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A Survey on Video Watermarking Method for Reliability and Security in Video Using Least Significant Bit

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Abstract— Digital watermarking techniques have fastest growing techniques for copyright protection and authentication. Digital watermarking field has so many articles which covers innovative approach. Hence, watermarking is a solution for patent protection and content verification mechanisms. Watermarking is classified into three domain i.e. spatial, transform and wavelet. Today's media use watermarking techniques for various applications such as copyright protection, copy control and tamper recurrence. Main focus involved in watermarking approach is its design considerations, choice of suitable watermarking methodology, security, reliability and robustness. In this survey we have studied and analyze much number of techniques and methodologies where we found video watermarking interesting. In this digital world many revolution has taking place with the paradigm of multimedia distribution. Computer networks with High speed in World Wide Web have revolutionized. Distribution and production of High quality copies of digital data through the internet by exploiting recent network and software technologies. Video piracy has become an increasing problem particularly with the proliferation of media sharing through the advancement of Internet services and various technologies. Security techniques that are based on security techniques only provide assurances for data confidentiality, authenticity, and integrity during data transmission through a public channel. However, many security techniques do not provide protection against unauthorized copying or transmitting of illegal materials. Digital watermarking is the act of hiding a message related to digital signals in different forms like an image, song, video within the signal itself. Using digital watermarking, copyright information can be implanted into the multimedia data by using some algorithms. Watermark information is mainly for protecting the copyright, covert communication and data file authenticity. Existing video watermarking techniques are divided into different categories Spatial, Transform and Pixel as shown in Fig1.

Keywords— Digital Watermarking, AVI Video, Least Significant Bit, Spatial Domain

I. INTRODUCTION

A. Digital Watermarking

Digital watermarking is nothing but a digital code embedded into digital cover content e.g. text, image, audio and in our case video sequence.

1) Watermarking is a concept of embedding a special pattern, watermark, is embedded into a document

B. Why need Digital Watermark?

Cryptography ensures confidentiality, authenticity, and integrity Cannot help after decryption Digital Watermarking can help

- 1) Prove ownership
- 2) Identify a misappropriating person
- 3) Trace the marked document's dissemination through the network.

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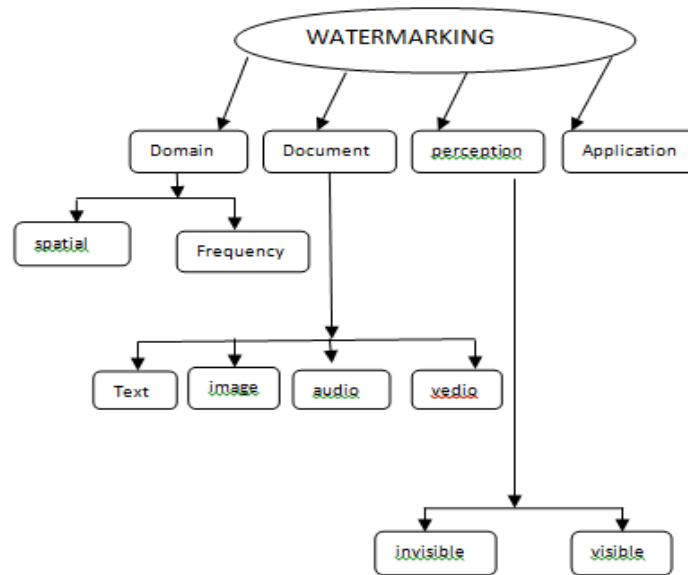


Fig1: Types of watermarking

C. Digital Watermarking Media

- 1) Video
- 2) Audio
- 3) Images

D. Why need Video Watermark?

- 1) Different interesting watermarking approaches have been proposed
- 2) Most of Video Watermarking is based on the techniques of the image watermarking
- 3) Video watermarking introduces some issues not present in image watermarking
- 4) Frame averaging, frame dropping, frame swapping, statistical analysis, interpolation ...

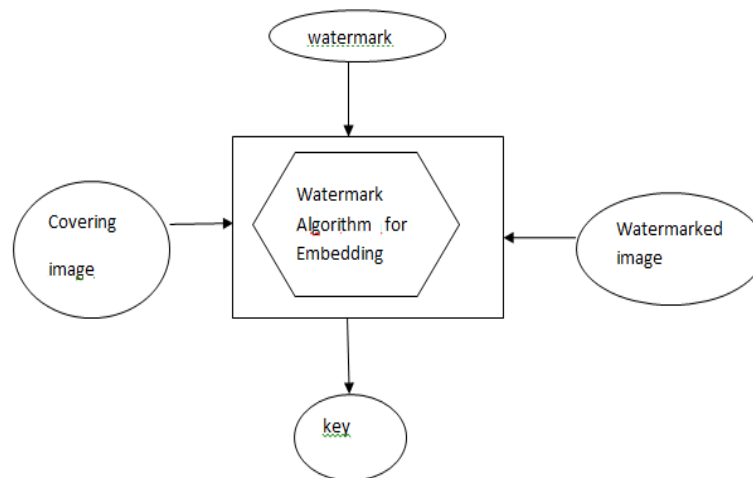


Fig (2):-watermarked Detection process

All digital watermarking include to algorithm: - one as the embedding algorithm and other as the detecting algorithm. These two processes are same for all the type of watermarking techniques. Fig: II shows the watermark embedding process in which the watermark is embedded in the cover image by using the embedding algorithm. And Fig:III shows the watermark detection process in which the embedded watermark is recovered by using the detection algorithm.

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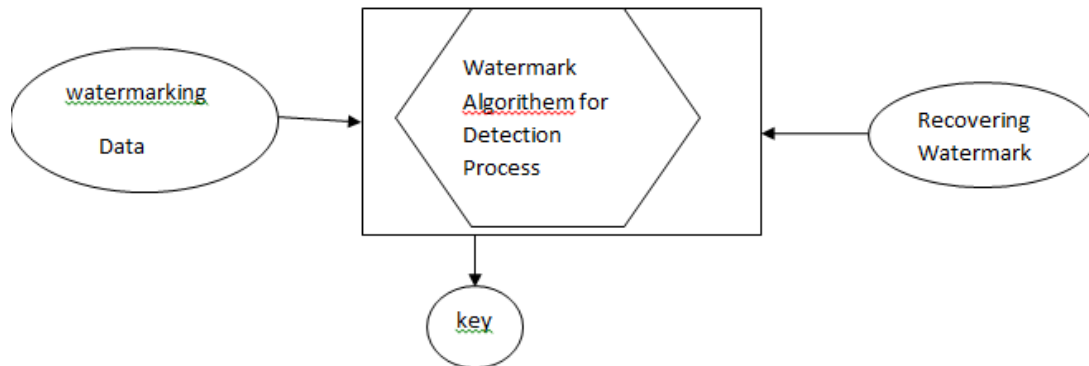


Fig (3):-watermarked Detection process

E. Video Watermarking Terminology

- 1) *Digital Video*: Digital video is a sequence or collection of consecutive still images.
- 2) *Payload*: The amount of information that can be embedded into the video sequence.
- 3) *Security*: In watermarking the security is assured in the same way as in encryption. Though the algorithm of watermarking process is public, security depends on the choice of the key.

F. Principle of video watermarking

The complete process of digital video watermarking is described into four steps: Watermark insertion or embedding, Watermark transmission or distribution through a channel, Watermark extraction or detection and Watermark decision.

Watermark embedding algorithm embedded a watermark into original video using a Key, which may be either public or symmetric key. Then the watermarked video transmitted over the channel. At the receiver side, watermark detection/ extraction algorithm used to detect a watermark. In last step, watermark decision, watermarking system analyzes the extracted data.

Properties of Video Watermarking—

For digital video watermark some most important characteristics or properties of watermarking process are required. Such as,

- 1) *Robustness*—The watermark should be impossible to remove from watermarked video, without the sufficient knowledge of an embedding process. The robust one is specially designed to withstand a wide range of attacks.
- 2) *Imperceptibility*—The watermark embedded into the digital video sequence should be invisible to Human Vision System (HVS).
- 3) *Unambiguous*—The extracted watermark should uniquely identify the original owner of the video.
- 4) *Loyalty*—A watermark has a high reliability, if the degradation it causes is very difficult to perceive for the viewer.
- 5) *Computational Cost*—Digital video watermark system includes, embedding and detecting process both should be fairly fast and should have low computational complexity.
- 6) *Interoperability*—Watermark system must be interoperable for the compressed and decompressed operations.
- 7) *CBR (Constant Bit Rate)*—In the bit stream domain, watermarking should not increase the bit rate.
- 8) *Random detection*—In video watermarking the detection of watermark can be done in any position of video.
- 9) *Blind detection scheme*—Non-blind detection scheme require the original data, but for video sequence it is very inconvenient to use original data because of its huge content compare to image. While a blind detection scheme doesn't require an original data, so it is useful for video watermarking.

II. CLASSIFICATION

Classification of Digital watermarking technique

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i)Type of watermark	i)Noise-pseudo noise,Gaussian random and chaotic sequences ii)Image- Logo ,Stamp image etc.
ii)Robustness	i)Fragile:Easily manipulated. ii)semi fragile:resist from some type of noise iii)Robust :Not affected from noise
iii) Domain	i)Spatial:Lsb,spread spectrum ii)frequency:DWT,DCT,DFT,SVD
iv)Perceptivity	i)visible watermarking: channle logo ii)Invisible watermarking:Like steganography
v)Host Data	i)Image watermarking ii)Text watermarking iii)Audio watermarking iv)video watermarking
vi)Data Extraction	i)Blind ii)Semi Blind iii)Non Blind

III. LSB: LEAST SIGNIFICANT BIT

The LSB technique is the simplest technique of watermark insertion.

- A. Consider a still image : each pixel of the color image has three components — red, green and blue.
- B. Allocate 3 bytes for each pixel. Then, each colour has 1 byte, or 8 bits.
- C. Use a secret key to choose a random set of bits.
- D. The more bits used in the host image, the more it deteriorates.
- E. Increasing the number of bits used though obviously has a beneficial reaction on the secret image increasing its clarity.
- F.
- G. 010101 1 1 110101
- H. 101001 + 1 1 111001
- I. 101000 101000

Example Photo:-

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Original Video

After covered new watermark

IV. CONCLUSION

In this review we have studied a lot of papers and analyze the content for various digital watermarking techniques also studied the details of the digital watermarking such as the classification, category, and types. Embedding process has got details how to use the different techniques with different domains. Mainly focused on our theme that is LSB technique and try to improve this technique with experimented results. Watermarking provides reliability and security in digital world.

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