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Background Detection by Two Way Technique

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Abstract— **Background subtraction is one of the key techniques for automatic video analysis, especially in the domain of video surveillance. Although its importance, evaluations of recent background subtraction methods with respect to the challenges of video surveillance suffer from various short comings. To address this issue, we identify the main challenges of background subtraction in the field of video surveillance. We then compare the performance of two background subtraction methods. First we subtract the background by median value method and then by histogram method. Then we see the result of both methods on Casia NLPR gait database.**

Keywords— **Foreground detection, Median Value, Histogram, Background subtraction**

I. INTRODUCTION

A common method for search-space reduction and focus of attention modelling in video analysis is background subtraction. The term Background subtraction covers a set of methods that aim to distinguish between foreground and background areas in video sequences utilizing a background model Over the past years, various BS methods have been developed (cf. surveys [6]), with each of them having its own characteristic, strength and weakness. Evaluation allows identifying those characteristics and helps to focus on the remaining problems. Although its importance, literature lacks of comprehensive evaluation of recent Background subtraction methods. One reason might be the huge effort involved in generating qualitatively high ground truth (GT) data of natural video sequences. Hence, some evaluations only use a few labeled frames or judge the performance at object level, which is considerably easier. However, evaluation at pixel-level provides more insight into strengths and weak nesses. Several methods for performing background subtraction have been proposed in the recent literature [1].

All of these methods try to effectively estimate the background model from the temporal sequence of the frames. In this paper there is subtract the background by calculating median value and histogram difference. The presentation of paper is 1. Background subtraction technique 2. Median value method 3. Histogram difference method 4. Experimental results and analysis 5 paper is concluded acknowledgement to Casia nlpr gait database in section 6.

II. BACKGROUND SUBTRACTION TECHNIQUES

In this paper there is an efficient foreground detection algorithm based on a new color space model and morphological filtering. This mode luses each pixel's color distortion and brightness distortion to detect the candidate foreground pixels. The color distortion considers the vector's position in color space so that it can assemble the color features effectively. Also shadow elimination process removes the moving shadow. By applying it to background subtraction, get a comparative complete foreground object[2].

In this paper present a method to extract the object by using the histogram technique. We present an interested method based on histogram of colored image to create silhouette image. It is clear that the best bundle rectangle around the object is obtained by using the green part of the image. The histogram of each color is implemented to decide the range of intensities that represented the background, and then these three silhouettes are intersected to get the final silhouette [3].

This paper describes a new method to detect moving objects in a dynamic scene based on background subtraction. The main goal of the method is to obtain and keep a stable background image to cope with variations on environmental changing conditions. In this way, we use a double background (long-term background and short-term background) to deal with temporal stability and fast changes. In addition, this method computes the temporal changes in the video sequence by a local convolution mask taking into account the information of the pixel neighbourhood, being less sensitive to noise. Besides, the method classifies the regions of change in moving and static blobs. The first ones represent real moving objects, and the second are related to illumination changes and noise [4].

This paper deals with an efficient background subtraction of image/frames of video by improving the execution speed, accuracy and reduce the usage of memory. Three important techniques are applied to improve the efficiency: super pixel extraction, canny edge detection and fuzzy c means. On applying the above three methods sequentially, the background of image/video can be segmented from foreground object accurately. The first method reduces the processing data more than 75%. Canny edge detection is an optimized method to detect edges. Fuzzy c means works well and good to segment the overlapped objects in an image/video. [5].

III. MEDIAN VALUE METHOD

Background subtraction has been extensively used in foreground detection, where a fixed camera is usually used to capture dynamic scenes. To reliably generate the background image from video sequences is critical [5]. In the proposed system a simple motion detection method based on median value is adopted to model the background from the video sequence. Let P represent a video sequence

having N image frames. The background P (x, y) can be constructed using the formula:

$$P(x,y)= \text{median}[P1(x, y), P2 (x,y),..PN (x,y)] \quad (1)$$

The value of P (x, y) is the background brightness to be calculated in the pixel location (x, y) and median symbolizes its median value. In the proposed gait recognition system, we have computed the median value rather than mean value of pixel intensities over N frames, since,

1)Distortion of the mean value for a large change in pixel intensities while the person moves. The median is impervious to spurious values and

2)Median value Computation is comparatively faster than the least mean square value [7].

Both these statements hold with the assumption that a person continuously moves around over the frames. Subsequently, the extracted background and the original image frames are provided for the foreground modelling.

Proposed Algorithm

1. Pick up the video.
2. Read al video frames.
3. Convert all frames into gray scale with particular frame size.
4. Consider rows and column for frame.
5. For l= 2 to frames-1
6. d1=(abs(pixel(:,:,l)-pixel(:,:,l-1)))
7. d2 = (abs(pixel(:,:,l)-pixel(:,:,l+1)))
8. Find the mean of the difference for the Median Value method
9. k = (d1+d2)/2
10. Convert k frame into binary image with intensity 0.2.
11. Connect component of binary image.
12. The binary frame and gray scale video frame gives foreground frame.

IV. HISTOGRAM METHOD

First read all the video frames. Consider the current frame and previous frame for difference Calculate the histogram data difference between current frame and previous frame; use the threshold for binary image. The gray scale video and binary video frames gives the foreground frame.

A. Proposed Algorithm

1. Pick up the video.
2. Read al video frames.
3. Convert all frames into gray scale with particular frame size.
4. Consider rows and column for frame.
5. for l = 2:nrames
6. d_hist=(abs(imhist(pixel(:,:,l))-imhist(pixel(:,:,l-1))));
7. hist_diff = length(find(d_hist));
8. if(hist_diff >= 2)
9. d(:,:,l)=(abs(pixel(:,:,l)-pixel(:,:,l- 1)));
10. k=d(:,:,l);
11. Convert k frame into binary image with intensity 0.2.
12. Connect component of binary image.
13. The binary frame and gray scale video frame gives foreground frame.

V. EXPERIMENTAL RESULTS AND ANALYSIS

Extensive experimentation has been carried out to portray the effectiveness of the proposed system and a detailed comparative analysis and discussion on the results are presented in the sub-sections below.

A. Data Acquisition

The experimentation of the work is performed with images publicly available in the National Laboratory of Pattern Recognition (NLPR) gait database. A brief description of the gait database taken for study: A digital camera (Panasonic NV-DX100EN) fixed on the tripod was used for capturing gait sequences in an open-air environment. The images correspond to a single subject poignant in the field of view without occlusion.

Figure 1. Sample of images for background subtraction.

B Results

This subsection contains the results of the experiments. The publicly available NLPR gait Database is employed in proposed work. The results of the presented two background subtraction technique is given in figure 2 and figure 3.

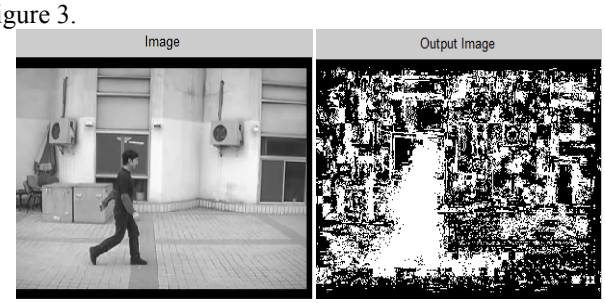

Figure 2 : (a) and (b) respectively.

In figure (a) frame is gray scale Video and fig(b) is frame foreground frame by using median value method.

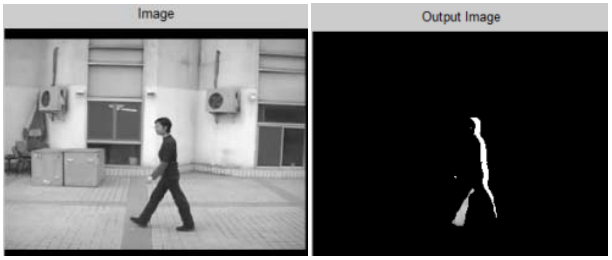

Figure 3 : (a) and (b) respectively

In figure (a) frame is gray scale Video and figure(b) is foreground frame by using Histogram method.

C Analysis

Histogram difference method is better than median value method The histogram difference calculating method is give fine foreground image than median value method ,and execution time is also vary.

VI. CONCLUSION AND FUTURE WORK

This paper uses two method for background subtraction. Among histogram difference method is better than median value method The histogram difference calculating method is give fine foreground image than median value method ,and execution time is also vary. In future work, these foreground detection techniques is used for Gait recognition, and try to find foreground with other effective method and give less noise.

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REFERENCES

[1] Brutzer, Benjamin H ferlin, Gunther Heidemann, “Evaluation of Background Subtraction Techniques for Video Surveillance”,Sebastian Intelligent Systems Group, University¨ t Stuttgart, Germany.

[2] Sivabalakrishnan.M and Dr.D.Manjula, ”An Efficient Foreground Detection Algorithm for Visual Surveillance System” , IJCSNS International Journal of Computer Science and Network Security, VOL.9 No.5, May 2009.

[3] Muzhir Sh. Al-Ani, Isra H. Al-Ani, “Gait Recognition Based Improved Histogram”, Journal of Emerging Trends in Computing and Information Sciences©2009-2011 CIS Journal, VOL. 2, NO. 12, December 2011 ISSN 2079-8407.

[4] Elas Herrero-Jaraba , Carlos Orrite-Uruuela, Jess Senar, “Detected motion classification with a double-backgroundand a Neighborhood-based difference “ , Pattern Recognition Letters 24 (2003) 2079–2092.

[5] Poornima S, Suganya Devi K, “Efficient Background Subtraction Using Fuzzy C Means” , Journal of Computer Applications ISSN: 0974 – 1925, Volume-5, Issue EICA2012-3, February 10, 2012.

[6] Massimo Piccardi,” Background subtraction techniques: a review”, IEEE International Conference on Systems, Man and Cybernetics, 2004.

[7] Liang Wang, Tieniu Tan, Huazhong Ning, and Weiming Hu, "Silhouette Analysis-Based Gait Recognition for Human Identification", IEEE transactions on pattern analysis and machine intelligence, Vol. 25, No. 12, December 2003.

[8] CASIA Gait Database, http://www.sinobiometrics.com