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MOVING OBJECT DETECTION WITH SHADOW COMPRESSION USING FOREGROUND SEGMENTATION

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Abstract - *Our project "Detection of moving objects with shadow compression using foreground segmentation" captures silhouettes of moving objects which will be positioned on previously recorded backgrounds to produce an interactive video network. Human tracking systems are basically popular research topics in computer industries. Our project will require to develop a certain sort of motion tracking software as one of its step towards the final goal. This project investigates the working of a foreground segmentation algorithm that will be used to extract moving foreground objects from a video. The video will be shot with a standard digital camera in a safe environment. The resulting video from the extraction process will contain a silhouette or shadow that tracks the foreground objects movements. The objectives for the project are to research a practical algorithm, implement the algorithm, and finally we apply filtering techniques to the extracted foreground to reduce the noises that will be remaining from the segmentation. This extraction process is part of a larger project that will be used as an interactive display. The entire project will combine silhouettes of moving object and pre-recorded background imageries to create a video network.*

Key Words*: *Foreground Segmentation, Kalman Filter, Shadow Compression, Shape Analysis, Silhouette.

1. INTRODUCTION

Motion detection usually is based on software monitoring algorithm that will be signaling, for example the surveillance camera begins capturing the event when the motion is detected. In object tracking system, the object is stationary that is located and the moving object is generally followed. The fundamental steps included in many computer based vision system for tracking the object and the motion detection is a real time segmentation of the moving region in the given image sequences. Segmentation is basically done in order to detect the required object accurately. Usually digital cameras are used as the input sensors, for recording the required image. In general, there are many conventional approaches and methods in moving object's detection like temporal differencing method, background subtraction method etc.

The limitation of the above specified method is that it does a very low quality job in extraction of all needed feature pixels. In background subtraction method, image background and foreground are mainly needed to be separated, then processed and analysed and then gives entire data features, but it is very much sensitive to dynamic scenes which changes due to lighting events. It is not possible to implement this without specialized hardware. Gray scale background is then subtracted from the foreground image. The resultant frames which are obtained are converted into binary image. Segmentation and the required feature extraction from sequences of frames are then performed in order to detect the moving object from the image. Then we plot a rectangular box in each frames, the object is then tracked. By checking pixel values in each and every frame, the position of the object is calculated.

2. METHODOLOGY

The equipments used for the project include a digital camera, video editing and compressing software, and a processing tool that will perform the extraction process. The digital camera will be used to take videos of moving foreground objects. Then, the video editing software will compress the video in order for the processing tool to recognize the file format. Lastly, the processing tool will output a video that will show only the shadow of foreground objects. Assumptions for the project may alter the decision for choosing the practical extraction algorithm. There are many different techniques that can extract foregrounds from videos. This project will use a statistical approach that can be applied to videos with random moving objects in the foreground. For all the categories of the information which a human can perceive, most of it comes from vision. The description of a video means one of the object's appearance in a continuous period of time. As the technology develops rapidly, the video application becomes an important aspect in everyone's daily life. In recent years, because of the rising requirement of security in public zones, intelligent video surveillance, which is an effective method, has a significant amount of influence on the society. Over the past years, numerous intelligent video surveillance systems have been emerging in the society. They play an important role on various categories of industries and places now.

In contrast to the video surveillance technology, intelligent video surveillance method have many advantages:

a) It has a 24-hour reliable surveillance: The intelligent video surveillance takes input from artificial intelligence algorithms instead of the manual work to analyze the

videos, which reduce the effect of human factor on the video surveillance result.

b) It gives a precise detection. Through defining the surveillance requirement during the process of detection, we can get a precise result of objects we want to detect.

3. PROPOSED WORK

The video in real time is obtained by using a webcam or digital camera. The background noise of the video is adjusted and the sensitivity in the video is calculated and stored. Then the difference between each of the two successive frames are analyzed. If the difference of the two successive frames is greater than a threshold value, then it is considered as a motion detection has occurred and the screenshot of the resulted difference image is generated simultaneously with an alarm. When the difference recorded is less than the threshold, it is finally considered as no motion is detected. The selection of the threshold value nearly depends upon the object detection of the environment in which it is supposed to be implemented. This selected threshold value that is then named as a sensitivity and then compared with the difference in the frames to detect the presence of the moving object. Using a triggering arrangement, the video capturing is activated or deactivated according to the requirement. Here the real time video is then captured using a webcam or digital camera. A stationary camera will record the field of the required view. A large monitoring area can lead to very small object images, which will graduately affect the resolution of the resulted object. Here the proposed algorithm is basically based on a model-free approach.

Compared with the difference in the frames to detect the presence of the moving object. Using a triggering arrangement, the video capturing is activated or deactivated according to the requirement. Here the real time video is then captured using a webcam or digital camera. A stationary camera will record the field of the required view. A large monitoring area can lead to very small object images, which will gradually affect the resolution of the resulted object. Here the proposed algorithm is basically based on a model-free approach.

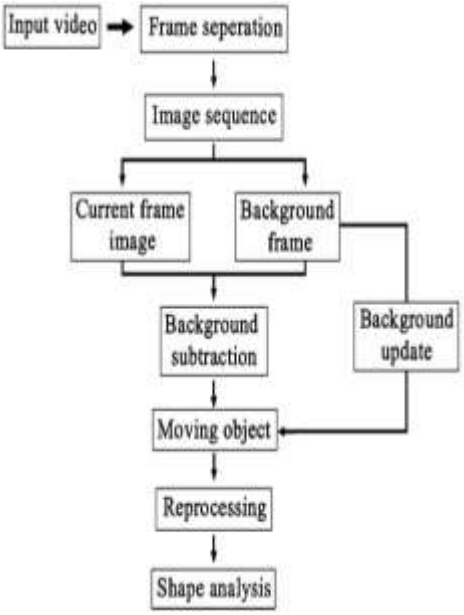

Fig -1: Flow Chart

3. RESULTS

Reference Frame: The below Image is the reference frame which we need to compare our output with. This frame has been taken from the video which we had shot in our lab. Here there is no moving object which is detected; therefore the output is as shown as below:

Fig -2: Reference Frame

Output Image: The motion of each track is estimated by a Kalman filter. The filter is used to predict the track's location in each frame, and determine the likelihood of each detection being assigned to each track. Track maintenance becomes an important aspect of this example.

Fig -3: Output Image

4. CONCLUSION

The result of our video from background subtraction fulfils most of the expectations from our project. The objective requires the extraction algorithm to accurately track the motion and the figure of any foreground objects. The extraction process does produce a well-defined figure of the foreground objects. It also can track any shape of multiple moving objects in the scene. However, the objective also requires the foreground objects to be tracked as accurately as possible. Our definite goal was to track the silhouette of moving objects and display it as our output.

5. FUTURE SCOPE

We have already implemented our project on a inbuilt video, currently we are working on tracking motion objects on live video. Only the outline of the moving objects is determined.

REFERENCES

[1] Thomas Moslund and Erik Granum, "The Survey about Computer Vision Based Human Motion Capture", Laboratory of Computer Vision and Media Technology, Aalborg University, Denmark.

[2] Nicholas R. Howe and Amanda Deschamps, "Better Foreground Segmentation Through Graph Cuts", Smith College2004,.http://maven.smith.edu/~nhowe/research/code

[3] Lijun Ding and Ardeshir Goshtasby, "On Canny edge detector", Pattern Recognition, vol. 34, pp. 721-725, 2001.

[4] Chris Stauffer and W.E.L Grimson, "Adaptive background mixture model for real time tracking", Massachusetts Institute of Technology, Cambridge, MA.

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