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Entropy based Digital Watermarking using 2-D Biorthogonal WAVELET

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***Abstract*: The Security is the most important aspect of Database, for maintain the integrity and as well as security of the system image watermarking is technique proposed at the year of 1996, in this paper we also implement image watermarking using 2-D biorthogonal Wavelt. The importance of transmitting digital information in digital watermarking system and the dissymmetric digital watermarking framework lived on media content communication is also being discussed in this paper. Then we apply watermarking embedding algorithm to keep the balance between watermarks' imperceptibility and its robustness while the data is being sent on the communication channel.**

***Keywords*: Discrete Wavelet Transform (DWT), Gray Scale, Peak Signal to Noise Ratio (PSNR).**

I. INTRODUCTION

Digital Watermarking works on the principle of concealing information from digital data. A special software package is used to detect the presence of concealed data in all its copies regardless of attempts to damage it. Digital watermarking technology makes use of the actual fact that the human eye has solely a restricted ability to look at changes. The observer doesn't notice any difference in small modifications of the color values of the image as they are corrected. Digital watermarks' quality is judged mainly in two ways: 1.It should be resistant to all intentional and unintentional attacks and 2.The embedded watermark should not get degraded from the image quality. As the resistance of a watermark against attacks is higher, the risk of image quality getting reduced is lower.

The types of information and data focused on during our research are:

- Digital Images
- Digital Audios, and
- Digital Videos

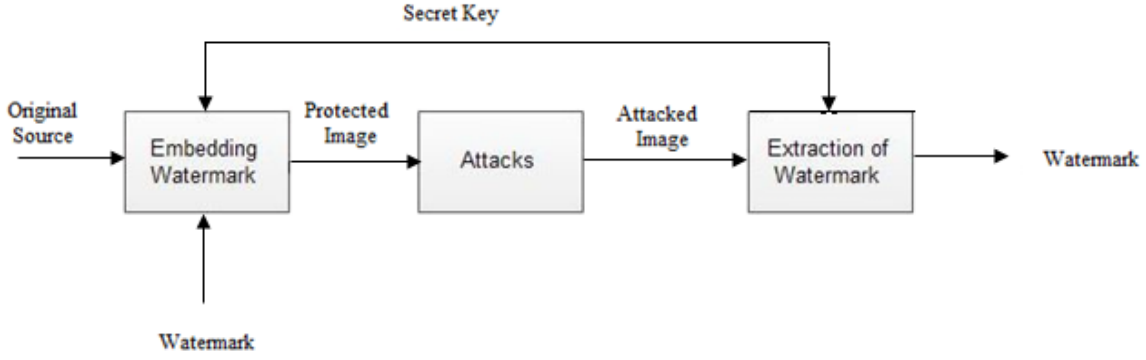

Fig: 1.1 Digital Watermarking methods

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The issue of copyright protection and their related data concealment techniques is considered very important in academic as well in the areas of industrial. .Most information concealment/data hiding schemes distort the cover media so as to embed the secret key. Though the distortion is often very less and in cognoscible, the reversibility is crucial to some sensitive applications. In various legal operations, it is needed to be able to reverse the marked image back to the cover image for legal consideration. Also high accuracy is being demanded in remote sensing and military imaging [7].

Image processing depends on compression that helps in reduction of file size for transmission of huge amount of data in an exceedingly stipulated and reduced time. The signal or image clearance and simplification that are unit a part of denoising or filtering is one of the common goals of image compression which is being provided by wavelet analysis. On the basis of compression ratio and PSNR, a comparative study considering the values of image quality has been delivered.

II. LITERATURE SURVEY

Qiu Yang et.al[3] This paper mainly introduces the entropy masking model in three different domains and give experiment report about utilizing spatial domain and DWT domain entropy masking model in the similar system of watermarking. In addition, we also analyze the advantages and disadvantages of these models from the aspects of imperceptibility and robustness through our simulation experiment.

Yana Zhang et.al[2] In this paper we discuss the essence of information transmission in digital watermarking system and the dissymmetric digital watermarking framework lived on media content communication. Then we propose a universal entropy masking model for watermarking embedding algorithm to keep the balance between watermarks' imperceptibility and its robustness.

E. Chrysochos et.al[4] This paper, introduces a new reversible watermarking scheme which are resistant to geometrical attacks are present. The proposed scheme does not require the original image for the extraction the watermark, and also does not induces the noticeable distortion during the watermarking procedure. Various watermarked images show robustness against geometrical attacks.

III. METHODOLOGY

In DWT domain BIORTHOGONAL wavelet for watermarking is used, initially, an Digital image is taken as input image after decomposition over different domain PSNR is being calculated.

For embedding the watermark PSNR in different domain namely DCT, Gray Scale and DWT is calculated. And watermark mis being embedded over the domain over which maximum value of PSNR is obtaine, After this, watermark is embedded in the original image using 2-DWT domain and PSNR calculate on the basis of which desired results are obtained.

Algorithm:

Step1: An image is taken as an input image.

Step2: For watermark embedding the PSNR in 2-DWT domain is calculated.

Step3: Now, Determine the maximum entropy in DWT Domain.

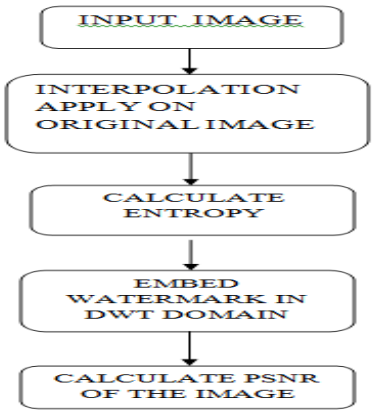

Fig 3(a): Flow Chart of Proposed Work

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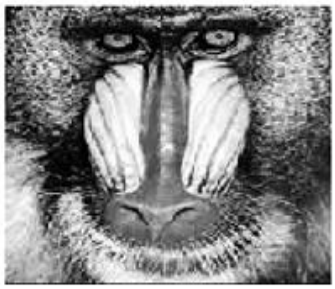


Fig 3(b): Original Image

Fig 3(c): Watermark Image

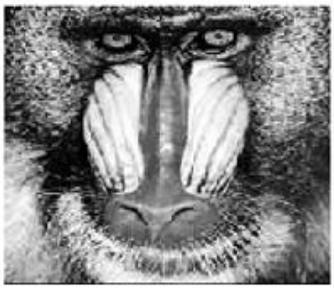


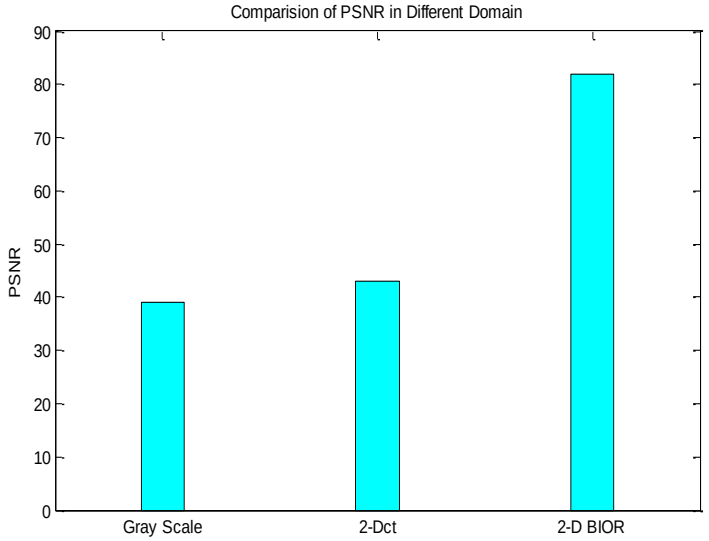
Fig 3(d): Watermarked Image

IV. EXPERIMENT AND RESULTS

The proposed system is implemented using MATLAB 2012a on an Intel i5 processor. The modifications in some of the images which are caused after embedding the watermark are presented in this section. The quality of image always measure in terms of PSNR. The results are presented above in Fig.3 (a) Where the original image along with the watermarked Fig: 3(b) one can be viewed. The proposed method produces a high quality watermarked image Fig: 3(d).

Table 4(a): Calculated PSNR

Domain	PSNR/dB
Gray Scale Domain	44.3676
2-DCT coefficients	43.4978
2-D Biorthogonal Wavelet	81.85



Graph 4(b): Results of PSNR

V. CONCLUSION

This paper finally concludes that 2-D Biorhogonal wavelet DWT Domain is better than DCT Domain and Gray Scale Domain. In this paper, the PSNR parameters on the basis of their entropy and the interpolation conclude that values obtained are found to be satisfactory. Further results may be improved using other parameters and by comparing with the DWT algorithm.

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