A Survey of Enhanced Digital Image Data Hiding Using Block Histogram Shifting

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Abstract - **Reversible data hiding is an important area of data hiding. Proposes a novel separable and error-free reversible data hiding in an encrypted image based on block histogram shifting, Specially the block histogram shifting method divides the original image into a series of non-overlapped blocks and these blocks are low PSNR and more error because original image data are embedding process using block shifting. The original data transfer one end to another end using internet, However different problems with sending original data or information over the internet, like threat, attacker, changed original information and personal or confidential data are hacked. Since there is high-quality potential for practical applications such as encrypted image data authentication and content owner, reversible data hiding process in encrypted image has increasing attention in recent years. Existing methodology based on block shifting histogram are low PSNR and visible hiding data and low robustness. Original data secure transfer through internet basic problem; there are much analysis of data hiding techniques likes image data hiding, watermarking, cryptography and steganography. Our proposed methods based on bit shifting methodology and improve robustness of data hiding and also the qualities of the encrypted image improve.**

keywords - **Image Encryption, Image Decryption, Data Hiding, Image Recovery, PSNR, Reversible Data Hiding, Image Protection, Block Histogram Shifting, Watermarking.**

I. INTRODUCTION

Reversible data hiding process are secure image data that hides information in cover images and data hiding system also needs secret communication. It is a method to hide extra message into cover media with a reversible approach accordingly that the original image and data cover content can be absolutely restored after extraction data or information of the hidden message. Traditionally, image data hiding is used for secret communication. Some Important applications, the embedded carriers or images are further encrypted to prevent the carrier or image from being analyzed to disclose the attendance of the embedment. Other applications could be for when the owner of the carrier or image might not want the other someone, including image data hider, to be familiar with the content of the image carrier before data hiding is actually performed, such as military images or secret medical images. This Condition, the content or data owner has to encrypt the content or data before passing to the data hider for information or data embedment. The receiver side can extract the embedded message and recover the innovative image. Many reversible data hiding have been proposed newly. Block histogram shifting process, data embedding based on 0 bit and 1bit. BHS method uses a lossless compression data and creates less PSNR and more MSE, the difference expansion method using histogram shifting for data embedding. Difference expansion method computation errors and PSNR [1].

- The data hidden drawback may be solved exploitation histogram shifting algorithmic program for information hiding.
- It concentrates on the restoration of image quality in order that the covered image may be totally retrieved.
- For greatly enhancing the protection the cryptography of the covered image is completed in order that within the absence of the key, the illegal user cannot access the image info.

II.REVERSIBLE INFORMATION HIDING METHOD DESCRIPTION

extra message are insert into some cover media, like military or medical pictures, in an exceedingly reversible manner so the first cover content are often absolutely repaired when extraction of the hidden message is termed reversible information hiding. General signal process generally takes place before encoding or when cryptography. Generally the content owner doesn't believe the supplier of the service, in such cases ability to supply manipulating the plain content secret is undesirable. Thus manipulation on encrypted information once keeping the plain content is allowed. Because of the restricted channel resource a channel supplier with none data of the cryptography key might compress the encrypted information, once the key information to be transmitted. So as to confirm the privacy the content owner ought to cipher the information once it share a secret image with alternative person. Some info's like the origin information, image notation or authentication information, and is wish to be superimposed among the encrypted image by a channel administrator who doesn't understand the first image content. At receiver side it should be additionally expected that the first content are often recovered with none error when cryptography and retrieve of extra message. Meaning a reversible information hiding theme for encrypted image is desirable. Information hiding is that the method of concealing the information into covers media. That is, the information hiding method links a collection of the embedded information and a collection of the quilt media data. In most cases of information hiding, the first image becomes distorted because of information hiding and can't be inverted back to the first media. That is, cover media has permanent distortion even when the hidden knowledge is removed. In some applications, like diagnosis and enforcement it's desired that the first cover

media are often recovered expeditiously with no loss. The marking techniques satisfying this demand are referred to as reversible, lossless, distortion-free or invertible in RHD [3].

Reversible information hiding (RDH) Message this could be done by choosing an encoding key that is use to encode the initial data once encrypting the data or information hiding secret is used and this information hiding secret is embedded on the encrypted data with the assistance of information hider block and this encrypted information containing embedded data is forward the channel .This will received by image decoding which will decode the received information and by this decode data the initial data is extracted by activity the reverse operation by using an equivalent encode process[4].

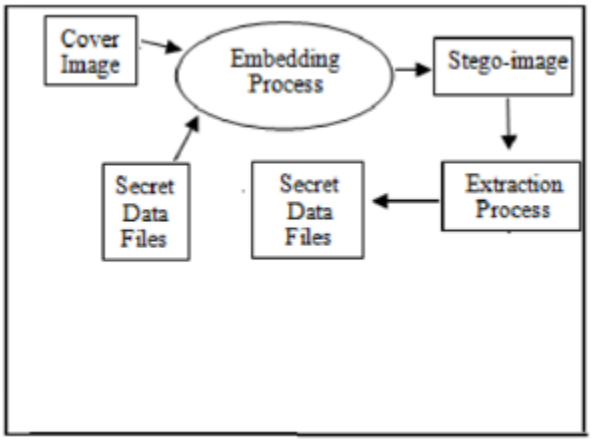

Figure1 Reversible information hiding method

III.EXISTING BLOCK-BASED TRANSFORMATION

The transformation technique works as follows: the original image is divided into a random number of blocks that are then shuffled within the image. The generated (or transformed) image is then fed to the Blowfish encryption algorithm. The main idea is that an image can be viewed as an arrangement of blocks. The clear information or data here in an image data is due to the relationship among the image data basics in a given deal. This perceivable information can be reduced by decreasing the correlation among the image elements using certain transformation techniques. The secret data or information key method of this approach is used to find out the starting point. The starting point plays a main role in structure the transformation information Table, which is then used to produce the transformed image with different random number of block sizes. The transformation procedure refers to the process of dividing and replacing a deal of the innovative image**.** Wavelet transform is a time domain localized analysis method with the window's size fixed and forms convertible. Time and rate in high frequency as a part of signals discrete wavelet transform to data transformed. Also there is good frequency differentiated rate in its low frequency part. DWT in image process is to multi-differentiated decomposing the image into sub-image of different spatial domain and self-determining frequency region. Then transform the coefficient of sub-image. After the original image has been DWT transformed, it is decomposed into 4 frequency districts which is one low frequency district (LL) and three high-frequency districts (LH, HL). If the information of low-frequency district is DWT transformed, the sub-level frequency district Information will be obtained. DCT watermarking is a process of embedding information. Information embedded is imperceptible, secure and robust.

IV.PREVIOUS WORK HAS BEEN DONE

The previous work provides the information or data of hiding scheme that provides reliability of data hiding in IP. Some of the scheme is mention below.

Jiantao Zhou et al. [9] proposed another reversible data hiding scheme over encrypted images. The data embedding is achieved through a public key modulation mechanism and so there is no need of a secret key. It is a grand two class SVM classifier at the receiver side to distinguish between encrypted and non-encrypted image patches and it also allows to jointly decoding the embedded message and the original image. The data embedding is done by simple XOR operations, without the need of accessing the secret key.

Ashwind S et al. [10] a novel method is proposed by reserving room before encryption with a traditional RDH algorithm. It maintains the excellent property that the original image can be lossless recovered after embedded data is extracted while protecting the image content's privacy. An algorithm on Reversible Data Hiding on images and data, not only enhances the data transmission but also data security.

X. Zhang et al. [11] Digital watermarking is a kind of data hiding technology. Its basic idea is to embed covert information into a digital signal, like digital audio, image, or video, to trace ownership or protect privacy. Among different kinds of digital watermarking schemes, reversible watermarking has become a research hotspot recently. Compared with traditional watermarking, it can restore the original cover media through the watermark extracting process; thus, reversible water- marking is very useful, especially in applications dictating high fidelity of multimedia content, such as military aerial intelligence gathering, medical records, and management of multimedia information. Reversible watermarking scheme based on additive

interpolation-error expansion, which features very low distortion and relatively large capacity. Different from previous watermarking schemes, we utilize an interpolation technique to generate residual values named interpolation-errors and expand them by addition to embed bits. The strategy is efficient since interpolation-errors are good at de-correlating pixels and additive expansion is free of ex-pensive overhead information.

M.S Hwanga et al. [12] planned a histogram shifting technique for image reversible data hiding testing on high bit depth medical images. Among image local block pixels, the high correlation for smooth surface of anatomical structure in medical images are exploited. Thus a different value is applied for each block of pixels to produce a difference histogram to embed secret bits. During data embedding, the image blocks are divided into two categories due to two corresponding embedding strategies. Via an inverse histogram shifting mechanism, the host image can be accurately recovered after the hidden data extraction.

T.Wang et al. [13] a new and reversible watermarking method is proposed to address this security issue. Specifically, signature information and textual data are inserted into the original medical images based on recursive dither modulation (RDM) algorithm after wavelet transform and singular value decomposition (SVD). In addition, differential evolution (DE) is applied to design the quantization steps (QSs) optimally for controlling the strength of the watermark. Using these specially designed hybrid techniques, the proposed watermarking technique obtains good imperceptibility and high robustness. Experimental results indicate that the proposed method is not only highly competitive, but also outperforms the existing methods. Localization algorithms, e.g., the dead reckoning, the maximum likelihood estimation (MLE) and the Sequential bayesian estimation (SBE). To the best of our knowledge, the reference is the first survey focusing on MWSNs localization.

L. Dong et al [14]. Proposed a novel reversible image data hiding method (RIDH). In this paper two class SVM classifier is designed to separate out encrypted and non-encrypted patches of images. This method provides higher embedding capacity and it also able to reconstruct original image and embedded message. Mainly, RIDH algorithm is designed for plaintext documents. In this message bits are embedded into the original image hence we can say that it works for lossless compression algorithm for compression certain features of images. The DE i.e. different expansion method improves the prediction error expansion (PEE)-based strategies which offers the state-of-the-art capacity distortion performance. The proposed two-class SVM classifier can efficiently separate outs the encrypted and non-encrypted patches of image.

Siva Jana Kiraman et.al [15] proposed a gray block embedding method, in this method the LSB bits are modified based on the MSB bit plane. In the embedding process the gray image is divided into the 4*4 blocks further this is divided into 2*2 blocks. The embedding process is done in 2 phase outer embedding and the inner embedding. In the outer a reference point is found in each of the 2*2 blocks and base o the MSB bit plane of then reference point in the 2*2 block the secret data is\ embedded into the other pixels. In the inner embedding the values of the reference point has been changed to increase the security. In the extracting process the reference point value are bought back and based on the reference point value the actual value are extracted from the stego image. The proposed scheme increases the embedding capacity and security by the complexity.

Zhaoxia Yin et al. [16] since there is good potential for practical applications such as encrypted image authentication, content owner identification and privacy protection, reversible data hiding in encrypted image (RDHEI) has attracted increasing attention in recent years. In this paper, we propose and evaluate a new separable RDHEI framework. Additional data can be embedded into a cipher image previously encrypted using Josephus traversal and a stream cipher. A block histogram shifting (BHS) approach using self-hidden peak pixels is adopted to perform reversible data embedding. Depending on the keys held, legal receivers can extract only the embedded data with the data hiding key, or, they can decrypt an image very similar to the original with the decryption key. They can extract both the embedded data and recover the original image error-free if both keys are available. The results demonstrate that higher embedding payload, better quality of decrypted-marked image and error-free image recovery are achieved.

Table 1. Explain related work

S.No.	Authors	Technique	Description
1	Jiantao Zhou et al.	Secure Reversible Image Data Hiding over Encrypted Domain via Key Modulation	Low embedding and low PSNR
2	Ashwind S et al.	Secure Data Transmission Using Reversible Data Hiding	MSE is more and low robustness
3	X. Zhang et al.	Separable reversible data hiding in encrypted image	RDH low robustness very low distortion and relatively large capacity
4	M.S Hwanga et al.	A reversible data hiding method by histogram shifting in high quality medical images	blocks data embedding but low PSNR and more MSE
5	T.Wang et al.	Reversible watermarking scheme for medical image based on differential evolution	good imperceptibility but more MSE
6	L. Dong et al	Secure reversible image data hiding over encrypted domain via key modulation	RIDH is low embedding low PSNR.
7	Siva Jana Kiraman et.al	Reflective Code for Gray Block Embedding,	low PSNR and Low robustness
8	Zhaoxia Yin et al.	Reversible Data Hiding In Encrypted Image Based On Block Histogram Shifting	low PSNR and more MSE

9	Proposed method	Proposed method based on bit histogram shifting process	Low MSE and good PSNR

V. PROBLEM DESCRIBED

In this project they are sending the data from sender to receiver in hidden format using digital image encryption or data hiding, cryptography and steganography techniques. Uncompressed media data consume a lot of memory and are therefore bulk of such data is difficult to store and transmit. Images contribute to the maximum storage requirements in the present world. Both storage and transmission time is affected. Hence image compression is need of the hour. Compression of images reduces the size of the memory required for storing the image. When they compress images, inner details have to be compromised but that increases our motive of storage and transmission to great extend. Multimedia based applications have created a need for better and efficient ways to encode signals image. Digital Image encryption or data hiding or data requirement is increasing day by day. Even after progress in technology in storage density the demand is difficult to achieve. One of the main problems and the criticism of the BHS are the blocking effect and block histogram shifting method low robustness. The problem with these blocks is that when the image is less robustness to low PSNR ratios, these blocks become visible and data hiding not proper. This has been termed as the blocking effect. The goal of the research is to data hiding proper the source image using histogram shifting algorithm and color the reconstructed into gray image obtained good robustness and optimal solution.

VI.CONCLUSION

A study on various reversible data hiding techniques is performed in data hide. Reversible data hiding schemes for encrypted image with a less PSNR computation is analyzed, that consists of image cryptography, data activity and data extraction/ image recovery phases the initial pictures are encrypted by a cryptography strategy. So a study relating to a cryptography strategy is performed. Although a data or information hider does not know the initial content, he can infix the key data into the encrypted image. Reversible data hiding in encrypted photos is also a replacement topic drawing attention as results of the privacy protecting requirements from cloud data management. Previous ways that implement RDH in encrypted pictures by vacating space once cryptography, as against that's projected by reserving area before cryptography. So the data hider can take pleasure within the further space empty get in previous stage to make data hiding methodology effort less. This system can profit of all ancient RDH techniques for plain pictures and reach rattling performance whereas not loss of excellent secrecy. These novel methodologies are able to do real changeableness, separate data extraction and greatly improvement on the quality of marked decrypted pictures. Thus the receiver will simply extract the image and also the secret information error free consistent with his wants by victimization each the bar chart shifting and anyone of them, as this methodology is extremely divisible. Compared to the opposite existing BHS strategies, the projected methodology extremely improves the embedding rate, similarly because the PSNR of the image is additionally smart. The above work is simulated using MATLAB simulation tool.

VII. EXPECT OUTCOME

In the field of reversible data hiding process improve peak signal noise ratio (PSNR) and minimization the mean squared error (MSE) using proposed data hiding method and compare to existing approaches (BHS). Find best possible solution, strong robustness and also providing data authentication.

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