A SURVEY REPORT ON SECURING DATA THROUGH WATERMARKING

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Abstract- In today's digital world, exchange of information (data) is been held electronically. Therefore there is a need for secure the data. There are various method like steganography, cryptography, compression etc. are common since past few years. One method to secure the data from unauthorized person is to use watermarking techniques. There are so many different watermarking techniques should be used to protect the secret information from unauthorized access. Among them securing data through watermarking using discrete wavelet transform method seems to be much better than traditional watermarking techniques used today. In this paper survey of securing data through watermarking techniques have been discussed by comparing and analyzing the performance of the past watermarking technique using discrete wavelet transform method.

Keywords: Digital image Watermarking, Discrete wavelet transform, data embedding, PSNR.

I.INTRODUCTION

Digital images are easily transmitted, modified and reproduced. Therefore, preserving the ownership of a digital image is an important issue. Digital Watermarking has recently become important in solving the image authentication problem. Watermarking is a technique that provides solution to the many longstanding problems related with copyright of digital data that can be detected or extracted later to make out some statement about the data. This information can be textual data about the author, its copyright, or it can be an image itself. It embeds an invisible in some case visible mark (payload) into digital content for the purpose of copyright protection, content authentication.

Watermarking technique adjusts an image by embedding user authentication information and extract watermarks from the watermarked image with recovering to the original image. This study presents digital image watermarking scheme under 3 level discrete wavelet transform. The DWT is based on small waves, called wavelets, of varying frequency and limited duration. Wavelet transform provides both frequency and spatial description of an image.

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DWT is the multi-resolution description of an image the decoding can be processed sequentially from a low resolution to the higher resolution. The DWT splits the signal into high and low frequency parts. The high frequency part contains information about the edge components, while the low frequency part is split again into high and low frequency parts. The high frequency components are usually used for watermarking.

II. LITERATURE SURVEY

A. An efficient wavelet based watermarking algorithm

Xiaojun Qi [1] proposed a secure algorithm for copy write protection and content authentication. The proposed efficient wavelet-based watermarking algorithm embeds a binary logo watermark by modifying the appropriate sub-band images in the wavelet domain. This algorithm can effectively hide a robust watermark due to the exploitation of the characteristics of the human visual system. The correlations between the watermarked wavelet coefficients and the rearranged pseudo-random sequences yielded from the digital logo at these two scales are stored as side information. The watermark is detected by comparing the correlations between the wavelet coefficients and the watermarking code at level 2 and level 3 with the stored side information. The performance of the proposed watermarking is robust to a variety of image processing techniques, such as JPEG compression, sharpening, resizing, and geometric operations.

B. A Lossless Data-hiding Technique based on Wavelet Transform

Hui-Yu Huang, Shih-Hsu Chang [2] have presented a data hiding technique based on quantized coefficients of discrete wavelet transform (DWT) in the frequency domain. Using the quantized 9/7 wavelet filter embeds secret information into the successive zero coefficients of the medium and high frequency components in each reconstructed block for 3-level 2 Dimensional Discrete Wavelet Transform of a cover image. The procedures of this approach include embedding, extraction, and restoration. This proposed method can achieve high embedding capacity and acceptable image quality of stego-image, and data reversibility.

C. Image Watermarking Using 3-Level Discrete Wavelet Transform (DWT)

Nikita Kashyap [3] proposed an Watermarking techniques using 3-level Discrete wavelet transform. Digital Watermarking techniques have drawn a lot of interest, where after the watermark has been extracted, the original content can be retrieved with zero distortion. The proposed method implemented a robust image watermarking technique for the copyright protection based on 3-level discrete wavelet

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transform (DWT). In this technique a multi-bit watermark is embedded into the low frequency sub-band of a cover image by using alpha blending technique. The insertion and extraction of the watermark in the grayscale cover image is found to be simpler than other transform techniques. The proposed method is compared with the 1-level and 2-level DWT based image watermarking methods by using statistical parameters such as peak-signal-to-noise-ratio (PSNR) and mean square error (MSE). The experimental results demonstrate that the watermarks generated with the proposed algorithm are invisible and the quality of watermarked image and the recovered image are better improved.

D. Robust DWT-SVD Domain Image Watermarking: Embedding Data in All Frequencies

Emir Ganic Ahmet, M. Eskicioglu [4], in this paper, proposes a hybrid scheme based on Discrete Wavelet Transform and Singular Value Decomposition. After decomposing the cover image into four bands, we apply the SVD to each band, and embed the same watermark data by modifying the singular values. Modification in all frequencies allows the development of a watermarking scheme that is robust to a wide range of attacks.

E. A novel DWT based invisible watermarking technique for digital images

M. Mohamed Sathik, S.S Sujatha[5] have propose an innovative watermarking scheme which utilizes the perceptual information of the image content to generate watermark. According to this disparity value between low frequency sub-band of wavelet domain and the rescaled version of original image are identified as watermark is done in high frequency domain of discrete wavelet transform since small modification in this domain are not perceived by human eyes. This watermarking deals with extraction of the watermarked information in the absence of original image. Peak signal to noise ratio and similarity ratio are computed to measure image quality.

F. Image Watermarking in DCT-DWT Domain

Angshumi Sarma, Amrita Ganguly [6].In this paper, two different methods of image watermarking are described. The host image is decomposed into four sub-bands using the first level DWT and then second level DWT is performed on the HL sub-band. In the first approach, the two smaller sub bands of the HL sub-band LH2 and HL2 are used to embed the watermark and in the second approach all the four smaller sub-bands of the HL sub-band are used to embed the watermark. In both the cases, 8x8 DCT is carried out on the sub-bands and the middle

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frequency DCT coefficients are selected for embedding the watermark.

G. A Digital Watermarking Algorithm Based On DCT and DWT

Mei Jiansheng , Li Sukang , Tan Xiaomei[7]. This paper introduces an algorithm of digital watermarking based on Discrete Cosine Transform and Discrete Wavelet Transform(DWT). According to the characters of human vision, in this algorithm, the information of digital watermarking which has been discrete Cosine transformed, is put into the high frequency of the image which has been wavelet transformed. Then distills the digital watermarking with the help of the original image and the watermarking image.

H. DWT Based Invisible Watermarking Technique for Digital Images

Pallavi Patil, D.S. Bormane [8] proposed a DWT based Invisible watermarking technique. The two most aspects of any image based steganographic system are the quality of the stego-image & the capacity of the cover image. A lossless data hiding scheme is presented based on quantized coefficients of discrete wavelet transform (DWT) in the frequency domain to embed secret message. Using the quantized DWT based method embed secret data into the successive zero coefficients of the medium high frequency components in each reconstructed block for 3-level 2-D DWT of cover image. The original image can be recovered losslessly when the secret data had been extracted from stego-image.

I. Digital Image Watermarking in Wavelet Domain

H. E. Suryavanshi, Amit Mishra, Shiv Kumar [9].This paper presents different aspects of watermarking and how it is useful for intellectual property protection on internet. Digital Image watermarking in wavelet domain involves transferring original data from spatial domain to frequency domain using Distributed Discrete Wavelet Transform technique and then embed watermark in the four sub-bands in frequency domain. The watermark information is distributed into the spatial coefficients and thus prevents cropping attack. It also greatly improves performance so that the scheme is robust against geometric attacks such as rotation or scaling and non-geometric attacks such as Gaussian noise, sharpening, and contrast adjustment.

J. Digital Watermarking: Data Hiding Techniques using DCT-DWT Algorithm

Kunal D Megha, Nimesh P Vaidya [10] have presented a new technique. Data hiding technique is robust for different attacks like scaling, Gaussian low-pass filtered, rotation etc. This algorithm provides multilayer security by using

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DWT domain, DCT domain, and color space conversions. Watermark should be able to provide full and reliable evidence for the ownership of copyright protected information products. It can be used to determine whether the object is to be protected and monitor the spread of the data being protected, identify the authenticity, and control illegal copying, also applying some attacks like image adding white noise, Gaussian low pass filter and measure the PSNR and NC (Normalized Coefficient) value.

K. Combined DWT-CT Blind Digital Image Watermarking Algorithm

Nidal F. Shilbayeh, Belal AbuHaija, and Zainab N. Al-Qudsy [11], this paper presents a new robust and secure system. The combined transforms will compensate the drawback of using each transform separately. Watermarking is done by modifying the coefficients of carefully selected DWT sub-band, followed by applying CT on the selected sub-band. The reason for applying the two transforms is based on the fact that combined transforms could compensate for the drawbacks of each other, resulting in effective watermarking.

Conclusion

In this paper, various discrete wavelet transform schemes have been presented and analyzed. Techniques which are based on discrete wavelet transform systems are emphasized, because these systems will improve the security level of watermarking algorithm by using properties of discrete wavelet transform. This technique can embed the visible and invisible watermark into the image which can be recovered by extraction technique. All the discrete wavelet transform techniques are good for image authentication and have their own advantages and disadvantages and give a protection to secure the data so that no one can access the image.

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