Original Article

Medical Image Encryption and Compression Using Masking Algorithm Technique

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ABSTRACT

Various images are low quality and difficultly to detect and extract information. Therefore, the image has to get under a process called image enhancement which contains an aggregation of techniques that look for improving the visual aspect of an image. Medical images are one of the fundamental images, because they are used in more sensitive field which is a medical field. The raw data obtained straight from devices of medical acquisition may afford a comparatively poor image quality representation and may destroy by several types of noises. Image Encryption and decryption is process to provide a security to images, the consequence of this method to transfer the image information with security from one place to another. In this paper entitle "Medical Image Encryption and Compression Using Masking Algorithm Technique" will make a cipher image in the format of this method the image is available in unrecognized format. In this paper used masking encryption algorithm technique makes the medical images in the form of cipher image format.

Keywords: Raw images, Masked encryption algorithm, Compression techniques.

INTRODUCTION

Nowadays on an internet the amount of digital visualization i.e. images, data...etc., is increasing rapidly. Lot of information which is transmitted through internet / networks in the form of images / data. Basically there are two main technology[3] are used. The first is based on the content protection is that encryption, in this technique to decrypts using a required key. In the second is based on protection of secretly embedding data / image with other image / data. In todays the challenging is the performance of encryption and compression. There are many encryption roles are there. When we applied simultaneously the technique of these on image / data, the contained information's are available in the form of unreadable and unrecognization, even the hackers are also not to interested / are not to take risky step to hack such typed information from the communication. In every day in the field different encryption techniques are already introduced, among them this entitle "Medical Image Encryption

and Compression for Secure using LSB change Algorithm" technique is some more better from all of those existed technique. Here in our proposed technique compression techniques are also used.

Image Encryption and decryption is process to provide a security to images, the consequence of this method to transfer the image information with security from one place to another. In this paper entitle "Medical Image Encryption, decryption using LSB change Algorithm" will make a cipher image in the format of this method the image is available in unrecognized format. In this paper used LSB changed values, after applying LSB add 3 random numbers simultaneously to LSB changed values, and apply mode of 255 conditions to any values is exasted of image value 0-255.

The need of this technique is helpful used in the navy and army if any information secretly from one place to another. Even though the country boots are can't to degrade the information.

Here there many encryption techniques are there, all of these techniques are clarified into two ways mainly. They are
1. Secrete Key Encryption algorithm Technique and
2. Public Key Encryption Algorithm Technique.

PROPOSED WORK

In this technique we should take a raw image as a source input file, because the raw image have not any header file, it is easy to allow the changes. After we took raw image as input file convert into digital format later arrange in reverse form of digital format. Apply the masking technique on digital file format. Here some mathematical calculations are we apply on raw file format to it makes the masked encrypted cipher image in unreadable format. And using compression technique we applied this compression technique on cipher image it will reduces the size of cipher image is call Compressed Encrypted image.

The followed steps and figure will explain in detail of proposed method.

Step 1: Should take RAW image as source input image file.

Step 2: Convert this RAW image to digital format.

Step 3: Apply masking technique

Step 4: Cipher image is created is called Encrypted image.

Step 5: apply compression technique on delivered cipher image.

Step 6: Created compressed Encrypt image in form of Unreadable format.

These above steps explained the proposed work in detail; Cryptography deals with taking a message and making it appear to random noise, unreadable to an outside world. It does nothing to hide the presence of message to itself. Often stenography is used in conjunction to cryptography so that message remains unreadable even if detected. This paper is to create across platform that can effectively encrypt a message and hide it inside a digital image file. As there are many application of combining cryptography and stenography like it allows for two parties to communicate secretly and covertly. It allows for some morally conscious people to safely whistle blow on internal actions. One of the other main uses is for the transportation of high level or top secret documents between international governments. (See figure 1.)

The medical image masking [] basically follows few things.

The algorithm work starts search according to the above step from the minimum gray level to the maximum. If the pixels number in the gray level is less than or equal to original image file format, the algorithm will distribute one pixel to the gray level. If the pixels are not all distributed when the search is end, the

algorithm will calculate the new step according to ***matrix [m] [n] / = range of masking value*** and start new search until the remaining pixels is all distributed. Then, the new histogram in Fig. 1is achieved.

- The grayscale histogram which is limited contrast in each contextual region is processed by histogram equalization. In our study, the Bins number for the histogram building for contrast enhancing transformation is restricted to 256 and the distribution of histogram is 'uniform' or flat histogram. In this study, the range is not specified in the experiment to get the full range of output image.
- The points in the middle of the contextual region are considered as the sample points.
- The result mapping at any pixel is interpolated from the sample mappings at the four surrounding sample grid pixels. Pixels in the borders of the image outside of the sample pixels need to be processed specially. The neighboring tiles were combined using bilinear interpolation and the gray scale values were altered according to the modified histograms.

Algorithm to mask the image

Loop (initiate =0; value<=size of pixel row value; increase value)

Loop (initiate =0; value<=size of pixel column value; increase value)

matrix[i][j]=read image file format matrix[i][j]/= range og masking value;

read (matrix[i][j]);

RESULTS

Here in this technique we compare the proposed method (Technique) with another existed method is gives a better result than of existed, **fig 2 and fig 3** show the comparison between original and retrieved images after applies the proposed method.

First in table 1 and graph 1 are shows the comparisons information regarding the compression of proposed method compression technique with original raw image compression technique with those sizes in bytes.

In Table 2 and graph 2 are shows the information regarding proposed compression technique with existed jpeg compression technique in size of bytes.

In Table 3 and graph 3 are shows the information regarding proposed compression technique with existed jpeg compression technique in size of bytes.

Here we observe in the above table and graph information raw compression is less than of proposed method by the cause of in original raw image only image information contained, but in the proposed compression image contains added random number information, i.e. it add some more information to the images.

CONCLUSION

In this paper we propose encrypts and compress the images using masking encryption algorithms technique for medical images. The main contribution of this entitle work will shows

1. A comparisons study between the raw image sizes with proposed masking image sizes.
2. This is also gives the comparisons information regarding the RAW images' Huffman and RLE compression's and masked image compressions', here we give better results than of existed.
3. This is also gives the comparisons information regarding the JPEG image compression's and masked images' different compression techniques, here we give better results than of existed.

   And also
4. A comparisons study on saving ratios in between JPEG SR and Proposed SR

(SR-Saving Ratio). Here also we give better results than existed.

The improvement of input medical images is up to 80% depends on medical images modalities and this result based on experts' evaluation by comparing input and output images.

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Table1. Comparisons between raw compression and proposed method cipher image compression

S. No.	Image Name	Raw Image Size	Huff Compression	Cipher Image Size	Huff Compression
1	Brain	12610	8807	12610	4866
2	Lena	21025	19959	21025	9644
3	Madhuri	16384	15232	16384	7197
4	Pepper	16384	15204	16384	7386
5	Head Scan	15625	14216	15625	7259
6	Shoulder	18225	14110	18225	7279

Table 2. Differentiate between original and retrieved image sizes

S. No.	Image Name	Raw Image Size	Cipher Image Size	Retrieved Image Size
1	Brain	12610	12610	12610
2	Lena	21025	21025	21025
3	Madhuri	16384	16384	16384
4	Pepper	16384	16384	16,384
5	Head Scan	15625	15625	15625
6	Shoulder	18225	18225	18225

Table 3. Comparisons between JPEG compression and proposed method compression

S. No.	Image Name	Raw Image Size	JPEG	RLE Raw Image	RLE Cipher Image
1	Brain	12610	17776	7731	6564
2	Lena	21025	24620	20957	14910
3	Madhuri	16384	22340	16291	8710
4	Pepper	16384	22285	16224	12066
5	Head Scan	15625	19431	14560	8464
6	Shoulder	18225	21312	13121	9306

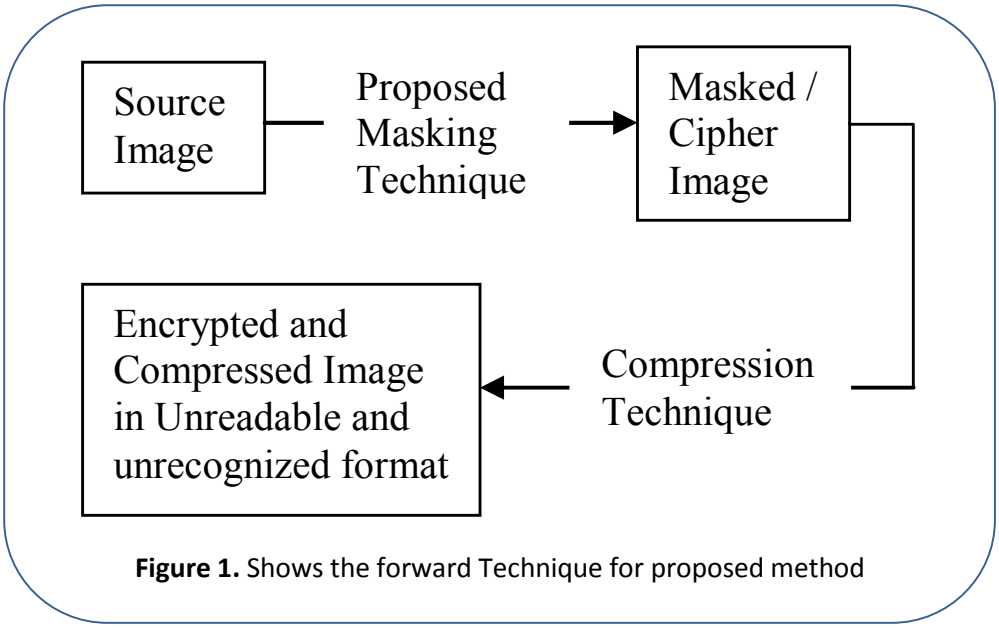


Figure 1. Shows the forward Technique for proposed method

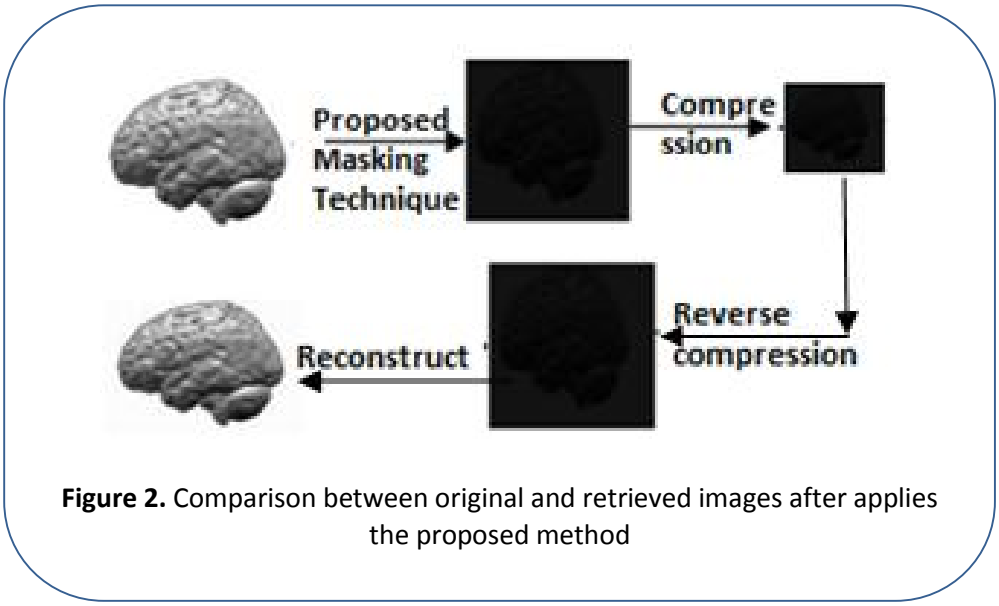


Figure 2. Comparison between original and retrieved images after applies the proposed method

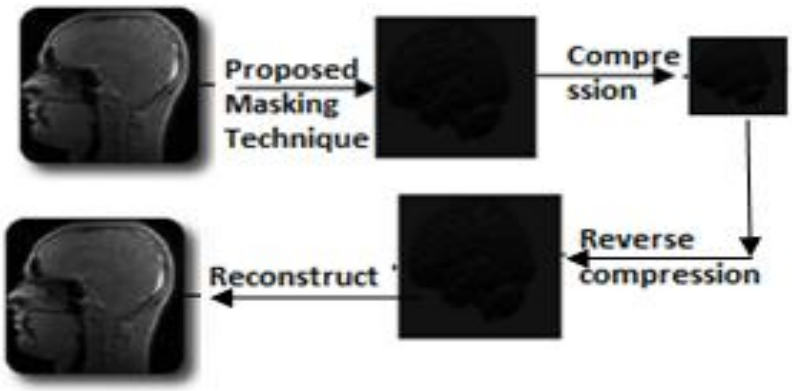
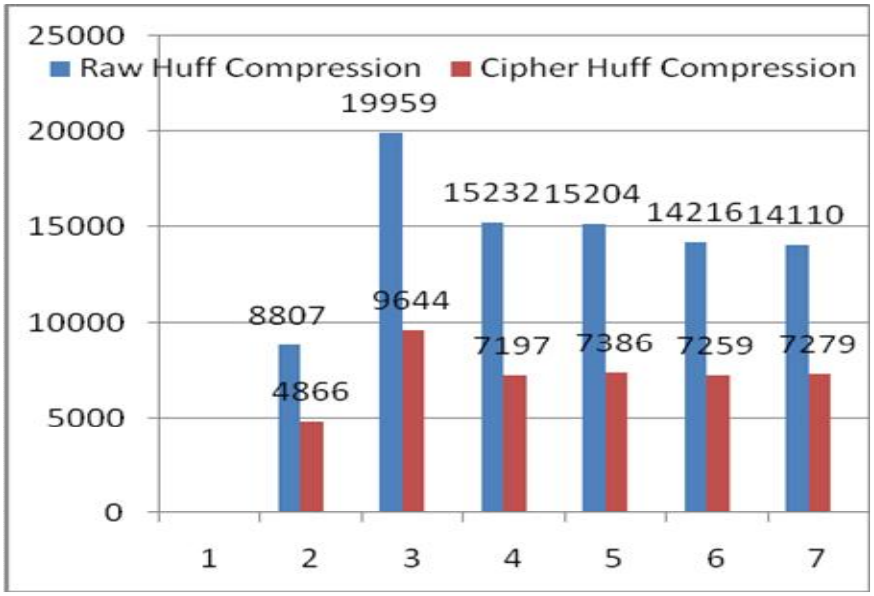
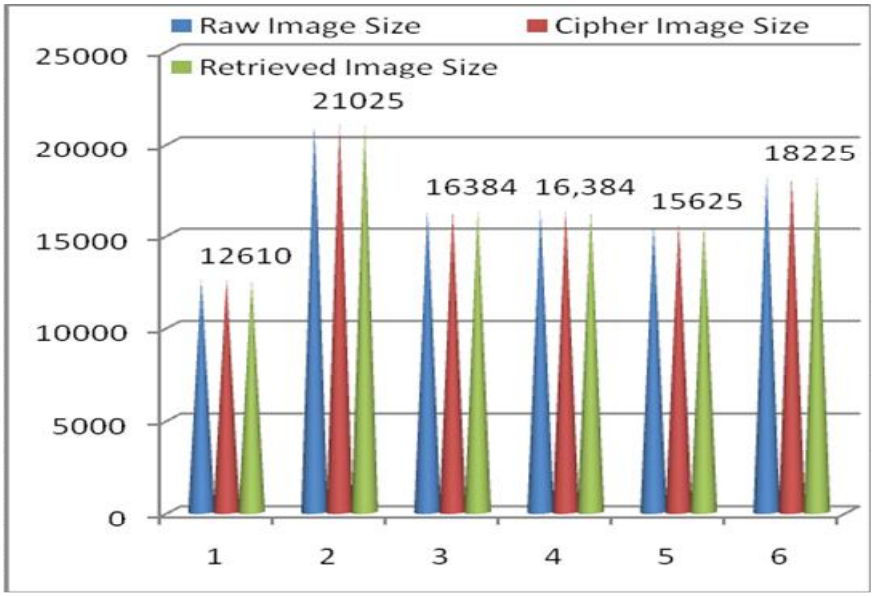


Figure 3. Comparison between original and retrieved images after applies the proposed method

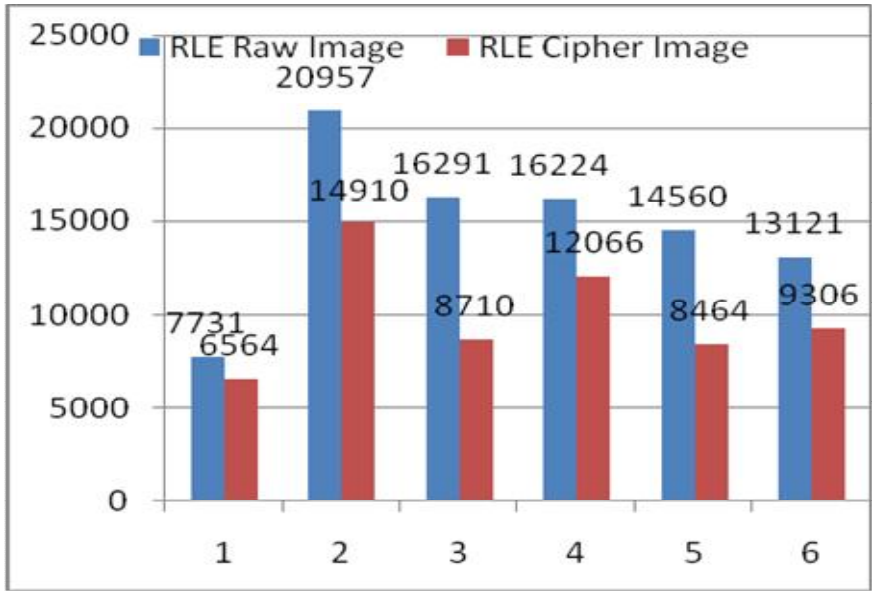
Graph 1. Show nothing difference between Raw Image and Cipher image sizes



Graph 2. Comparisons between Raw compression and proposed method compression



Graph 3. Shows the graph information no loss in between original image and retrieved images along with cipher images



Graph 4. Comparisons between JPEG compression and proposed method compression