A Review on Digital Video Watermarking

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Abstract: The illegal distribution of a digital movie is a common and significant threat to the film industry. With the advent of high-speed broadband Internet access, a pirated copy of a digital video can now be easily distributed to a global audience. A possible means of limiting this type of digital theft is digital video watermarking whereby additional information, called a watermark, is embedded in the host video. This watermark can be extracted at the decoder and used to determine whether the video content is watermarked. This paper presents a review of digital video watermarking techniques in which their applications, challenges and important properties are discussed, and categorizes them based on the domain in which they embed the watermark. It then provides an overview of a few emerging innovative solutions using watermarks. Protecting a video by watermarking is an emerging area of research. The relevant video watermarking techniques in the literature are classified based on the image-based representations of a video in stereoscopic, depth-image-based rendering and multi-view video watermarking. We discuss each technique and then present a survey of the literature.

Keywords: Watermarking, video, embedding, security

I.   Introduction:

Recent advances in online technology, usage of multimedia data has become foreseeable in human daily life. The explosive advancement of the digital Internet technology has promoted the ultimate transmission of multimedia content over public network inevitable which has attracted to a wide importance in protecting the ownership of the content. But such transmission creates unintentional holes to produce pirated content. Digital content ownership and authentication have become a major issues and consideration in these days. Specifically, distribution of a video over the Internet has become practical without making credit for an intended copyright owner. Digital video watermarking has an essential research area with the growing global threats pose a security risk to copyright owners. The idea of watermarking is a method of concealing secret data in a host video against copyright breach. Digital video watermarking involves two important stages: watermark embedding or insertion- and extraction process. The objective of the former process is to embed a watermark before compression of a digital video to ensure its authenticity and integrity. The reverse operation of the former process is the function of the later process. As almost all the image watermarking schemes have applied different techniques which are not suitable to the digital video content, the redundant data apparently increases.

II.   Applied Technique

A digital watermark is a model or digital signal introduce into a digital document such as text, multimedia or graphics and carries information distinctive to the copyright owner. Among the delivered techniques in recent years, the ones based on the Discrete Wavelet Transform (DWT) are gaining more reputation due to their outstanding spatial localization, frequency spread and multi-resolution features. Video watermarking involves embedding cryptographic information determines from frames of digital video. Usually, a user viewing the video cannot remember a difference between the original, marked video and the unmarked video, but a watermark extraction application can read the watermark and it can obtain the embedded information. Watermark is the part of the video, rather than part of the file format. In video file format this technology works individually.

Discrete Wavelet Transform Watermarking:

In this watermarking scheme, the watermark is decomposed into different parts and embedded in the corresponding frames of different scenes in the video. As identical watermark is used within each motionless scene and independent watermarks are used for successive different scenes, the proposed method is robust against the attack of frame dropping, averaging, swapping, and lossy compression. Video is divided into different scenes by scene change detection and each frame is transformed to wavelet domain before watermark is embedded. And the watermark needs to be preprocessed, being cropped crop into different parts.
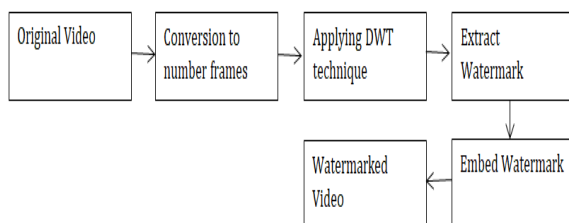

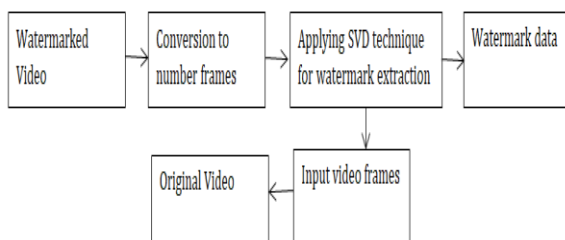Figure 2.1 Proposed Video Watermarking Technique

Figure 2.2 Proposed Original Video Extraction Techniques

III.   Literature Survey:

Gopika V Mane et al. (2013) proposed the protection and illegal redistribution of digital media has become an important issue in the digital era. This is due to the popularity and accessibility of the Internet now a days by people. This results in recording, editing and replication of multimedia contents. Digital watermarking can be used to protect digital information against illegal manipulations and distributions. Digital watermarking technique is the process of embedding noise-tolerant signal such as audio or image data in the carrier signal. This technique provides a robust solution to the problem of intellectual property rights for online contents. This paper reviews different aspects and techniques of digital watermarking for protecting digital contents.

Ankitha A. Nayak et al. (2014) proposed during the last few years' mobile devices like smart phone and tablet witnessed a random growth in terms of hardware and software. The increased growth of apps, sharing data, videos, images through internet need security and intellectual property right. Developing a watermarking technique for data protection and authentication on shared data in mobile internet within the limited memory and significant battery consumption is one of the current challenging fields. In this paper we have performed a survey on available video watermarking techniques and a feasibility study on video watermarking techniques for mobile devices. Also the comparative study on features of watermarking with different video watermarking algorithm is performed.

Rakesh Ahuja et al. (2015) presented the review covers the video watermarking literature published from 1997 to the year 2015. Through extensive work, some selection is necessary. Therefore, only articles published by a process of peer review in archival journal are reviewed. Papers are grouped according to the implementation techniques and further divided into sub techniques. Many papers deal with fundamental of digital video watermarking, including experimental, numerical and analytical works. Others are related to application or natural system. In addition to reviewing journal articles, this review also takes papers of good conferences and meeting on video watermarking. The main aim of authors is to provide every details regarding digital video watermarking under an umbrella. In other words all aspects of video watermarking are placed together in order to helpful to those readers looking the complete literature related to video watermarking scheme.

Payal dhiman et al. (2016) presented state image retrieval plays a dynamic character. The turf of image retrieval has been a dynamic research zone for numerous eras and has been rewarded more and

more devotion in current years as a outcome of the theatrical and wild increase in the tome of digital images. CBIR purposes at verdict image database for exact images that are alike to a given query image based on its features. Users can question sample images based on these features such as texture, color, region, shape and others. Mark or nearby Images can be regained in a slight fast if it is clustered in a correct way. For gathering, we use fuzzy- c mean clustering. In this system related images will be retrieved from database.

Nitisha Soni et al. (2017) proposed Content based image retrieval (CBIR) from large resources has become an area of wide interest nowadays in many applications. CBIR is very useful in several applications such as medical imaging, modern diagnosis, remote sensing and satellite imaging. The different types of images are subjected to set of operations used as constituent stages of CBIR. The method was initially used in 1990s and it is an image retrieval method using image vision contents such as color, texture, shape, spatial relationship, not using image notation to search images.Satellite imagery has become an important part of our information source. The amount of high resolution satellite imagery is growing rapidly, and much of it is now available to the public through various map services, such as Google Maps, etc.

Anjali C Solanki et al. (2018) proposed that nowadays, in every field there is a broad use of digital contents. Digital documents can be easily copied by large numbers of people without any cost. People can be download image, audio, and video, and they can share them with friends. Due to this reason, there is more probability of copying of digital information. Therefore, there is need of restrict such illegal document copyright of digital media. Digital watermarking is the major solution to this problem. In this paper, we provide survey of different watermarking technique.

Md Shahid et al. (2018) presented a pilfered duplicate of a digital video would be easily disseminated to the global audience because of the rapid high-speed internet. Due to impeccably replicable nature of digital video, numerous unlawful duplicates of the original video can be made. A video can undergo several intentional attacks like frame dropping, averaging, cropping and median filtering and unintentional attacks like the addition of noise and compression which can compromise copyright information, thereby denying the authentication. Hence techniques are needed to secure copyrights of the proprietor and counteract illegal copying. One of the techniques is Video Watermarking strategy for concealing some sort of information into digital video sequences that are orders of successive still frames. In this paper, we study properties of video watermarking, the arrangement of computerized video watermarking systems, watermark attacks, its applications, issues and challenges for video watermarking. At last, we propose some future research directions.

Mr. K. Sai Krishna et al. (2018) proposed a digital watermark is added to a image/frame, is a more or less visible information in the form of a text, logo, audio etc. that has been added to the original image, audio or video. The added information can be more or less transparent to make it either easy or hard to recognize the watermark. Video watermarking is relatively an innovative tool that has been proposed to solve the problem of illegal manipulation and sharing of digital video. It is the process of embedding copyright information into video watermarking. In this paper, we use DWT (discrete wavelet transforms) and SVD (single vapour decomposition) for embedding video watermarking algorithm and then we use IDWT (inverse discrete wavelet transforms) for extracting the video watermarking. For this video embedded and extraction of watermarking process we include image watermarking to get easy video watermarking and better understanding. The performance of the proposed algorithm is analyzed by using MSE, PSNR by adding attacks.

Xiaoyan Yu et al. (2018) proposed with the development and popularization of the Internet and the rise of various live broadcast platforms, digital videos have penetrated into all aspects of people's life. At the same time, all kinds of pirated videos are also flooding the Internet, which seriously infringe the

rights and interests of video copyright owners and hinder the healthy development of the video industry. Therefore, robust video watermarking algorithms for copyright protection have emerged as these times require. In this paper, we review robust video watermarking algorithms for copyright protection based on original videos and compressed videos. Basic models and properties of video watermarking algorithms are described, and the evaluation indexes corresponding to each property are also introduced. To help researchers understand various existing robust watermarking algorithms quickly, some basic information and the quantitative estimation of several performances are analyzed and compared. Finally, we discuss the challenges in the research of robust video watermarking algorithms, and give possible development directions for the future.

K. Muthumanickam et al. (2019) proposed the research on digital video watermarking techniques either to permit or deny the use of copyright service has acquired much attention. A video is a sequence of interconnected frames, thus embedding the watermark should be planned accurately and keep the hacking process more complex is very essential. Selection of random frames for inserting the watermark in a video decides the robustness against frame attacks like frame reduction, frame averaging and frame dropping. This paper proposes a Random Frame Section algorithm to embed a watermark dynamically without compromising its quality during frame selection process and Lucas algorithm to improve its robustness. The experimental analysis demonstrates the effectiveness and applicability of our approach. The outcomes confirm that the proposed method shows optimal result and robust against various frame based attacks.

IV.   Conclusion:

Firstly, an overview of digital video watermarking applications and their challenges, such as the imperceptibility and security of a watermark, blind detection and robustness to attacks was provided. In the literature, a great deal of work has been undertaken by researchers to develop a digital image or video watermarking algorithm that deals with

these issues. The watermark embedding techniques were classified based on the domain in which they embedded the watermark, including compressed, spatial and transform. Each technique was discussed in detail and some existing works related to them were then reviewed. Transform domain watermarking techniques were considered to be robust, stable and provide more imperceptibility than spatial and compressed domain-based approaches. We also discussed geometric-invariant watermarking techniques and surveyed relevant studies. After undergoing the several studies it can be concluded that video watermarking using wavelet transform is very secure watermarking technique .for image compression single value decomposition method used in the existing search papers. The existing techniques give peak signal to noise ratio 42 approx.

V.   Reference:

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