

Surveillance of Object Motion Detection and Alert Using Android

M.Dennish Ammu¹, P.Puviyarasi², S.Sathish Kumar³

UG Scholar, Department of ECE, Jayalakshmi Institute of Technology Dharmapuri, Tamilnadu, India¹

UG Scholar, Department of ECE, Jayalakshmi Institute of Technology Dharmapuri, Tamilnadu, India²

Associate Professor, Department of ECE, Jayalakshmi Institute of Technology Dharmapuri, Tamilnadu, India³

ABSTRACT: Video Surveillance systems have increase their needs of dynamism in order to allow different users to monitor the system selecting different quality of service (QoS) depending on the system status and to access live and recorded video from different localizations, for example mobile devices through android application. More concretely, in IP surveillance systems, some resources involved are limited or expensive so dynamic reconfiguration could become competitive advantage for system integrator and designers able to offer flexible applications which are adaptable to users needs. This surveillance based service system provides security for particular place which alerts the user by sending alert messages. We proposed the background subtraction technique to detect the foreground objects in frequency domain with the absence of background noise. The simulated result shows the methodologies for effective object detection has better accuracy and less processing time consumption than existing methods.

KEYWORDS: Background subtraction; android application; Real-time surveillancesystem

I. INTRODUCTION

Automated surveillance systems are highly needed in commercial, law enforcement and military applications. Mounting video cameras is cheap, but finding available human resources to observe the output is expensive. Although surveillance cameras are already prevalent in banks, stores, and parking lots, video data currently is used only "after the fact" as a forensic tool, thus losing its primary benefit as an active, real-time medium. What is needed is continuous 24-hour monitoring of surveillance video to alert security officers to a burglary in progress, or to a suspicious individual loitering in the parking lot, while there is still time to prevent the crime. In addition to the obvious security applications, video surveillance technology has been proposed to measure traffic flow, detect accidents on highways, monitor pedestrian congestion in public spaces, compile consumer demographics in shopping malls and amusement parks, log routine maintenance tasks at nuclear facilities, and count endangered species. The numerous military applications include patrolling national borders, measuring the flow of refugees in troubled areas, monitoring peace treaties, and providing secure perimeters around bases and embassies.

II.REMOTE VIDEO SURVEILLANCE

Surveillance in many modern cities and buildings often uses closed-circuit television cameras. The word surveillance is commonly used to describe observation from a distance by means of electronic equipment or other technological means. However, surveillance also includes simple, relatively no- or low-technology methods such as direct observation, observation with binoculars, postal interception, or similar methods. Remote video surveillance enables users to view live video on a laptop, tab or mobile from just about anywhere in the world with internet.

To facilitate the remote viewing, you simply type in the IP addresses of your network security camera in your internet browser. Remote video surveillance takes remote monitoring to a whole new level. This android

application for remote video surveillance enables you to view multiple cameras simultaneously, control PTZ settings, and view recorded images, search through archived footage, play back events and much more.

III. IMPACT OF SURVEILLANCE

- The greatest impact of computer-enabled surveillance is the large number of organizations involved in surveillance operations:
- The state and security services still have the most powerful surveillance systems, because they are enabled under the law. But today levels of state surveillance have increased, and using computers they are now able to draw together many different information sources to produce profiles of persons or groups in society.
- Many large corporations now use various form of "passive" surveillance. This is primarily a means of monitoring the activities of staff and for controlling public relations. But some large corporations actively use various forms of surveillance to monitor the activities of activists and campaign groups who may impact their operations.
- Many companies trade in information lawfully, buying and selling it from other companies or local government agencies who collect it. This data is usually bought by companies who wish to use it for marketing or advertising purposes.
- Personal information is obtained by many small groups and individuals. Some of this is for harmless purposes, but increasingly sensitive personal information is being obtained for criminal purposes, such as credit card and other types of fraud.

A. SCOPE OF THE PROJECT

Some of the major challenges that need to be handled by the project include

- Changes in illumination
- Background dynamics
- Camera setup
- Object motion
- Different types of objects
- Size of the monitored area

B. PURPOSE OF THE PROJECT

The main purpose of the project is to detect all the objects that are newly added to an environment both moving objects like human beings, animals and vehicles, and immovable objects that are added to the environment. It detects motion in unwanted time and send an alert message to the user email id. The major part of this remote video surveillance is to develop an android application to view the monitoring the area from anywhere off-site.

IV. EXISTING SYSTEM

In the previous method that remote video surveillance monitoring through the android application is done through the DDNS and port-forwarding method. In this method once you have configured DDNS and port-forwarding and have obtained an IP address to view online of your security camera systems from a remote location. An adaptive model for backgrounds containing significant stochastic motion (e.g. water) is proposed. The new model is based on a generalization of the Stauffer– Grimson background model, where each mixture component is modeled as a dynamic texture. An online K-means algorithm for updating the parameters using a set test of sufficient statistics of the model is derived. A dynamic texture models the entire video frame, and pixels that are not well explained, conditioned on the previous frame, are marked as foreground. This method has limited effectiveness, because a global fit usually demands excessive representational power from the dynamic texture. The greatest challenge on monitoring characters from a monocular video scene is to track targets under occlusion conditions. First, a dynamic background subtraction module is employed to model light variation and then to determine pedestrian objects from a static scene. To identify foreground objects as

characters, positions and sizes of foreground regions are treated as decision features. Moreover, the performance to track individuals is improved by using the modified overlap tracker, which investigates the centroid distance between neighboring objects to help on target tracking in occlusion states of merging and splitting. For each frame, the foreground estimation algorithm detects a set of consistent foreground rectangles, where each of them is assumed to be either a person or a group of people. The tracker maintains the trajectory of each person overtime, whose head and foot location are sent to the auto-calibration module. The resulting calibration parameters are utilized by the crowd segmentation module in segmenting a group of people into individuals.

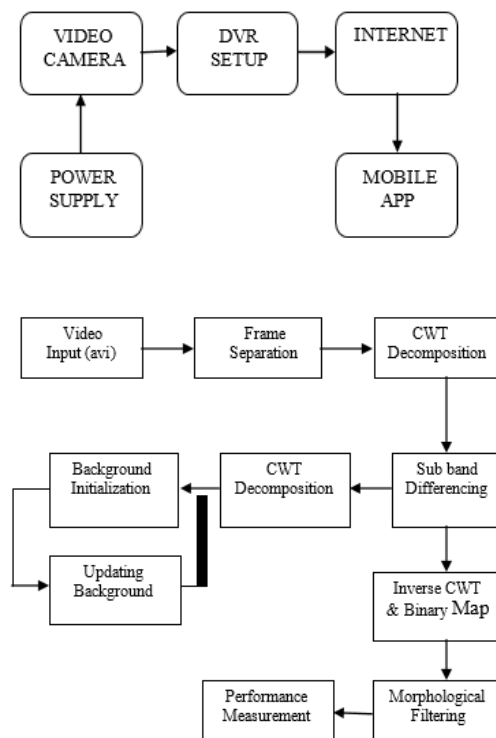
A. SUMMARY OF EXISTING SYSTEM

The major drawback of this DDNS and port-forwarding method is that this method is not securable and easily hackable. Also its time taking for setting is high. The existing system suffers from various drawbacks like sensitivity to various lighting conditions, costly computational procedures, color dependency of the object, ignorance of shape and texture of the object, limitations with respect to changing scenes.

V. IMPLEMENTATION OF PROPOSED SYSTEM

A. CONSTRUCTIONAL BLOCK DIAGRAM

A. ARCHITECTURE DIAGRAM.



An input video file in avi format is given to the system. The video file is parsed into a sequence of images called frames. The frames are then decomposed using composite wavelet transform and then subband differencing is performed. The frames are decomposed into foreground and background which are mapped after the subband differencing process and inverse composite wavelet transform is carried out. Morphological

filtering is a process that combines both erosion and dilation to improve the quality of the detected objects. Then the performance of the system is measured.

IV. MODULES

A. **FRAME SEPARATION**

An Input Video (.avi files) is converted into still images for processing it and to detect the moving objects. These sequences of images gathered from video files by finding the information about it through „aviinfo“ command. These frames are converted into images with help of the command „frame2im“. Create the name to each images and this process will be continued for all the video frames. The following diagram represents the process flow of this separation

B. **BACKGROUND SUBTRACTION**

Background subtraction is the first step in the process of segmenting and tracking. Distinguishing between foreground and background in a very dynamic and unconstrained outdoor environment over several hours is a highly challenging task. Background model is kept in the data storage, and four individual modules do training of the model, updating of the model, foreground/background classification and post processing. The first k video frames are used to train the background model to achieve a model that represents the variation in the background. When the background model has been initialized through the training period the classification of pixels as either foreground or background is a relatively simple task. If a pixel at image coordinate (x,y) lies within the subspace of RGB space described by any of the code word in the codebook at position (x,y), then the pixel is classified as background, otherwise it is foreground.

C. **MORPHOLOGICAL FILTERING**

Morphological image processing is a collection of nonlinear operations related to the shape or morphology of features in an image. Morphological operations rely only on the relative ordering of pixel values, not on their numerical values, and therefore are especially suited to the processing of binary images. Morphological operations can also be applied to grey scale images such that their light transfer functions are unknown and therefore their absolute pixel values are of no or minor interest. Morphological techniques probe an image with a small shape or template called a structuring element. The structuring element is positioned at all possible locations in the image and it is compared with the corresponding neighbourhood of pixels. Some operations test whether the element "fits" within the neighborhood, while others test whether it "hits" or intersects the neighbourhood. Zero valued pixels of the structuring element are ignored, i.e. indicate points where the corresponding image value is irrelevant.

D. **CONNECTED COMPONENT ANALYSIS**

The output of the change detection module is the binary image that contains only two labels, i.e., „0“ and „255“, representing as „background“ and „foreground“ pixels respectively, with some noise. The goal of the connected component analysis is to detect the large sized connected foreground region or object. This is one of the important operations in motion detection. The pixels that are collectively connected can be clustered into changing or moving objects by analyzing their connectivity.

In binary image analysis, the object is extracted using the connected component labelling operation, which consist of assigning a unique label to each maximally connected Foreground region of pixels. One of the important labelling approaches is “classical sequential labelling algorithm”. It is based on two raster scan of binary image. The first scan performs the temporary labelling to each foreground region pixels by checking their connectivity of the scanned image. When a foreground pixel with two or more than two foreground neighboring pixels carrying the same label is found, the labels associated with those pixels are registered as being equivalent. That means these regions are from the same object. The handling of equivalent labels and merging thereafter is the most complex task.

The first scan gives temporary labels to the foreground pixels according to their connectivity. The connectivity check can be done with the help of either a 4-connectivity or 8-connectivity approach. 8-connectivity approach is used. Here, the idea is to label the whole blob at a time to avoid the label redundancies. The labelling

operation scans the image moving along the row until it comes to the point P , for which $S = \{255\}$. When this is true, it checks the four neighbors of which Based on that information, the labelling of P occurs.

VI. SUMMARY OF PROPOSED SYSTEM

The proposed system will have better accuracy than the existing method of detection process. The android alert system reduces the crime or illegal activities in the monitoring site. This method of object detection using the background subtraction will reduce the time effort greatly and it will not affect by any sensitive light changes.

VII. CONCLUSION AND FUTURE WORK

A. CONCLUSION

Remote video surveillance and mobile monitoring so favorable is because that they both fit within your busy schedule. Remote monitoring and mobile surveillance give you on-the-go, real time access to your live camera view so you can check up on your property anytime day or night. These remote solutions made by the IP camera. Object detection in video is the basis for a number of important applications such as real time surveillance and visual tracking. For performance evaluation, we have implemented and evaluated our methodology. In the experiments performed both in indoor and outdoor environments, our approach considerably reduces the detection delay while effectively handling random noise. The capability of this system extends to detecting foreground objects under all reasonable lighting conditions, tracking moving objects as they move along their trajectories, measuring the performance of the application as opposed to the ground truth of the video, handling occlusions and noises, projecting the object separated from its background.

B. FUTURE WORK

In the future we aim to improve object detection further by giving video clip in any format and in any size. In future the detected object should be named. Also, the future work will enable the user to search for any object in video by naming the object present in the video. Searching of an object will be similar to searching a word in a word document. Further the future work will empower the user to identify the time frame, duration, number of occurrence of the object. It would be a revolution in the field of surveillance if searching an object in the video by name could be accomplished. In addition to surveillance it would prove to be a greater advantage in the field of machine vision.

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