sms Capability



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ABSTRACT:

In this paper, the structure of video capture system based on S3C2440 processor is presented. And the embedded system, video capture, short message service (SMS) alarm, and client video monitor are introduced. Video 4 Linux is used to get the camera video data, which is transferred to the Web Server, and the data is displayed on the client browser.

The system can also be connected with mobile phones, using SMS to control alarm equipment. The system can be applied in intelligent anti-theft, intelligent transportation, intelligent home, medical treatment, as well as all kinds of video surveillance systems.

Compared with video capture system based on digital signal processor (DSP), this system has the advantages of fewer modules, lower cost, higher intelligence, higher system stability, and higher security.

With the development of Broad Band, computer networks, and image processing technology, video capture has been widely used in image acquisition, security, health care, intelligent community, alarm, transportation and so on. But it also has many problems, such as high cost, low intelligence, poor stability, weak security.

In order to solve these problems, S3C2440 microprocessor is adopted in this embedded video Acquisition system which combining with the Linux operating system. Video capture is realized by the Video 4 Linux.

Index-terms:

USB camera, GSM module, Linux,, ARM9 processor.

I.INTRODUCTION :

With the development of Broad Band, computer networks, and image processing technology, video capture has been widely used in image acquisition, security, health care, intelligent community, alarm, transportation and so on. But it also has many problems, such as high cost, low intelligence, poor stability, weak security. In order to solve these problems, S3C2440 microprocessor is adopted in this embedded video acquisition system, which combining with the Linux operating system.

Video capture is realized by the Video 4 Linux. The Linux kernel provides programming interfaces and data interface functions API for a variety of devices. And it has the advantages of strong network function, system stability, and high safety. The SMS alarm and control function enable the system to the broader development prospects.

In this paper, concept is developed for live video monitoring and controlling the system processes from anywhere in the world. This particular approach is taken mainly due to the large and common usage of portable computing and communication devices in everyday use. Another key concept is the usage of an Ethernet element that provides the SCADA to be connected over the network to provide web based interface for easy to use with worldwide coverage.

The USB video device class (UVC) specification allows for interconnectivity of webcams to computers even without proprietary drivers installed. Microsoft Windows XP SP2, Linux and Mac OS X (since October 2005) have UVC drivers built in and do not require extra drivers, although they are often installed in order to add additional features.

II. RELATED WORK:

The ARM9 architecture and SAMSUNG's S3C2440A 16/32-bit RISC microprocessor. SAMSUNG's S3C2440A is designed to provide hand-held devices and general applications with low-power, and high-performance micro-controller solution in small die size. The ARM processor is a Reduced Instruction Set Computer (RISC).

The ARM was originally developed at Acorn Computers Limited of Cambridge, England, between 1983 and 1985. Nowadays every industrial and commercial process needs control system; it can be either by means of old relay technique or by using highly advanced electronic controllers. With this necessity in mind, comes the requirement of monitoring and controlling of these processes from remote locations, for which SCADA systems were introduced.

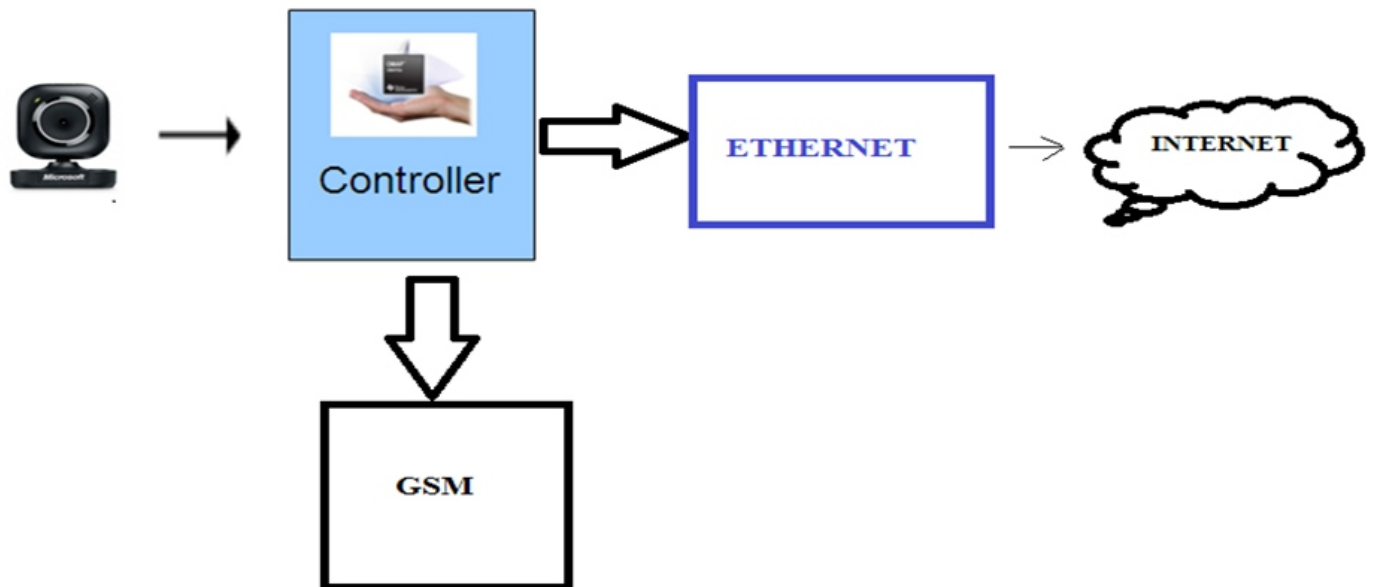


Figure-1: block diagram

Embedded Linux is the use of Linux in embedded computer systems such as mobile phones, personal digital assistants, media players, set-top boxes, and other consumer electronics devices, networking equipment, machine control, industrial automation, navigation equipment and medical instruments. According to survey conducted by Venture Development Corporation, Linux was used by 18% of embedded engineers.

Ethernet is a family of computer networking technologies for local area networks (LANs) commercially introduced in 1980. Standardized in IEEE 802.3, Ethernet has largely replaced competing wired LAN technologies. Systems communicating over Ethernet divide a stream of data into individual packets called frames. Each frame contains source and destination addresses and error-checking data so that damaged data can be detected and re-transmitted.

The standards define several wiring and signaling variants. The original 10BASE5 Ethernet used coaxial cable as a shared medium. Later the coaxial cables were replaced by twisted pair and fiber optic links in conjunction with hubs or switches. Data rates were periodically increased from the original 10 megabits per second, to 100 gigabits per second.

GSM MODULE:

Short Message Service (SMS) is a text messaging service component of phone, web, or mobile communication systems, using standardized communications protocols that allow the exchange of short text messages between fixed line or mobile phone devices. SMS text messaging is the most widely used data application in the world, with 2.4 billion active users, or 74% of all mobile phone subscribers. The term SMS is used as a synonym for all types of short text messaging as well as the user activity itself in many parts of the world. SMS is also being used as a form of direct marketing known as SMS marketing.

SMS as used on modern handsets was originated from radio telegraphy in radio memo pagers using standardized phone protocols and later defined as part of the Global System for Mobile Communications (GSM) series of standards in 1985 as a means of sending messages of up to 160 characters, to and from GSM mobile handsets. Since then, support for the service has expanded to include other mobile technologies such as ANSI CDMA networks and Digital AMPS, as well as satellite and landline networks.

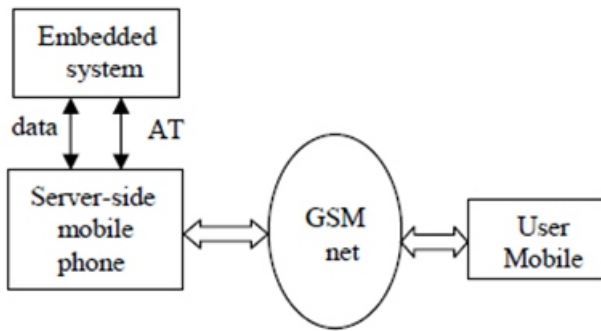


Figure-2: Structure of GSM network

III.RESULTS:

When the camera is inserted the device will be shown in “/dev/video0” on the development board root file system. Connect the board using UART cable from UART0 to PC COM port. Now configure IP address for the mini2440 board in the terminal by typing the following command.

```
#ifconfig eth0 10.0.0.166 netmask 255.0.0.0
```

Connect the board to network using Ethernet cable using RJ45 connector. Now at client side open the web browser and type the following IP address in address bar.

```
10.0.0.166:8080/video_capture.html
```

Now we can see the following output on the browser on the client side. We can see the video at the development board and a button for sending short message service. When we click that button browser sends the request to the board, it checks for the command type and performs the requested operation.

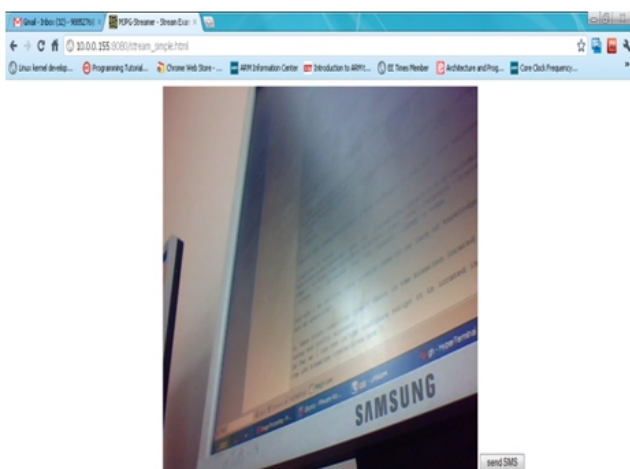


Figure-3: The final output on client browser

IV.CONCLUSION:

The structure of video capture system based on S3C2440 processor is presented. And the embedded system, video capture, short message service (SMS) alarm, and client video monitor are introduced. Video 4 Linux is used to get the camera video data, which is transferred to the Web Server, and the data is displayed on the client browser or on client.

The system can also be connected with mobile phones, using SMS to control alarm equipment. The system can be applied in intelligent anti-theft, intelligent transportation, intelligent home, medical treatment, as well as all kinds of video surveillance systems. Compared with video capture system based on digital signal processor (DSP), this system has the advantages of fewer modules, lower cost, higher intelligence, higher system stability, and higher security.

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