Embedded Video Surveillance With Real time Monitoring On Web

G. Senthi Kumar[1], S.Ragu[2] , N. Siva Kumar[3]

[1] Associate Professor, Panimalar Engineering College , Chennai,

[2] PG Scholar , Panimalar Engineering College , Chennai,

[3] Faculty, Panimalar Engineering College , Chennai

ABSTRACT

Surveillance Recently, the use of security surveillance system including CCTV is increasing due to the increase of terrors and crimes. However as the data recorded through the video surveillance system is exposed, the invasion of privacy is raised. The studies on the technology of protecting privacy from the surveillance system in addition to these organizations are actively carried out. To distinguish the human of privacy protection, the identification technique is necessary. This paper proposes the human identification method that uses height and clothing-color information appropriate for the intelligent video surveillance system based on smartcard. It can obtain reliable feature information using smartcard. In this paper, representative colors are extracted by applying octree-based color quantization technique to the clothing region and height is extracted from the geometrical information of the images. Identification is accomplished by comparing the similarities between two data based on Euclidean distance. From the experiment, we could see that the identification of a human can be checked through the proposed system.

I. INTRODUCTION

Several video streaming solutions handle all the steps of the process, namely video grabbing, encoding, network streaming and video playback. Two examples of popular off-the-shelf suites are Microsoft Windows Media® and Real Networks®, based on Helix technology [4]. The encoding layers of such systems are intended to provide streaming server capabilities, i.e., to handle intensive video broadcasts. They require strong processing platforms and/or server-oriented operating systems. For example, Windows Media Streaming Server runs on Windows Server OS only. The main goal of these proprietary solutions is to provide massive access to both live and stored video resources for entertainment purposes, rather than ubiquitous, uni-cast video streaming as required for surveillance purposes. For this reason their latency is usually rather high, being in conflict with requirement #2. Moreover, since the typical users are non-technical practitioners, their settings are often pretty limited mainly in terms of video coding and network streaming. Regardless of such considerations, their performance in mobile video surveillance working conditions is not negligible.

We measured the overall streaming performances of both Windows Media and Real Networks, since they both provide a video player for PC and PDA. Skype® probably represents the popular freeware tool for live multimedia streaming, addressing audio and video. The overall performance of this system is very interesting, though it has some limitations to be applied for mobile video surveillance. In particular, the settings flexibility is even coarser than the aforementioned tools since almost everything is automatically handled: for instance, grabbing source, frame size and rate and video bit rate are not adjustable. This approach makes the system very easy to be used for audio/video calls but also very rigid and certainly not flexible enough to be used for our goals. Moreover, according to the methodologies that will be presented in Section V, analytical latency measurement becomes unfeasible in such conditions. Skype is meant for audio streaming, that cannot be disabled in favor of video, producing a bandwidth waste that becomes a critical issue on radio mobile connections. Finally, the video player is currently implemented in the PC version only.

II. RELATED WORKS

Digital Video Recorders (DVRs) were a great improvement over the tape based video recorders for video surveillance. Standard DVRs use same analog video signal but record the video on digital hard drive. The incoming analog video signal from cameras is captured, digitized and compressed by electronics in the DVR and both audio and video is stored on hard drive for playback at a later time. NVRs connect to IP cameras or streamers over a LAN or a WAN and record video as data streams. For the purpose of live viewing, the compressed streams received at the NVR need to be uncompressed and re-assembled as per viewer request. Hybrid DVRs accept input for both analog and IP based digital cameras.

DVRs, NVRs and Hybrid DVRs, all have their roots in the traditional video surveillance. These systems are primarily focused on meeting needs of security. IP cameras and NVRs make use of the connectivity and wiring techniques developed for LANs and WANs using the Ethernet protocol and use IP protocol for data transport. Use of the system as networked video surveillance system has been an after thought in these solutions. These devices were designed primarily as recording devices and were not designed to take advantage of IP network infrastructure and as such are limited in terms of remote live preview, replay and remote administration and management of the system. NVSS is a natural next step for video surveillance. At the heart of an NVSS is IP network and the Internet. Performance and use over internet possess challenges and to build a highly effective system the NVSS systems need to be engineered from the ground up considering the strengths and challenges of the Internet.

III. PROPOSED SYSTEM

Main Architecture of the Video Surveillance System

The video wireless surveillance system can be divided into three parts in our design: the video data nodes for data collection, the video monitoring nodes and the embedded video control server. The embedded video control server is the central part of the designed video surveillance system, which can be divided into the internal network interface, the external data network interface and the MCU control unit. The internal data network interface is made up of an 802.11 module for receiving data from each of the video data nodes, which is in charge of the video data acquisition and uploading. The external network interface which includes a wireless Internet access module is responsible for the data publishing. In the video control server side, both the internal and the external network interface are all controlled by an embedded microcontroller unit. A video data node consists of a video camera for video data sampling and an 802.11b module for data transmission, an embedded microcontroller unit which could be the same one as the video control server.

The video data acquired by the video data nodes are sent to the video control server through 802.11 links. The video data server, which has wireless 3G Internet access, transmits the video stream data through the 3G wireless data link and publishes them on the designated web site. In cases of reachable wired Internet access, the wired means of Internet access for the video control server is also implemented. A video monitoring node is relatively simple in structure. It can be either a computer with wired Internet access or a mobile phone with wireless Internet access. When the endusers, either a wired Internet user or a mobile phone user, access the designated web site, the required video stream will be downloaded from video control server to each of the terminals for displaying after the authentication procedures. A tiny web server on the video control server based on the CGI (Common Gateway Interface) program provides end-users with user-friendly operating interface, convenient for monitoring and maintenance. Authentication is made to confirm the identity of the end user. Afterwards, the video

data is downloaded in the web browser and linked to the media player for displaying.

MODULE DESCRIPTION

- ***Server***
- ***Control servlet***
- ***Mobile control servlets***

SERVER

The administrator name and password is been given and it is been logged in to start the Web Camera for Real Time Monitoring of the particular area to provide security.

CAPTURING THE VIDEO

In this module we are capturing the video from webcam using Java Media Framework (JMF) API.

What is JMF?

JMF is a framework for handling streaming media in Java programs. JMF is an optional package of Java 2 standard platform. JMF provides a unified architecture and messaging protocol for managing the acquisition, processing and delivery of time-based media. JMF enables Java programs to

(i) Present (playback) multimedia contents,

(ii) Capture Audio through microphone and video through Camera,

(iii) Do real-time streaming of media over the Internet,

(iv) Process media (such as changing media format, adding special effects),

(v) Store media into a file.

Why JMF?

The main drawback of native implementations of media players is that they are platform dependent. Hence they are not portable across platforms. This directly means applications using platform-dependent media players and processors are unsuitable for web-deployment. JMF provides a platform-neutral framework for handling multimedia.

CONTROL SERVLET MOVING OBJECT RECOGNITION

In this module, we are finding the moving object by comparing the each frame with background template using background subtraction algorithm.

COMPARING EACH FRAMES

Background subtraction is a commonly used class of techniques for segmenting out moving objects of interest in a scene for applications such as surveillance. It involves comparing an observed image with an estimate of the image if it contained no objects of interest. The areas of the image plane where there is a significant difference between the observed and estimated images indicate the location of the objects of interest. The term “background subtraction" comes from the simple technique of subtracting the timely updated background template from the observed image and then threshold the result to generate the objects of interest.

MOVING OBJECT RECOGNITION

After the background template has been constructed, the background image can be subtracted from the observed image. The result is foreground (moving objects). Actually, the background is timely updated.

In case of some random disturbances, each pixel will fluctuate in a small range even there is no expected moving objects in the scene. So there must be a strategy to judge it. A threshold is defined in the system. If the difference of one pixel between real time frame and template is more than 10, then add 1 to the threshold. When differences of all pixels in the frame are all calculated, moving objects is thought to appear if the threshold is more than 3 percent of the total number of pixels in the frame.

MOBILE CONTROL SERVLETS ALERTING SYSTEM

In this module we are alerting the central control unit or the user through SMS using the GSM Modem.

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up

modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves.

Typically, an external GSM modem is connected to a computer through a serial cable or a USB cable. Like a GSM mobile phone, a GSM modem requires a SIM card from a wireless carrier in order to operate.

With the GSM modem, you can do things like:

- Reading, writing and deleting SMS messages.
- Sending SMS messages.
- Monitoring the signal strength.
- Monitoring the charging status and charge level of the battery.
- Reading, writing and searching phone book entries.

IV. DISCUSSION

The system has the following features:

- Displays a live video stream
- Optimized transmission for low-speed internet connections
- Optimized transmission if only some parts of the image has changed
- No image transmission if nothing has changed between one and the next frame
- Java applet client, only a common browser is required to display the live video
- Supports HTTP tunneling if no direct connection to server is possible (behind a firewall)
- Build in HTTP server
- Build in HTTP administration interface, password protected access
- Frame rate between 1..6 frames/sec for slow internet connections (64 kbit/sec)
- Frame rate up to 20 frames/sec for for local network connections
- Adjustable welcome picture and station logo
- Adjustable client and server settings

V. CONCLUSION

In this report, the design and implementation of a embedded video surveillance system based on embedded xp and JMF is proposed. The realization of both wired Ethernet and the wireless 3G accesses of Internet are implemented. A Database in the video control server to automatically store the selected frames of the video stream data is implemented. A high-speed video monitoring sub-system using 802.11 in our surveillance system is also realized. Furthermore, we build an on-line service system and remote monitoring network for our system, which will provide all the video data nodes with remote maintenance, malfunction on-line diagnosis and device firmware automatic update etc. We can also build the maintenance sub-system that will transmit the latest information of the video data nodes to the remote controller, which can be either a PC or a 3G cell phone with Internet access. When certain malfunction occurs in the system, the video control server will send a signal to the remote controller or initiate a video phone call to user's cell phone through 3G wireless network.

REFERENCES

[1] Xiao Liu, Jun Gao, "Implementation of Transmitting 4Channel CIF Digit Video Through One BT.656 ParallelInterface a Using FPGA [J]", *Electronic Engineer*, China,2006, 32(4), pp. 8-10

[2] Chu-Sing Yang, Ren-Hao Chen, and Chao-Yang Lee,"PTZ Camera Based Position Tracking in IP SurveillanceSystem[C]", *3rd International Conference on SensingTechnology*, Tainan, Taiwan, 2008, pp. 142-146.

[3] Hou-Jie Bi, "The new generation video compression coding standard—H.264/AVC [M]", *Posts & Telecom Press*,China, 2005.

[4] Ying Wang, "H.264 Video Encoder Realization and Optimization Based on ADSP-BF561 [D]", Xi'an Jiaotong University, 2007.

[5] Xiao-wei Huang, Ying Zhang, and Feng Chen, "H.264 Encoding Based on BF533 [J]", *Application of electronic technique*, China, 2005, 31(8), pp. 41-43.