

ANALYSIS OF VIDEO WATERMARKING TECHNIQUES

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ABSTRACT : *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. Video watermarking can be used to protect video 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. With the help of this technique a robust solution of intellectual property rights for online contents. This paper reviews different aspects and techniques of digital watermarking for protecting digital contents.*

Keywords: *Attacks, Content protection, DWT, PSNR, Watermarking techniques*

Introduction:

The popularity of digital video based applications is accompanied by the need for copyright protection to prevent illicit copying and distribution of digital video. Copyright protection inserts authentication data such as ownership information and logo in the digital media without affecting its perceptual quality. To increase robustness the watermark process is introduced into the video. Our video watermarking algorithm is robust against the attacks of frame dropping, averaging and statistical analysis, which were not solved effectively in the past. In the embedding video data scheme the secret data is embedded randomly segmented and reconstructed without knowing the original

host video. Secret data is embedded in individual video frames using the frequency domains of DWT. Finally the PSNR reading is compared for the Original Video & Watermarked Video

Video is a sequence or collection of consecutive still frames. The amount of information that can be embedded in the video sequence is called payload. In reality video watermarking techniques need to meet other challenges than that in image watermarking

schemes such as large volume of the inherently repeated sequence of data between frames.

The watermark embedding scheme can either embed the watermark into the host signal or to a transformed version of the host signal. Transform domain watermarking is a scheme that is used to transform image frequency domain in such a way to modify the transform coefficient. Some common transform domain watermarking for image data can be Discrete Cosine Transform (DCT) based or Discrete Wavelet Transform (DWT) based. This scheme is very useful for taking advantage of perceptual criteria in the embedding process for designing watermark techniques. Spatial domain watermarking has the capability of performing some transformation directly on image pixels. The use of perceptual models is also an important component in generating an effective and acceptable watermarking scheme for audio just as it is used in image watermarking.

Digital Media Security

Watermarks and watermarking methodology have categorized in many fields which are explained here. There are many types of watermarking techniques

which is classified in four categories according to the digital documentation.

- a) Image Watermarking
- b) Text Watermarking
- c) Audio watermarking
- d) Video Watermarking

Other watermarking algorithms are classified in three types on the basis of human perception.

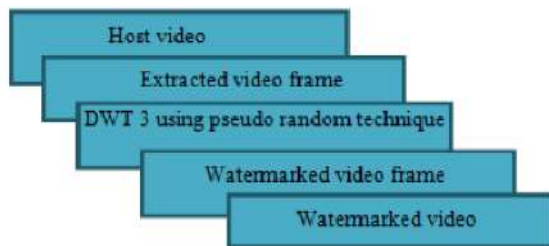
- a) Visible watermarking
- b) Invisible watermarking
- c) Dual watermarking

Visibility is linked to the notion of human eye, so that watermark is visible in the watermarked document without any extraction procedure. Generally logos are used in images, videos and document file which provide visible watermarking. Invisible watermarking is a watermarking technique where human eye cannot detect the watermark hide in the cover image or any other document.

Third is, watermark algorithms which are classified based on information for detection. They are:

- a) **Blind Watermarking:** - In blind watermarking, original data is not required for detection the watermark. Only Secret key is used for detecting.
- b) **Semi-blind watermarking:** - In this watermarking technique, sometimes some additional information may be required to detect watermarks. After adding watermarking, some watermarking requires access to basic data, which is called watermarked data.
- c) **Non-blind:** - Here in Non-blind watermarking technique for detecting the watermark original data is required.

Steps of Digital Video Watermarking



1) Host Video

It is the plain video which is used as an input to the process of digital video watermarking.

2) Extracted Video Frame

We extract the video frame from the plain video. We get consecutive frame.

3) DWT-3 using Pseudo Random Technique

Each original extracted video frame is combined with a pseudo random key generated by pseudo random technique. Multi-level discrete 3-D wavelet transform is applied to each extracted video frame combined with key.

4) Watermarked Video Frame

After following the above steps, each video frame get watermarked and watermarked video frame is obtained.

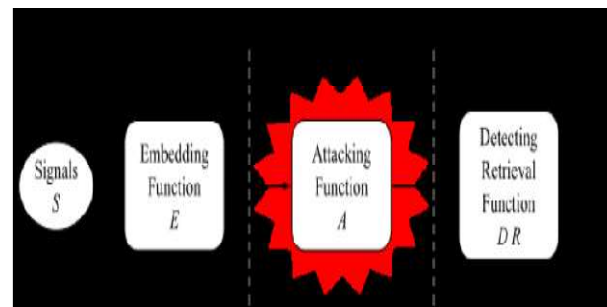
5) Watermarked Video

All the watermarked frame combined to form a watermarked video and at last watermarked video is obtained.

Problem Definition

The information to be embedded in a signal is called a digital watermark, although in some contexts the phrase digital watermark means the difference between the watermarked signal and the cover signal. The host signal is which signal where signal meets watermark . A watermarking system is usually divided into three distinct steps, embedding, attack, and detection. In embedding, an algorithm accepts the host and the data to be embedded, and produces a watermarked signal.

If this person makes a modification into a watermark frame, this is called an attack. While the modification may not be malicious, the term attack arises from copyright protection application, where third parties may attempt to remove the digital watermark through modification. There are lots of possible modifications, for example, lossy compression of the data (in which resolution is diminished), cropping an image or video, or intentionally adding noise.



Attacks on watermarks

a) **The resizing schemes** like JPEG and MPEG degrades the data quality, thus possibly altering the watermark.

b) **Geometric operations** like rotation, translation, scaling and cropping distort data and possibly alter the watermark.

c) **Signal Processing Operations** like D/A, A/D conversion, re-sampling, re-quantization, dithering, linear filtering, non linear filtering etc.

Intentional attacks: The intentional watermark attack includes Single frame attacks like filtering attacks, contrast and color enhancement and noise adding attack. Or statistical attacks like averaging attack and collision attack.

Unintentional attacks: This is due unwanted we can resize in frame of a video. We have to possible one copy of frame

Conclusion

In this paper is study of different video watermarking techniques given by researcher till now but after study it is concluded that the previously techniques are not that much efficient to provide security and these techniques are very common in the field so can be detected very easily by hackers for extraction of watermark inserted in videos. So we need for new robust technique which will be able to hide watermark at such place in frames so cannot be extracted easily and provide more security over video watermarking old techniques.

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