Implementation of Text and Image Fusion in the Area of Security

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ABSTRACT

The image is most widely used communication mode in the different areas like medical area research area, business area, military area etc. The important image transfer will take place over an unsecured internet network .thus there is need of proper security for the image to avoid the unauthorized person's access the important information. the advantage of image is that it covers more multimedia data and it need protection .the cryptography is a kind of image security method ;that offers the secure transmission and storage method for the image over the internet security is the major concern for any system to maintain the integrity ,confidentiality and image authenticity. Today the world is going to be digitalized. Every business units, government and private sectors, research units are using the digital image as transferring mode for every critical data. This image over the internet which will be not secure therefore there is a need of image security. In this paper we have discussed various image security techniques. In particular we are using DWT, based approach.

Keywords: DCT, Digital Signature, DWT, Image Processing, Image Security.

I. INTRODUCTION

1.1 Background

In today's rapid growth of digital communication and electronic data exchange, many of us communicate in cyber space without thinking about the security of the same. In today's highly computerized and interconnected world, the security of digital image/video has become increasingly more significant in applications such as pay-per-view TV, confidential video conferencing, medical imaging and in industrial or military imaging systems, online transactions, passwords, digital signatures legal' s, etc. These applications need to control access to images and provide the means to verify the integrity of images.

1.2 Necessity

Today, various people utilize the distinctive applications to image data transfer. By far most of the people use their images for various customers using the social application. The attack on these social applications can copy or hack the important data. For better usage of these applications, users are using it on their mobiles, tablets, etc. The protection against the hacking attacks on those web or available is plans, there exist distinctive data security framework for multimedia data. These present security frameworks are either using encryption or steganography, or the combination of both. There is diverse securable image encryption that can be especially for protection against the unauthorized access. Information transferred over the internet having important data of military, security associations, social or adaptable

applications. Hence the image security is necessary. The commonly used security mechanisms are DFT, DCT, DWT, etc.

1.3 Objective

To provide security for transmission of image data in order to retain data confidentiality and secured.

1.4 Theme

We are using novel image fusion technique to provide security for transmission of image data in order retain data confidentiality and secured authentic communication. It utilizes encoding and decoding technique with the help of DWT (Discrete Wavelet Transform). hentic communication.

II. LITERATURE SERVEY

2.1 Related Works

1. "Secret Message/Image Transmission Technique".J.K.Madal- has been proposed through visual cryptographic shares which are covered by meaningful images so that a potential eavesdropper won't know there's a message to be read. A binary image is taken as cover image and authenticating message/image has been fabricated into it through a hash function where two bits in each pixel within four bits from LSB of the pixel is embedded and as a result it converts the binary image to gray scale one. Visual cryptographic shares are generated from this converted gray scale image and these shares are hidden into separate meaningful images. During decoding shares are fetched from received meaningful images and combined to regenerate the authenticated image from where the secret message/image is obtained through the same hash function along with reduction of noise. Noise reduction is also done on regenerated authenticated image to produce original cover image at destination

2. "Discrete Cosine Transform (DCT) Based Spread Spectrum Data-Hiding Algorithm That Provides Statistical Security". Palak K. Amin-In this paper, author has proposed a novel unlike other spread spectrum based data hiding algorithms. The proposed algorithm does not introduce a low-pass filtering effect in the stegno image's histogram, thereby making the presence of hidden data statistically undetectable. The proposed algorithm does not compromise on robustness or capacity to achieve this goal. When compared to the generic block DCT based data-hiding scheme, the proposed algorithm provides a 41% reduction in the relative entropy between the probability mass functions of the host and stego images, thus improving the statistical security of the system. The proposed algorithm is robust against a variety of image manipulating attacks such as noise addition, filtering, blurring, sharpening, JPEG compression etc.

3. "Image Security Techniques" Ganga Holi-In this paper the world is going to be digitalized in all the ways. Every business units, government and private sectors, research units are using the digital image as transferring mode for every critical data. These images over the internet are not secure. Therefore there is a need of image security. Currently, there exist various image security techniques like encryption, watermarking, steganography, etc. This paper discusses the basic image security techniques, the survey of the recent research in the field of image securities like ANN Based Approach, Genetic Algorithm Based Approach, DCT based approach, chaos-based approach, SVD based approach, Steganography based approach, DWT based approach, visual cryptography based approach, watermarking based approach. The paper provides the future scope of image security

4. "Image Fusion Techniques And Its Implementation In Biometric Recognition" Divyaloshini- in this paper A Biometric system is essentially a pattern recognition system that makes use of biometric traits to recognize individuals. Authentication systems built on only one biometric modality may not fulfill the Requirements of demanding applications in terms of properties such as performance, acceptability and distinctiveness. Most of the unimodal biometrics

systems have problems such as noise in collected data, intra-class variations, interclass variations, non universality etc. Some of these limitations can be overcome by multiple source of information for establishing identity; such systems are known as multimodal biometric systems. The aim of this paper, regarding multimodal biometric verification, is twofold: on the one hand, to review some fusion strategies reported in the literature and, on the other hand, to implement a biometric system with most suited fusion technique. In this paper three fusion techniques (PCA, DCT &DWT) are analyzed and DWT will be established as a most suited fusion technique for multi modal biometric system of iris, palm print, face and signature. The fused image is then extracted by using Inverse Discrete Wavelet transmission.

2.2 System Development
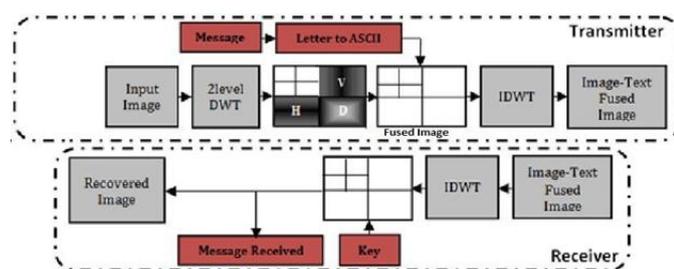
Figure 1. Image-Text Fusion Algorithm
Input Image

We will give input image as a fusion image and data image.
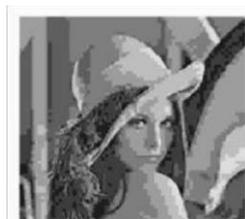
Figure 2. first input image

1 Level DWT

In first level DWT we use algorithm because its converted into four sub- band These are y-band ,v-band ,h-band and d-band.

Y-band – Y band is called as luminance it gives a high intensity.

V-band- V band is called as vertical band its stored vertical information .

H-band- H band is called as horizontal band its stored a horizontal information .

D-band- D band is called as diagonal band its stored a diagonal information .

Discrete wavelet transform (DWT)

the Image fusion mechanism for security enhancement with the DWT sub band exchange. The method offers reduced bandwidth utilization and less transmission time as it converts coloured :images to compressed textured Gray-scale images.
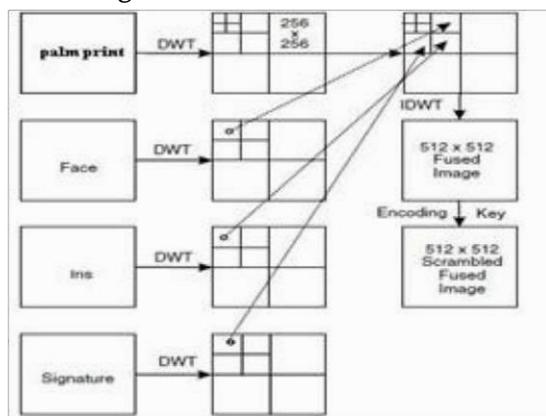

Figure 3. Discrete wavelet transform

## 2 Level Discrete Wavelet transform (2DWT)
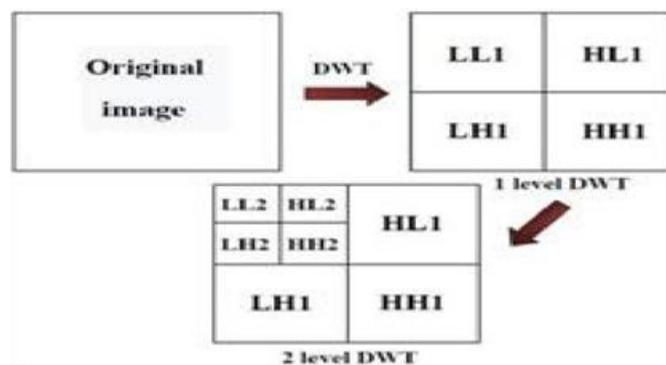
Figure 4. 2Level DWT

The third method of this mechanism uses 2-D Discrete Wavelet Transformation (DWT). DWT also converts the image from the spatial domain to frequency domain. the image is divided by vertical

and horizontal lines and represents the first-order of DWT, and the image can be separated with four parts those are LL1, LH1, HL1 and HH1. In additional, those four parts are represented four frequency areas in the image. For the low frequency domain LL1 is sensitively with human eyes. In the frequency domains LH1, HL1 and HH1 have more detail information more than frequency domain LL1.

Idwt (Inverse Discrete Wavelet Transform)

This algorithm is used for compression of fused image and text image. IDWT Compress the fused image and transmitted with help of transmitter. then its received at the receiver side and again we use IWDT for expand the fused image .

Decoder(key)

for separation the text and image we use decoder .then we get two separate image or image and text.

III. SOFTWARE AND TOOLS

MATLAB (matrix laboratory) is a multi-paradigm numerical computing environment. A proprietary programming language developed by Math Works, MATLAB allows matrix manipulations, plotting of functions and data, implementation of algorithms, creation of user interfaces, and interfacing with programs written in other languages, including C, C++, C#, Java, Fortran and Python.

Although MATLAB is intended primarily for numerical computing, an optional toolbox uses the MuPAD symbolic engine, allowing access to symbolic computing abilities. An additional package, Simulink, adds graphical multi-domain simulation and model-based design for dynamic and embedded system.

Matlab Langauge Syntax

if, elseif, else	Execute statements if condition is true
for	for loop to repeat specified number of times
parfor	Parallel for loop
switch, case, otherwise	Execute one of several groups of statements
try, catch	Execute statements and catch resulting errors
while	while loop to repeat when condition is true
break	Terminate execution of for or while loop
continue	Pass control to next iteration of for or while loop
end	Terminate block of code, or indicate last array index
pause	Stop MATLAB execution temporarily
return	Return control to invoking function

IV. CONCLUSION

This experiment result clearly demonstrate that the feature vector consisting of coarse component images can be handled easily in MATLAB and consumes less data base space with high accuracy. By combining the iris, palm print, face and signature recognition scheme the accuracy of the recognition can be improved. It is also impossible to reconstruct original image from fused images which makes system more secure and reliable.

Image fusion is the process of combining relevant information from two or more images into a single informative image containing the complementary information from the source images. The objective of image fusion is to keep maximum spectral information from the original multispectral image while increasing the spatial resolution.

V. FUTURE SCOPE

In future we use this technique for transmission secured and compress data .We can use for high transmission speed . in future we can combining the iris, palm print, face and signature recognition scheme the accuracy of the recognition can be improved. It is also impossible to reconstruct original image from fused images which makes system more

secure and reliable. In future we use this technique in watermarking security technique. A feed forward back propagation neural network. major part of testing is performed on IRS-1D images,which can be further extended to user other type of satellite images.As only CT,MRI and PET images are used to test the proposed BFLN method, but it can be further extended other type of medical images.

APPLICATION

1) It is used in many multimedia.
2) The data and image is widely used for many aspects of military, hospital etc.
3) It is used to research institute and scientist.
4) It is used in internal communication.

ADVANTAGES

1) Minimizing colour distortion
2) Produce highly preserved spatial & spectral resolution
3) Increase the control in the low & high ends of an image histogram

DISADVANTAGES

1) Poor directional selectivity for diagonal features become the wavelet features are separable and real
2) It should not be used if preserving the original scene radiometry is important
3) Alters the spectral information of the original image

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