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Secure Text/Image Data Communication by Image Steganography into Video Sample

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Abstract: Video steganography is the technique which can hide the sensitive text data. In the past times, various techniques have been proposed for video steganography which is broadly into wavelet transformation and discrete transformation. In this research paper, novel technique has been proposed which is based on textual feature extraction, selection and encryption. The proposed algorithm is implemented in MATLAB and it has been analyzed that it performs well in terms of PSNR and MSE.

Keywords: DCT, DWT1, DWT3, PSNR, MSE, BER, MAD

I. INTRODUCTION

In order to hide the data from external users, there are various modifications made for which the steganography and cryptography techniques are used the most these days. There are large numbers of applications which include the usage of these techniques. They help in hiding the messages, the secret information related to credit cards and for various such applications.

The conversion of important information into unreadable form is known as encryption. Encryption is utilized as a secure mechanism in order to protect the data from past few decades by various organizations and single users. With the increase in growth of digital world there has been an increase in demand of securing the digital images.

The initial phase executed in the work proposed in this paper is the pre-processing phase. Here, two random video frames are chosen as input images. One of these images is utilized for creating a key and the other image is used for providing encryption with that key used. Further, with the help of gray level co-occurrence matrix algorithm the various texture features of an image are extracted. The wavelet transformation algorithm is applied in order to choose the best features. Further, the second image is partitioned into numerous blocks. Each block here is encrypted by applying chaos-based image cryptosystem in it.

The further sections of this paper are summarized as follows: The past work related to this research is presented in Section 3. Section 4 explains the proposed methodology along with the flowchart. The various experimental results are presented in Section 5 along with the analysis made.

II. LITERATURE SURVEY

In 2011, Guoji Zhang et al, proposed in this paper a novel image encryption method which helps in defining the skew tent chaotic map. This method further helps in generating permutation-diffusion architecture within this paper. The P-box is chosen as a similar size of plain image within this method. This helps in changing the location of pixels. The plain-image helps in identifying the key stream which is generated by the skew tent chaotic map. In order to provide reliable network security and secure communications within the networks, this method is highly beneficial. The attacks possible in the network can be prevented with the help of key space. In 2014, Shabir A. Parah et al. proposed in this paper a data hiding mechanism which will include within it the scrambling and pseudorandom methods. This helps in providing a two layer security to the embedded data. A good perceptual transparency can be seen on the stego images generated through this mechanism. In 2015, Wen Chen et al. proposed in this paper a new method in order to provide encryption to multiple-image encryption. The three-dimensional space is utilized here within which a series of particle-like points are appropriated. This is mainly done with the help of isolation of each of the information present in the image. The encryption of all the particle-like points is done into phasejust mask through this method. As per the simulation results achieved it can be seen that the proposed method enhances the security within the 3D applications as well. In 2016, Venkata Krishna et al. proposed in this paper a new image encryption mechanism that includes the AES and visual cryptography methods. The main motive here is to protect the image for which an encoding mapping is proposed. This method helps in converting the key into shared with respect to the Visual Secret Sharing mechanism. By making modifications in the key shares the confidentiality is tested here.

This is to be done before the data arrives towards the destination. As per the simulation results it is seen that in case there are any encrypted shares attained by the intruder from the network, the original secret image cannot be accessed without the application of cipher on it. This results in keeping the data still secure .

In 2016, Xianye Li et al. proposed in this paper a new multiple-image encryption mechanism. The modified logistic map algorithm is included along with the coordinating sampling and compressive ghost imaging in order to secure the data. This results in increasing the feasibility of the method. Initially, the random phase-just masks are generated along with the application of modified logistic map algorithm. Further, the next step focuses on creating 2Ddiscrete cosine transformation (DCT) operation from the multiple secret images. The random sequences observed here are scrambled which are further grouped to an image. The sampling matrices are utilized in order to group these images amongst which the consolidated image is placed in the object place of the used method. In 2016, Malika Sharma et al. proposed in this paper an image encryption method which includes the two stage iterative logistic map in it. In order to extract an image in single output, an image encryption method is to be generated. This results in including legitimate level of confusion and diffusion within the system. It is seen through the experimental results that the proposed method provides more secure mechanism which helps in improving the performance of this method in compare to the other methods.

III. THE PROPOSED METHOD

This work is based on image encryption. According to an existing technique, which is applied on enciphering application in which image is transmitted over unsecured channels. To encrypt the image for the transmission over unsecured channels, image is divided into blocks. The image when divided into blocks, these divided blocks are rearranged to encrypt the image. The blocks are shuffled into fixed pattern and this pattern is decided by the key which used for encryption. The key is derived based on relationship between pixels of the image. The proposed algorithm can be applied in the following steps:-

1) Pre-Processing Phase: In the pre-processing phase, the two random video frames are chosen as input images which need to encrypt and second image is the image from which key need to generate.

2) Feature Extracted: In the second phase, the textual features of the first image is extracted using the DCT/DWT algorithm. The DCT/DWT algorithm will extract the features like energy, entropy etc. from the image.

3) DCT/DWT algorithm

a) Count all the number of pixels in the matrix in which the data is saved.

b) Store the counted pixels in matrix P[i,j].

c) Check similarity between pixels in the matrix by applying histogram technique.

d) Calculate contrast factor from the method.

e) The elements of image need to be normalized by dividing the pixels.

f) Apply Matlab DCT and DWT command for wavelet transform.

IV. CONCLUSION

In this work, it has been concluded that video steganography is the efficient technique to provide security to the sensitive data. The general image steganography techniques are classified into wavelet based and discrete techniques. Here a novel technique has been proposed which is based on feature extraction, selection and generation of stegno image. The performance of proposed

algorithm is tested in terms of MSE and PSNR. It has been analyzed that proposed algorithm performs well in terms of these two parameters and provide good results against various attacks. In future, we can increase more wavelet transformation level for high security of data and also increase number of message image into more number of frames.

REFERENCES

[1] Wiryawan, I. G., Sariyasa, & Gunadi, I. G. A. (2018). Steganography based on least significant bit method was designed for digital image with lossless compression technique. 2018 International Conference on Signals and Systems (ICSigSys).

[2] Rajalakshmi, K., & Mahesh, K. (2017). Video steganography based on embedding the video using PCF technique. 2017 International Conference on Information Communication and Embedded Systems (ICICES).

[3] R.M. Haralick, K. Shanmugan, and I. Dinstein, "Textural Features for Image Classification", IEEE Transactions on Systems , Man, and Cybernetics, Vol. SMC-3, Nov 1973, pp. 610-621.

[4] Zhigang Shang and Mengmeng Li, "Combined Feature Extraction and Selection in Texture Analysis",2016, IEEE, 9th International Symposium on Computational Intelligence and Design (ISCID), 2016, Vol. 1, pp. 398 – 401.

[5] S. Sowmya and S. V. Sathyanarayana, "Symmetric Key Image Encryption Scheme with Key Sequences Derived from Random Sequence of Cyclic Elliptic Curve Points over GF(p)", 2014, International Conference on Contemporary Computing and Informatics (IC3I), pp. 1345 - 1350.

[6] Guoji Zhang, Qing Liu, "A novel image encryption method based on total shuffling scheme", 2011, Optics Communications 284 2775–2780.

[7]   Shabir A. Parah, Javaid A. Sheikh, Abdul M. Hafiz, G.M. Bhat, "Data hiding in scrambled images: A new double layer security data hiding technique", 2014, Computers and Electrical Engineering 40 pp.70–82.

[8]   Nisreen I. Yassin, Nan cy M. Salem, and Mohamed I. El Adawy "Block Based Video Watermarking Scheme Using Wavelet Transform and Principle Component Analysis"IJCSI International Journal of Computer Science Issues, Vol. 9, Issue 1, No 3, January 2012.

[9]   HananeH.Mirza, HienD.Thai, Yasunori Nagata and ZenshoNakao" Digital Video Watermarking Based on Principal Component Analysis" in Department of Electrical and Electronics Engineering, University of the Ryukyus Okinawa 9030213,Japan, 2011.

[10] SanjanaSinha, PrajnatBardhan, SwarnaliPramanick, AnkulJagatramka, Dipak K. Kole, ArunaChakraborty.."Digital Video Watermarking using Discrete Wavelet Transform and Principal Component Analysis"International Journal of Wisdom Based Computing, Vol. 1 (2), August 2011

[11] Snehal V. Patel, Prof. Arvind R. Yadav "Invisible Digital Video Watermarking Using 4-level DWT" National Conference on Recent Trends in Engineering & Technology, 14 May 2011

[12] KesavanGopal, Dr. M. MadhaviLatha"Watermarking of Digital Video Stream for Source Authentication" IJCSI International Journal of Computer Science Issues,Vol. 7,Issue 4, No 1, July 2010.

[13] Salwa A.K Mostafa, A. S. Tolba, F. M. Abdelkader, Hisham M. Elhindy, „"Video Watermarking Scheme Based on Principal Component Analysis and Wavelet Transform"" IJCSNS International Journal of Computer Science and Network Security, VOL.9 No.8, August 2009.

[14] Mandeep Singh Saini, VenkataKranthi B, Gursharanjeet Singh Kalra., "Comparative Analysis of Digital Image Watermarking Techniques in Frequency Domain using MATLAB SIMULINK", International Journal of Engineering Research and Applications (IJERA)ISSN: 2248-9622 Vol. 2, Issue 4, May-Jun 2012.

[15] Keshav S Rawat, Dheerendra S Tomar,"Digital watermarking schemes for authorization against copying or piracy of color images" Indian Journal of Computer Science and Engineering Vol. 1 No. 4 295-300

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