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Object Based on Genetic Dynamic Saliency Map and Frame Difference Method

Venkatesh. Y[1], Meghashyam Reddy. S[2]
[1]Department of ECE, Shree Institute of Technical Education, Tirupathi, India
[2]Assistant Professor, Department of ECE, Shree Institute of Technical Education, Tirupathi, India

Abstract: The paper presents the moving object based on genetic dynamic saliency map and frame difference method. Moving object in videos is crucial in application areas such as content-based video Compression, visual surveillance and automatic traffic monitoring. In this paper, we present the genetic dynamic saliency map (GDSM) and frame difference, which is an improved version of dynamic saliency map (DSM).
Index term: saliency map, frame difference, genetic algorithm.

I. INTRODUCTION

Nowdays, vision sensor have been introduced in detecting object in day time or night time. Vision sensor can be applied in many areas, such as in medical system, military system, transportation system, robotic and control system, and surveillance system. Using vision, the system can detect, recognize and actuate accurately depend on how good the image have been processing [1],[2],[3],[4]. Identifying moving objects from a video sequence is a fundamental and critical task in many computer-vision applications. A common approach is to perform Background Subtraction, which identifies moving objects from the portion of a video frame that differs significantly from a background model. There are many challenges in developing a good Background Subtraction algorithm. First, it must be robust against changes in illumination. Second, it should avoid detecting non-stationary background objects such as moving leaves, rain, snow, and shadows cast by moving objects. Finally, its internal background model should react quickly to changes in background such as starting and stopping of objects.

Previously, the researchers are concentrated on the static camera which is fixed installed in the place and take the video of object [5], [6], [7], [8]. Current researchers now are looking for dynamic case where it was involved with raining, waving leaves, moving escalator, moving of sea water, moving of river water and moving of clouds [9]. All these unnecessary moving objects will be detected if used the traditional method such as frame differencing or mixture of Gaussian. The detection accuracy will be poor.

An approach that uses parameterized 3D model is proposed in [4]. The adopted model for object classification is a generic object model based on the shape of a typical sedan. For the purpose of estimating object parameters, we have to build the correspondence among the objects detected at the different frames by tracking schemes. The corners are detected as features for object tracking in [5]. In [3], it uses a feature-based approach with occlusion reasoning for object tracking in congested traffic scenes. Additionally, the objects are tracked through sub-features instead of entire object to handle occlusion effect. More recently, a stochastic approach called particle filtering are widely used for tracking objects by relaxing the Gaussian assumption of object motion [6].

The rest of this paper is organized as follows. In section II, we describe the overview of the GDSM method. The frame difference methods of object detection, object tracking, object classification and counting are introduced in sections III. Section IV gives some experimental results. Finally, a conclusion will be presented in section V.

II. GDSM METHOD

GDSM is an improvement of the DSM model with the help of a genetic algorithm (GA). In this method follow two steps to reduce noise. They are process of creating the saliency map (SM), weighted center-surround difference (CSD). The Gaussian noise around objects, generated by the repetitive image resizing in the Gaussian Pyramid, it reduce the object detection performance. The sizes of the moving objects are bigger than the real sizes. In this paper, the weights of CSD are optimized using GA to get tighter object regions. GA starts with a population of randomly initialized weights that are being optimized with the lower and upper bounds, which are zero and one, respectively. The average error of moving object detection in all training images is calculated based on the overlap ratio, and used in calculating the fitness function based on below equation. The overlap ratio is calculated by the ratio of theintersection area to the union area of the hand-labeled ground truth and the detected object area by the algorithm:

$$fitness\ function = E(1 - overlap\,ratio)$$

$$overlap\ ratio = \frac{A_{T\cap D}}{A_{T\cup D}} = \frac{A_C}{A_T + A_D - A_C}$$

Where At is the area of the ground truth of the target object, and is the area of the detected object using GDSM. ADis the area of the intersection. The GA algorithm has minimize the fitness function and maximum accurate and better detection by maximizing the overlap ratio in above equation.

III. PROPOSED METHOD

The block diagram of proposed method as shown in fig.1.

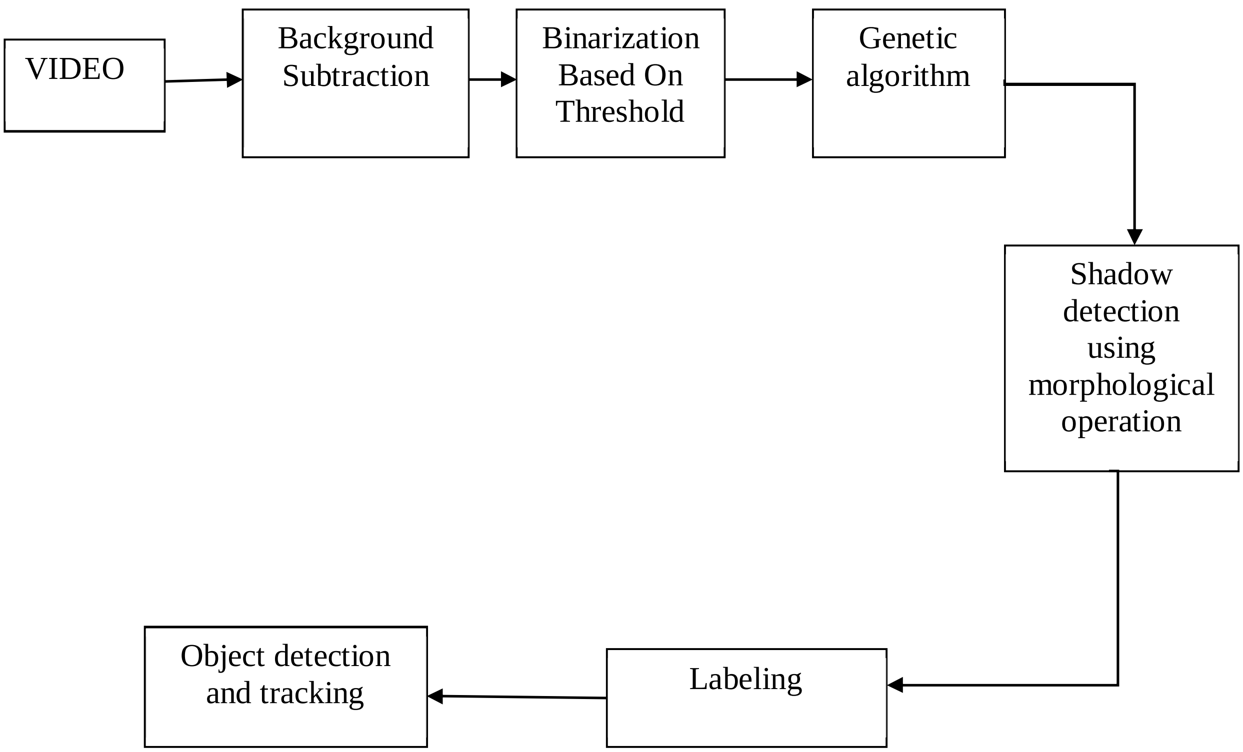

Fig.1. block diagram of proposed method

Each block will explain below subsections

A. Morphological close operation

They are two types of morphological operators. There are a number of morphological operators, but two most fundamental operations are *dilation* and *erosion*; all other morphological operations are built from a combination of these two. In binary images dilation is an operation that increases the size of *foreground* objects, generally taken as white pixels although in some implementations this convention is reversed and images erosion is an operation that increases the size of *foreground* objects.

B. Frame difference method

After obtaining GDSM, the previous image is calculated .The frame subtraction operator takes two images as input and produces as output a third image whose pixel values are ones or zeros. The subtraction of two images is performed straightforwardly in a single pass. The output pixel values are given by:

Q (i, j) = P1 (i, j) – P2 (i, j)

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Where

P1=background frame

P2=current frame from given video

There are many challenges in developing a good background differencing algorithm for object detection. First, it must be robust against changes in illumination. Second, it should avoid detecting non-stationary background frame such as moving leaves, rain, snow, and shadows cast by moving objects. In our efforts to develop a high performance algorithm for object tracking we have tried to overcome the difficulties in our object detection module. Using background differencing on background-by-frame basis a moving object, if any, is detected with high accuracy and efficiency. Once the object has been detected it is tracked by employing an region based object tracking method. The algorithm of background frames segmentation as shown below

```
Fr=rgb2gray(fr);
background_frame=abs(double(gdbs background)-double(previous frame)
for j=1:width
for k=1:height
If  background_frame(k,j)>threshold
 Fg(k,j)=fr(k,j);
else
 Fd(k,j)=0;
End
End
End
End
```

If any noises occur, used morphological operation to remove noises in a frame

IV. EXPERIMENTAL RESULTS

input image

Fig.2. original video

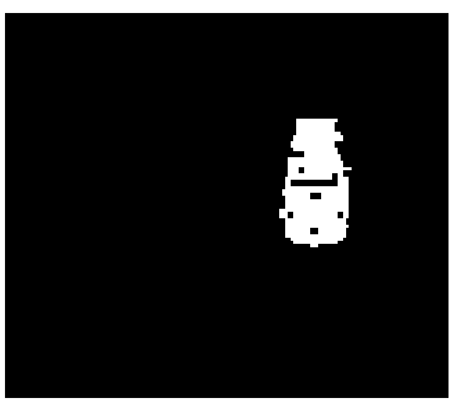


Fig.2. Segmentation based on genetic algorithm with frame difference

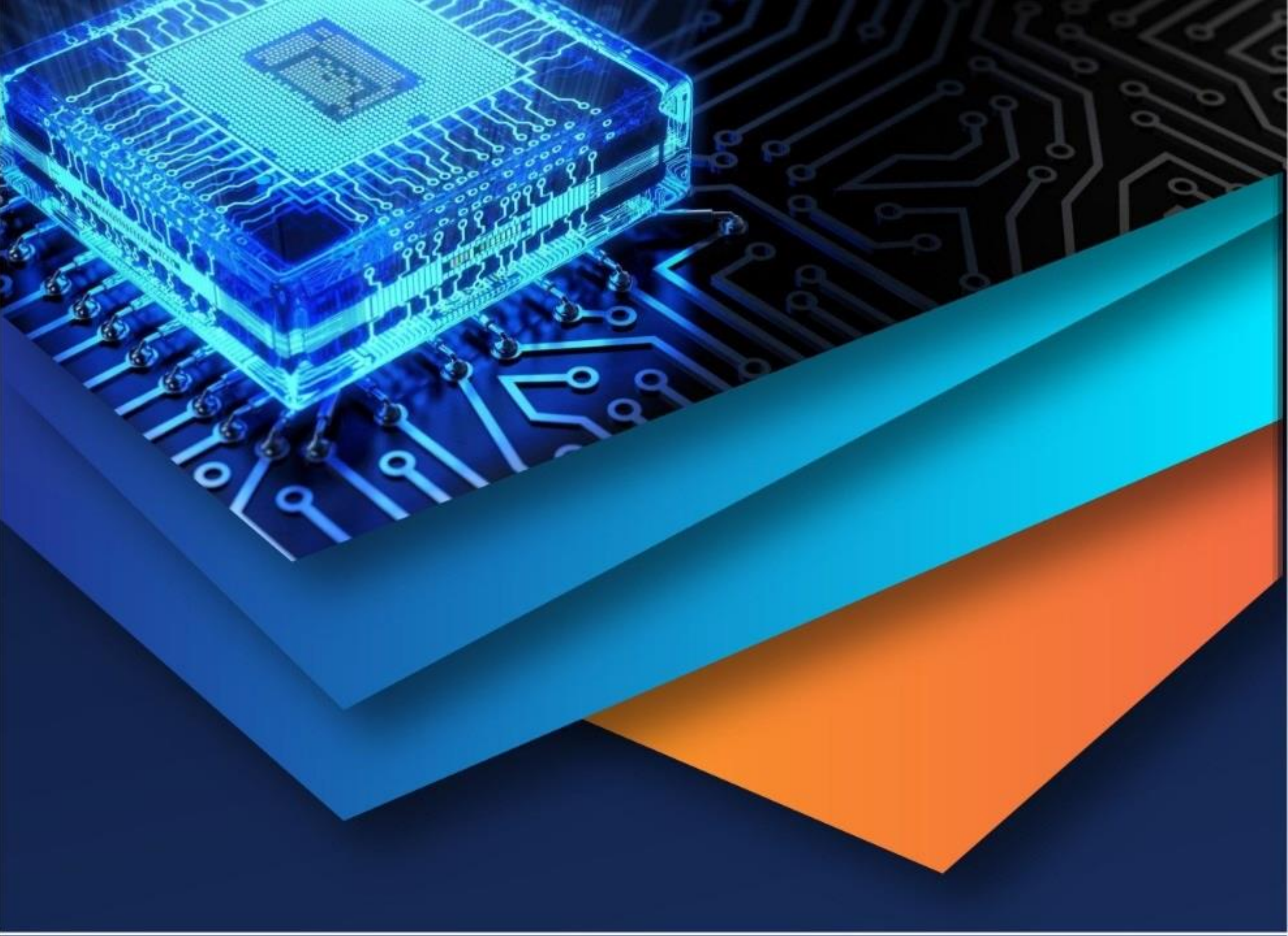
Fig.3. moving object tracking based proposed method

V. CONCLUSION

In this paper, to detect the objects and tracking using GDSM and frame difference method. This technique is detecting moving objects and tracking accurately. This algorithm is more efficient and robust for the dynamic texture environment with new objects in it. This technique has been successfully used to identify moving vehicles objectsand tracking in outdoor environments; this system achieves our goals of real-time performance over boundless experience of time lacking human intrusion.

REFERENCES

[1] Ciaran O Conaire, Noel O' Connnor, Eddie Cooke, Alan Smeaton. "Detection Thresholding Using Mutual Information". International Conference on Computer Vision Theory and Applications, 25-28 February 2006, Setubal, Portugal.
[2] Weiming Hu, Tieniu Tan, Liang Wang, Steve Maybank. "A Survey on Visual Surveillance of Object Motion and Behaviors". IEEE Transactions on Systems, Man, and Cybernatics, No. 3, August 2004.
[3] Attila Jozsef Kun, Zoltan Vamossy. "Traffic Monitoring with Computer Vision". 7th International Symposium on Applied Machine Intelligence and Informatics, 2009. SAMI 2009. Date:30-31 Jan. 2009
[4] Jianping Wu, Zhaobin Liu, Jinxiang Li, Caidong Gu, Maoxin Si, Fangyong Tan. "An Algorithm for Automatic Object Speed Detection using Video Camera". Proceedings of 2009 4th International Conference on Computer Science & Education.
[5] Chomtip Pornpanomchai, Thitinut Liamsanguan, Vissakorn Vannakosit. "Object Detection and Counting from a Video Frame. Proceeding of the 2008 International Conference on Wavelet Analysis and Pattern Recognition, Hong Kong, 30-31 August 2008.
[6] Ya-Li Hou, Grantham K.H Pang. "People Counting and Human Detection in a Challenging Situation". IEEE Transaction on Systems, Man, and Cybernatics, Vol 41, January 2011.
[7] Guruprasad Somasundaram, Vassilios Morellas, Nikolaos Papanikolopoulos. "Counting Pedestrians and Bicycles in Traffic Scenes". Proceedings of the 12th International IEEE Conference on Intelligent Transportaion Systems, St. Louis, MO, USA, 3-7 October 2009.
[8] Kulrapat Jaijing, Pakorn Kaewtrakulpong, Supakorn Siddhichai. "Object Detection and Modelling Algorithm for Automatic Visual People Counting System". 6th International Conference on Electrical Engineering/Electronics, Computer, Telecommunications and Information Technology, 2009. ECTI-CON 2009.
[9] Jie Shao, Zhen Jia, Zhipeng Li, Fuqiang Liu, Jianwei Zhao, Pei-Yuan Peng. "Robust Visual Surveilllance based Traffic Information Analysis and Forewarning in Urban Dynamic Scenes". IEEE Intellligent Objects Symposium University of California, San Diego, Ca, USA 21-24 June, 2010.



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