Video Object Identifications and Monitoring Using Fast Template Matching Technique*

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Abstract

Nowadays, finding criminals is a challenging task for any Security Services especially in the video. The challenges may come when a video is a highly compressed and low quality. The proposed approach provides an idea for identifying suspicious objects from video and tracking their positions for entire frames. It is expected the proposed concept will outcome better results than any other existing technique. Through this concept, an intention is given on enhancing the low-quality video and then tracking a suspicious objects with the help of a template matching algorithm.

Index Terms—Compress/uncompressed video, pattern matching, object detection, template matching, local binary pattern, etc.

I. INTRODUCTION

Video is a combination of frames(images) and audio. When friends are displayed with proper rate, it creates an illusion to our eyes and we feel it becomes a video. The video is generally stored either in a compress or in an uncompressed format in memory space. Compress videos have a format like MP4, MPEG and other whereas AVI video is considered as uncompressed video. In the proposed system, we are using both compressed and uncompressed and soft video. It will not affect the size and other parameters of a video. The major focus of the propose concept is not to find only suspicious objects but to locate each and every object given as an input to the project. Propose system consists of models like 1. Video enhancement 2. Suspicious object detection

Video enhancement is done by extracting frames from a video and then applying different kinds of image filters on extracted frames. There is number of filters available like Kalman filters, high pass low pass filter, median filter, mean filter and other. We provide entirely different methods of announcing frames of a video that is based on intensity of each and every region of a frame. The frame is divided into multiple segments using the wavelet decomposition method and then the mean intensity is calculated for every segment. If the mean of a segment is below threshold level, the value of each pixel component get updated with a proper threshold value. In this concept, care must be taken that no one segment of decompose frame should not get disturbed. If the segment is very Darken, the intensity of its pixels gets incremented and if it is very whiter, pixel intensity should get decremented. The proposed method of enhancing video frame filters only bows region of an image which how low quality or degraded quality and rest of the sections becomes a touch. This concept is very well applicable to the videos which are captured with low-resolution cameras. As the proposed concept's main objectives if to enhance the quality of the compressed and uncompressed video which are taken other through a low-quality camera or high-quality camera. Suspicious object detection is entirely based on a relative template matching algorithm. A template matching algorithm is a powerful tool

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for locating one image into another image. Also applicable to audio where a concept is called as crosscorrelation. In relative template matching technique, a frame as well as a suspicious segment is converted into its equivalent local binary pattern (LBP) and then matching is done with position to position method. If all the pixels value (local binary pattern) are present in local binary pattern of a video frame, its position is marked with a rectangle value. It is also possible to set a threshold for a local binary pattern matches. And accuracy of technique entirely depends on a threshold applied for a local binary pattern. The local binary patterns never change even after the change happened in video frame or in a suspicious objects. LBP changes according to the intensity of the image. Figure 1 shows
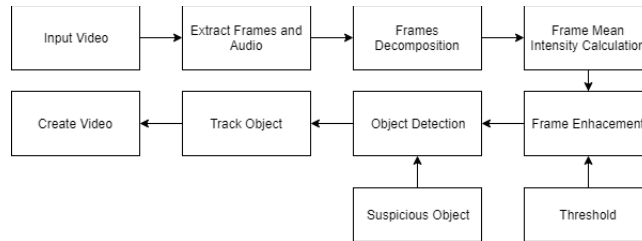

Fig. 1.Object detection and tracking

object detection and tracking method implemented with video frame enhancement and relative template matching algorithm. Input video consist of a sequence of N frames and audio. Frames are extracted and the mean intensity of each frame is calculated. The extracted frames are enhanced by updating pixels value according to the threshold given as an input. Once video frames are enhanced, it is very easy to locate suspicious objects. An enhance frames are given as input to object detection algorithms which have another input as suspicious object. Finally, the suspicious object is located and track in all the frames of video.

A. *Motivation*

Propose concept is motivated by observing challenges present in a literature survey

1 Existing techniques are not good for low-quality videos
2 Existing techniques locate a suspicious object only on high threshold.
3 Suspicious object definition static in existing techniques.
4 No focus is given on frame enhancement.
5 Existing techniques are work well with high-quality videos.
6 The existing technique use absolute template matching technique.
7 Most of the existing techniques are neither feasible not accurate for any kind of the input video.

B. *Objectives*

Propose concept have below mention objectives

1 To enhance video frame quality.
2 To implement wavelet decomposition technique.
3 To Implement the relative template matching algorithm find one image inside the other.
4 To calculate local binary pattern(LBP).
5 To maintain Robustness for handling any kinds of an input video.

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6 To locate suspicious object respect to office colour, shape and position.

II. LITERATURE REVIEW

The paper published by Martucci[1] suggested an approach for resizing images but operating in the discrete cosine transform (DCT) domain. This method can be used at the resizing tool for standalone image and it can be integrated with various image Compression technique discrete cosine transform(DCT)

Young-Chang Chang and Reld. J. F.[2] propose a novel method for balancing the RGB colour values of an image caused by a vision system component. Comprehensively and removing colour component error without specifying any errors source and their effects. An algorithm based on the use of standardized colour chart which is develop as a preprocessing tool colour image analysis. colour calibration method contains an algorithm for auto-correct illumination in this scene. This algorithm was tested under two different conditions that are uniform and nonuniform illuminations in a video frame.

U. M. Kamthe ; C. G. Patil[3] 2018, suggested an approach based on motion features between two different objects. First of all different suspicious objects are defined using semantic approach and their object detection is done using background subtraction. Hindi approach detected objects are classified as a human and non-human object. Object tracking is done using correlation technique.

Chen Wang ; Jian Liu ; Yingying Chen ; Hongbo Liu[4] propose fine-grained channel state information from off the Shalfe Wi-Fi to detect suspicious object which is extremely dangerous. There suspicious object detection system reduces the deployment cost and it is very easy to set up in public venues. This system relies on two major components i.e first occurrence of a suspicious object and then it identifies dangerous materials based on constructed CSI value. Their result shows that a system can detect more than 95percentage accurate suspicious object and it also has an accuracy of identifying 90percentage dangerous material type.

Garima Mathur ; Devendra Somwanshi ; Mahesh M. Bundele[5] suggested an approach that has an object to create video sequence for moving object tracking. Propose system was implemented on captured video sequence. A suspicious object is detected first and interact in subsequent frames. Experimental implementations perform an object tracking without missing any frame and successful relay a bounding box. It successful generates a frame sequence after implementation of the mean shift algorithm. performance of these algorithms was done by tracking the user-defined object and by performing overlay function in predefined object. P. A. Dhulekar ; S.T. Gandhe ; Nachiket Sawale ; Vikas Shinde ; Sunil Khute[6] propose is a system that includes night vision camera and Raspberry Pi module which can transmit videos of War. This system can be used as a proper machine for defence sector to minimises the loss of human life and also to avoid infiltration at border region. The algorithm works on the principle of optical flow for movement detection. Their algorithm developed in real-time by motion-based object detection technique.

Tamanna Sahoo; Bibhuprasad Mohanty[7] 2018 suggested a background subtraction method which is employed in the wavelet transform domain. By setting approximate wavelet Coefficient to 0 and then accurate coefficient value is provided which is necessary information for moving object detection. This technique reduce the probability of misdetections and also avoid variations occur due to illumination. This system has been compared with popular frame difference in method, background subtraction and global thresholding. Their suggested the method is superior to that of visual inspection.

Takuya Ogawa ; Kyota Higa ; Kengo Makino ; Shoji Yachida ; Katsuhiko Takahashi[8] proposes a robust and fast object tracking technique using dynamic marks and adaptive search for tracking suspicious persons and object. Dynamic marks technique removes appearance changes from the target region for getting

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accurate robustness. Adaptive search method restrict region to detect a target using special temporal consistency off-target for improving processing speed. The concept has been tested and their result shows that it improves robustness appearance than any other conventional method. Another result shows that the processing speed of the proposed method is faster than any other conventional method of object detection and tracking.

Xiaofeng Zhang ; Li Zhang ; Dun Li[9] proposes an algorithm that trains and learn routing intrusion target of powerline, relies on the detection of intrusion target of the powerline in real-time application. It also Discovers abnormality in time and protects the normal operations of power line. their proposed technique is quick to detect the abnormal target of powerline and alarm suspicious external intrusion.it focuses detection of offline operations of large vehicle manufacturers such as trains and excavators. Maarten Vandersteegen ; Kristof Van Beeck ; Toon

Goedemé[10] propose a solution for fast and accurate object detection and tracking. They concentrate on multi data set learning strategy yielding top Sky object detection. This model generalizes well on unseen data and copes with different line Heights. It applies the Optimisation step that has minimum latency with reasonable loss in accuracy.

III. CONCLUSIONS

To set an objective of proposed method, a different technique of object detection and video enhancement has been studied. It is expected that the proposed system will get better results than any other existing technique. A survey was done and mention in this paper how many limitations in motion object detection technologies like video quality, video frame enhancement, audio extraction, flexibility e and others. Propose concept will try to overcome all these challenges exist in previous methods. It is also the main focus to implement a simple and robot system so that it can be used by a common man.

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