

Inter frame Video Duplication Forgery Detection: A Review

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Abstract: Identifying inter-frame forgery and tampering a video is a challenging topic in video forensics. Tampering involves falsification with video content in order to cause damage or make unauthorised modification/alteration. These tampering impacts need to be studied. Till now the studies employed a video authentication method that detects and determines both frame duplication and region duplication in terms of video forgery, and locates factors that impact video forgery. In this review paper all the proposed techniques based on video duplication forgery has been studied to test whether the video is real or not.

Keywords: Duplicity, Forgery, Intra-frame, Inter-frame, Correlation, Feature extraction

INTRODUCTION

With Video editing techniques, it becomes increasingly easy to modify the digital videos. However to identify the authenticity of videos has become an important field in information security. Video forensics aims to look for features that can distinguish video forgeries from original videos, thus people can identify the authenticity of a given video. A kind of distinguishing method which is based on video content and composed of copy-move detection and inter-frame tampering detection becomes a hot topic in video forensics.

So far, many video forensics techniques have been studied. some proposed to detect double compression, detected video forgery with sensor noise patterns, and exposed forgery based on the videos' content. In the aspect of inter-frame forgery detection, first exposed the frame deletion or insertion by pre-diction error. They discovered that frames moving from one group of picture (GOP) to another will have larger motion estimation errors. However, their method would fail if a complete GOP is deleted. It has become complicated to comprehend and differentiate an authentic video from a tampered one. This is due to the several forgery methods that the public can avail with, which as a result, recordings of video processing have become a great challenge. In recent years, blind digital video forgery detection has been employed to determine the authenticity of digital video forms a topic that has been of significance among researchers.

Video feature recovery is getting the chance to be more indispensable with the exponential advancement of the Web.

With the exponential improvement of feature granting sites, e.g. YouTube, the amount of features being searchable on the Web has hugely extended. Examinations on social feature offering stages uncover a high quantify of repetition with covering or duplicacy substance. They exhibited that there are when in doubt 27% copies among the question things of 24 noticeable inquiries from YouTube, Google Video and Yahoo Video. To keep away from being overwhelmed with copies in the feature yield and utilize such repetition for diverse assignments, for instance, mining the inside structure of feature database, programmed feature labelling etc, it is critical to making a close duplicacy. Web feature recovery system. Notwithstanding the way that various systems have been proposed to address this issue, they are on a very basic level focusing on the recovery precision while infeasible to request on Web scale feature database continuously. To once-over two or three issues that happens as a result of close -duplicacy features are, a common circumstance could be that a Web customer needs to get some novel features yet winds up with groups of close video features in the top-situated listed records returned by the web hunt instrument. Both occasions oblige NDVR methods to achieve their destinations. To identify almost

copied features from the expansive gathering of features, general strategy is-

- 1) Firstly, a feature is isolated into arrangement of casings.
- 2) On that basis feature frames are separated.
- 3) This mark of the feature is then contrasted
- 4) The most relative features are returned as NDVs.

In expected routes for discovering NDVs, single highlights were extricated for similitude.

Different techniques used to detect inter frames forgery

1. velocity field consistency:- velocity field consistency [14], is a technique which is proposed to detect inter-frame forgery (i.e consecutive frame deletion and consecutive frame duplication). The generalised extreme studentised deviate (ESD) test is applied to identify the forgery types and locate the manipulated positions in the forged videos. This method is able to distinguish the forgery types, identify the tampered video and locate the manipulated positions in forged videos as well.

2. consistency of correlation coefficients:- consistency of correlation coefficients of gray values [4], method to classify original videos and inter-frame forgeries. Gray value is efficient in depict video content. They showed four frames gotten from a 100- frame inserted video. The first and forth images were the adjacent frames before frame insertion. They inserted 100 frames between them and the inserted 100 frames are continuous. The second and third frames are the first and last frames of the video which was inserted to the original video.

3. optical flow consistency:- Optical flow consistency [12], method based on the assumption that the optical flows are consistent in an original video, while in forgeries the consistency will be destroyed. They first extract optical flow from frames of videos and then calculate the optical flow consistency after quantization and normalisation as distinguishing feature to identify inter-frame forgeries. They instruct the Support Vector Machine to classify original videos and video forgeries with optical flow consistency feature of some sample videos and test the classification accuracy in a large database. Experimental results show that the proposed method is efficient in classifying original videos and forgeries. Furthermore, proposed method performs also well in classifying frame insertion and frame deletion forgeries.

4. Dimensionality diminishment:- A dimensionality diminishment based system creator proposed [18], a method

and utilized PCA (Principal Component Analysis) for imitation picture. This methodology is same like DCT system and enhanced in catching separating highlights. In this system the picture changed into grayscale and isolated into numerous parts, which are spoken to into vectors. These parts or squares are composed it lexicographically before coordinating and utilized PCA to speak to the different pieces in a substitute mode. It is capable for identification even minor varieties due to lossy pressure. However the proposed method is for dark scale pictures furthermore forms each shading direct in shading pictures and PCA is for recognition the fakes. The proposed technique is better for identifying duplicate move imitations and gives less number of false positives.

5. Singular value decomposition:- Singular Value Decomposition (SVD) [19], chief to post-handling methods. In this strategy the connection is utilized for duplicated and fixed territories and for looking equivalent locales. In this proposed technique the picture is isolated into numerous little covering squares and after that SVD is requested to remove the copied frames.

6. Intensity method:- Intensity-based Method routines one proposes system based on intensities and isolated into various corresponding pieces. After division the square part into four headings and two equivalent amounts of. The partitioned every square highlights of vector and figured the pieces which are utilizing Additive White Gaussian Noise (AWGN) operation and lexicographically sorted. The gathering of same squares highlight vectors not portray as a reshaped zone of picture. Therefore, the methodology must be set up to control combines, and demonstrates the duplicacy are as to utilize shift vector strategy. The proposed technique is lower computational and compound to post-handling operations. At whatever point the fashioned zones are predominant with square size the system is well and come up short when the pictures are huge smooth locales and profoundly bended.

7. Another study proposed used to finish duplicate move fabrication discovery continuously. Different methodologies have high reckoning time and not suitable for ongoing applications, for example, PCA, DWT, or SVD. The proposed methodology began from isolated the grayscale picture into numerous covering pieces of a positive size and power highlights for each square are extricated. The two areas of the highlight vectors store the piece position. In this strategy the execution is better contrast with other customary strategies. This execution conceivable through diminish the preparing time. The methodology is likewise control the false discovery rate through altering the piece size. However, the system is not for shading pictures.

8.Hu development:- In Hu development based method the creator [16], utilized Hu moments and arrangement powerful to a few post-handling systems like lossy JPEG pressure and obscuring. The procedure diminishes the measurements through Gaussian pyramid of the picture. The SIFT development system creator [17] proposed for seeing picture duplicate move imitations through SIFT and Zernike moments. The reason for SIFT calculation is perform ordinary location. Be that as it may, the calculation not identifies level duplicated districts. The technique begins from SIFT highlights focuses extraction and utilized these highlight for possible matches. However, the strategy diminishes the choice of recognizing level imitations.

9.Blur movement:-In Blur Movement, system the creator utilized property for invariants of picture regions because of non-effected by method for obscure added substance commotion and debasement. In this system the procedure began from tilting of picture squares of a particular size and obscure invariants with every piece. The each size is 72 long in highlight vector. In the event that there are two comparable non-indistinguishable neighbourhoods measured as an inaccuracy.. The proposed system identified copied district for pictures and differentiate copied features which are changed difference values. The one of the main issue in this strategy is processing time is relatively high.

10.In year 2010dec, Michihiro Kobayashi, Takahiro Okabe [1] developed an approach to detect suspected regions in a video of a static scene on the basis of the noise characteristics. this method can be applied to various kinds of videos which are contaminated by large noise and recorded with scan formats .In year 2013, Gajanan K. Birajdar, Vijay H. Mankar [2] made an attempt to survey the recent developments in the field of digital image forgery detection. In this blind forgery detection techniques and passive image authentication is presented. In year 2014feb, Aniketpathak, Dinesh [3] proposed methods made to detect changes in the video, as video editing techniques are getting very complicated. In year2014, Yu Cheng, Liss brown [5] presented a technique for detecting events in surveillance videos and evaluate it in the SED task of TRECVID . They propose:

- 1) An interactive approach to visualize data with temporal relations
- 2) A novel risk ranking method to differentiate detection results.

In year 2014, SALAM A. THAJEEL, GHAZALI SULONG [6] present the analysis of image tampering in a video which are classified into block based method and key point based method. In year2015, Asst. prof., Department of ISE,

JSS ATE, Bangalore [7], provided an overview of the image tampering literature and challenges involved in video forgery where passive technique is formed.

Some methodologies are very suitable for differentiating close indistinguishable features. For features which are copied, either spatially or temporally. The second class addresses the issue by utilizing nearby keypoint highlights. Keypoints will be remarkable nearby patches recognized over distinctive scales. Its adequacy have been shown in [8, 9], where feature duplicates with considerable changes in foundation, shading and lighting can even now be effectively recognized. Keypoint-based methodologies can be further subdivided into classifications: direction based [8, 10], keyframe-based coordinating [9] and visual words based [7]. Direction based methodologies track keypoints transiently along the feature succession, which structures sack of directions compressing the moving design of keypoints. Such representation offers two focal points: encourages the limitation of close video features, and backings high velocity online recovery strated in [8, 11]. By and by, direction extraction is generally a extremely extravagant logged off handling due to the need for separating keypoints over edges. The way that direction highlight is delicate to cam movement likewise makes it just application link for accurate video (or duplicate) recovery. Keyframe-based coordinating, while not capable to portray fleeting content, is indicated to display incredible execution for close video picture/feature identification [9].

CONCLUSION

In this paper, video techniques regarding duplication has been studied. All the techniques required some type of video data depending like in optical flow we require the scene change variation. In VFI we require velocity of objects in scene change by identifying peak points. Such techniques are dependent on visual similarity and structural change frame to frame but have not been tested for change in scale (change in size) and change in colour, odour for RGB videos. So we have purposed a new technique through which we will cover the gap of the inconsistency in environment like size change and colour consistency change. The new purpose method will depend on the Gaussian distribution of optical flow through this we will hybridised the optical flow technique and enhance the number of feature used for referencing the duplication detection.

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