Secured Lossless Share Watermarking

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Abstract— Security has gained a lot of importance as information technology is widely used. The main issue in visual cryptography is quality of reconstructed image. This problem is overcome by using "Secured Lossless share Watermarking ". In this method the quality of reconstructed image is higher and the security of share is high compare with conventional visual cryptographic scheme. The secret image is converted into. Each share is embedded to different carrier images. Invisible watermarking method is used for embedding carrier image and shares. For security, the invisible watermarked shares are then encrypted, AES modified encryption method is used. The encrypted shares are send to other participants. At the receiver end receiving the shares and decrypt the shares, then combining these shares together reveal the secret. The quality of rejoined shares and original secret shares are almost same.

Keywords— LTVC: Lossless Tagged Visual Cryptography; Embedding; Watermarking; Shares; AES modified encryption.

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I. INTRODUCTION

Cryptography refers to the study of mathematical techniques and related aspects of Information security like data confidentiality, data Integrity, and of data authentication. Visual cryptography was originally invented and pioneered by Moni Naor and Adi Shamir in 1994 [3] at the Euro crypt conference. Visual cryptography is ''a new type of cryptographic scheme, which can decode concealed images without any cryptographic computation". As the name suggests, visual cryptography is related to the human visual system. Visual cryptography is regularly used for image encryption. The text data is converted to image format and use that textual data as image. Encryption starts with the use of secret sharing concepts where the secret image is split into shares which are noise-like and secure. These images are then transmitted or distributed over an entrusted communication channel. Recognition of a secret message from overlapping shares and the secret image is decrypted without additional computations or cryptography knowledge. Visual cryptography schemes are characterized by two parameters: the expansion corresponding to the number of sub pixels contained in each share and the contrast, which measures the "difference" between black and white pixels in the reconstructed image. Combined the shares together reveal the information. Minimum two shares are needed for revealing the secret image. The shares are treated as black and white pixel; (n, n) matrix is used for representing black and white pixel. White is represented as "0" and black pixel is represented as "1".   Fig. 1 illustrates a computer simulation result of a basic (2, 2) VC sharing example, where panel (a) is the secret image with text

"VC," and panels (b) and (c) are the two generated shares. Each share consists of noisy black dots, and is two times the size of the original image. The result of superimposing the two shares is shown in panel (d), on which the secret text "VC" is revealed and can be recognized using naked eye. The performance of a VC scheme is usually characterized in terms of the pixel expansion and the contrast. Pixel expansion is the number of pixels in a share used to encode a pixel of the secret image, and contrast represents the luminance difference between the area of black pixels and the area of white pixels in the stacked image.
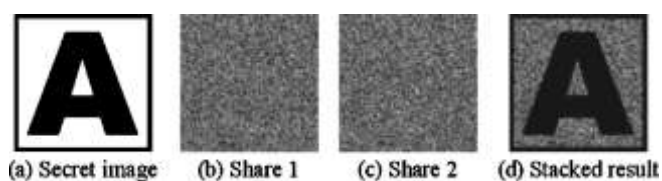

Fig. 1. Computer simulation of a (2, 2) VC scheme. (a) Secret image. (b) Share1. (c) Share 2. (d) The superimposing result of the two shares.

In the fig 1 the decoded image quality is less compared to the original secret image this problem can be overcome by using " Secured Lossless share Watermarking ". The lossless TVC (LTVC) scheme which hides multiple secret images without affecting the quality of the original secret image. As a result, the decoder can rebuild exactly the identical secret image as that of conventional VC. In other words, the shares are losslessly modified to hide the tag images. The shares are watermarked first, an improved image watermarking invisible LSB embedding method, then the embedded image is encrypted by using AES modified

encryption method. Using this encryption the security of share is increased.

II. RELATED WORKS

Visual secret sharing for multiple secrets[5].Conventional visual secret sharing schemes are designed for a single secret image so it is inefficient to generate numerous share images for multiple secret images simultaneously. Therefore, a novel visual secret sharing scheme for multiple secret images is proposed in this scheme. In the proposed encryption process, a stacking relationship graph of secret pixels and share blocks is generated to indicate the encryption functions, and a set of visual patterns is defined to produce two share images according to this graph. Based on the stacking properties of these patterns, the secret images can be obtained from the two share images at aliquot stacking angles. In this scheme makes the number of secret images not restricted and further extends it to be general. As a result, the proposed scheme enhances visual secret sharing schemes' ability for multiple secrets. In visual cryptography mainly images are handled, shares are embedded with another carrier images.

The scheme provides more secure and meaningful secret shares that are robust against a number of attacks like blurring, sharpening, motion blurring etc. There are various innovative ideas and extensions exist for the basic visual cryptographic model. In the existing VC schemes no security is provided to the secret shares and adversaries can alter its bit sequences to create fake shares. And in the proposed scheme, the vulnerability of these binary secret shares is overcome by hiding them invisibly into some host images. During the decryption phase, the secret shares are extracted from their cover images without needing any of the cover image characteristics because the watermark extraction technique is blind. The overlapping of these shares reveals the secret. The decoded secret image quality is improved.

III. PROPOSED SYSTEM

A lossless tagged visual cryptography scheme is one of the most efficient multi-secret visual cryptography (MVC) schemes, the tagged visual cryptography (TVC) is capable of hiding tag images into randomly selected shares. The encoding processes of TVC and other MVC schemes bring distortion to shares, which definitely lowers the visual quality of the decoded secret image. To overcome this lower quality problem new method is proposed, an extended TVC scheme, named as lossless TVC (LTVC). [1] Specifically, *lossless* means that the proposed LTVC scheme encodes the tag image without affecting the rebuilt secret image, i.e., the

decoded secret image of LTVC has the same visual quality with that of the conventional VC scheme. In this thesis work the lossless tagged visual cryptography is applied in watermarking of compressed images.

Wang and Hsu proposed a tagged VC (TVC) [2] scheme in which more secret images can be revealed by the folding up operation. Specifically, when fold up a share along its midline, an additional secret image is visually presented. Obviously, the folding up operation is easier for participants. However, both MVC and TVC scheme have a problem that they inevitably bring distortion to the shares of conventional VC. Consequently, the secret image disclosed by stacking the shares in MVC or TVC has lower quality than that of Naor and Shamir's conventional VC.

To deal with this problem, a new method proposes a lossless TVC (LTVC) scheme which hides multiple secret images without affecting the quality of the original secret image. As a result, the decoder can rebuild exactly the identical secret image as that of conventional VC. In other words, the shares are losslessly modified to hide the tag images. This losslessy tagged shares are embedded with a carrier image, LSB embedding is used the watermarked shares are encrypted next and send the shares to other users. AES modified encryption is used. AES to ensure improving the encryption performance; mainly for images characterized by reduced entropy. The implementation of both techniques has been realized for experimental purposes.
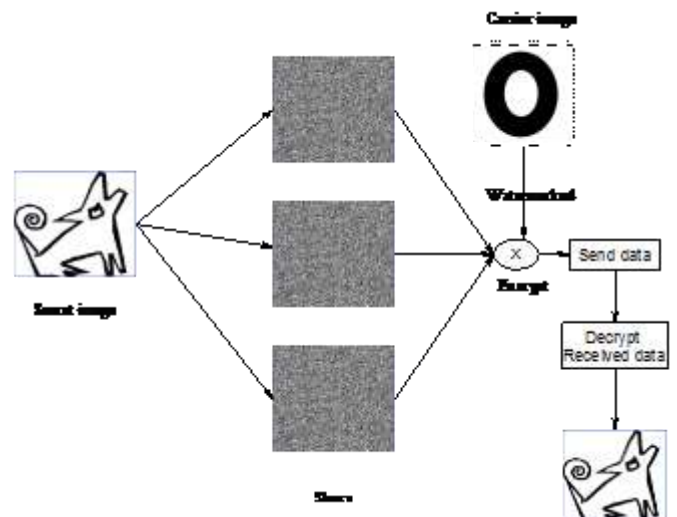

Fig 3.1System Architectural Diagram Representation

In this fig 3.1 the secret image is divided into shares and each share is embedded with a carrier image and the watermarked image is encrypted, then the image send to

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other participants. Then decrypt the image and reveal the information about the secret.

A. Image Preprocessing

Select image from different source, then the image will be categorized. The data will be image or text, the text data converted into image format and then processed. The width and height of image is checked and resize the image if the size of image exceeds the system required image size. In visual cryptography the images are handled like black and white pixels. The selected images are categorized into two types carrier image and secret image. The images are first histogram based classifies and then the images are converted into black and white pixel using gray scale conversion. In image processing and photography, a color histogram is a representation of the distribution of colors in an image. For digital images, a color histogram represents the number of pixels that have colors in each of a fixed list of color ranges that span the image's color space, the set of all possible colors.

The color histogram can be built for any kind of color space, although the term is more often used for three-dimensional spaces like RGB or HSV. For monochromatic images, the term intensity histogram may be used instead. For multi-spectral images, where each pixel is represented by an arbitrary number of measurements (for example, beyond the three measurements in RGB), the color histogram is N-dimensional, with N being the number of measurements taken. Each measurement has its own wavelength range of the light spectrum, some of which may be outside the visible spectrum. If the set of possible color values is sufficiently small, each of those colors may be placed on a range by itself; then the histogram is merely the count of pixels that have each possible color.

B. Share Construction

In this proposed scheme the secret image is divided into shares. The original image is divided into different shares such that each pixel in the original image is replaced with a non-overlapping block of two subpixels. Anyone who holds only one share will not be able to reveal any information about the secret. To decode the image, each of these shares is xeroxed onto a transparency. Stacking both these transparencies will permit visual recovery of the secret. In this module the secret image is selected and the white pixels in the image will be removed first and then each black pixels in the image is replaced to different shares. The shares will be stacked together then reveal the secret. For more security embedding the shares with a carrier image.

C. Embedding Data

The carrier image is embedded with shares invisible watermarking ,LSB embedding is used. Least Significant Bit (LSB) embedding is a simple strategy to implement steganography. Like all steganographic methods, it embeds the data into the cover so that it cannot be detected by a casual observer. The technique works by replacing some of the information in a given pixel with information from the data in the image. While it is possible to embed data into an image on any bit-plane, LSB embedding is performed on the least significant bit(s). This minimizes the variation in colors that the embedding creates. For example, embedding into the least significant bit changes the color value by one. Embedding into the second bit-plane can change the color value by 2. If embedding is performed on the least significant two pixels, the result is that a color in the cover can be any of four colors after embedding. Steganography avoids introducing as much variation as possible, to minimize the likelihood of detection. In a LSB embedding, always lose some information from the cover image. This is an effect of embedding directly into a pixel. To do this we must discard some of the cover's information and replace it with information from the data to hide. LSB algorithms have a choice about how they embed that data to hide. They can embed losslessly, preserving all information about the data, or the data may be generalized so that it takes up less space. The embedded data will encrypted for more security, AES modified Encryption is used. Then the encrypted data is send.

D. Extracting Data

At the receiver side the share will be received. The secret data is extracting from the embedded image. The decryption process for extracting carrier image and secret image is done, then reveal the secret. Extract the image from each document D.

I V. CONCLUSION

Visual cryptography (VC) is a process where a secret image is encrypted into shares which refuse to divulge information about the original secret image. The secret image can be recovered simply by stacking the shares together. In conventional VC at the decoding time the quality of original image will be reduced. This problem is overcome by using A lossless tagged visual cryptography scheme, which is one of the most efficient multisecret visual cryptography (MVC) schemes. Specifically, *lossless* means that the proposed LTVC scheme encodes the tag image without affecting the rebuilt secret image. Security of

sahares improved by using LSB embedding and AES encryption methods.

V. ACKNOWLEDGEMENT

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