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Transformation of Images Using Wavelet Transform For Image Watermarking of Text in Binary Images

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Abstract—DWT and DCT compress the image and generates a decomposed image use of those decomposed band has been demonstrated in this paper of watermarking. Image watermarking is important for transmition of secret data over communication channel.DWT ensures the security, however text hiding is slightly different and uses the transformation the other way round and hence enhances the complexity and also the dissolving capacity of the cover image as now the text data range gets equivalent to the image data range hence it gets settle down easily, on the other hand the secrete image still uses the dwt technique to get its range altered and hence the images gets settled down easily without revealing any information.

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I. INTRODUCTION

Digital watermarking is tectics which provides security to multimedia content like Image, Text, Video and Audio. In this technique information embedded in digital content and use some algorithm for watermark procedure.In this we use two phase of watermark embedding and extraction,extraction is the revese process of embedding algorithm.[1] So in this paper to achieve high robustness we are using combine image and text within an image using transform based techniques.we use transform based techniques because it gives good result than spatial domain.[2]

II. WATERMARKING TECHNIQUES

Watermarking technique based on two domains Spatial domain and Transformation domain.Spatial domain algorithms are LSB,SSM and modulation based.Transformation techniques are better than spatial domain they are more robust than spatial.In this paper we are discussing about frequency domain transformation. In the Frequency domain the watermark is embedded into frequency coefficients of host image. Frequency domain watermarking is more robust than spatial domain watermarking because embedding of watermark into the altered frequency coefficients of the transformed image

[4].Frequency domain watermarking techniques are Discrete Fourier Transform (DFT), Discrete Cosine Transform (DCT), and Discrete Wavelet Transform (DWT).

Discrete wavelet transform:
Discrete Wavelet transform (DWT) is transformation tool which decomposes an image.Wavelet transformation provide both frequency and spatial description.This paper defines suitability of DWT for image watermarking. This transform decomposes the image into three directions horizontal, vertical and diagonal.

TEXT ALGORITHM USING DWT
A robust text watermarking algorithm using combined image and text watermark to protect the text documents fully . The previous work of text watermarking used combined image and text as watermark . But in [1], text document is not encrypted. In the proposed work, we encrypted the text document to increase security. In the proposed algorithm, the watermark is logically embedded in the text and then the text is encrypted. Later the text is decrypted and the watermark is extracted. In the proposed algorithm the occurrences of double letters existing in text are utilized to embed the watermark as in [1]. The watermark embedding is done by the original copyright

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owner of text and a watermark key is generated. The watermark is later extracted to prove authenticity. Thus the watermarking process involves two stages.

1. Watermark embedding, and
2. Watermark extraction. Text algorithm using DWT

In text algorithm the task is to make a separate function which can accept a text data of length 128 bits. A message box is created which only takes the string char values as a data type string.128 bit length is a standard length for experimental purpose .if the text data limit exceeds from 128 bit length then the extra text will be cut off however this length can be extended but 128 bit length is standard length.now in the next step data will be embedded into the cover image whose size is 512x512.
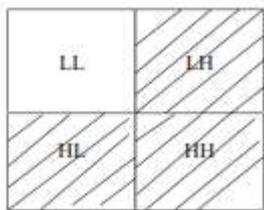

Figure 1: Text Algo

IMAGE ALGORITHM USING DWT

To apply DWT first of all we will do image analysis. we will take any size of image initially let us assume the image size is to be mxnx3 initially. As the image is in RGB image next step should be the standardization of the images for easy calculations. us take the image size to be 512x512x3 for the experimental value and for easy calculations.

Y = imread(„test(1).jpg");Y = rgb2gray(y);

Rgb2gray term change the color image into gray scale image. now the image size will be 512x512.
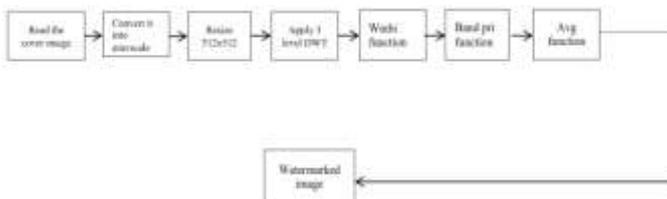

Figure 2:Image decomposition and Bit insertion

When we resized the image size we apply dwt and after that will do diferent types of functions and then we get our watermarke d image.

DCT(DISCRETE COSINE TRANSFORM)

Discrete Cosine Transform techniques are robust than spatial domain techniques.These are robust against image processing operations like brightness,cropping and low pass filter.[7]They are costly and implementation is hard.It is based on two techniques global based or block based techniques.This technique not good for geometric attacks. DCT used in image processings and it uses in imageprocessing,pattern recognition and data compression.[8]

DFT(discrete Fourier Transform)

Fourier Transform (FT) is robust against geometric attacks like scaling,cropping,translation and rotation.Fourier transform modifying its frequency coffifient.[5] It decomposed image into sine or cosine form,in DFT embedding done by two ways first is direct embedding and second is template based embedding. Template technique defines the concept of templates in this we embed template ehich find out transformation factor .when image transformed first template is searched and then it resynchronize the image.

IV. RESULTS

Image watermarking is a vast field of data security, data protection and for signing data and for many more fields too. Image watermarking can also be used to transmit the secrete data from one end to another end it may help the national security agencies too for sharing any confidential information with their other companions. In this paper data hiding has been exhibited. Image and Text both are hided behind a cover image of size 512 X 512, secrete image is of 48X48 and maximum length has been taken of 128 char length, which makes it technically of length 1204 bits.

Figure 3: original image

Figure 4: Watermarked image

Average PSNR calculated for the applied algorithm is 45.987db whereas the MSE is calculated to be 0.76. Many other parameters which are calculated are mention in Table 1.

Parameter	Value
MSE	0.76
PSNR	45.987
SSIM	1
MAE	0.031

Table Parameters

Execution time taken by the whole process and by the individual process has also been noted down and is presented in table 2.

Process Name	Time (in seconds)
Gray Scale Conversion	0.11071
Image Resize	0.086692
Level 1 Band Composition and Store	2.709310
Image Formation from the bands	2.573052
Image Bits Insertion	0.037658
Text bit insertion	0.010118
Overall Process Time	9.646472

Table 2: Execution Time
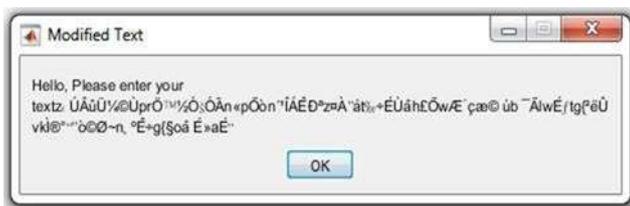

Figure 5: original Text

Figure6: Original text length

Figure7: Modifying text for embedding

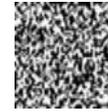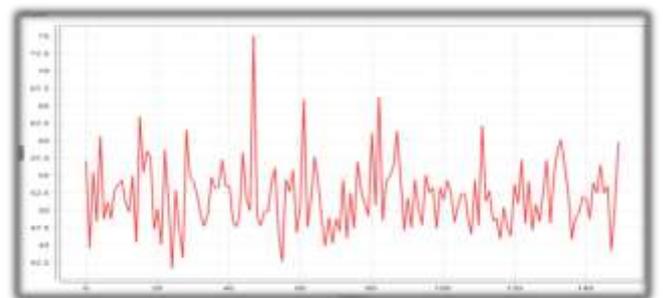

Figure8: Orginal secret image

Figure9: Extracted secret image

FIGURE 10: EXTRACTED TEXT DATA AT MATLAB COMMAND WINDOW

Various Images has been tested over the same algorithm and the generalized graphs have been generated

Watermarking is an emerging in research area for copyright protection and authentication of multimedia content new watermarking technique is specified that uses both combined text and image. The watermark is required to prevent the original images and other documents over the internet.

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