Journal of The Gujarat Research Society
ISSN: 0374-8588
Volume 21 Issue 13, December 2019

A REVIEW PAPER ON IMAGE SECURITY THROUGH IMAGE ENCRYPTION METHOD

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Abstract

We need fast and robust security systems with the rise in digital communication, multimedia data such as digital images, videos, etc. Encryption is one of the strategies to shield our data from unauthorized users in order to achieve high protection. The proposed model in this paper seeks to provide the images with protection using a combination of image encryption and image stitching techniques. Using chaotic encryption methods makes it harder for attackers to decrypt the image. First, each image to be transferred is partitioned and then each portion is encrypted and sent to the recipient. That is why the image would not be able to be used by a person with a single part or two parts of the image. The algorithm for image stitching used on the end of the receiver makes it simple for him to produce the original image. Image encryption provides the image with a double layer of security along with image stitching. The need for this strategy is for protection and privacy to be accomplished during contact.

Keywords: *Image, Encryption, Security, Data protection, Algorithms, Digital methods.*

I. INTRODUCTION

The rapid growth in multimedia applications and remote networking is contributing to digital image protection issues. Owing to the regular communication of digital products across networks, security systems need to be quicker, more effective and more stable [1]. As criminal activities on the internet are rising, the protection of the network is not strong enough to keep data secure. We need the transmission of data to be carried out safely [2]. Protection should be supported with image encryption and image stitching for image data such as sensitive images relating to military or businesses or security companies etc.

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Figure 1: Illustrates the Real Images and Encrypted Image

II. IMAGE ENCRYPTION METHOD

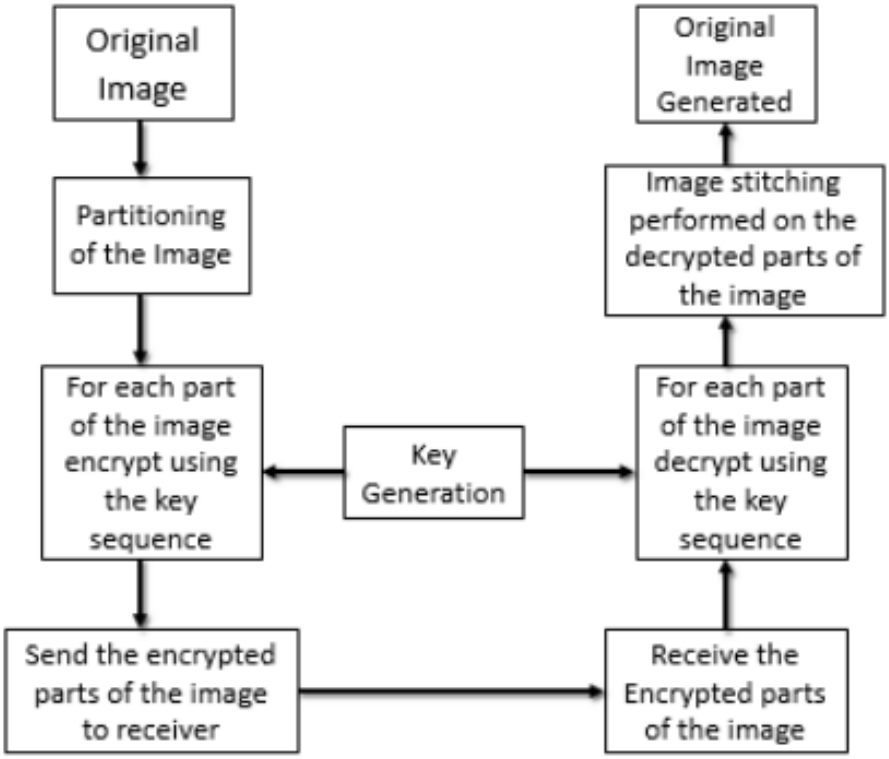

Figure 2: Illustrates the block diagram of system flow [2]

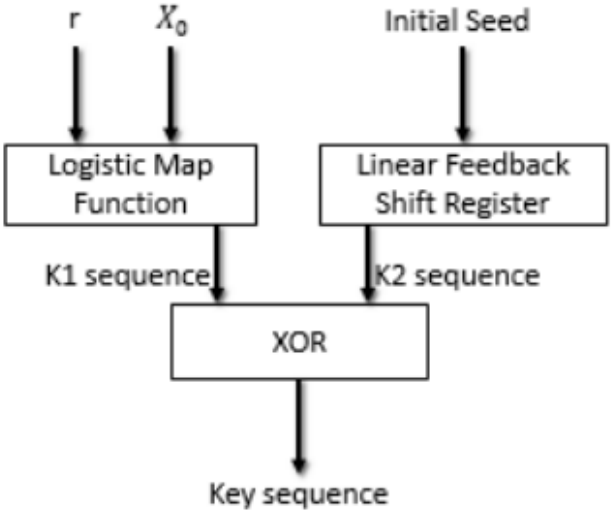

Figure 3: Illustrates the block diagram of Key Generation [3]

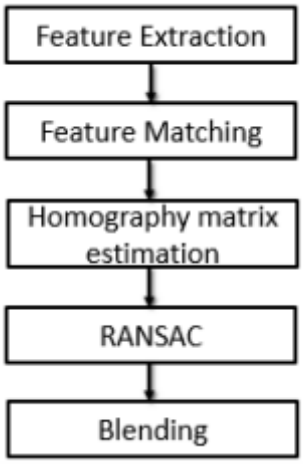

Figure 4: Illustrates the block diagram of the stitching process for the image [4]

$$E(x) = \frac{1}{N}\sum_{i=1}^{N} x_i$$

$$D(x) = \frac{1}{N}\sum_{i=1}^{N} (x_i - E(x))^2$$

$$cov\ (x,y) = \frac{1}{N}\sum_{i=1}^{N} (x_i - E(x))\ (y_i - E(y))$$

$$r_{xy} = \frac{cov\ (x,y)}{\sqrt{D(x)}\sqrt{D(y)}}$$

$$\sqrt{D(x)} \neq 0, \sqrt{D(y)} \neq 0$$

$$NPCR = \frac{1}{M \times N}\sum_{i=1}^{M}\sum_{j=1}^{N} D(i,j) \times 100\ \%$$

$$UACI = \left[\sum_{i=1}^{M}\sum_{j=1}^{N}\frac{|C1(i,j) - C2(i,j)|}{255}\right] \times \frac{100\%}{M \times N}$$

$$D(y) = \frac{1}{K}\sum_{i=1}^{K}(y_i - E(y))^2$$

$$r_{x,y} = \frac{C(x,y)}{\sqrt{D(x).\sqrt{D(y)}}}$$

Where $C(x,y), D(x)$ and $D(y)$ can be evaluated by using the following equations [5].

$$C(x,y) = \frac{\sum_{i=1}^{K}(x_i - E(x))(y_i - E(y))}{K}$$

$$D(x) = \frac{1}{K}\sum_{i=1}^{K}(x_i - E(x))^2$$

$$D(y) = \frac{1}{K}\sum_{i=1}^{K}(y_i - E(y))^2$$

III. LITERATURE REVIEW

A new approach for image encryption: Omid invented parallel sub-image encryption with hyper chaos at al. In this paper, a new image encryption scheme is proposed, based on a complete shuffling and parallel encryption algorithm. In the encryption algorithm, two chaotic structures were used to confuse the relationship between the plain-image and the cipher-image. The plain image is first divided into 4 sub-images to make the encryption process more complicated and complex, and then the location of each sub-image is pseudo-randomly altered according to a logistic map. Next, to shuffle the location of pixels in the whole image, a complete shuffling matrix is used and then sub-images are encrypted simultaneously in a parallel way. The USC data base experimental results show that the proposed encryption algorithm has a low time complexity and has the advantages of large key space and elevated security [6].

IV. DISCUSSION AND CONCLUSION

A framework consisting of a combination of image encryption and image stitching techniques for image protection is proposed in this paper. This unusual combination provides the photos that are being transferred with double layered security. The image encryption method used is the chaotic key sequence generated by the logistic map sequence and the sequence generated by the linear feedback shift register states. It is more beneficial to use the image stitching method using feature-based technique to perform image stitching on the various decrypted image pieces. It is possible to further improve the proposed scheme to send several images at a time. The number of partitions may be increased in order to express a larger image and a higher degree of privacy. To obtain multiple images in a non-sequential order and still produce the original image, the Image Stitching algorithm can be further updated.

V. REFERENCES

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