Advanced Feature Matching Approach for Object Detection in Video

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***Abstract*— Detection of object from a video and then tracking of that object is an important task in computer vision. Object detection means to detect or locate objects from consecutive frames of a video file. On the other hand, tracking is a process of locating moving multiple interested objects in a video file or camera depends upon the requirement. In technical term, object tracking defined as the route or path of an interested or required object in the frame plane which is moving around the image plane. It has the becoming the most emerging technology of nowadays due to the computational power, good quality and low cost video camera. Traditionally various techniques were used for the motion detection as the feature extraction is the crucial part of the detection process. But each technique used has some limitations due to which they were not able to detect the small variation in the features. In this work the LBP technique is used for the detection and matching of the features from the frame of the video. This technique is considered to be better technique for the feature extraction. From the results obtained it is concluded that this technique of detection of feature is better and efficient than the traditional technique.**

Keywords*— *object detection, object tracking, LBP, subtraction ,human motion.

I. INTRODUCTION

Human visual system is becoming the most emerging technology of nowadays due to the computational power, good quality and low cost video camera.[3] As the need of automated video system are implanting users are showing interest in object tracking algorithm. Object tracking is the video processing which is used in wide number of applications. Some of the areas that are using object tracking for security purpose where particular person is traced in a video and for astronomical studies where planetary objects are traced from satellite data. [4] For instance, in traffic surveillance application concerned object may be human or car. For the detection of the object the extraction and matching of feature is the important process. In this work the linear binary pattern approach is used for the detection and the matching of the features that is considered to be better than the traditional method of detection. [5] As time passes computer applications are becoming vital part in every field. Due to which it has been used in several applications. In analysis of video three basic steps are involved as:

- Detection of required object or interested object from moving objects.
- Tracking of the selected object in successive frames.
- Analysis of route or path of selected object to understand the behavior of required object.

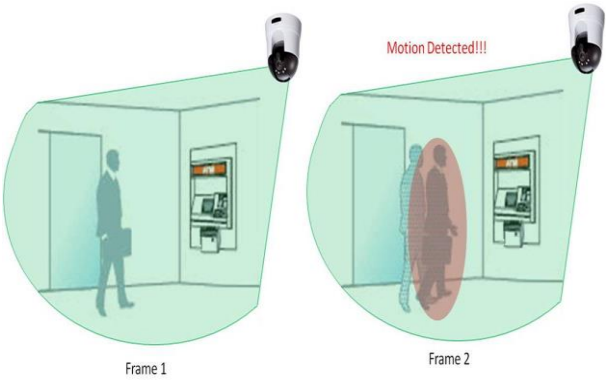


Fig 1. Example of object detection in video. [3]

Object detection plays a vital role in tracking algorithm for detection of a concerned object in a frame or video or from that frame where an object has seen in video. [2] In such cases, information stored from the frame sequence can be utilized through object detection system for reduction of false detection. Some of the techniques used for object detection are mentioned below:

- **Point Detectors** -Very first technique which is used to detect an object is Point detectors. These are helpful in discover point from the video frame having a surface in particular area. Merit of using this type of detectors is that an interesting or concerned point remains unchanged even though enlightenment and camera perspective remains changing. Some of the point detectors used in are Harris detector, Moravec's detector, KLT detector etc.

- **Background Subtraction** – Second used technique for the detection is Background Subtraction. In this type of detection, a scene is representing through establishment display and then performs deviations from model from one to every another approaching frame. [10] And then if any change occurs in a picture concludes into change in an object or moving object. Thus pixels contributed to the region and acquire the change in the frame for further processing. Resultant method is known as background subtraction. Some of the methods using this technology are Hidden Markov Models, frame differencing region based etc.

- **Segmentation** – last technique which can also be applied on detection of an object insinuated as segmentation. The basic idea of this technique is to divide the whole picture into comparable areas called segments. [11] Thus it involves two parts i.e. in the first part criteria that will be used for the allotment of the segment and second part will be used to make strategy to attain useful division between the segments. In the literature section of this thesis, different methods of segmentation have been discussed by several researchers to detect an object. Some of them are active contours, mean shift clustering etc.

II. PROBLEM STATEMENT

In human motion detection system first step is to detect the object from the video. For motion detection the frames of the videos are extracted. These frames will help in the detection of the motion of the object. In traditional system the frame extraction method were not as efficient. In this form the video direct frame to frame extraction was done. A threshold value was kept according to which the frame extraction was done.

The main disadvantage of this method was that it could not detect the minor changes that take place. Systems designed using this approach was not that much efficient as in this the minimum scaling was done. It could detect the small changes or feature variations. Thus the traditional methods were not efficient so there is need to propose new method that will detect small changes in order to detect the motion of the object in the video.

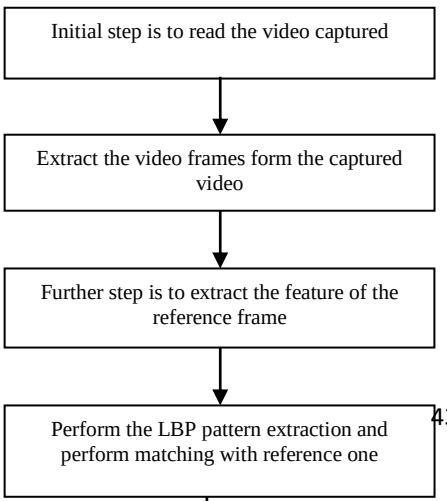
III. PROPOSED WORK

In the video object tracking system the main focus till date is to check the frames and by the use of Euclidean distance approaches which make use of the differences between the previous frames along with the present frames. This technique is successful in most of cases but it is very simple approach which can be non-effective in most of cases and the chances to get the perfect object detection in the live frames. So there is need to provide the algorithm which will be more effective this can be done by extracting the feature of the image or can say the frames. To overcome the problems of the traditional approaches in this proposed work a new technique is designed that can detect the motion and object in the video sequence. So in proposed work a feature extraction algorithm can be introduced to check the variation in the frames and object can be detected in it. The techniques which can be used for feature extraction is linear binary pattern approach. The LBP technique is considered as one of the best technique for the feature extraction. So this method is considered to be better and efficient.

IV. METHODOLOGY

The methodology of the proposed work is defined below. In this work the conventional method of the human motion detection is improved.

1) Initially step is to read the video that is captured earlier. From this video the motion of object is to be detected. So this is the first step the captured video is read.
2) After the selection of the video. Next step is to extract the frame of the video that is selected. The frames of the image consists the information that is to be extracted for the further use.
3) Now, extract the information from the frame, after the frames are extracted from the videos. The features of the reference frame are extracted that are used for the further processing.
4) The LBP pattern extraction is used for the extraction of the features from the frame and for matching of the features with the reference frame.
5) Finally mark the object detected in the frame with movement. The motion of the object is detected in the video.



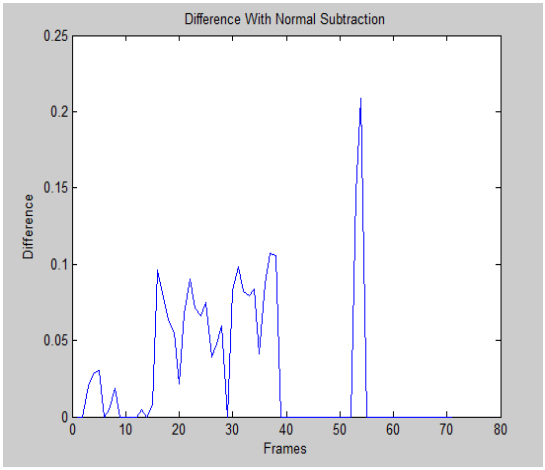


Fig 4. This graph show diffrences with normal subtaction method

Fig 2. Flow diagram of the proposed approach.

V. RESULTS AND DISCUSSION

In this section of Results and discussion we have discussed about the results that were obtained by applying proposed method. This section gives description of the proposed algorithm. In this the LBP technique is used for the detection of the motion from the video. This method is considered to be efficient and better than the traditional method for the motion detection in the video.

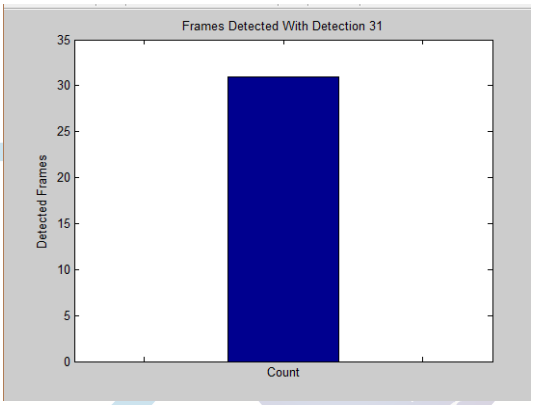


Fig 5. shows frame detected using detection

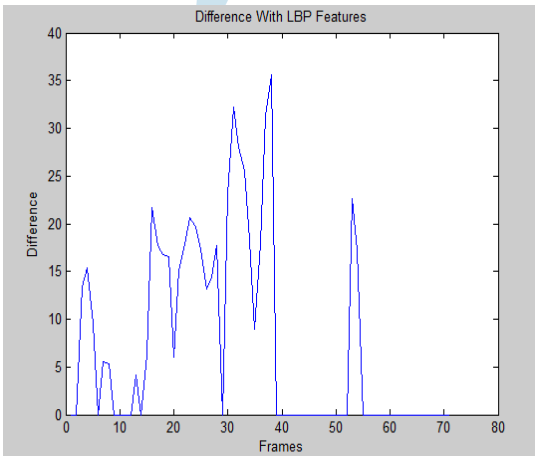


Fig 3.This graph show diffrences with the LBP features

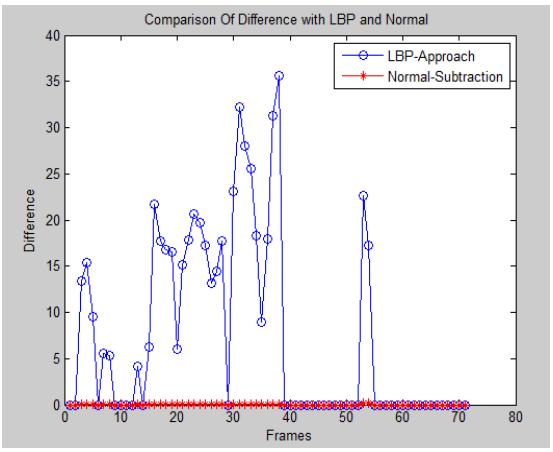


Fig 6. Comparsion between the LBP and normal subtraction method

VI. CONCLUSION AND FUTURE SCOPE

In visual surveillance system the detection of the human is crucial for several diverse applications. Thus to obtain the minimal change occur in the frame LBP has been used. As the results obtained depict that the proposed technique is much efficient than the traditional techniques. Thus it is concluded that proposed technique is helpful in extracting features efficiently and easily.

As in this proposed work the LBP technique is used in the future this method can be further enhanced by combining LBP with the Histogram of oriented gradients (HOG) descriptor which improves the detection performance. Along with this the accuracy of the designed system should be more.

VII. REFERENCES

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