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An Effective Object Detection Video Surveillance And Alert System

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Abstract *- Traditional video surveillance system takes a large amount of storage space. Recording everything captured by a surveillance camera consumes the large storage space and hence limits the duration of video that can be stored. Recording everything makes it tedious for a human to review entire stored video. Mounting video cameras is cheap, but finding available human resources to monitor the output is expensive. All these parameters reduce the effectiveness of traditional video surveillance. To solve these problems, recording only crucial images that contains important information is the only way. Nowadays, the size of storage media increases day by day. Although the largest capacity of hard disk is about 2 Terabytes, it is not enough large if we store the video file without compressing it. Image Compression aims to describe the process of storing the image with less number of bytes in digital memory by removing the redundancy from the image. Digital Images are stored with BMP, TIFF, GIF, JPEG formats. So to overcome these disadvantages we are proposing an effective object detection and video surveillance system. Video surveillance has found its importance for security purpose in every industry throughout the past several years, especially where the safety is of utmost importance.*

Key words - Object detection, real time video surveillance, edge detection, alert message system, SOBEL filter, motion detection.

I. INTRODUCTION

In recent years modern video surveillance systems gained attention in the wider community of computer vision and security system. Today, the issue receives more intense pursuit from the narrower but more focused visual surveillance community. An automated video surveillance system consist a network of sensors which observes people as well as other moving and interacting objects in a given environment for patterns of normal/abnormal activities, interesting events, and other domain specific goals. On the other hand, the problem of robust object detection and tracking is even harder to address given the requirement that the video surveillance systems have to operate in widely varying weather conditions and all time periods.

The objective of this paper is to describe the development of an intelligent surveillance system for urban security in an academic environment. This system incorporates with a wide range of advanced surveillance systems and provides greater accuracy in real-time moving object detection and tracking with traditional cameras. System also provides recognition of generic object classes and specific human abnormal behavior triggering an alarm, camera control and multi camera cooperative tracking, human activity recognition and analysis, recognition of simple multi-agent activities, real-time data dissemination, data logging and dynamic scene visualization. The proposed architecture takes advantage of time-varying data from multiple cameras to obtain point correspondences and perform robust calibration. It tracks a moving object in the scene and uses its location at every time step as a single point correspondence among multiple cameras.

There is an immediate need for automated surveillance systems in commercial as well as military applications. Mounting video cameras is cheap, but finding available human resources to observe the output is expensive. Surveillance cameras are already used in banks, stores, parking lots, but the video data currently is used as only “after the fact” as a forensic tool, thus losing its primary benefit as an active, real-time medium. What needed is continuous 24-hour monitoring of video surveillance so 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.

II. PRPOSED SYSTEM

Identifying moving objects from a video is very critical task in many computer vision applications, to solve these problems, recording only crucial images that contains important information is the only way. This project provides a high accuracy motion detection algorithm for real-time motion detection by considering real time video frame information, i.e., image that contains motion in the scene. This can be done with a any traditional camera and a motion detection algorithm that detects motion. The motion detection algorithm robustly distinguishes motion from lighting changes. Web camera can take the snapshot of the moving object and at the same time, it will activate the warning system before storing the frames on the memory.

A. Median filtering

The main purpose of median filtering is improve the image as a data that suppresses unwanted distortions or enhances some image features important for further processing we used median filter to enhance image quality.

B. Grey scale conversion

A grayscale digital image carries only intensity information. Grayscale images are also known as black-and-white images which are composed of shades of gray, varying from black at the weakest intensity to white at the strongest. To convert any color to a grayscale representation of its luminance, first one must obtain the values of its red, green, and blue (RGB) primaries in linear intensity encoding, by gamma expansion.

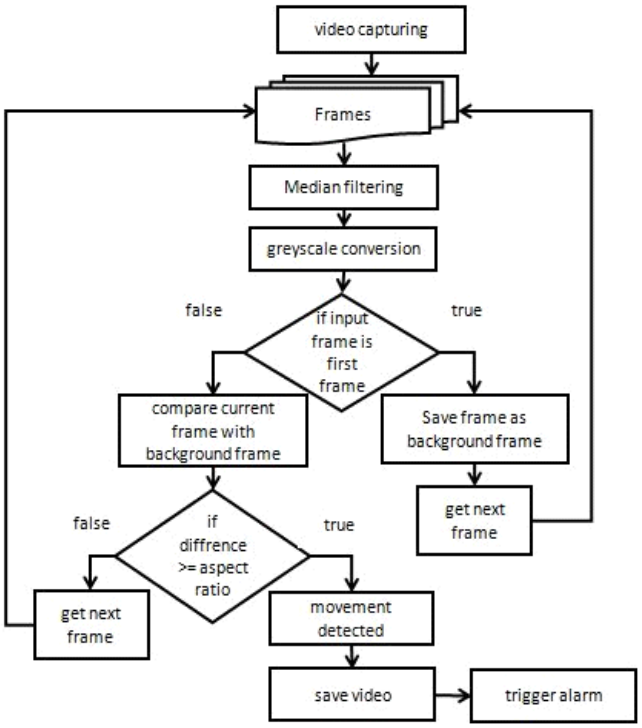


Fig 2.1 Architecture diagram

C. Algorithm

Input : Array of frames

Step 1: Perform Median Filtering

Step 2: Convert grayscale

Step 3: Take first frame f1 and compare it with next frame f2

Step 4: Compare both images

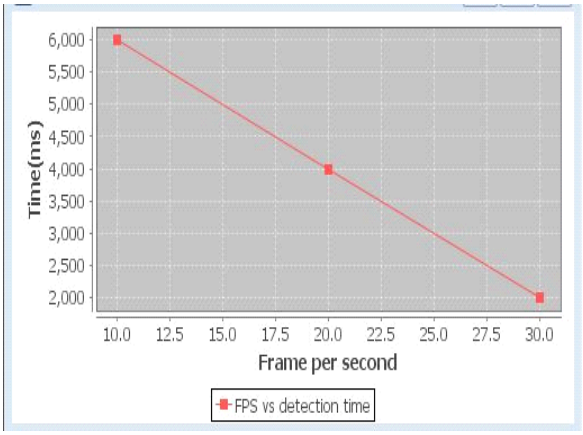
Step 5: If changes found calculate the changed area

Step 6: Detect object

Step 7: Else go to next frame

Step 8: End.

III. EXPERIMENTAL RESULTS



Graph 1 Frame per second vs detection time

IV. CONCLUSION

In this paper, real time moving object detection system based on the results indicate that the proposed system consistently performs well under different environmental conditions including indoor, outdoor, sunny, and foggy cases. Moreover, it outperforms well known edge based method in terms of detecting moving objects and error rate. Overall system result assures that the proposed system can be a suitable candidate for moving object detection in real time video surveillance system.

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