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Visible Mosaic Imaging for Secure Image Transmission

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ABSTRACT: Information security is becoming increasingly important in the modern networked age. Secure Image Transmission has the potential of being adopted for mass communication of sensitive data under the scrutiny of an adverse censoring authority. Several steganographic techniques for transmitting information without raising suspicion are found in Literature. However visible mosaic images allow the user to securely transmit an image under the cover of another image of same size. Mosaic means picture or decorative design made by setting small colour pieces, also mosaic is a composite picture made of overlapping images, photos etc. Reshuffle of the fragments of a one image in another image form a new image called mosaic image. To create a mosaic image, secret image is first divided into rectangular shaped fragments, called tile images, which are fitted into a target image called secret fragment visible mosaic image of same size. The mosaic image looks similar to preselected target image, is yield by dividing input image into fragments and transforming their colour into another colour. It implemented using Matrix lab.

KEYWORDS: Color transformation, Data hiding, Encryption of image, Mosaic image, Secure image transmission.

I. INTRODUCTION

Images from various sources are frequently utilized and to be transmitted through the internet for various applications, such as online personal photograph albums, confidential enterprise archives, document storage systems, medical imaging systems, and military image databases are used. These images usually contain private or confidential information so that they should be protected from leakages during the secure transmissions. Recently, many methods have been proposed for securing image transmission, for which two common approaches are image encryption and data hiding. Image encryption is a technique that uses to encrypt image into noise form, using high redundancy and strong spatial correlation. The encrypted image is a meaningless file and before encryption additional information is not provided. Data hiding is alternative for image encryption that hide secret image into a cover image so that no one can realize the existence of the secret data. Large number of data is not hide into a single is the main issue of data hiding. Specifically, if one wants to hide a secret image into a cover image with the same size, the secret image must be highly compressed in advance. A new technique for secret image transmission is proposed with the help of secret image and target image.

In this paper, the proposed method says, a new technique for secure image transmission is defined, which transforms a secret image into a meaningful mosaic image. They have the same size and looking like a preselected target image. The proposed method is by Lai and Tsai, in which a new type of computer art image, called secret-fragment-visible mosaic image is proposed. The mosaic image is the result of the fragments that a secret image in disguise of another image. It is called the target image. The weakness of Lai and Tsai is the requirement of a large image database so that the image can be sufficiently similar to the selected target image. The user is not allowed to select their image for use as the target image. Therefore in this study we remove this weakness of the method while keeping its merit. The aim is to design a new method that can transform a secret image into a secret-fragment-visible mosaic image of the same size. We can select target image without the need of a database.

II. EXISTING METHOD

Existing work on secure image transmission involve techniques, such as, image encryption, data hiding, and JPEG compression. Image encryption is a technique that makes use of the natural property of an image, such as high redundancy and strong spatial correlation, to get an encrypted image based on Shannon's confusion and diffusion

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properties [1]–[7].Image encryption which only creates meaningless noise image and encrypts the image using a secret key, does not provide additional information before decryption and may arouse attacker's attention during transmission. In order to avoid this problem, data hiding technique was used, that hides the secret message into a cover image in order to hide the existence of secret data. The main issue here was to hide a large amount of data into secret image. Also, when the secret and cover image were of the same size, the secret image was highly compressed in advance, which affected the quality of image. Different techniques used in data hiding methods were LSB substitution [8], histogram shifting [9]. Image compression methods were also used, such as JPEG compression, which was not meant for line drawings and textual graphics, in which the sharp contrasts between adjacent pixels are often destructed to become noticeable artifacts.

III. PROPOSED METHOD

Here we are introducing a technique in which a secret image is transformed into a meaningful mosaic image of the same size. The mosaic image looks similar to target image. This method is called secret-fragment-visible mosaic image. Here our main aim is to transform secret image to mosaic image that is similar to target image without the need of a database and also select real time images. This method transforms a secret image into mosaic image without compression as in data hiding. In the mosaic image creation firstly select the one secret image and target image both having same size, secrete image is divided into number of fragments called the tiles of images. Then target image it again divided into same number of tiles as that of secrete image then apply the colour transformation on it the fit that tiles of secret image into target block and form a mosaic image. Color transformation based on color transfer scheme[10]. The idea of the proposed method is shown in fig 1:

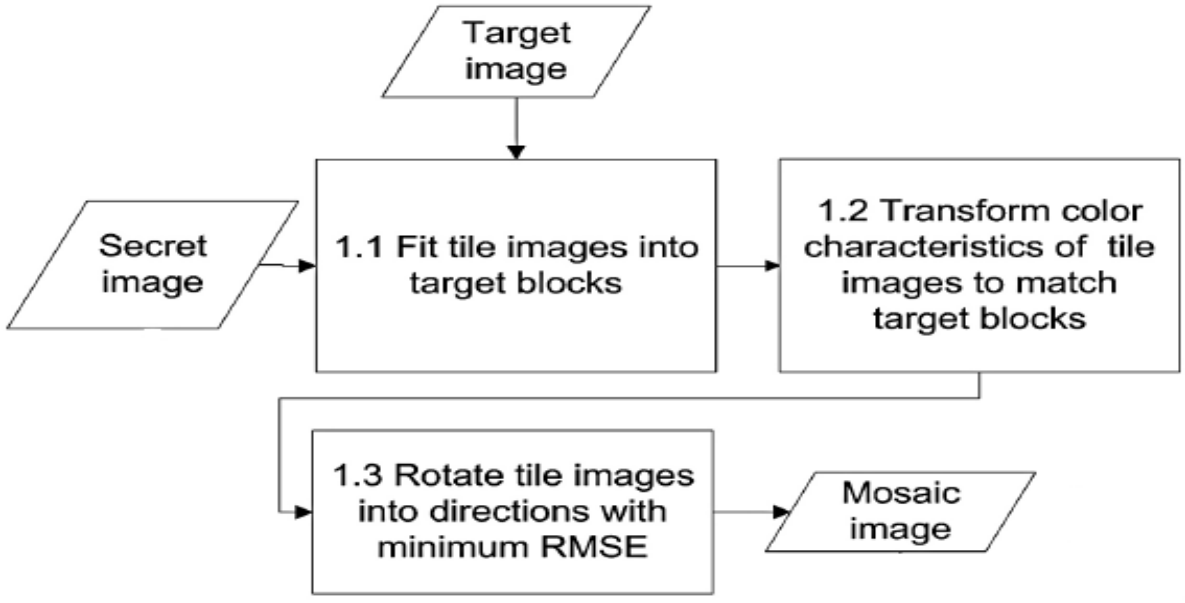

Fig 1: Flow diagram of the proposed method.

Mosaic image creation includes,
1) Fitting the tile images into the target blocks of a preselected target image.
2) Transforming the color characteristics of the tile image in the secret image and the corresponding target block in the target image.
3) Rotating each tile image into a direction with the minimum RMSE.

IV. ALGORITHM OF THE PROPOSED METHOD

Stage 1. Fitting the Tile Images into the Target Blocks.
Step 1. If the size of the target image is different from that of the secret image then change the size to be identical.

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Step 2. The means and the standard deviations of each tile images are calculated.
Step 3. Sort the tile images according to the computed average standard deviation values of the blocks and map in order the blocks in the sorted to those in the sorted.
Step 4. Create a mosaic image by fitting the tile images into the corresponding target blocks.

Stage 2. The color transformation between the tile images and the target blocks are performed.
Step 5. For each mapping from secret to target calculate the mean and SD.
Step 6. Each pi in each block of F with color value ci, transform ci into a new value using ci''=qc(ci-μc) + μc'. If ci'' is not less than 255 or if it is not greater than0, then change to be 255 or 0.

Stage 3. Rotating secret image blocks in the direction with minimum RMSE value
Step 7. Compute the RMSE values.
Step 8. Rotate tile into the optimal direction with the smallest RMSE value.

V. RESULT

Fig 2: Secret image

Fig 3: Target image

Fig 4: Mosaic image

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VI. 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. This is done by the use of proper color transformations pixel by pixel in mosaic tile images with large color similarities. The secret image is hiding into the target image. This target image has the same size as the secret image. There is no loss of data and error free. No noise is found in these images.

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