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Compressed Video Stream Digital Watermarking

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Abstract:

Digital Watermarking is not a new name in the technology world but there are many new issues arise related with watermark. This paper surveys recent advances in digital watermarking techniques in digital images. The aim of digital watermarking with hidden data added into content of multimedia. In this paper, DCT technique issued and when size of image is increase then also increases PSNR without decreasing power of embedded factor[1] (alpha factor) in same format.

Keywords:

Discrete Cosine Transform (DCT); Peak Signal to Noise Ratio (PSNR)

Introduction

Digital Watermarking represents an effective method for authentication and ownership right protections. It involves embedding watermark data into original information .Watermark information cannot be stored in file header because anyone with a computer and a digital editing workstation would be able to convert the information to another format and remove the watermark. It always embedded to multimedia signals. There are a lot of processes performed by unauthorized persons who aim to damage or corrupt the embedded information.

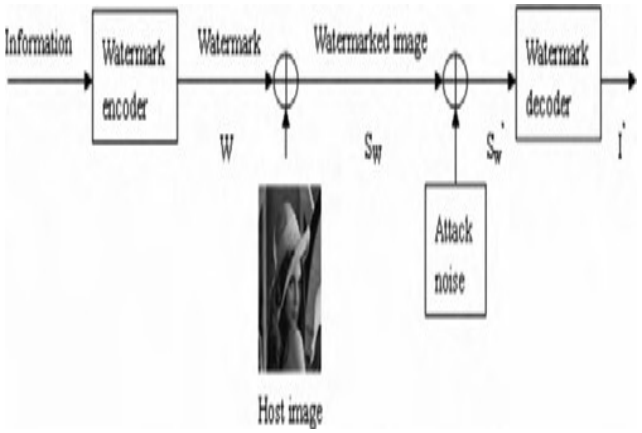

Figure1.WatermarkModel

Watermark is a design of watermark signal W to be added into a host image. The watermark signal, apart from depending upon image Sw, may also depend upon key K and the host image I into which it is embedded.

Robustness:

The watermark should be impossible to remove even if the algorithmic principle of the watermarking method is public. Of course, any watermark can be removed with sufficient knowledge of particular embedding process. Therefore, it is enough if any attempts to remove or damage the watermark. Result in severe quality degradation of the video sequence before the watermark is lost.

Spread Spectrum Watermarking:

The watermark should not be placed in perceptually insignificant regions of the image (or its spectrum), since many common signal

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and geometric processes affect these components. The problem then becomes how to insert a digital watermark into the most perceptually significant regions of the spectrum in fidelity preserving fashion. Clearly, any spectral coefficient may be altered, provided such modification is small. However, very small changes are very susceptible to the noise. To solve this problem, the frequency domain of the image or sound at hand is viewed as a communication channel, and correspondingly, the watermark is viewed as a signal that is transmitted through it. Attacks and unintentional signal distortions are thus treated as noise that the immersed signal must be immune to. We originally conceived our approach by analogy to spread spectrum communications. One transmit a narrowband signal over a much larger bandwidth such that the signal energy present in any single frequency is undetectable. The watermark is spread over very many frequency bins so that the energy in any one bin is very small and certainly undetectable. To insert a watermark in the frequency domain of an image we should first apply DCT (Discrete Cosine Transformation). It is a standard way to represent an image in frequency domain.

- Multiple Watermark Method for Privacy Control and Tamper
- Detection in Medical Images

Multiple watermarking approach:

Robust digital image watermarks are suitable with copyright protection because they remain intact with the protected content under various manipulative attacks.

The annotation watermark can take the robust form in order to preserve data integrity. Annotation information can be patient name, hospital name, date and time of imaging process, and image dimension. On the other hand, the fragile watermarks are good for tamper detection. Proposed a watermarking method that voids embedding watermark in the region of interest (ROI). Although it preserves the image quality in that region, the major drawback is the ease of introducing copy attack on the non-watermarked regions. In contrast that method, we propose to embed a fragile watermark that covers the entire central region of an image. This say, tampering in small regions can be located easily. Proposed a wavelet-based watermarking scheme to embedded multiple data watermarks in medical images. Although the scheme offers medical confidentiality and record integrity, the visual quality of watermarked images can be improved to achieve higher PSNR values. No other approach is to create a virtual border by inserting extra line of pixels around image borders in order embed watermarks within it. This approach increases size and storage space. Such approach is in contrast to space saving objective of watermarking. In addition, the absent of a fragile watermark makes it vulnerable to tampering. We propose a multiple watermark system as shown. The annotation watermark and the fragile watermark are embedded separately into different regions of the image

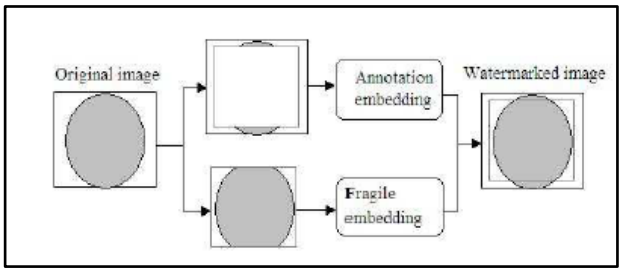

Figure2. Multiple watermark embedding

Perceptual transparency

The watermarking system must embed the watermark in the image in such a way that the visual quality of the image is not perceptibly distorted. Hence, we must use the suitable metric to verify the imperceptibility of the watermarking algorithm. In this project, I did not use any mathematical metric (such as MSE or PSNR) to quantify the distortion due to watermarking. Instead, we commented on the visual quality of images by comparing how the original image and watermarked image look. The embedded signature should not affect the image quality. In fact, the watermarking system must embed the watermark in the image in such a way that the visual quality of the image is not perceptibly distorted.
Insertion capacity the insertion capacity depends generally on the application used for the image. In fact, in the medical field the

signature can express information on the patient medical stereotype. Each time the size of the signature increases there will be degradation of the medical image. Specificity The mark must be sufficiently specific to be clearly identifiable during its extraction. It must also be exact to identify clearly the concerned person and any mistake can change the result.
Security The security of watermarking techniques is very similar to the security of the encryption techniques. A watermarking technique is actually protected if knowing the algorithms to embed and extract the watermark does not help an unauthorized party to detect the presence of the watermark.

Security providing:
Multiple watermark process will generate random keys for each and every image. Using these keys the reverse process will be done by receiver side.

Conclusion:
This report has presented the need for watermarking, types of digital attacks, requirements for online MPEG video watermarking and then the ongoing research in watermarking technology. The robustness and scaling of each method has been mentioned. Further work could concentrate on finding the appropriate stage for watermark embedding with goals such as minimal processing and maximum security.

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