ANOMALY DETECTION USING OTSU BASED FEATURE EXTRACTION METHOD

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ABSTRACT

Automatic video surveillance is one of the most active areas in computer vision. At the core of automatic video surveillance are anomaly detection methods, which have been shown to be highly effective to detect unusual events without a priori knowledge about these events. In this paper an anomaly detection framework is designed using compact feature sets. The methods used are foreground detection and feature extraction. Features from foreground detection help to efficiently capture events associated with weak motion, such as loitering or the abnormal presence of subjects; while features from histogram of gradient are useful to detect events associated with sudden motion, such as panic or fights.

Multiple inference models are employed to accurately describe the activity of challenging scenes, where anomalous events can be due to sudden motion, weak motion or both.

1..INTRODUCTION

In computer vision application , such as video surveillance, human motion analysis , human machine interaction and object based video encoding, objects are often the moving foreground object in a image sequence. One effective way of foreground object extraction is to suppress the background points in the image frame. To achieve this , an accurate and adaptive background model is often desirable. Another important factor that also deters their applicability in practice scenarios is the fact that research on realistic surveillance is still very limited. We test our frame work on real sequence captured by surveillance cameras and depicting realistic events. Evaluation results shows that our framework achieves good results.

2..OBJECTIVE

To design a video anomaly detection framework suitable for compact features set.

To reduces the number of features to be processed during the training and interference stages.

3.. RELATED WORKS:

Anomaly detection methods can be classified into two main categories: accuracy-oriented methods and processing-time-oriented methods.

Accuracy oriented methods concerned with improving the detection accuracy. The class of accuracy-oriented methods has seen important contributions over the past decades. However, the good performance of these methods is usually attained at the expense of increasing frame processing times. These methods are characterized by employing various techniques to first select the spatio-temporal regions of the scene to be modeled and analyzed. Such techniques include dense scanning , multi-scale scanning and convolution-based Spatio-Temporal Interest Point (STIP) detection . These techniques usually provide sufficient data to capture the scene's dynamics and spatio-temporal compositions; however, the number of spatio-termporal regions selected for analysis may result in a large number of features to be processed .

Processing-time-oriented methods are concerned with reducing frame processing times. Processing-time-oriented methods have recently gained interest within the area of video anomaly detection These methods usually reduce computational times by reducing the

number of features to be processed per frame or by employing local low-complexity descriptors.

Optical flow method has recently gained interest within the area of video anomaly detection. These methods usually reduce computational times by reducing the number of features to be processed per frame. It is used improve the framework detection accuracy by exploiting this flexibility; specifically, by considering the optimization of our framework's parameters given a particular set of environmental conditions used to capture a sequence.

4.. PROPOSED WORK:

In our project a video is captured by the stationary camera which is placed in ATM for detection of anomaly, then converting the video into frames and stored it in a folder. Next foreground detection is done by using otsu's method. only few number of frames are taken for analyzing the video based on frame rate of 25fps. For different recognition problems, it is necessary to adopt different methods for feature selection and extraction. Features which are for one task may not be effective on others. That is to say, according to specific application, it is necessary to select different feature extraction methods. Among them, the Histogram of Oriented Gradients is the most commonly used.

A.BLOCK DIAGRAM:

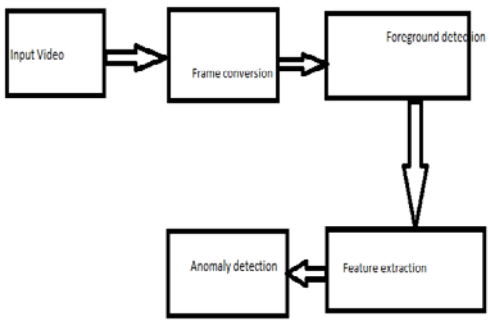


Fig: block diagram of video anomaly detection

B.FRAME CONVERSION:

FRAME RATE:

Frame is one of the many still images which compose the complete moving picture. Frame rate is expressed in number of frames per second or fps.It is a frequency at which consecutive images called frames appears on a display .This applies equally to film and video cameras , computer graphics and motion capture system.Frame rate may also be called as frame frequency and be expressed in hertz.

5. FOREGROUND DETECTION:

Foreground detection is one of the major tasks in the field of computer vision whose aim is to detect changes in the image sequences. Many application do not need to know everything about the evolution of movement in a video sequence , but only requires the information of changes in the scene. Detecting foreground to separate these changes taking place in the foreground of the background. It is a set of techniques that typically analyze the video sequence in real time and are recorded with a stationary camera.

A.ALGORITHM:

1.OTSU'S METHOD:

It is used to automatically perform clustering based image thresholding or the reduction of a graylevel image to a binary image. The algorithm assumes that the image contains two classes of pixels (foreground and background pixels).Otsu threshold method seems to have produced a perfect extraction and yielded good result in moving object tracking. Otsu's method is used to convert gray level image to a binary image. The two clusters are obtained by Otsu method based on threshold value and the statistical measures are optimized. The automatic thresholding of gray-level images via two-dimensional. This method provides good segmentation of the object in an image. It calculate the optimum threshold by separating two classes so that their combined spread is minimal or equivalently so that inter-classes variance is maximal. The extension of the original method to multilevel thresholding is known as multi-otsu method.Compute histogram and probabilities of each intensity level. Set up initial values. Set through the all possible threshold 1,2,3,… .The advantage of this method is it operate directly on the gray level histogram, so it is fast.

6. RESULTS AND CONCLUSION :

In this paper, a work on moving objects detection is performed based on various threshold values. Our framework extracts a compact set of features based on foreground detection and histogram of gradient information. The binarized image which allows

extracting features from a limited number of different frames in a fine-to-coarse fashion. This helps to process a significantly smaller number of features than those processed by dense-scanning based methods .As part of the evaluation, we also showed that our frame work is flexible to be tailored to the characteristics of the sequences, if these are known a priori, in order to improve performance. Our future work is aimed at further enhancing our framework's detection accuracy by exploiting this flexibility ;specifically, by considering the optimization of our framework's parameters given a particular set of environmental conditions used to capture a sequence.

Table 1

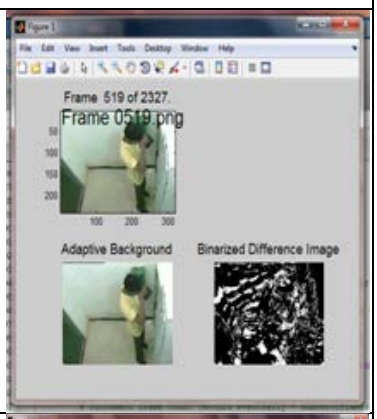
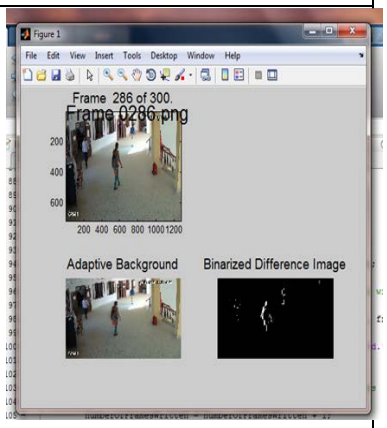
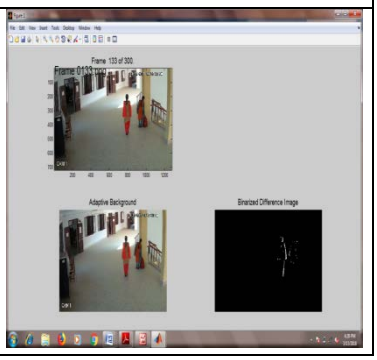
Foreground Detection Output

VIDEOS	THRESHOLD	RESULT
Video1 **Video2**	**0.9** **0.9**	**False** **False**
Video1 **Video2**	**0.5** **0.5**	**True** **True**

In this paper two videos(video 1and video 2) are taken for analysis and various threshold value is chosen to find the desired output .When the threshold value is 0.9 the binarized image does not acquire a desired output and the result image contain high noise. But when the threshold value is 0.5 the binarized image acquire the desired output. From the comparison table it is obvious that accurate result is obtained at threshold value=0.5.

Table 2

Results of anomaly detection using Various threshold level

Video	Threshold level	Video Output
Video 1	0.9	
Video 1	0.5	
Video 2	0.9	
Video 2	0.5	

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