

# Digital Watermarking: Comparing Two Techniques

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## Abstract

In rapid development and wide use of Internet, information transmission faces a big challenge of security. Thus security of multimedia contents becomes a vital issue and there is a need in protecting the digital content against counterfeiting, piracy and malicious manipulations.. Digital watermarking is a very important field for copyrights of various electronic documents and media. It is one of the proposed solutions for copyright protection of multimedia data and multimedia content has become a very active research area over the last several years. This paper comparing two techniques and find out which one is most suitable for the image protection against the malicious, piracy and counterfeiting manipulations of the image. This work and it' all step has been implemented through MATLAB.

## Keywords

Digital image watermarking, Protection, Spread-Spectrum techniques, Least Significant Bit (LSB)

## I. Introduction

The recent growth of networked multimedia systems has increased the need for the protection of digital media. This is particularly important for the protection and enforcement of intellectual property rights. Digital media includes text, digital audio, images, video and software. Many approaches are available for protecting digital data; these include encryption, authentication and time stamping.

Digital watermarking technology is an emerging field in computer science, cryptography, signal processing and communications. In this paper we present algorithms for image authentication and forgery prevention known as watermarks.

In this paper we present algorithms for image authentication and forgery prevention known as watermarks. Figure 1 shows the block diagram for watermarking digital images.

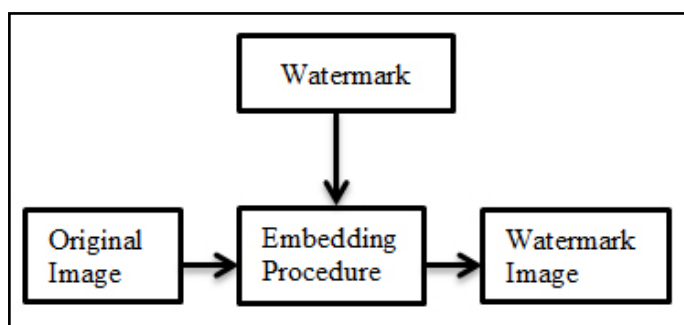


Fig. 1: Block Diagram of Watermarking Algorithm

## A. Digital Watermarking Classification

- Robustness
- Perceptibility
- Capacity

Robustness is resists a designated class of transformations. Robust watermarks may be used in copy protection applications to carry copy and no access control information.

Perceptible is presence in the marked signal is noticeable (e.g. Network Logo, Content Bug, Codes, Opaque images.).

Capacity of the embedded message determines two different main classes of digital watermarking schemes:

- a. multiple-bit watermarking
- b. non-zero-bit watermarking

## B. Types of Digital Watermarks

Watermarked and watermarking techniques can be divided into various categories in various ways. The watermarks can be applied in spatial domain. An alternative to spatial domain watermarking is frequency domain watermarking. It has been pointed out that the frequency domain methods are more robust than the spatial domain techniques.

Watermarking techniques can be divided into four categories according to the type of document to be watermarked as follows.

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

Image Watermarking is authentication in image by using watermarking. Video Watermarking is authentication in video by using watermarking. In audio watermarking the authentication is provided by watermarking. In text watermarking the authentication provided in text.

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

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

Visible watermark is a secondary translucent overlaid into the primary image. The watermark appears visible to a casual viewer on a careful inspection.

The invisible-robust watermark is embedded in such a way that alternations made to the pixel value are perceptually not noticed and it can be recovered only with appropriate decoding mechanism.

The invisible-fragile watermark is embedded in such a way that any manipulation or modification of the image would alter or destroy the watermark.

Dual watermark is a combination of a visible and an invisible watermark.

From application point of view digital watermark could be as below.

- source based or
- destination based.

Source-based watermark are desirable for ownership identification or authentication where a unique watermark identifying the owner is introduced to all the copies of a particular image being distributed. A source-based watermark could be used for authentication and to determine whether a received image or other electronic data has been tampered with. The watermark could also be destination-based where each distributed copy gets a unique watermark identifying the particular buyer. The destination – based watermark could be used to trace the buyer in the case of illegal reselling.

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