Monitoring and Movement Detection of an Object Using Consecutive Frame Comparison Method

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Abstract- Movement is the act or process of moving an object or person. Movement detection system gives notification when some object for which monitoring is to be done change its physical state from one to another. This paper presents a motion detection mechanism based on consecutive Frame comparison method. System can detect the motion of real world by using camera or from within the video film by extracting the consecutive frames. This system is also tested on real world data and corresponding results are discussed.

Keywords -*Motion Detection, Movement detection using Real World Camera, Motion detection from video*

1. INTRODUCTION

Detection of movement of objects is very important in various areas. Movement is the act or process of moving an object or person. The movement system provides a continual care and the movement of persons from the site. We can use this system anywhere in homes, hospitals, malls, banks and at any public place, where we want to detect the movement.

- In the security systems like in banks we can use the movement detection systems to prevent from theft.
- In the Elevator system we can detect the unusual movement by the person or object.
- In sports we can use the movement detection of the players and by this we can take care of the kids who are playing.
- In the parking we can monitor & detect the movement of cars and prevent the cars from theft.
- On the border area we use the movement detection system for the purpose of security.

The scene analysis often starts with segmenting the foreground objects from the background of the image. This basic image motion detection step is the second part of this work. The focus is on the real-time surveillance systems. The image subtraction algorithm should be robust and able to adapt difficult and changing conditions. Furthermore, only a common case is analyzed when the camera is static. This presents an analysis of the common pixel-based image subtraction. The assumption is that the images of the scene without the intruding objects exhibits some regular behavior and that the scene can be described by a probability density function for each pixel in the image. If the image acquisition of the scene is available, the foreground objects are detected by spotting the parts of the image that doesn't fit in the scene model. The main problem is updating and adapting the scene model. An efficient algorithm that has an RGB value subtraction for each image pixel is developed. The first application is a traffic monitoring problem. The algorithms were directly applied since the camera was static. Final demonstrational system was able to automatically extract some important traffic parameters and detect some traffic events of interest. The second application was a more challenging case of tennis game matches. The

movements of the player are recognized using an appropriate set of features. Two interesting and timely problems of a practical nature are considered and the results could be of interest to many professionals in the field including video surveillance, gaming and the security system. Although very specific, the two applications have many elements that are important for any surveillance/monitoring system.

Detection of object was analyzed in the previously described algorithm. Tracking the objects is another basic operation a computer should perform in order to understand the environment. The image motion or 'optical flow' can be defined as the movement of the image patterns in an image sequence. This basic motion is important for many computer vision tasks and closely related to the object tracking problem. Measuring the motion of a single point in the image presents an 'ill-posed' problem. However, it is usually reasonable to assume that the points from a small image neighborhood have some similar motion. The movement is then calculated for a small image patch by searching the next image from the sequence for a similar patch. In the similar way an object can be tracked. A larger part of the image is considered then and therefore a more elaborate model is needed to model the possible transformation from one image to another. This type of object tracking is usually known as frame comparison. The third part of the thesis presents some improvements for the basic image motion problem. The paper will discuss the analysis of the problem of choosing the points in an image for calculating the image movement. These points are usually called 'feature points'. Not every point from an image is suitable for computing the optical flow. This problem is known as 'the aperture problem'. For example, consider an area of uniform intensity in an image. The movement of a small patch within the area would not be visible and the calculated optical flow will depend on noise. There are some standard procedures for selecting suitable points. This paper points out that most feature point selection criteria are more concerned with the accuracy, rather than with the robustness of the results. A way of estimating the 'percentage of detection Right time' is proposed. The size of the 'percentage of detection Right time' can be used as a measure of feature point Robustness

hm used to attain the background motion vector. After global motion is estimated background can be eliminated through the registration difference algorithm. At the end they use higher order statistics to attain motion target exactly. In this algorithm it improves the performance of the detection moving targets.

unity systems such as borders or buffer zones is of utmost importance in particular with worldwide increase of military conflicts, illegal immigrants and terrorism over the past decade. The purpose of this is to design the a surveillance which would detect motion in a live video feed and record the video deed only at the moment where the motion was detected also to track the moving object based on background subtraction using video surveillance. The moving object is identified using the image subtraction method.

2. PROBLEM FORMULATION

There are many of the problems with the existing systems.

- The existing systems monitor the whole video and detect the movement of person or object of the real time video by which some unusual movements will be detected which is not needed by the user.
- The existing system does not detect the small movement made by the person or by object.
- The existing system use 3G mobile phones and VGA cameras to detect the

movement, due to noise it leads to the bad results.

- The existing system does not generate any alarm during unusual movement detection.

3. PROPOSED SYSTEM:

In our research work, video is captured using a stationary camera. The selection of the model of a camera is an important aspect of any changes detection algorithm. We use a single camera that is fixed to our pc.

First of all, we load the video with the help of a stationary camera. That video will be shown in the GUI window. Then we select portion we want to detect movement from the buttons design on the right side of the GUI window. Then we click on the button Start Logging. As we click on the button Start Logging, Camera will take frame of the whole video but gives us result of portion which we have already selected in the form of graph Right time. We can also Resize the selection part with the help of buttons that are Resize(-) and Resize(+) provided on the GUI window. Similarly, we can also move to up, down, left, and right with the help of buttons that are up, down, left and right provided on the GUI window.

4. OBJECTIVE

- To develop the GUI based system for motion detection and generate the graph in which the percentage of movement is there right time.
- To develop a frame subtraction algorithm to detect the motion in consecutive frame corresponding to time.
- To compare the performance of the existing system with proposed system.

To generate the graph to represent the performance of the proposed system

5. RESEARCH METHODOLOGY

1. First we attach a stationary High quality camera with the system. Then we select the portion of which we want to capture movement by using GUI Buttons.
2. After this we use GUI start monitoring button for start the movement capturing.
3. The stationary camera captures the real time video by which the system can store the current frame and last frame of video.
4. Then the algorithm divides the each frame in to pixel by pixel and finds the RGB value of each pixel.
5. Then convert the value of pixels into array of rows and coloums.
6. After this subtract the RGB value of each pixel of last frame from the current frame.
7. Then after subtraction of RGB values of two frames, it calculates the absolute value of each pixel.
8. By using absolute value, if the result is in the negative integer it converts into the positive integer.
9. Then convert the RGB value in to black & white which shows only two values of each block i.e. 0 and 1.
10. After this combine the binary value of each block to make a new image and open it into black & white area in which the changes show the white i.e. 1 & unchanged portion shows the black i.e. 0.
11. Then calculate the percentage of changes of the selected portion , by using the changed area Right whole selected area.
12. Store the current frame into previous frame.
13. At the end the graph will show the percentage of movement Right time in seconds.
14. Repeat steps from 3 to 13 until the there .

We take low quality and high quality videos from two different cameras as input. we run

both the low quality as well as high quality video on the proposed system for taking result as output.

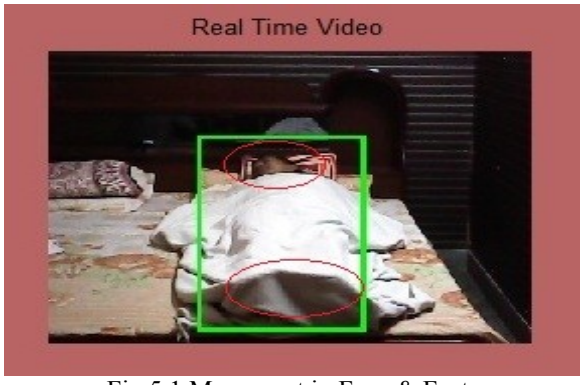

Fig 5.1 Movement in Face & Feet

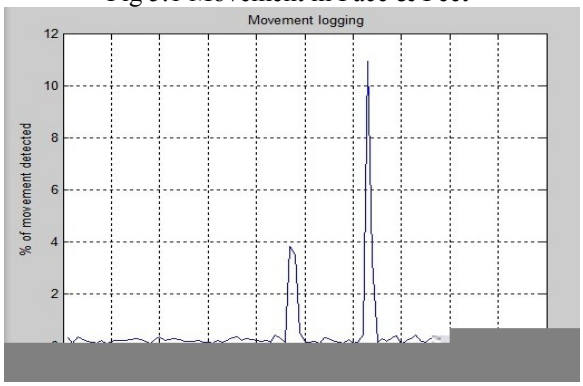

Fig 5.2: Graph of Movement of Face & Feet

6. CONCLUSION

In this study, a new method of monitoring and movement detection system is proposed. By using the image subtraction of the consecutive frames taken by the camera, We can select the needed part of the video instead of whole video and detect the various changes made by the any person or by object. The identification of the appropriate changes made by the person or by object is shown in the form of graphs. This research work is very helpful for video surveillance, security systems and for patient who were on bed for a long period and are unable to move. Because in these situations, only a minor movement made is detected that plays an important role.

REFERENCES

[1]Zhang shun, Su Xiuqin, Xie Liyin ," Global Motion Compensation for Image Sequences and Motion Object Detection" IEEE, 2010.

[2]Chandana S*," Real Time Video Surveillance System Using Motion Detection" IEEE,2011

[3]Milos Pilipovic et al." A Real-Time Projection System Based on Object Motion Detection and Tracking using Optical Camera"IEEE 2011.

[4]Chunrong Yuan et al," Detection of Moving Objects by Statistical Motion Analysis" IEEE, 2010

[5]Maha M. Azab et al, "A New Technique For Background Modeling and Subtraction For Motion Detection in a Real Time" IEEE,2010.

[6]Lijing Zhang et al," Motion human detection based on Background Subtraction," IEEE 2010.

[7]Suwich Tirakoat, "Optimized Motion Capture System For Full Body Human Motion Capturing Case Study of Educational Institution and Small Animation Production", IEEE, 2011

[8]Francesco Cardile, Giancarlo Iannizzotto et al, "A Vision Based System for Elderly Patients Monitoring" , IEEE, 2010

[9]Qiang Liu, Robert J. Sclabassi et al, "A DCT-Domain Approach to image change detection and its application to patient video monitoring",MultiMedia Signal Processing Workshop,IEEE,2005.

[10]K. S. Tan, R. Saatchi et al, "Real-Time Vision Based Respiration Monitoring System", IEEE 2010

