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Importance of Picture Encryption Techniques: A Review Papers

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ABSTRACT: ***The security of data or information is one of the major problems around the world, and many practical methods have been explored by different researchers around the globe over the last decade. The privacy of the data has now become a primary concern for a few days and needs more attention in order to protect the confidential data of the strikers during the transmission of data over communication channels. This paper provides a detailed study of current image encryption algorithms, their efficiency, and compatibility with existing communication systems. In addition, this research will allow various researchers to determine the new image encryption algorithm secrecy threats that have been used for data secrecy over the past few years. In the current comprehensive survey, a detailed analysis of the existing algorithms in the RGB picture arena will also be provided.This paper therefore focuses primarily on the problems of confidentiality and difficulties in the color image encryption domain.***

KEYWORDS: Communication Channel, Image Encryption,Data Secrecy, Image Encryption, Encryption Algorithm.

INTRODUCTION

The image encryption techniques are highly demanded to ensure the secrecy of the image data during transmission over insecure networks around the globe. Due to the growth of multimedia applications worldwide, various studies on pragmatic image encryption techniques have been investigated from the confidentiality perspective of images[1]. Color image encryption techniques are highly demanded to ensure the secrecy of the image data during transmission over insecure networks around the globe. Due to the growth of multimedia applications worldwide, various studies on pragmatic image encryption techniques have been investigated from the confidentiality perspective of color photos[2]. Color image encryption techniques play a key role in preserving the privacy of the sensitive image data of the strikers globally through the internet.

There are several methods that are used to maintain the consistency of the images during decryption in order to retain the quality of the colored images. Privacy is one of the tough components needing more attention to secure global picture details.The phase retrieval techniques are recognized as one of the most important methods to solve optical inverse problems. In this analysis, several phase retrieval algorithms are addressed. The existence of conditions that are ill-posed also makes the estimation complicated. In order to achieve more

precise convergence result in iterative computation, the multiple-image phase recovery technology is invented as a synthesis[3].

Using the following formulas, the relationship analysis of the images is carried out. Correlation plays a key role in assessing the resemblance between the two neighboring pixels of the plain image as well as the cypher image. By applying the formulas below, the correlation coefficient of the images can be determined.

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

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

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

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

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

In order to lose the image data during the transmission through the communication channel, there are some parameters that ensure the vulnerability of the different image formats against the strikers' various attacks[4]. The Pixel Change Rate Number (NPCR) and Unified Average Shifting of Power (UACI). The formulas for calculating the NPCR and UACI for an image is given below.

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

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

LITERATURE REVIEW

Aarti et al. reviewed another paper on DES, AES and Blowfish for image encryption and decryption.The most critical aspect of information security is Network Security, since it is responsible for protecting all data passed through networked computers. [1] We answer and survey DES, AES and Blowfish for Image Encryption and Decryption in this document. It is a key concern in today's world that when transmitting images over the internet from one network to another network.For this authors offered a survey related researches and done some problem identification and suggest some future suggestion which can be useful for image encryption[5].

Bhattacharyya et al. explored another paper on the topic of a survey of steganography and steganalysis technique in image, text, audio and video as cover carrier. The steady growth in communication technologies and the use of public domain (i.e. the Internet) networks has greatly facilitated data transmission. Such open communication networks, however, have a greater susceptibility to security threats that cause unauthorized access to information. Encryption is traditionally used to understand the confidentiality of communication.This paper provides a critical overview of steganography and analyses the features of different cover media, namely image, text, audio and video, in relation to the fundamental concepts, the advancement of steganographic methods and the creation of the corresponding steganalysis schemes[6].

DISCUSSION

Another critical constraint is the correlation coefficient to ensure that the encryption algorithm is very accurate. The expression is given below[4].To guarantee confidential transmission and image capability over the network, image encryption plays a paramount role. Then again, due to the large amount of details used, real-time image encryption faces a more noteworthy test.

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

Where $C(x,y), D(x)$ and $D(y)$may be evaluated by utilizing the following equations.

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

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

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

CONCLUSION

This detailed analysis offers a brief overview on the importance of image encryption algorithms that have been examined over the past decade by numerous researchers to provide more advanced solutions to the existing problems related tothe image secrecy. The image encryption is a proactive solution to secure sensitive data from strikers during data transfer over the communication media.In the modern world, one of the main agendas is the protection of confidentiality of the images. This paper also provides a detailed study of the performance parameters of the pictures for the quality analysis of the pictures to validate the encryption algorithms.Though numerous studies have been done to provide more security for color images, there is a vast scope in this area to explore the more sophisticated and fast color image encryption methods.

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