

Introduction

1.1 Overview of the research topic:

The revolutions and advent in internet technology has resulted in many new opportunities for creating and delivering the contents in digital form with increasing use transmitted information's via internet, we need to protect information's such as: image, audio, video files and so on. We discuss in this research how to protect image by adding watermarks to them. The Purpose is, to prevent every person who might be using your image without your permission.

Digital image watermarking is one of the most widely used techniques for protection of ownership rights of digital images. Appeared on banknotes and important documents with the aim to protect them against forgery [1].

There are many Techniques that applied to the field of digital watermarking this increase needs in watermarking methods appear as a result of a growing number of attacks against watermarking systems.

A digital watermark could be used either source based or destination based. From the application point of view, source based watermarks are used for authentication or ownership identification.

According to the type of document, watermarking techniques can be divided into four categories: they are text watermarking, image watermarking, audio watermarking and video watermarking.

Right now, digital watermarking is an active and leading area of research.

1.2 Background:

The term ‘digital watermarking’ first appeared in 1993, when (Tirkel) presented two watermarking techniques to hide the watermark data in the images [2]. The success of the Internet digital storage devices and quality of service it possible to create, transmit, and distribute digital content in an easy way.

The growth of e-commerce applications in the World Wide Web also requires the need to increase the security of data communications over the internet. To provide security to these applications and the protection and enforcement of intellectual property rights for digital media, data encryption and information hiding techniques were introduced & developed. Digital watermarking is a technology that provides and ensures security, data authentication and copyright protection to the digital media.

Digital Watermarking is the process of embedding data called a watermark (also known as Digital Signature or Tag or Label) into the digital media (such as text, image, audio and video) such that watermark can be detected or extracted later to make an assertion about the object. For example, information about copyrights, ownership, timestamps, and the legitimate receiver could be embedded [3]. Digital watermarking by itself prevent copying, modification, and re-distribution of documents.

However, if encryption and copy protection fail, watermarking allows the document to be traced back to its rightful owner of unauthorized use. Digital watermarking Enters in many areas including signal processing, telecommunications, cryptography, Medicine, and law. Watermarking is used for Proof of Ownership (copyrights and protection), Copying Prevention, Broadcast Monitoring, Authentication and Data Hiding.

Images make up a major component of multimedia content. Examples of images are digital arts, illustrative diagrams, and cultural heritage paintings in digitized form and digital photographs. Advances in computing hardware, software, and networks have created threats to copyright protection and content integrity. For instance, images can be copied, modified, and distributed easily. Digital watermarking is a potentially good tool in enabling content protection. Encryption can offer confidentiality and integrity in content protection, and the decrypted content can be further protected using digital watermarks.

The watermarking process embeds a signal into the image without significantly degrading its visual quality [4]. Then the image can be made public or sent to the end user. Later, the detected watermark can be used for the purposes of copyright protection and content authentication.

Copyright protection concerns the positive identification of content ownership in order to protect the rights of the owner. Robust watermarks can be used in copyright protection because they are persistently associated with an image. Attempts to remove the watermark should result in severe degradation of the image's visual quality. The detection of a watermark in an image can be used to identify the copyright holder.

1.3 Problem statement:

The motivation for taking up “Digital Watermarking in Images” as topic for this research is a new field of security and important in verifying from digital information scattered wide on the internet. Protection of digital multimedia content has become an increasingly important issue for content owners. Watermarking is identified as a major means to achieve copyright protection, As a result of shortcomings and flaws in technique LSB:-

- It lacks basic robustness.
- Vulnerable to noise.
- Vulnerable to cropping, scaling.

We found that there was a scope of improvement in these techniques use technique Discrete Wavelet Transform (DWT).

An important issue arises for the protection of the rights of all participants it has been recognized and current laws of copyright protections are inadequate for dealing with digital data.

1.4 Research Objectives:

Driven by the urgent need to protect the digital image content that is being widely and wildly distributed and shared through the Internet by an ever-increasing number of users the field of digital watermarking has witnessed an extremely fast-growing development since its inception.

Copyright protection concerns the positive identification of content ownership in order to protect the rights of the owner. Robust watermarks can be used in copyright protection because they are persistently associated with an image. Attempts to remove the watermark should result in severe degradation of the image's visual quality. Digital watermarking hides in images the information necessary for ownership identity to offer copyright Protection and authentication.

Copyright Protection: for the protection of the intellectual property, the data Owner can embed a watermark representing copyright information in the data.

The embedded watermark can be used as a proof, e.g. in a court if someone intentionally infringed the copyrights.

The main objective of this thesis is:-

- Provide Image Authentication and Protection.

1.5 Methodology:

There are many ways to protect images, watermarking is probably the most effective and it's simple to use.

- Implement it used Matlab is the software that we will use to represent the system.
- An DWT Techniques is the Technique that will use to embedding and extraction watermark
- Mean Square error (MSE), Peak Signal to Noise Ratio (PSNR), the Parameters that will use to measure the quality of the image.

1.6 Research scope:

Research activities in digital image watermarking have become more specialized. Therefore, it is important to identify the focus of study. In this thesis, investigate of robust the watermark, semi-fragile watermarking, and hybrid methods. In addition, we also examine hybrid methods that combine the advantages of robust and semi-fragile watermarks For example, a watermark embedded in an image can be used to provide information web-based.

The printed image can be captured using a camera-phone, and the detected watermark is sent to a web server in order to retrieve extra information associated with the image. This technology could be useful in linking advertisements in printed magazines and time-sensitive materials on web servers. This strategy offers cross-media promotional coverage and content updates. The areas that contribute to the development of digital watermarking include the following:

A) Information and Communication Theory.

B) Signal Processing.

C) Digital image Processing.

Each of these areas deals with a particular aspect of the digital watermarking problem we also need to consider trade-off between watermark properties that have conflicting characteristics.

1.7 Contribution:

The research process started with a thorough literature survey on image watermarking methods for copyright protection and content authentication.

Our research work has the following contributions the major outcomes of this research are:

- Study and understand the digital watermarking.
- The development method and Techniques of a watermarking.
- We have performed a complete survey on the watermarking technologies.
- We compare the proposed Techniques with the existing scheme in different aspects and discuss the advantages and the disadvantages of our Techniques.

1.8 Thesis out line:

This research is organized as **5** chapters:

- Chapter (1) overview of the research topic and problem statement and research objectives.
- Chapter (2) digital watermarking and properties of digital watermarks and Application of watermarking and watermarking techniques.
- Chapter (3) Methodology and Algorithm Performance.
- Chapter (4) Simulation Environments and Flow chart for this system.
- Finally, Chapter (5) Conclusion and Recommendation.