

Home Monitoring System Based On Android Platform

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Abstract: Background subtraction methods are widely exploited for moving object detection in videos in many applications, such as traffic monitoring, human motion capture and video surveillance. H.264 banks on this method for its encoding and decoding logics. Along with the powerful android platform and the H.264 encoding technique which uses the background subtraction method we stream and monitor in real time for surveillance purpose by designing a mobile application which works both on sender as well as receiver end by just adjusting our orientation. Face detection as well as motion detection enhance our purpose and solve the query of small storage capacity of mobile devices.

Keywords: Android phones, Home monitoring, H.264, Real-time transport protocol.

1. INTRODUCTION:

In This Project we will design and execute a Home Surveillance system using the smart Android terminal device. The implementation of the system happens through two modules, it includes the server module and the client module. The server module records the video and implements the H.264 video-encoding technique upon it. The transmission of video happens with the help of RTP protocol. The client module receives the data in the form of bit streams, and decoding of the video happens in real time with playback. Because of the limited storage capacity of portable devices, the server module implements the face detection algorithm, which stores only the important information. This surveillance system is executed through smart phones (android platform) which are used for the elderly Customers. We can get real time information about elderly people living at home by using this surveillance system. It can also provide emergency alert about emergency situations through the SMS to authorized users. This system has a good mobile performance and transmission stability. It is intelligent, portable and practical to use.

2. MOTIVATION:

Our country is a populous country. According to statistics, in 2013, our elderly population (55 years and older) is more than three hundred million. With the rapid increase in the elderly population of our society, the demand for such home monitoring products is more and more urgent and demanding. The system suggested provides not only monitoring capabilities it also has an alert notifier which informs us through a SMS whenever there is an intrusion. Therefore, in this article, we will implement the application of home monitoring on the platform of Android mobile phone.

3. PROBLEM DEFINITION:

The age-old video surveillance system is usually setup on PC (Desktop) to implement the monitoring system. However the mobility of PC is poor. It needs someone to guard in front of the monitoring equipment, which often brings a lot inconvenience to the monitoring. In order to meet the demand of market, mobile, high definition, and intelligent will be the future development trend of the surveillance technology. With the increase in the popularity of android platform, as well as the quick development of Wi-Fi technology, The Boom of Mobile Internet took place. The video surveillance technology takes a small baby leap in its rapid development.

4. OBJECTIVES:

- To Stream live Video using an android device
- Video should be encoded using H.264 before Sending to the network
- Video Decoding requires authorization
- Face Detection as well as Motion Detection
- Alert notification through SMS to authorized person

The organization of this document is as follows. In Section 2 gives literature survey, Section 3 gives details of system architecture. In Section 4 presents research findings and your analysis of those findings. Section 5 concludes the paper.

5. LITERATURE SURVEY:

The video surveillance system has long been in use for human monitoring in sensitive areas like banks, grocery stores, traffic management on highways, public places which are quite crowded. Due to the advancement in technology the storage devices are available at a very low cost thus providing financial management.

H.264 Encoder: It is a lossy compression technique which makes use of the I,B,P frames ideology in sequential order for referencing .I frame stands for intra-coded frame , they don't take reference points i.e they take less processing time .P frame usually is adjacent to intra frames ,they take more process time than I but less than B. B frames usually take huge processing time as they have many reference points from I as well as P.

Motion detection technique: The Frame differencing method uses the two or three adjacent frame based on time series image to subtract and gets difference images, its working is very similar to background subtraction after the subtraction of image it gives moving target information through the threshold value. This method is [3,4] simple and easy to implement, and also it is similar to the background subtraction. But this method is highly adaptive to dynamic scene changes, however, it generally fails in detecting whole relevant pixels of some types of moving objects. Additional methods need to be adopted in order to detect stopped objects for the success of higher level are computationally complex and cannot be used real-time without specialized hardware.

6. PROPOSED SYSTEM:

a. System Architecture

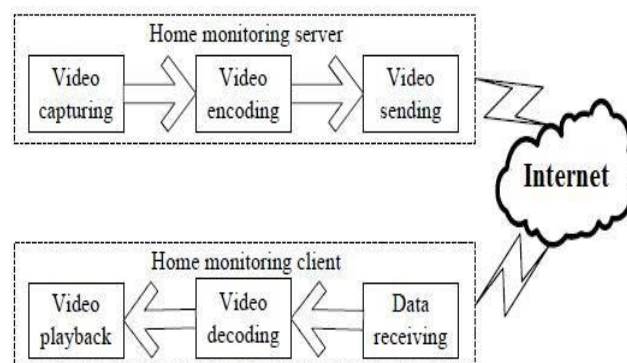


Figure 1 Block Diagram of System

- Video Capture: A client device in home will be in video recording mode.
- Video Encoding: After a video is recorded it will be encoded using H.264 video encoding technique.
- Video Sending: As limited storage capacity of mobile devices, Video will be stored on server in encoded format.
- Server Functionality: Due to resource limitation on client side face detection or motion detection will be carried out on server side
- Data Receiving: A Tracker client device will receive data from server
- Video Decoding: A Tracker client device will decode the receive data from server
- Video Playback: A Tracker client device will play a decoded video.

B. Models of Project

1. Client and Device registration Module (Figure 2)

- Input: User Details example Name, email, mobile number, tracker number.
- Output: All the data will registered to web server and user successful registration message will appear.



Figure 2: Client and Device registration Module

2. Video Capture Module(Figure 3)

- Input: Recording Video
- Output: Recorded Video

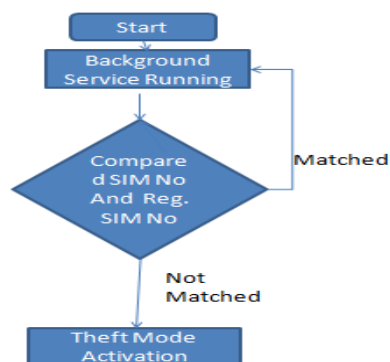


Figure 3 Video Capture Module

3. Video Encoding Module(Figure 4.)

- Input: Recorded Video
- Output: H.264 Encoded Video.

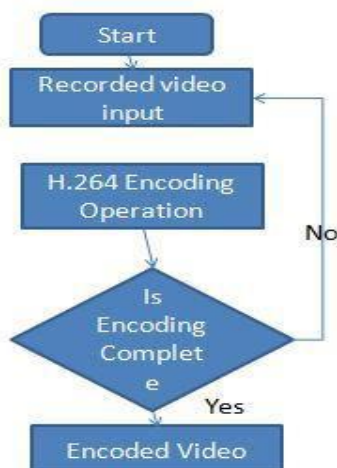


Figure 4: Video Encoding Module

4. Video Sending Module (Figure 5)

- Input: Encoded Video
- Output: Video Registered at server

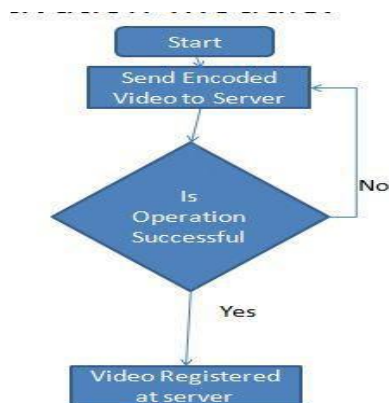


Figure 5:Video Sending Model

5. Face Detection and Motion Detection Module. (Figure 6)

- Input: Recorded video at server side
- Output: Alert if face or motion detected

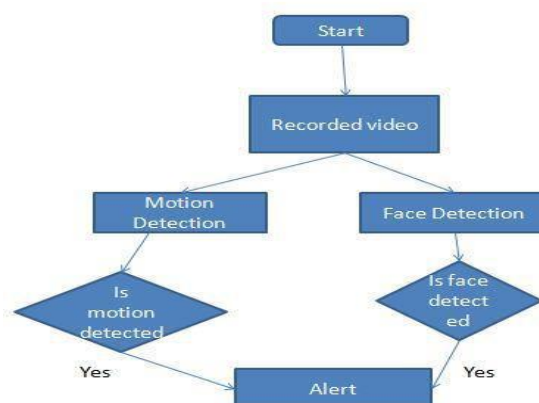


Figure 6: Face Detection and Motion Detection Module

6. Tracker Video Receiving Module (Figure 7)

- Input: Receive Command from tracker to server
- Output: Encoded Video Received

7. Tracker Video Decoding and playback Module. (Figure 8.)

- Input: Received encoded video
- Output: Decoded Video

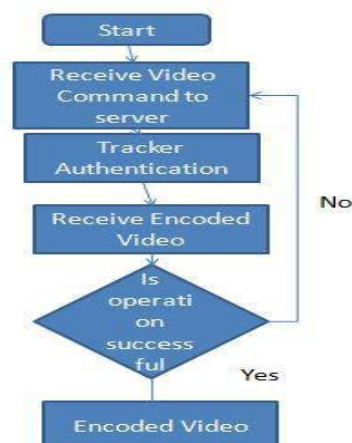


Figure 7 Tracker Video Receiving Module

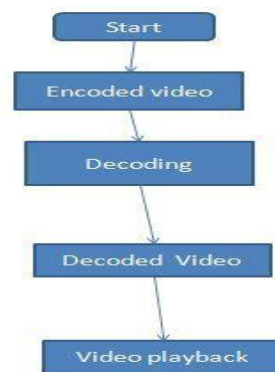


Figure 8 Tracker Video Decoding and playback Module

3. Results

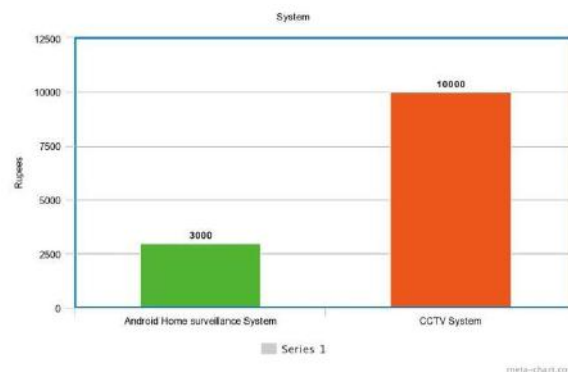


Figure 9: Costing Comparison

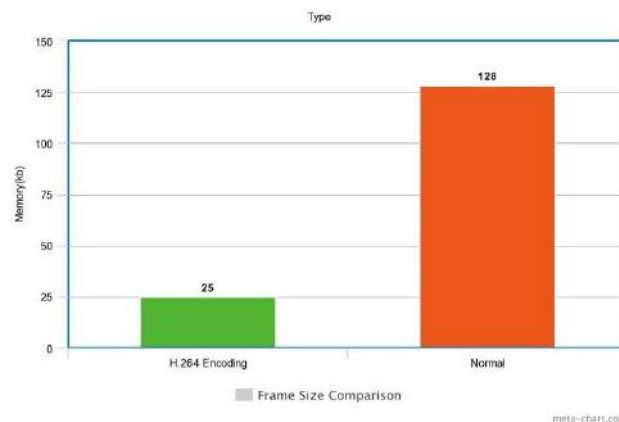


Figure 10: Frame Size Comparison

4. CONCLUSION:

With the aid of the Android mobile devices, the user can know the old man at home timely and dynamically at a remote place. The system can also provide emergency early warning. This system is of good performance and stable transmission. Simultaneously, it has a bit of intelligent ability. It is convenient and practical as well. What we have studied can provide certain reference for solving the problem of the elderly care.

The video surveillance is of great value in use and vast potential for future development. A home monitoring system based on the Android mobile terminal is convenient, flexible and can provide more help for people's daily lives. In the future it can be added more function on this basis.

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