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Analytical Study Of Real Time Object Tracking For Video Survelliance

Ms. Gayatri D. Datarkar[1], Prof. Rahul Dhuture [2]
[1](gdkatole@gmail.com , ECE, TGPCET/ NAGPUR, India)
[2](rmdhuture@gmail.com ECE, TGPCET/ NAGPUR, India,)

Abstract: *Real time Object tracking is important task in video surveillance, human–computer interaction, traffic pattern analysis and robotics. The proposed modified mean shift algorithm is used for continuous tracking in complex situations, such as the shape and the illumination of the object change. The mean shift algorithm is utilized here to detect the object target area, and then a decision on the tracking effect is made. If tracking fails, the object area is matched with the target model and a new track position is identified. Otherwise, the target model is periodically updated according to the changing of state of moving object. In the frame of moving object target deformations, such as the uncertainity of scale and illumination, the algorithm is varified and analysed with the mean shift algorithms. Our emphasis will be there on to show, the proposed method can effectively track an object under the condition of vedio streamming.*

Keywords: *component; formatting; style; styling; insert (key words)*

I. INTRODUCTION

The object tracking is an important elementary operation in several computer vision-based applications including, video monitoring and surveillance, sensing in robotics, key-frame identification, and many more. Object tracking is a mechanism to track an object and to take an action on another object, based on changes occuring in the properties of the object being tracked. There has been a great increase in the availability and amount of video information due to the ever increasing use of videos in several applications such as activity recognition, visual surveillance and intelligence user interface.

Object tracking becomes important because of its several important applications such as: surveillance and Security -to serve better sense of security service, to identify people; Traffic management - to analyze crowd, to detect accidents; Retail space instrumentation - to analyze shopping behavior of customers, to enhance building and environment design;

Tracking of visual objects can be done either by forward-tracking or by back-tracking. The first and foremost step is to detect the moving object in video streams. We can go for three approaches in object tracking:

- Extraction of characteristics which resembles points, lines, segment from image sequences. In this case tracking stage relies on matching procedures every time this resembles Feature based methods.
- The second approach is Differential method which actually resembles optical flow computation.
- Third approach is measurement of inter image displacement using correlation.

The main obstacle in video tracking is to assign target locations in consecutive video frames, especially when the objects are moving rate is relative fast to the frame rate [1]. Number of approaches for object tracking has been proposed and varified. The appropriate approach which is to be used it depends on the context in which the tracking is to be performed and the end use for which the tracking information is being sought.

II. RELATED WORK

For the purpose of robust object tracking. The MAP based algorithm has been proposed. It is basically based on a sparse collaborative model. This model can exploit both holistic template and local representations to check for drastic appearance changes. It consist of Sparse Discriminative Classifier(SDC) and Sparse Generative model(SGM) for object tracking. It requires online update scheme to update the templates.[2]

Mean shift utilizes color distribution with uniform quantization. But , the quantization method ignores the close relationship of color statistics. The color histogram consists of many empty bins because of uniform distribution. In order to reduce the number of empty bins an optimal color based mean shift algorithm was proposed . In this the histogram agglomeration technique was applied to extract the optimal colors.[3]

In order to determine the candidate target region, mean shift algorithm was utilized and then a judgment on the tracking effect was made according to the Bhattacharyya coefficient. In case of tracking failure, the candidate area was matched with the target model by SIFT feature. In the next and final step a new track position was determined.[4]

III. MEAN SHIFT

Here, Mean-shift [1] is a nonparametric density gradient estimator is used to identify the image window that is similar to the object's color histogram in the current frame. The mean shift is a non-parametric feature space analysis technique. The basic of mean shift algorithm is that it relies on color cues. It iteratively carries out a kernel based search starting at the last position of the object. Color cues form a most meaningful stucture of many tracking algorithms [2–6]. Since color histograms are robust to partial occlusion, are scale and rotation invariant, the resulting algorithm can effectively and successfully handle non-rigid deformation of the object and extensively changing dynamics in complex background posture. The benefit of color is that it is a weak model and is therefore unrestrictive about the type of objects which is being tracked. The main problem regarding tracking with color alone occurs when the region around the target contains objects with same color. When the region is cluttered in this way a single cue does not provide reliable performance because it fails to fully model the target. The texture and edge features have been used for video based tracking purposes but it is not applied to tracking with mean shift technique. In this paper we show that color, texture and edge complete each other and provide reliable performance output. When the region is cluttered, a single cue does not provide reliable performance because it fails to fully model the target. A cue-selection approach is proposed in [7] which present visual cues for object tracking in video sequences is done by particle filtering. A histogram-based framework is developed for the analysis of color, edge and texture features. This paper presents visual features for tracking of moving object in video sequences using Mean Shift algorithm. The features used in this paper are color, edge and texture. Mean shift Algorithm is expanded based on number of features. Object tracking refers to method to track an object (or multiple objects) over a sequence of images. Mean shift analysis is a possible forward-tracking technique because it estimates the positions of the regions in the current frame from the previous frame. Mean-shift tracking is a technique for following an object of interest as it moves through a video sequence. It is a gradient ascent approach that models the image region to be tracked by its color histogram. The mean shift is a method for finding local maxima of a density function from given discrete data samples. It works with a search window that is positioned over a section of the distribution. The mean shift technique is an application independent tool .It is suitable for real data analysis because it does not assume any prior shape (e.g. elliptical) on data clusters. Therefore, there are numerous approaches employing the mean shift algorithm in object tracking. This paper provides a single reference of the great majority of papers and techniques presented on mean shift technique. We compiled over 10 years' papers pertaining to different Mean shift methods published up to the date of submission of this manuscript. Papers referencing mean shift methods from previous papers without any medication or improvement have been omitted. It is possible that one or more papers were unintentionally omitted. We apologize if an important method or improvement was left out. This manuscript steps through a wide variety of methods with a brief discussion and categorization of each. We have avoided discussing slight medications of existing methods as distinct methods. Continuously Adaptive Mean shift tracking that is based on adaptation mean-shift. When probability density image is given it finds the mean (mode) of the distribution by iterating in the direction of maximum increase in probability density. This is one of the simplest methods and gives reliable and robust results, if the colors in the background area differs significantly from those in the target object. CAM shift procedure are given below:

1. Set the region of Interest (RoI) of the probability distribution function of the entire image.
2. Select the initial location of the Mean Shift search window.
3. Calculate the color probability distribution of the region centered at the Mean Shift search window.
4. Use Mean Shift algorithm to find the center of the probability image.
5. Store the zero moment (distribution area) and centered location.
6. For the next frame, center the search window at the mean location found in Step 4 and set the window size to a function of the zero moment.
7. Go to Step 3 and repeat the whole process again.

IV. PROPOSED METHOD

In this project modified mean shift algorithm will be utilizing color features and texture features for object tracking. In order to extract the texture features from object we will apply LBP (Local Binary Pattern) technique.

A. LBP

It is a very effective technique to elaborate the texture feature. It has got merituous qualities such as fast computation and rotation invariance. Thus LBP has wide applications in texture analysis, image retrieval image segmentation etc.

B. COLOR HISTOGRAM

Now coming to the feature like Color feature, we will employ color histogram for extraction of object. Basically, histograms are the collection of data which are organized into a set of predefined bins. Color histogram is distribution of point sample and it actually represents the object in proper manner. Here color feature is extracted in the form of RGB Colour space which are divided into equal k-intervals which is known as a bin. Number of bins feature is given by Mc=k^3. Simple colour histogram ignores the close relationship of colour statistics.

C. JOINT COLOR HISTOGRAM AND LBP

Sometime simple color histogram fails to distinguish between target and background when both seems almost similar. Sometimes the target loses its information in spatial domain. For the above said reason it becomes more convenience to use joint color histogram rather than simple color histogram. The joint color histogram and LBP will applied togetherly to improve the tracking capability of conventional mean shift algorithm. In this technique the texture value is assigned to each pixel and then combined with pixels color value to represent target feature. So a joint color histogram method is proposed for the more diffrentiative and effective target representation.

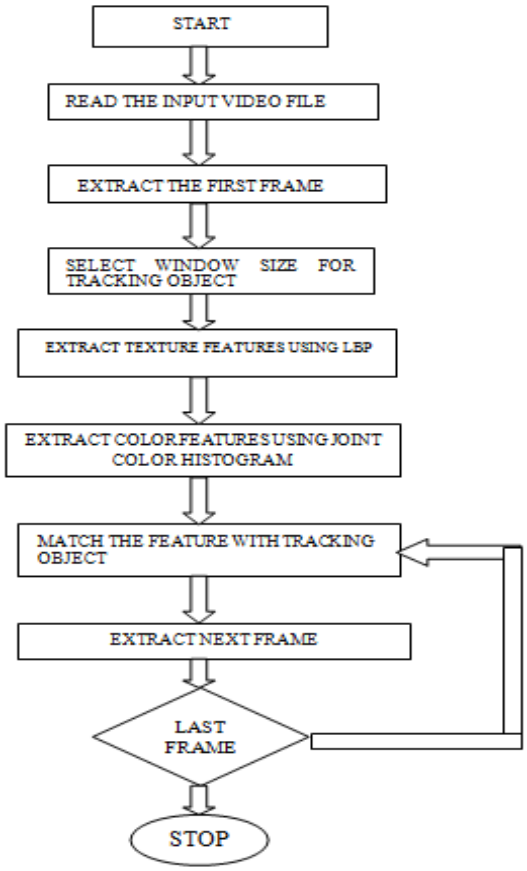

Fig:1 Flow chart of proposed algorithm

V. CONCLUSION

The mean shift algorithm with LBP and color histogram increae the robustness of tracking in diffrerent condition.it is analysed that moving object and tracking are two main core things in video surveliance. The performance of traditional algorithm has been enhance by joint color histogram and LBP. The accuracy of the algorithm also depends upon the speed moving object and clearity of a video.

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