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LSB and DCT based Steganography

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Abstract: *This Research paper give the analysis of Least Significant Bit (LSB) given by Steganography and Discrete Cosine Transform (DCT) grounded Steganography Technique. LSB predicted Steganography bed the textbook communication in least significant bits of digital picture.*

Keywords: LSB, DCT, Steganography Method

I. INTRODUCTION

Steganography comes from the Greek word Steganós (Covered) and Graptos (Writing). Steganography in these day refers to information or a data that has been concealed inside a digital picture, videotape or audio file.

A. Steganographic Techniques

Physical Steganography

Physical Steganography has been considerably used. In ancient time people wrote communication on wood and also covered it with wax.

Digital Steganography

It is the method of invisibly hiding important information within data. It conceals the fact that communication exists by hiding the factual communication.

Published Steganography

Digital Steganography affair can be in the form of published documents. The letter size, distance and other characteristics of a cover messages can be manipulated to carry the sheltered communication .

II. STYLES OF CONCEALING DATA IN DIGITAL IMAGE

Least Significant Bit (LSB)

LSB is the lowest bit in a series of figures in binary. e.g. in the double number 10110001, the least significant bit is far right 1.

```
  PIXELS     (00100111 11101001 11001000)
             (00100111 11001000 11101001)
             (11001000 00100111 11101001)
  240    :   011110000
RESULT        (00100110 11101001 11001001)
              (00100111 11001001 11101000)
              (11001000 00100110 11101000)
```

The given digit 240 is changed into first eight bytes of the digits and only 6 bits numbers are changed.

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Discrete Cosine Transform (DCT)

DCT portions are used for JPEG compression. It separates the image into corridor of differing significance. It transforms a signal or image from the sphere to the frequency sphere.

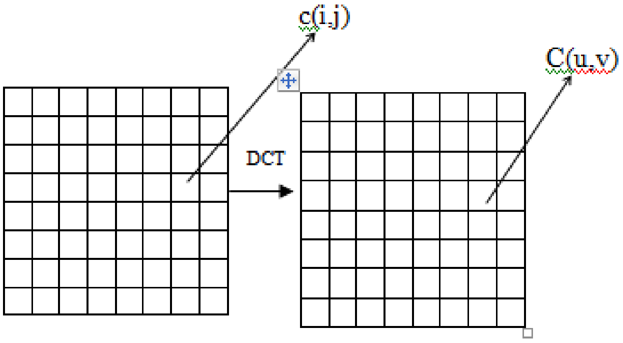


Fig. I Transform of an Image

Also, the input image is of size N X M. c(i, j) is the potency of the pixel in row i and column j C(u,v) is the DCT calculate in row u and column v of the DCT matrix.

DCT is used in steganography as

Image is broken into 8×8 block of pixels.

It goes from top to bottom, left to right, and DCT apply to each block.

III. LITERATURE CHECK

A lot of Research has been carried out on Steganography because it's important to know how important data can be concealed without image distortion. Their description is as follows:

Ken Cabeen and Peter Gent [1] have banided the fine equations of Discrete Cosine Transform (DCT) and its uses in image compression.

Andrew B. Watson [2] has mooted Discrete Cosine Transform (DCT) fashion for converting a signal into fundamental frequent element.

Jessica Fridrich et. al [3] have mooted a dependable and accurate method system for detecting least significant bit (LSB) successive embedding in digital images.

IV. ALGORITHMS OF STEGANOGRAPHY

Lsb Predicted Steganography

Algorithm to bed textbook communication-

Step 1: Read the cover image and message communication which is to be hidden in the cover image. Step 2: Convert textbook communication in binary.

Step 3: LSB of all the pixels of cover image is calculated

Step 1: Read the stego image.

Step 2: LSB of every pixels of stego image is calculated. Step 3: Recoup bits and convert each 8 bit into character.

DCT predicted Steganography

Algorithm to bed textbook communication- Step 1: Read cover image.

Step 2: Read secret communication and convert it in binary. Step 3: The cover image is broken into 8×8 block of pixels.

Step 4: Working from left to right, top to bottom abate 128 in each block of pixels.

Algorithm to recoup text communication- Step 1: Read stego image.

Step 2: Stego picture divided into 8×8 block of pixels.

Step 3: Working from left to right, top to bottom abate 128 in each block of pixels. Step 4: DCT is active on each of the sub- parts.

V. PERFORMANCE AND RESULTS

PSNR is act as the parameter to calculate the Comparative analysis of LSB and Steganography. Both grayscale and colored images have been used for trails.

$10\log\,(\text{maximum}(\text{maximum}(\,x), \text{maximum}(\,y))^2$

$$PSNR(x, y) = \frac{10}{x - y^{2}} \quad | \quad |$$

LSB Grounded Steganography

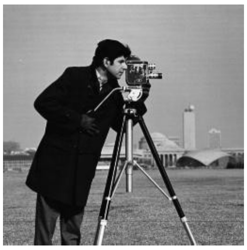


Fig. II Original image

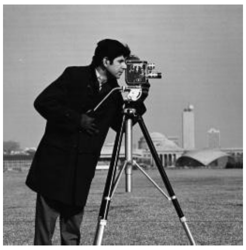


Fig III Stego image

PSNR between Fig II and Fig III = 51.0870 dB

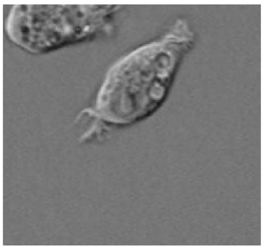


Fig. IV Original cell.bmp

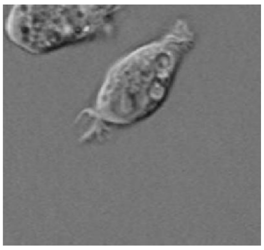
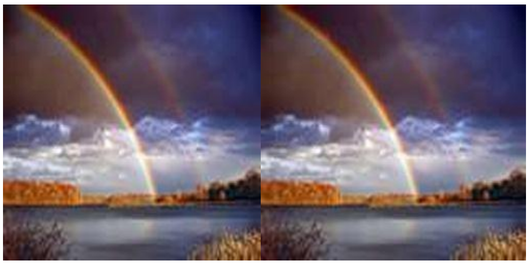


Fig. V Stego cell.bmp

PSNR between Fig. IV and Fig. V = 49.7214 dB



DCT Grounded Steganography
Using Gray Image

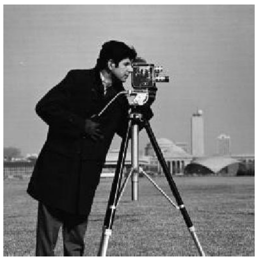


Fig. XIV Original cameraman.bmp

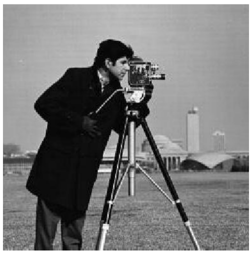


Fig. XV Stego cameraman.bmp

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PSNR between Fig XIII and Fig. XIV = 55.3865 dB

VI. CONCLUSION

LSB predicted steganography bed the text communication in LSB of cover image. DCT predicted steganography bed the text communication in LSB of DC portions. This paper tool LSB predicted steganography, DCT predicted steganography and computes PSNR rate. PSNR is the peak signal to noise rate, in rattle, between two images. This rate is used as quality dimension between two images.

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