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DETECTION & TRACKING OF MOVING OBJECT

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ABSTRACT- Now days in the aggressive field security matters have increases rapidly. That's why it is necessary of one which is capable to save anyone's personal estate from damage such as theft, demolition of property, people with awful commitment etc. Hence, it is imperative for the surveillance methodologies to also augment with the developing world. We are using Normalized cross correlation method for moving object detection, Component connected analysis for tracking of moving object and Real time video streams compression of with high reliability is possible using proposed algorithm. Apply Normalized Cross Correlation after dividing successive two video frames from video frame sequence into four parts. Then determine the sub frame with minimum value of NCC to detect the occurrence of moving object in it. After detection of moving object, track the moving object. For tracking first of all locate the movable object by investigation of connected components and by morphological dilation operation, then we has to do centroid calculation for tracking the moving object.

Keywords- Component connected analysis, Detection rate, Normalized Cross correlation

I. INTRODUCTION

Moving object detection and tracking algorithms are an important research area of computer vision and comprise building blocks of various high-level techniques in video analysis that include tracking and classification of trajectories. The problems for objects detection and tracking system:-False alarms and non-detection of the detection module, reason for that failing of module, or the very tiny objects (i.e. humans).Tracking difficulties, reason is failing of the previous modules, and partial occlusion of the objects, or stop and go motion. Susceptible to noise, less performance against noise, makes it incompatible for actual time event. Quantify the obtained results in order to evaluate and tracking algorithms used and associate a confidence measure to the obtained objects trajectories. The method helps for detection and chase of object is (NCC) and partitioning to detect the object movement .NCC method helps to find out similarities within two adjacent frames in image sequence. Based on two adjacent frame location within image sequence we can determine the value of NCC. If the similarities within two frames are higher value or exactly same in the image sequence, means object is steady or no movement of object detected. So in that case value of of NCC is maximum.

In case similarities of two consecutive frames in the image sequence are very less, that means object is movable in the frame sequence and in that case normalized cross correlation is smaller than Threshold value.

II. LITERATURE SURVEY

A. *Existing Methods:*

Below listed existing method we are using for object detection and tracking.

1) *Frame Subtraction Method:* Difference between two subsequent frames through the image sequence to find out the existence of movable component.[8]

2) *Optical Flow Method:* with the help of this method to compute the optical flow field of image and perform clustering processing corresponds to features of optical flow dispersion of image.[9]

3) *Foreground extraction by Subtraction of Background:* The difference between the present frame and background frame to find out movable objects, using very simple algorithm. But very reactive to the variation into the exterior atmosphere and has very less capacity against interference.[10]

4) *Existing Method - Drawback:* With the help of frame Subtraction is not possible to find out a complete outline of movable object, so the detection of movable object is inaccurate. Optical Flow technique has high complexity of computation, susceptible to noise, very less performance against noise and it becomes not feasible for real-time demanding occasions The Background method is very susceptible to the variation in the outside atmosphere and it has less ability against the interference

B. *Complexity in moving object detection and tracking*

Tracking of identified movable object in an frame sequence is a central part of smart surveillance system however it is having more complexity and most important task. With the help of tracking the system is able to extract interconnected temporal information about objects and higher level behavior analysis steps can achieve. Due to occlusions and reflections tracking becomes a difficult research problem. There are some situations because of that most of tracking systems often fail. This could be either because of illumination changes, pose variations or occlusions.

To eliminate fail of system we need for automatic performance evaluation emerges in these applications. Also we necessary to changes short and long term dynamic scene as like repeated movement (e.g. ignore tree leaves), brightness reflectance, shade, camera sound and unexpected That's why , it is imperative role to take attention to finding out espial of object stage to be steady, healthy and rapid visible surveyance system.

C. Proposed method

The requirement of the system is the colour video frames captured by camera. The frame is transformed from RGB colour space to YUV colour space, and then coded in YUV colour space. To growth of the compression the weight of YUV is assigned as 4:2:2 considering the features of human vision. After conversion, Normalized cross correlation is used for motion detection and object tracking. *Advantages of Proposed method:*It is realized that the real-time firmness of video flow with high reliability to detect and track the object in frame sequence.

III. System Framework

A. Normalized Cross correlation:

Manoj S. Nagmode & Madhuri Joshi presented object determine stages to have accurate, robust and rapid visible surveyance system. The algorithm used gives superior presentation in terms of Detection Rate (DR) and dispensation time.Similarity within two images measured by correlation and it is useful in feature extraction.

$$r = \frac{\sum_m \sum_n (X_{mn} - \bar{X})(Y_{mn} - \bar{Y})}{\sqrt{\sum_m \sum_n (X_{mn} - \bar{X})^2 (Y_{mn} - \bar{Y})^2}} \quad \ldots\ldots\ldots\ldots\ldots\ldots (1)$$

In the above equation X & Y is the average pixel value in image X and Y respectively. 'r' is normalized With respect to both the images and it always lies in the range [-1, 1].

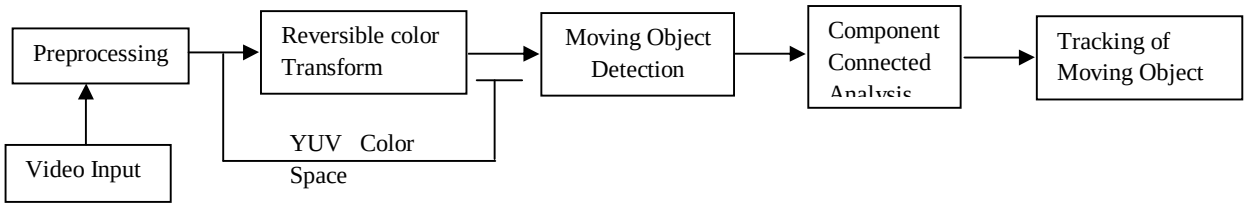

Fig. 1 System Framework

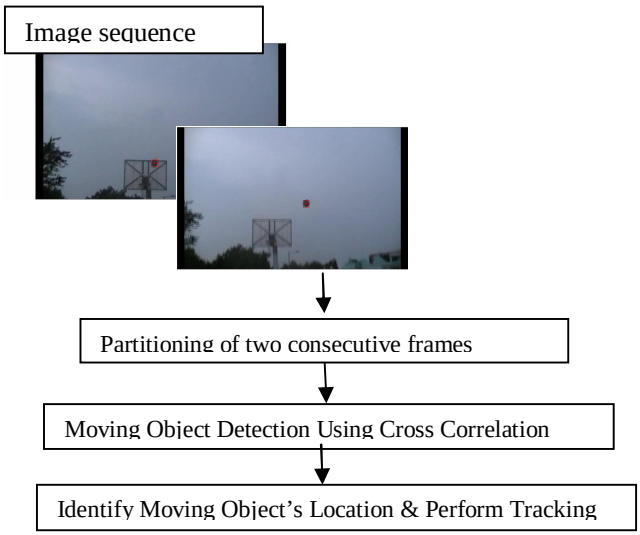

Fig. 2 Basic Steps

B. Detection & Tracking of Moving Object

For moving object detection & tracking basic steps involved in the process are shown in fig, input image sequence is taken from the static camera. Two adjacent frames in video frames are separated in four sections. Object which is moving can be detected by evaluating Normalized Cross Correlation in between two separated frames. After finding movable object, the position gained by determining component connected analysis. By determining the centre point of the identified movable object is determined in the tracking of the recognized movable object.

Tracking means the finding an object over time, thus beginning its path. To set up an association within objects in successive frames this is the plan of object tracking and to pull out temporal data of objects as route, attitude, speediness and track.

1) *Algorithm:* Below listed basic algorithm steps for moving object detection and tracking.

- Examine two successive frames from the frame series called as present frame and prior Frame
- These frames partitioned into four parts.
- For ex: present frame is segregated into four parts called as x1, x2, x3 and x4. And prior
- Frame is divided into four parts called as y1, y2, y3 and y4.
- After separating the present and prior frame in to four parts then Calculate the NCC of each section and these four values of NCC is called as r1, r2, r3 and r4.
- Compare the calculated four values of NCC of the sub image and find out minimum values of these four values of NCC.
- Apply the threshold to lower value of NCC.
- Take typical of four NCC values (i.e. r1, r2,r3 and r4) and this is called as threshold value.
- Suppose in the first part we are getting the less value of NCC that means the movable object is available in that part.
- Consider the initial part and take the difference within two successive frames of the initial part
- Locate the position of the movable object by preparing module connected analysis and Morphological processing.
- Tracking of the moving object is done by Centroid calculation.

From the r1, r2, r3 and r4 of NCC values find out second less value to perform or to check whether any other movable object is available t in other section of the image.

2) *Flow chart for detection & tracking of moving object:*

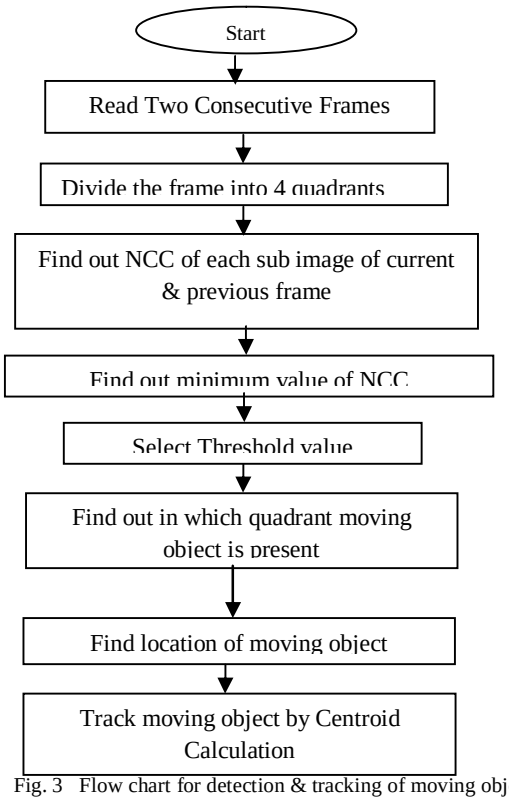

Fig. 3 Flow chart for detection & tracking of moving object

IV. Result Analysis

Software used: Windows platform using MATLAB7. Video I/P: Size 480x360, frame rate 30fps .

Fig. 4 Frame 0003 extracted from video

Fig. 5 Frame 0004 extracted from video

Fig. 6 Result After converting RGB to YUV

Fig. 7 Result After dividing frame into 4 sections

Fig. 8 Result after finding out NCC:

Fig. 9 Result after CCA:

Fig. 10 Motion of detected Object

TABLE I
DETECTION RATE & FAILURE RATE ANALYSIS.

SR. NO.	DETECTION RATE	FAILURE RATE
VIDEO 1	83%	16%
VIDEO 2	92%	1.7%
VIDEO 3	88%	11%
VIDEO 4	96%	3%
VIDEO 5	89%	10%

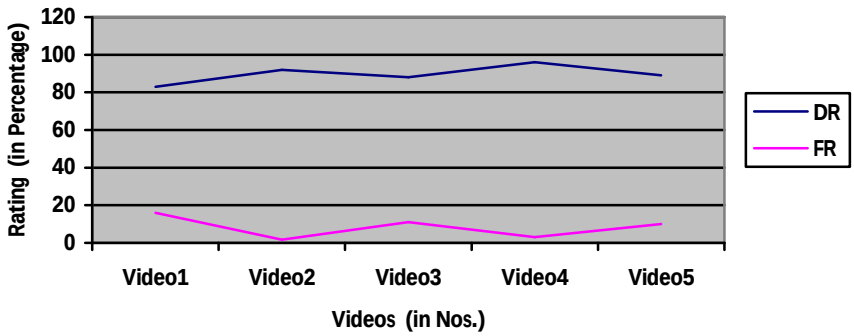

Fig. 11 Graphical analysis of Detection rate & Failure rate as follow:

V. CONCLUSION

We presented a scheme to detect moving object i.e Normalised cross correlation. A scheme is presented which employs adaptive strategy based on Normalized cross correlation and also can obtain high fidelity to detect and track the object in frame sequence.

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