A Study on Smart Video Security for Banks Using Mobile Remote Control

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ABSTRACT

Real-time moving object detection is critical for a number of embedded applications because threats such as security surveillance and visual tracking are involved in the detection. Moving object detection is the fundamental step in automated video analysis. It often acts as an initial step for further processing such as classification of the detected moving object. Thus moving object detection is essential for real-time surveillance; however, it is challenging to support moving object detection in a timely fashion due to the compute-intensive nature. Object detection in a video is usually performed by object detectors or background subtraction techniques. Often, an object detector requires manually labeled examples to train a binary classifier, while background subtraction needs a training sequence that contains no objects to build a background model. To automate the analysis, object detection without a separate training phase becomes a challenging task. In this paper, a novel algorithm for moving object detection is proposed which falls into the category of motion based methods. It solves the challenges in a unified framework named DEtecting Contiguous Outliers in the LOw-rank Representation (DECOLOR).
Keywords: Automated video analysis, low-rank modeling, motion segmentation, moving object detection, surveillance.

1. INTRODUCTION

Now days high levels of security at public access facilities like airports and seaports is an extremely complex challenge. A number of technologies can be applied to various aspects of the security challenge, including screening systems for people and objects (bags, vehicles, etc.), database systems for tracking "trusted people," biometric systems to verify identity, and video surveillance systems to monitor activity. Today's video surveillance systems act as large-scale video recorders, either analog or digital. Their primary focus is the application of video compression technology to efficiently multiplex and store images from a large number of cameras onto mass storage devices (either video tapes or disks). These systems serve two key purposes: providing a human operator with images to detect and react to potential threats and recording evidence for investigative purposes. While these are the first steps in using video surveillance to enhance security, they are inadequate for supporting both real-time threat detection and forensic investigation. By considering these aspects we decide to take a survey on different video surveillance system and make a new technology or system for bank video surveillance system.

2. EXISTING SYSTEM

In paper [1] Object detection is a fundamental step for automated video analysis in many vision applications. Object detection in a video is usually performed by object detectors or background subtraction techniques. To automate the analysis, object detection without a separate training phase becomes a critical task. People have tried to tackle this task by using motion information. But existing motion-based methods are usually limited when coping with complex scenarios such as nonrigid motion and dynamic background. In this paper, they show that the above challenges can be addressed in a unified framework named DEtecting Contiguous Outliers in the LOw-rank Representation (DECOLOR). This formulation integrates object detection and background learning into a single process of optimization, which can be solved by an alternating algorithm efficiently. They explain the relations between DECOLOR and other sparsity-based methods. Experiments on both simulated data and real sequences demonstrate that DECOLOR outperforms the state-of-the-art approaches and it can work effectively on a wide range of complex scenarios. Also Paper [2] tells us that, Scene change detection is a key technique of video coding; it has an important impact on the video quality. This paper analyzed and compared three conventional algorithms of scene change detection, aiming at the shortcoming of scene change detection algorithm based on image complexity, presented an improved algorithm of scene change detection based on image complexity combining with G012 rate control standard. Some experimental results show that the improved algorithm could correctly detect sudden scene change and gradual scene change between GOP, overcomes the problem which the original algorithm could not detect the gradual scene change between GOP, and effectively enhances detection accuracy of scene changes in video sequences. In paper [3] they talk about, Remote video surveillance is the use of cameras and other surveillance equipment to monitor properties and assets from a separate location. It is often used as a force multiplier or asset protection device for areas where it is not possible, practical, or

affordable to install a cable network. It is commonly deployed in city and campus applications, or any place where it is difficult to monitor the surroundings using common means. Remote surveillance is a great opportunity to use wireless technologies for connectivity due to the flexibility they provide. A video surveillance system is only as reliable as the network it is connected to, so careful planning of the network technologies and equipment choices are crucial. By doing such work they would allow user to keep a watch on security location from any remote location. The communication and the platform needed to access surveillance devices should be standard channel and device. The communicating and accessing device should be fully based on software. This will make easy for user to control and access surveillance devices. Accounts for all users should be maintained. This will make proper utilization of communication bandwidth using standard software based platform. This allows user to access surveillance devices from a standard user friendly platform like web portal or mobile devices.

3.COMPARISON OF EXISTING SYSTEM

3.1 Closed-Circuit Television (CCTV)

CCTV is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. It differs from broadcast television in that the signal is not openly transmitted, though it may employ point to point (P2P), point to multipoint, or mesh wireless links. CCTV is often used for surveillance in areas that may need monitoring such as banks, casinos, airports, military installations, and convenience stores. It is also an important tool for distance education. In industrial plants, CCTV equipment may be used to observe parts of a process from a central control room, for example when the environment is not suitable for humans. CCTV systems may operate continuously or only as required to monitor a particular event. A more advanced form of CCTV, utilizing Digital Video Recorders (DVRs), provides recording for possibly many years, with a variety of quality and performance options and extra features (such as motion-detection and email alerts). More recently, decentralized IP-based CCTV cameras, some equipped with megapixel sensors, support recording directly to network-attached storage devices, or internal flash for completely stand-alone operation. Surveillance of the public using CCTV is particularly common in the UK, where there are reportedly more cameras per person than in any other country in the world. There and elsewhere, its increasing use has triggered a debate about security versus privacy.

3.2 Computerized monitoring

CCTV monitoring station run by the West Yorkshire Police at the Elland Road football ground in Leeds. The system identifies where a person is, how he is moving and whether he is a person or for instance a car. Based on this information the system developers implement features such as blurring faces or "virtual walls" that block the sight of a camera where it is not allowed to film. It is also possible to provide the system with rules, such as for example "sound the alarm whenever a person is walking close to that fence" or in a museum "set off an alarm if a painting is taken down from the wall".VCA can also be used for forensics after the film has been made. It is then possible to search for certain actions within the recorded video. For example if you know a criminal is driving a yellow car, you can set the system to search for yellow cars and the system will provide you with a list of all the times where there is a yellow car visible in the picture. These conditions can be made more precise by searching for "a person moving around in a certain area for a suspicious amount of time", for example if someone is standing around an ATM machine without using it. Maintenance of CCTV systems is important in case forensic examination is necessary after a crime has been committed. In crowds the system is limited to finding anomalies, for instance a person moving in the opposite direction to the crowd, which might be a case in airports where passengers are only supposed to walk in one direction out of a plane, or in a subway where people are not supposed to exit through the entrances. VCA also has the ability to track people on a map by calculating their position from the images. It is then possible to link many cameras and track a person through an entire building or area. This can allow a person to be followed without having to analyze many hours of film. Currently the cameras have difficulty identifying individuals from video alone, but if connected to a key-card system, identities can be established and displayed as a tag over their heads on the video.

3.3 Closed-circuit digital photography (CCDP)

A development in the world of CCTV (October 2005) is in the use of megapixel digital still cameras that can take 600 x 200 pixel resolution images of the camera scene either on a time lapse or motion detection basis. Images taken with a digital still camera have higher resolution than those taken with a typical video camera. Relatively low-cost digital still cameras can be used for CCTV purposes, using CCDP software that controls the camera from the PC. Images of the camera scene are transferred automatically to a computer every few seconds. Images may be monitored remotely if the computer is connected to a network. Combinations of PIR activated floodlights with .3Mpix and better digital cameras are now appearing. They save the images to a flash memory card which is inserted into a slot on the device. The flash card can be removed for viewing on a computer if ever an incident happens. They are not intended for live viewing, but are a very simple and cheap "install and forget" approach to this issue. Closed-circuit digital photography (CCDP) is more suited for capturing and saving recorded photographs, whereas closed-circuit television (CCTV) is more suitable for live monitoring purposes.

4.STUDIED SYSTEM ARCHITECTURE

On the basis of below reference paper we prepare our system architecture for the remote bank video surveillance system.
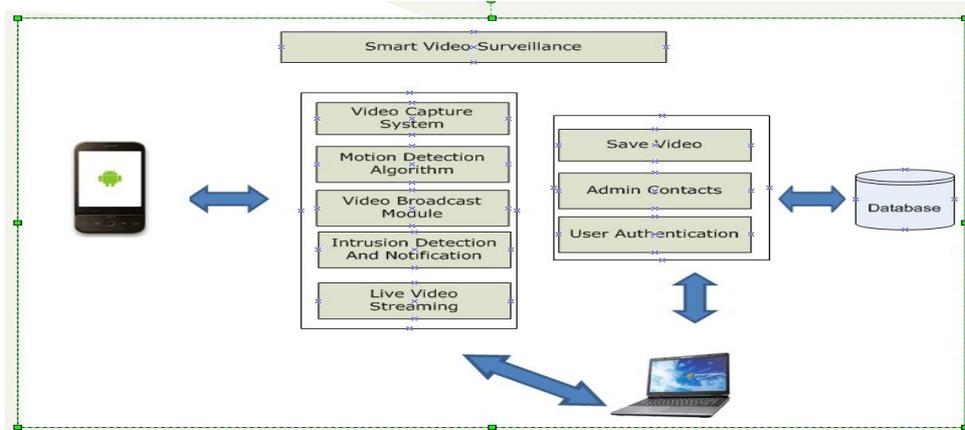

Figure 1. System Architecture

1) Remote access can be provided by almost any communications means possible.
2) User can either log on to home server via internet connection and control/monitor using appropriate authentication.
3) Alternatively user can control the system using SMS messages. A short application written for mobile can also take care of sending the messages from user's mobile to home server Android Mobile. This will eliminate the need for the mobile user to remember the long keyword sequences to be sent in order to activate/deactivate a control, etc.
4) In case none of the above communication means are possible, user can simply use email to send authenticated mails to home server account and control the system. User can also receive the feedback information via email.
5) Proper authentication using mobile number, email id, and passwords is done before the user is allowed to control/monitor the home server.
6) Using a camera and motion detection algorithm user is also informed about any intrusion and the image/video is transmitted online.
7) User can also send a series of command sequences scheduled for a later time. The commands will be executed automatically at the server when the time arrives. The commands may include activating / deactivating a relay, setting threshold, etc. Live streaming Over Mobile Phone.

5.CONCLUSION

From above survey we conclude that now days there are many new and advance technology are available in market for video surveillance system. But there no proper use of that system, that's why by surveying such systems in market we are going to implement new type of video surveillance system for banking purpose. Also such systems transform video surveillance from a data acquisition tool to information and intelligence acquisition systems. Real-time video analysis provides smart surveillance systems with the ability to react to an activity in real-time, thus acquiring relevant information at much higher resolution. The long-term operation of such systems provides the ability to analyze information in a spatiotemporal context.

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