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A Comparison between Traditional Video Monitoring System and Motion Detection Using Sad Algorithm and Movie Editor

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Abstract- In this paper, we briefly summarize our video research framework and present our current work on real-time object tracking and motion detection. Traditional video surveillance system consumes large amount of data. Capturing and recording each and every data is very time consuming. Also, viewing and retrieving such data is a big issue. To overcome this problem we identify and record only interesting video frame that contains motion in scene. Continuous scene monitoring applications like ATM booths, traffic, parking system, malls, hospitals etc. consumes large volume of data. Sometimes, due to camera issues like low frame rate, less speed, noise, occlusion we cannot track the object accurately. To avoid such problems, we use movie editor in which we can edit our frame and video.

Keywords **- Image Processing, Motion Detection, Object Tracking, Movie Editor**

1. Introduction

In today's world, the security concerns have grown rapidly. Hence, it is imperative for one to be able to safeguard one's property from worldly harms such as bank robbery, theft etc. The latest technology used in the fight against thefts and destruction of property is the video surveillance and monitoring which is used to monitor and capture every inch and second of the area of interest. Video surveillance is increasing significance approach as organizations seek to safe guard physical and capital assets.

Tracking is defined as the set of constraints that describes the better action performed. One of the crucial roles in video tracking is to associate target locations in respective consecutive video frames. It is impossible to detect the objects in a fast motion relative to the frame rate. In contrast to traditional video monitoring system, only interesting video images with significant amounts of motion in the field of view should be identified and recorded.

Therefore, we have developed a methodology to detect only the motion of special interest in a video stream environment and this is an idea to ensure that the monitoring systems not only actively participate in stopping the crime, but also while the crime is taking place. As soon as any motion in a live streaming video is detected, the software will activate a warning system and capture the live streaming video. Here, we have overcome the problem of storage capacity by recording only video that contains important information, video that contains motion in the scene.

Here, we are also using Movie editor which is an integral part of this video surveillance system. With the help of this movie editor, we can modify the movie like editing, cropping, viewing the image with different angles, splitting in RGB format, cutting frames and video, compressing etc. which in turns help us view the image and video and track the object more precisely.

2. Problem Definition

1. It is very difficult to track the moving object present inside the moving videos. The algorithm known as macro block motion vectors which generates a part of video methods. Motion plays the vital role in motion features. During the training phase of normal activity, motion feature generates joint statistical distribution. If two or more people walk too close to each other, then it is very difficult to track the particular object.

2. Recording everything is very time consuming for human to review the stored video. Video surveillance is increasing significance approach as organizations seek to safe guard their physical and capital assets. But to capture each and every video is not possible. So, there is a need to review only "interesting" videos.

3. Thus, the problem of storage capacity can be resolved by recording only video that contains important information and contains motion in the scene. The large amount of data for storage and display are produced by video surveillance. Continuous and long-term human monitoring of the related video is impractical, ineffective and time-consuming. There is a need of identifying and recording only those images with significant amount of motion in the field of view and thus the video can be compressed.

3. Proposed Approach

It is better to use the macro block motion vectors which generate part of standard video methods. Motion is totally relied on motion features. During the training phase of the normal activity, this estimates joint statistical distribution of the motion features. During online operation, improbable-motion feature values indicate abnormal motion. Considering the motion vectors rather than pixel data which help us to reduce the input data rate by about two orders of magnitude that allow the real-time application on limited computational platforms. Previous works that rely on segmentation, grouping have been reported. There is a step during activity analysis which generates liberation from the process of segmentation. Movie editor is used to detect suspicious frames in videos also used to give special effects for movies.

Following are the process in the development stage:

1. Functional Requirements.
2. System modeling and simulation.
3. Code generation and implementation.

Proposed methodology shown with two diagrams:

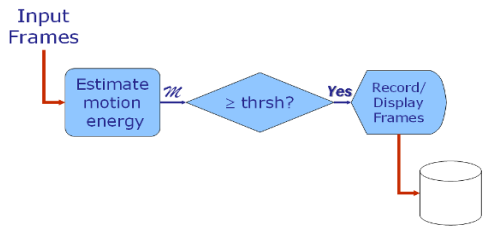

Figure 1: The Motion Detection Process

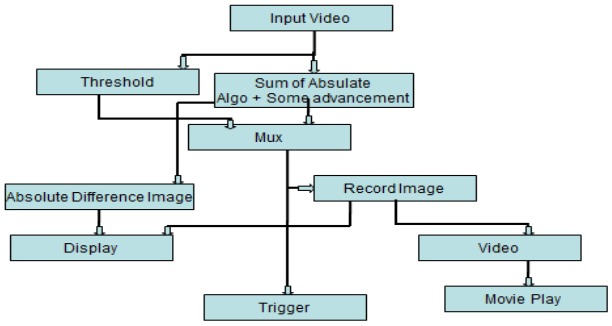

Figure 2: Video Surveillance block diagram.

4. Result

Our system detects the frame with current time by which we can monitor the person under observation.

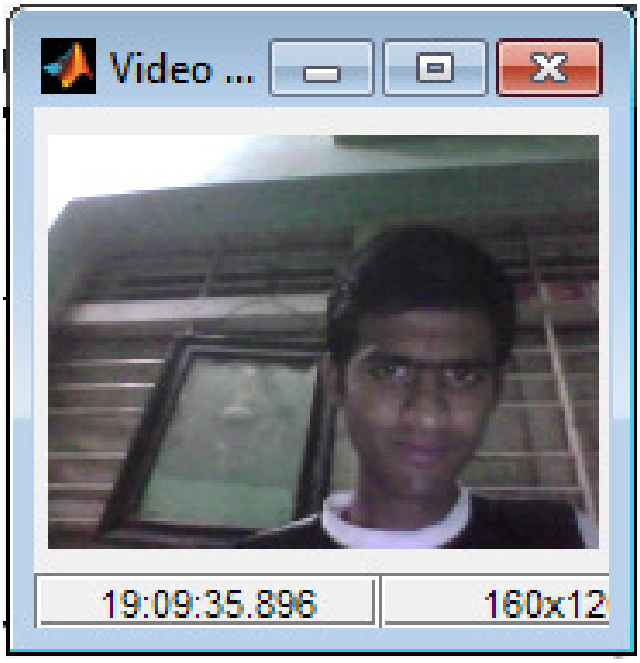

Figure 3 :- Video surveillance with time

This system shows sudden changes if there are changes in continues frame, the motion estimator detect the frame above threshold frequency. The threshold frequency value $1*e^5$ is the standard value. If the difference between the frame is above threshold value then it detects the frame through Quadrant Motion Estimator.

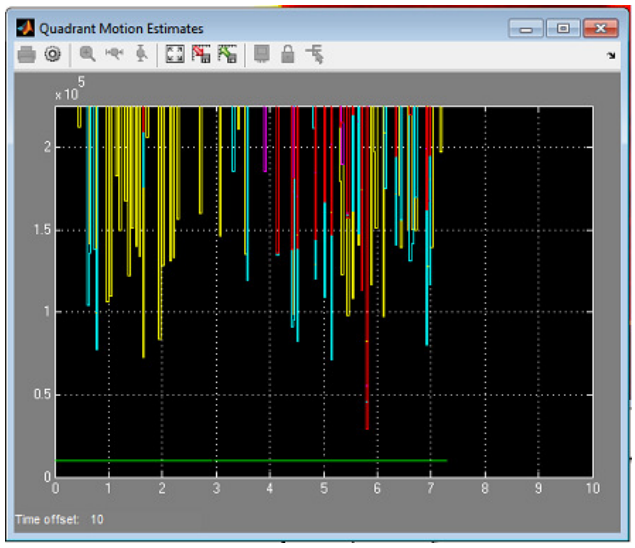

Figure 4:-Quadratic Motion Estimator

The quadratic motion estimator detects object above the threshold value. If any motion or changes occurs, it gives sudden changes in graph from which we can detect the object in real time.

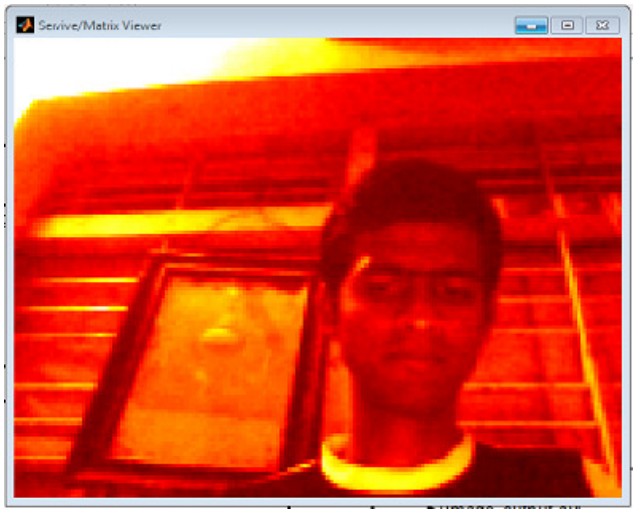

Figure 5 :-Matrix View of Frame

It detects the frame in four quadrants in such a way that it detects the red color in the frame easily and detects the object in the frame if the threshold value is high.

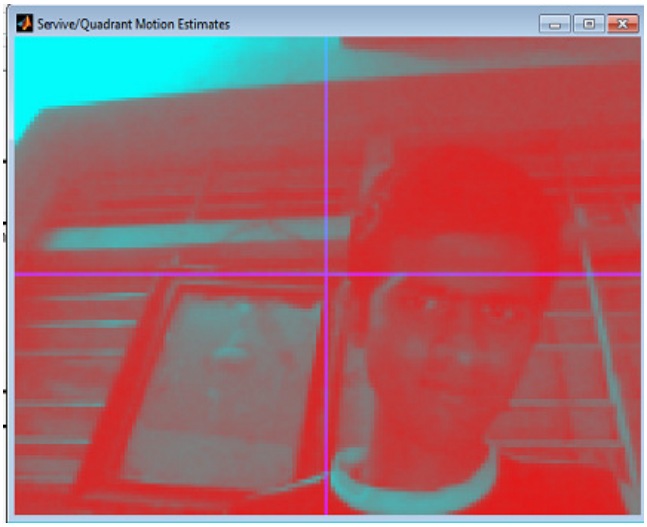

Figure 6:-Quadrant Motion Estimates

By using SAD algorithm, it detects the object by taking difference between the current frame and previous frame continuously such that it highly detects the object and its behavior. Frames are getting stored in an AVI format. The frame rate is 40 -50 frames per second. It uses cross hair and block sum algorithm to detect the frame difference in quadrant.

Figure 7:-Frame detected using SAD algorithm

Figure 8:-Frame using Intensity algorithm

5. Conclusion

This application can be used in following fields:

Security: It can useful for security purpose in Banks, ATMs, Malls etc.

Hospitals: Mainly in the field of psychiatry, where there is continuous need of monitoring of behavior of patients.

Offices: To monitor the employees and their actions.

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