

# A REVIEW ON MOVING OBJECT DETECTION IN VIDEO FORENSICS

Aswathy K S<sup>1</sup>, Jayaresmi J<sup>2</sup>

<sup>1</sup>M. Tech Student, Dept. of ECE, LBS Institute of Technology for Women, Kerala, India

<sup>2</sup>Assistant Professor, Dept. of ECE, LBS Institute of Technology for Women, Kerala, India

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**Abstract** - Video surveillance systems acquire a top notch activity as application-oriented studies that are developing swiftly within the past decade. The foremost recent studies try to integrate computer vision, image processing, and AI capabilities into video surveillance applications. As a results of the recognition of smart mobile devices and also the low cost of surveillance systems, visual data are increasingly being employed in digital forensic investigation. Digital videos are widely used as key evidence sources obvious identification, analysis, presentation, and report. The most goal of this paper is to develop a comparative study on moving object detection in video forensic.

**Key Words:** Video surveillance, Object detection, Video forensics, Anomaly detection, Video synopsis

## 1. INTRODUCTION

Forensic video analysis and multimedia evidence processing are still relatively new compare to tradition photography-based analysis. In recent, the new technologies make it much easier to make, collect, and analyze these image materials. The advances of emerging strategies like mobile devices, low cost image/video taking pictures devices along with informatics (such as AI, machine learning, etc.) have appreciably extended the forensic analysis level. As a result, there has been a good deal of research work on image and video validation of image and video integrity. The footage in digital forensics is frequently used for comparative analysis, together with forensic analysis, comparison of images of questioned about recognize objects like subjects, vehicles, clothing, and weapons. In many modern CCTV systems, biometric authentication services are embedded to spot online criminals or suspects. Other services like motion detection, body and face recognition, cross-pose recognition, gait recognition, are widely researched within the past few years. In some hard cases (poor viewing conditions), it's very difficult to spot humans benefit of face, body, still, etc. Although many image processing techniques are developed within the past few decades, most of them don't benefit of face, body, etc.

## 2. LITERATURE REVIEW

Modelling human blobs in crowd for analysing the behaviour is a crucial issue for video surveillance and may be a challenging task thanks to the unpredictability. Huge video dataset is captured by using various

resources like surveillance cameras in many places including the general public environment like depot, airport etc. it's very time ingesting to observe the whole video manually for forensic purposes of study. In [1] B. Yogameena and K. Sindhu Priya proposes a video synopsis method which is employed to represent a brief video while preserving the essential activities for a protracted video. Compact video synopsis is proposed via the usage of a spatiotemporal optimization, which can shift the active object along the space as properly as time and hence keep from collision amongst them. This synthesized compact background is introduced by using multilevel patch relocation (MPR) method to supply a bigger virtual motion space for shifted objects. The synoptic video is proposed here to detect if any anomalies of human crowd(s) is present within the scene during a quicker time.

In [2] an efficient approach for detecting abandoned luggage in surveillance videos are discussed by K. Lin, S. Chen, C. Chen, D. Lin and Y. Hung. They combine short- and long-term background models to extract foreground objects. They introduce a framework to spot static foreground regions supported the temporal transition of code patterns, and to see whether the candidate regions contain abandoned objects by analysing the back-traced trajectories of baggage owners.

Person specific identification is a crucial problem in computer vision. However, forensic video evaluation is that the device in surveillance applications, sort of a particular individual Video Footage Record is accustomed assist personalised monitoring. In [3] Y. Balasubramanian, K. Sivasankaran and S. P. Krishraj proposes an answer to spot the particular person very quickly through offline which is able to be valuable to analyse the incident/crime earlier. This method helps to cut back the big volume of video data by using an object-based video synopsis. After that, Viola-Jones face detection, deformable part based models are accustomed detect the face attributes. Subsequently, histogram of oriented gradients and oriented centre symmetric local binary sample facets are extracted. Support vector machine classifier is employed to classify the susceptible and long lasting features. The algorithm works properly even in tricky conditions like expression changes, pose, illumination editions and whether or not the face is partly additionally as completely occluded in few frames.

Detecting tampered transferring objects from video sequence is that the most challenging problem in video forensics. Approaches based on moving object are extra

complicated because making an enormous difference between tampered and non-tampered regions is difficult. Hence, in [4] S. Safie, A. A. Samah, G. Sulong, H. A. Majid, R. Muhammad and H. Hasan proposes a block matching algorithm (BMA) in video copy-move forgery detection scheme to detect regions that represent either tampered or non-tampered moving object is employed. Adaptive rod pattern search (ARPS) has been chosen because the first-rate acceptable BMA to detect regions of transferring object in video forensic because of the actual fact of its performance.

As a consequences of the world deployment of surveillance cameras, authorities have received a sturdy tool that captures footage of things to do of humans publicly areas. Surveillance cameras allow continuous monitoring of the area and permit footage to be obtained for later use, if a criminal or other act of interest occurs. The examination subsequently pursuits at evaluating the energy of proof at supply and recreation levels. In [5] D. Seckiner, X. Mallett, C. Roux, D. Meuwly, and P. Maynard proposes the source and mission tiers which are inferred from the trace, bought inner the range of CCTV footage. The source level alludes to aspects discovered within the anatomy and gait of a personal, at the identical time because the endeavour degree relates to endeavour undertaken by way of the person within the footage. The strength of evidence relies upon on the value of the data recorded, the place the endeavour stage is powerful, but supply stage requires similarly development. It is consequently advised that the digital cam and also the associated distortions must be assessed first and predominant and, where possible, quantified, to figure out the extent of every shape of distortion present within the footage.

Local binary pattern (LBP) is one in all the foremost successful feature descriptors. However, LBP and its variants haven't been as successful as other feature descriptors in video anomaly detection (VAD). This can be because LBP and its variants are mainly designed for spatial texture analysis. In [6] X. Hu, Y. Huang, X. Gao, L. Luo and Q. Duan develop a brand new variant of the LBP called the squirrel-cage LBP (SCLBP) is proposed for VAD. By imitating the form of cage rotor, the proposed SCLBP are regularly considered a stretched LBP in temporal direction. The SCLBP can efficaciously encode the action data and is insensitive to noise and beside the purpose disturbances brought on with the help of dynamic background and illumination change SCLBP is that the first variant of the LBP particularly designed for action characterizing. The SCLBP has top notch flexibility, extendibility, and low dimensionality.

Object detection and monitoring are the foremost challenging a part of any laptop vision applications. In computer vision, video surveillance may be a famous lookup location in an exceedingly dynamic environment, specifically for safety reasons. The video surveillance science plays a fundamental function to forestall crime,

terrorism. The video outputs are filtered and processed with the help of human operators and just in case of a forensic, the excessive volume of facts made it challenging to trace any object. This work has been finished an aim to cut back the trouble of human operators with a rise within the latent period to forensic events by N. Funde, P. Paranjape, K. Ram, P. Magde and M. Dhabu in [7]. It involves designing of an efficient object tracking system for easy environments where the camera is static, background is straightforward and no similar object to the one being tracked is present. The system is given network configuration of the cameras and roads of the surveillance area, video dumps and a picture of the article to be tracked. It tracks the articles via the videos and dumps the tracked portions of the videos where the object was present.

### 3. CONCLUSION

The main aim of forensic video analysis is to spot strong evidence items at different level. This review focuses on object detection in video forensics. This also briefs different methods used for identifying evidences or objects from a video.

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