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Different Video Watermarking Techniques - A Review

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ABSTRACT

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.

Keywords : Watermarking, DWT, DCT, SVD

I. INTRODUCTION

Digital video watermarking is the process of embedding digital code into digital multimedia (images, audio and video sequence). The embedded information or watermark can be a serial number or random number sequence, ownership identifiers, copyright messages, control signals, transaction dates, information about the creators of the work, bi-level or gray level images, text or other digital data formats. A complete digital watermarking system should include three basic parts: watermark generation, watermark embedding and watermark extraction or detection[2]. A watermark is information about origin, ownership, copy control etc. This information is embedded in multimedia content. The watermark is embedded and extracted as per requirement. A watermark is typically used to identify either the originator or authorized user, state usage rights, verify the authenticity or integrity of the data, or control its use and distribution. Video watermarking is different from image watermarking, because additional data are available here that allows information to be more redundantly and reliably embedded. Digital video is a sequence or collection of images. The amount of information that can be embedded in the video sequence is called payload.

II. VIDEO WATERMARKING TYPE

Video watermarking techniques can be divided into various categories in various ways. The watermarks can be applied in spatial domain or frequency domain. Different types of watermarks are shown in the following figure 1[3].

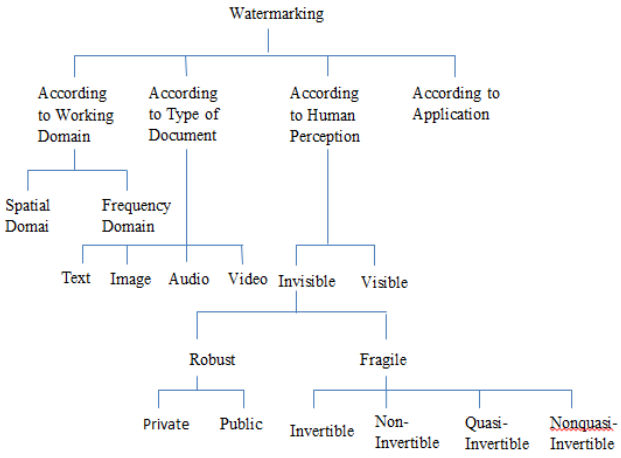

Figure 1. Types of watermarking techniques[3]

According to the type of document, watermarking can be divided into four different types as follows.

- ✓ Image Watermarking
- ✓ Video Watermarking
- ✓ Audio Watermarking
- ✓ Text Watermarking

According to the human perception, watermarking can be divided into three different types as follows.

- ✓ Visible watermark
- ✓ Invisible-Robust watermark
- ✓ Invisible-Fragile watermark
- ✓ Dual watermark

III. VIDEO WATERMARKING APPLICATION

- **Copyright Protection**

Copyright protection is very first targeted application for digital watermarking. In digital multimedia, watermarking is used as copyright protection to identify the copyright owner[1].

- **Fingerprinting**

The illegal distribution of video content after copying a movie using a camcorder from the theater is a major problem. A video content owner can use this technique to trace the source of illegal copies. In this method, a unique watermark is embedded in each copy issued to each customer or movie theater in which movie released. It may contain a customer's identification or information relating to the movie theater so that, in case of copyright infringement, the content owner can easily blame the customer or cinema which allowed the illegal copy through camcording[1].

- **Medical application**

Medical media and documents also digitally verified, having the information of patient and visiting doctors. These watermarks can be both visible and invisible. This watermarking helps doctors and medical applications to verify that the reports are not edited by illegal means[14].

- **Video Authentication**

A watermark embedded in a host video can be used to check the authenticity of its content. There are some critical applications, such as video surveillance and medical imaging, in which protecting the content from alteration is very important[1].

- **Broadcast Monitoring**

Broadcasting of TV channels and radio news is monitoring by watermarking. It is done with the paid media like news broadcast or sports broadcast[2].

IV. VIDEO WATERMARKING TECHNIQUES

Video watermarking techniques can be divided into two major categories:

A. Spatial Domain Watermarking

This domain focuses on modifying the pixels of one or two randomly selected subsets of images. It directly loads the raw data into the image pixels. Some of its algorithms are LSB; SSM Modulation based technique.

- **Least Significant Bit**

The earliest work of digital image watermarking schemes embed watermark in LSB of the pi pixels. Given an image with pixels, and each pixel being represented by an 8-bit sequence, the watermarks are embedded in the last (i.e., least significant) bit, of selected pixels of the image. This method is easy to implement and does not generate serious distortion to the image.

B. Frequency Domain Watermarking

This technique is also called transform domain. Values of certain frequencies are altered from their original. There are several common used methods, such as DCT, DWT, and DFT.

- **Discrete Cosine Transform**

DCT represents data in terms of frequency space. An image is usually divided into non-overlapped m*m block. In general, a block always consists of 8*8 components.

- **Discrete Wavelet Transform**

The DWT is a mathematical tool that decomposes an image or video frame into a lower-resolution approximation image (LL) and three detail components, vertical (LH), diagonal (HH) and horizontal (HL). The approximation image (LL) is the low-frequency part and detail components LH, HH and HL are the high- frequency part with decompositions able to be conducted at different DWT levels.

- **Singular Value Decomposition**

The Singular Value Decomposition (SVD) is a technique that can be used in video watermarking. SVD is performed, after which singular values are usually modified to embed the watermark. An inverse SVD is then applied to obtain the original content.

V. LITERATURE REVIEW

An Overview of Digital Video Watermarking techniques for both 2D and 3D video contents. 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[1].

Watermarking technique based on the frequency domain in which the watermark is embedded and also tried to classify the digital watermarking in all the known aspects[2].

Various aspects of digital image watermarking in terms of overview, watermarking techniques, attacks, applications, performance analysis. Apart from it a brief and comparative investigation of watermarking techniques is presented with their advantages and disadvantages[3].

The current literature on digital watermarking and different methods are compared for embedding and extracting watermark on the basis of PSNR[4].

Based on watermarking on multimedia and to verify the effect of various attacks on watermarked video and shows different techniques of video watermarking and attacks[5].

A new semi blind scheme for video watermarking that is more robust towards attacks. The watermark object has been embedded in each frame of the original video[8].

TABLE 1. COMPARATIVE STUDY OF DIFFERENT VIDEO WATERMARKING TECHNIQUE

Sr no.	Proposed paper	Method used	Highlights of research
1	An Efficient Video Watermarking Approach Using Scene Change Detection	2 level Discrete Wavelet Transform(DWT), Singular Value Decomposition(SVD)	High robustness particular to frame swapping, frame dropping and mpeg compression.
2	An Overview of Digital Video Watermarking	SVD,DFT,DCT,DWT	Provide robust, stable and imperceptible watermarking approach.
3	CHAOTIC Map Based Video Watermarking Using DWT And SVD	Discrete Wavelet Transform(DWT), Singular Value Decomposition(SVD), Chaotic map	Chaotic map provide good imperceptibility, capacity and security.
4	Review on Digital Video Watermarking Techniques	Discrete Wavelet Transform(DWT), Discrete Cosine Transform(DCT)	Classified watermarking technique based on the transform domain.
5	A Review on Digital Watermarking Techniques, Applications and Attacks	It works based on spatial domain and frequency domain	It shows watermarking techniques, attacks, applications, performance analysis.
6	DIGITAL WATERMARKING	DCT,DWT,DFT,FCNN	Different methods are

	– A REVIEW		compared for embedding and extracting watermark on the basis of PSNR.
7	Analysis of Attacks on Video Watermarking	Discrete Cosine Transform(DCT)	To study watermarking on multimedia and to verify the effect of various attacks on watermarked video.
8	A Digital Video Watermarking Technique Based on Identical Frame Extraction in 3-Level DWT	3-Level Discrete Wavelet Transform(DWT)	Strong robustness against some common attacks such as cropping, Gaussian noise adding, Salt & pepper noise adding, frame dropping and frame adding.

VI. CONCLUSION

In this paper, different video watermarking techniques will be surveyed. Now a day's data hacking is very serious problem on internet services that can be avoided using different watermarking techniques. Till now watermarking is work based on spatial domain and now new approach will used the frequency domain based on DCT,DWT, SVD.

VII. REFERENCES

[1]. Md. Asikuzzaman and Mark R. Pickering,"An Overview of Digital Video Watermarking", IEEE TRANSACTIONS ON CIRCUITS AND SYSTEMS FOR VIDEO TECHNOLOGY, 2017.

[2]. Alka N. Potkar, Saniya M. Ansari,"Review on Digital Video Watermarking Techniques" The International Journal of Computer Applications (0975-8887) Volume 106-No.11, November 2014.

[3]. Ms. Komal M.Shukla, Mr. Ashish K.Mehta,"A Review on Digital Watermarking Techniques, Applications and Attacks", IJECS Volume 4 Issue 4 April, 2015 Page No.11237-11245.

[4]. Amarjeet Kaur, Rajneesh Talwar,"DIGITAL WATERMARKING-A REVIEW", Vol. 1, Spl. Issue 2(May, 2014).

[5]. Varsha Gaikwad, Rehana Shikalgar, Shubhangi Sagare, Shital Shendage, "Analysis of Attacks on Video Watermarking" International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE) Volume 6, Issue 4, April 2017.

[6]. Sanjay Kumar, Ambar Dutta,"Performance Analysis of Spatial Domain Digital Watermarking Techniques", International Conference On Information Communication And Embedded System(ICICES 2016).

[7]. Ameena Ahammed, Reeba R,"A Survey on Watermarking Techniques", International Journal of Scientific Engineering and Applied Science (IJSEAS)-Volume-2, Issue-1, January 2016.

[8]. Divjot Kaur Thind,Sonika Jindal, "A Semi Blind DWT-SVD Video Watermarking", International Conference on Information and Communication Technologies (ICICT 2014).

[9]. Jeebananda Panda, Prince Garg, "An Efficient Video Watermarking Approach Using Scene Change Detection", IEEE-2016.

[10]. Ramakrishnan S, Dhinakaran S, Sabari Ashwanth P,Dhamodharan P, "CHAOTIC Map

Based Video Watermarking Using DWT And SVD", International Conference on Inventive Communication and Computational Technologies (ICICCT 2017).

[11]. Tamanna Tabassum, S.M.Mohidul Islam, "A Digital Video Watermarking Technique Based on Identical Frame Extraction in 3-Level DWT", IEEE-2012.

[12]. Ankita P. Chauhan, Rohit R. Parmar, Shankar K. Parmar, Shahida G. Chauhan, "Hybrid Approach for Video Compression Based on Scene Change Detection", IEEE-2013.

[13]. Rini T Paul,"Video Watermarking Based On DWT-SVD Techniques", International Journal of Science and Research (IJSR)-2014.

[14]. Mohan Durvey, Devshri Satyarthi "A Review Paper on Digital Watermarking" IJETTCS Volume 3, Issue 4, July-August 2014.

[15]. Bharti Mishra, Rashmi Kashyap, "A Review Paper on Digital Watermarking Techniques & Its Applications", International Journal of Science and Research (IJSR), Volume 5 Issue 6, June 2016.