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A SURVEY ON A MOSAIC IMAGE CREATION FOR SECURE SECRET IMAGE TRANSMISSION

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Abstract - Hiding the data in images has been area of interest in the image processing domain. Although so much work has been carried out in the literature to resolve the issues like increasing the data capacity, creating the secret image alike of target image but most of the works fails to meet the practical requirements. This paper presents an approach that can transform a secret image into a secret fragment-visible mosaic image of the same size that has the visual appearance of any freely selected target image without need of a database. Where, this mosaic image generation has done by dividing the secret image into fragments and transforming their respective color characteristics into corresponding blocks of the target image.

Keywords- Secret image, Target image, Mosaic image

I. INTRODUCTION

The rapid growth of internet usage over high bandwidth and low cost computer hardware has propelled the explosive growth of Covert communication using images. In the present year, secure and hidden communication is the foremost requirement of the people. Therefore covert communication is gaining attraction by people due to the security issues over internet. These days, images from different sources are

frequently utilized and are transmitted through the web for different applications; for example, secret endeavor chronicles, report stockpiling frameworks, restorative imaging frameworks, and military image databases. These images normally contain private or secret data so that they ought to be shielded from spillages amid transmissions.

As of late, numerous techniques have been proposed for securing image transmission, for which two basic methodologies are image encryption and information covering up. Encryption of image is a method that makes utilization of the characteristic property of an image, for example, high repetition and solid spatial connection, to get an encoded image. The encoded image is good for nothing and this may stir the outsider's consideration because of its irregularity in structure amid transmission. Another system for secure image transmission is information concealing that shrouds a mystery element into a spread image so that an outsider can't discovered the vicinity of the mystery substance. The issue of information stowing away is the trouble in installing vast volume of mystery element into a solitary image. On the off chance that anybody needs to conceal a mystery substance into a spread image, the mystery element must be exceptionally packed before. Amid recovery this will bring about twisting of the mystery substance. In this paper, we propose a methodology for secure image transmission is required, which is to change a mystery image into an important Secret Fragment Mosaic image with size verging on same and seeming to be like the preselected target image. we propose an approach for secure image transmission is needed, which is to transform a secret image into a meaningful Secret Fragment Mosaic image with size almost same and looking similar to the preselected target image. The mosaic image is the outcome of arranging of the block fragments of a secret image in a way so as to disguise the other image called the target image. The mosaic image, which looks similar to a randomly selected target image, which is used for hiding of the secret image by color transforming their characteristics similar to the blocks of the target image Such technique is necessary so for the lossless recovery of the transmitted secret image. The appropriate information is embedded into the mosaic image for the recovery of the transmitted secret image.

II. LITERATURE REVIEW

Images which actually contain private data must be protected from leakages during transmissions for that many methods have been proposed for securing image transmission. Up to now whatever the existing system are and work related to this technique is explained below:

Ya-Lin Lee[1], shows a technique for the transmission of the secret image securely and losslessly. This method transforms the secret image into a mosaic tile image having the same size like that of the target image which is preselected from a database. This color transformation is controlled and the secret image is recovered losslessly from the mosaic tile image with the help of the extracted relevant information generated for the recovery of the image. The secret image transforms automatically into a so-called secret-fragment-visible mosaic image of the same size. The mosaic image, is used as a camouflage of the secret image, and is yielded by dividing the secret image into fragments and transforming their color characteristics to be those of the corresponding blocks of the target image.

Kede Ma[2] shows a method for data hiding into an image by reserving room before encryption of the image. This paper shows that first enough space is reserved in the image after which it is converted into encrypted form.

Siddharth Malik, Anjali [4] proposed a keyless approach to encryption methods which are used to encrypt images. We make the use of this paper to apply the keyless approach in the proposed method. This is done by generating relevant information with the help of some RMSE value which help to rotate the tile images to a certain angle.

I. J. Lai and Tsai [5], proposed a new type of computer art image called secret-fragment-visible mosaic image is proposed which is created automatically by arranging small fragments of a given image in a mosaic form, and then embedding given secret image in the resulting mosaic image. This type of information hiding is useful for covert communication and secure keeping of secret images.

W. B. Pennebaker [19] tries to explain that the main obstacle in many applications is the quantity of data required to represent a digital image. For this we would need an image compression standard to maintain the quality of the images after compression. To meet all the needs the JPEG standard for image compression includes two basic methods having different operation modes: A DCT method for "lossy" compression and a predictive method for "lossless" compression.

III. PROPOSED WORK

In this, a new technique for safe image transmission is proposed, which transforms a secret image into a meaningful mosaic image with the same size and looking like a preselected target image. This method transforms a secret image into mosaic image without compression as in data hiding. The weakness of [5] is that requirement of large image database so that the generated mosaic image can be sufficiently similar to the selected target image. Using this method the user cannot select his/her favorite image as a target image. Therefore to overcome this drawback; a new method has been designed that can transform a secret image into secret fragment visible mosaic image of the same size.

Once the target image has selected by the user, the given secret image is first divided into rectangular fragments called tile images, which then are fit into similar blocks in the target image, called target blocks, according to similarity criterion based on color variations. The color characteristics of each tile image is transformed onto a corresponding target block in the target image, which results in a mosaic image looking like a target image.

The proposed method is based on secret-fragment-visible mosaic image which includes two phases as shown in the following diagram:

1] Mosaic image creation

2] Secret image recovery

The block diagram of proposed system is as follows:

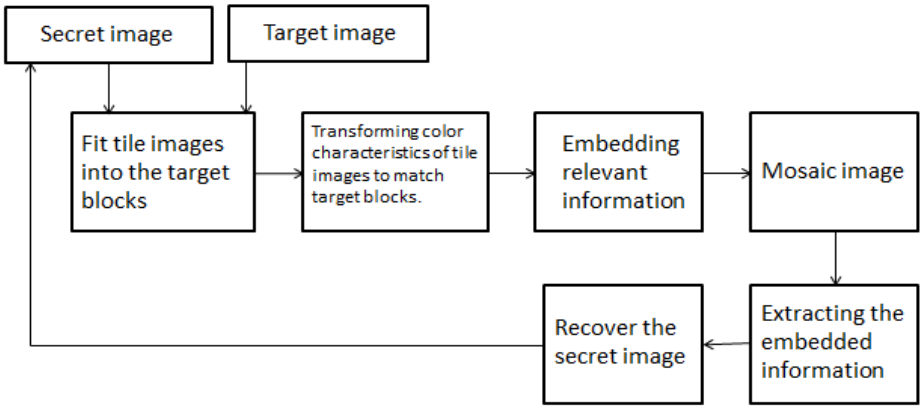

Figure 1: Flow diagram of the proposed method

1) Mosaic image creation :

Stage 1: Select secret image and target image.

Take a secret image and target image as input.

Stage 2: Fitting the tile images of the secret image into the target blocks .

Divide the secret image S into n tile images {T1, T2, . . . , Tn} as well as the target image T into n target blocks {B1, B2, . . . , Bn} with each Ti or B_j being of size NT .

Compute the means and the standard deviations of each tile image Ti and each target block Bj for the three color channels and compute accordingly the average standard deviations for Ti and Bj , respectively, for i = 1 through n and j = 1 through n. we compute the means and standard deviations of *T* and *B*, respectively, in each of the three color channels R, G, and B by the following formulas:

$$\mu_c = \frac{1}{n}\sum_{i=1}^{n} c_i, \quad \mu_c{}' = \frac{1}{n}\sum_{i=1}^{n} c_i{}' \qquad (1)$$

$$\sigma_c = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(c_i - \mu_c)^2}, \quad \sigma_c{}' = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(c_i{}' - \mu_c{}')^2} \qquad (2)$$

In which c_i and c'_i denote the C-channel values of pixels p_i and p'_i, respectively, with $c = r$, g, or b and C=R, G, or B.

Sort the tile images in the set Stile = {T1, T2, . . ., Tn} and the target blocks in the set Starget = {B1, B2, . .. , Bn} according to the computed average standard deviation values of the blocks; resulting in a mapping sequence L of the form: T1 → B1 , T2 → B2 , . . . , Tn → Bn .

Create a mosaic image F by fitting the tile images into the corresponding target blocks according to L.

Stage 3: Transforming color characteristics of tile images to match target blocks.

Transforming the color characteristics of each tile image in the secret image to become that of the corresponding target block in the target image.

Stage 4: Embedding relevant information:

Embedding the codeword in the mosaic image. The codeword must be check and match for the recovery of secret image from the mosaic image.

2) Secret image recovery :

- Extracting the embedded information for secret image recovery from the mosaic image.
- Reverse transforming the color characteristic of each tile image in the secret image to become that of the corresponding target block in the target image.
- Recovering the secret image using the extracted information.

The output for mosaic image creation is as follows:

Fig.2. Result by the proposed method

IV. CONCLUSION

Images from different sources are transmitted through the internet for various applications. These images usually contain private or secret data so that they should be protected from leakages during transmissions. A method is proposed to securely transmit a secret image that create mosaic images which also can transform a secret image into a mosaic tile image with the same size of data for concealing the secret image. The original secret image can be reconstructed nearly lossless from the created mosaic images.

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