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A Review on Reversible Secure Audio Data Hiding Technique over an Encrypted Domain

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ABSTRACT

Stenography is the art of covered or hidden writing. The purpose of *stenography* is covert communication to hide the existence of a message from a third party. It is very important to hide the secret data efficiently, as many attacks made on the data communication. The host signal can be a still image, speech or video and the message signal that is hidden in the host signal can be a text, image or an audio signal. The cryptography concept is used for locking the secret message in the cover file. The cryptography makes the secret message not understood unless the decryption key is available. It is related with constructing and analyzing various methods that overcome the influence of third parties. Modern cryptography works on the disciplines like mathematics, computer science and electrical engineering. Here a novel reversible audio data hiding scheme over encrypted domain is proposed. In this project, we will develop the encryption process on secret speech signal data bits-level to achieve greater strength of encryption which is hidden inside the cover image. The encryption algorithm applied with embedding method is the robust secure method for data hiding. Compared with the other approaches it provides the higher embedding capacity and is able to reconstruct the original audio perfectly.

Keywords: Cryptography, Encryption, Secret Signal, Cover Signal.

I. INTRODUCTION

In recent years, signal processing in the encrypted domain has attracted considerable research interest. As an effective and popular means for privacy protection, encryption converts the ordinary signal into unintelligible data, so that the traditional signal processing usually takes place before encryption or after decryption. However, in some scenarios that a content owner does not trust the processing service provider, the ability to manipulate the encrypted data when keeping the plain content unrevealed is desired.

Stenography is data security tool which stores the secret information in cover media file in such a way that no one else except the sender of the information and the intended receiver can only suspect the existence of any sort of information. Cryptography is also an information security tool, which provides encryption techniques to conceal the secret information.This Work Proposes a Novel Reversible Audio DataHiding (RIDH) Scheme Over Encrypted Domain. In this project we have to transmit the audio file which is hidden inside a cover image. So that Unauthorized Party cannot be able to Hack it. Reversible data hiding a novel technique which is used to embed additional information in the encrypted images, applies in military and medical images, which can be recoverable with original media and the hided data without loss. A number of reversible data hiding techniques were proposed in the recent years, but on analysis, all lacks in providing the security and authentication.

II. METHODS AND MATERIAL

Literature Review

Jiantao Zhou, Weiwei Sun, Li Dong, Xianming Liu, Oscar C. Au, Yuan Yan Tang [1].They proposed an encrypted-domain RIDH scheme by specifically taking the above-mentioned design preferences into consideration. The proposed technique embeds message

through a public key modulation mechanism, and performs data extraction by exploiting the statistical distinguish ability of encrypted and non-encrypted image blocks. Since the decoding of the message bits and the original image is tied together, our proposed technique belongs to the category of non-separable RIDH solutions. Compared with the state-of-the-arts, the proposed approach provides higher embedding capacity, and is able to achieve perfect reconstruction of the original image as well as the embedded message bits. Extensive experimental results on 100 test images validate the superior performance of our scheme.

Dr.V.Khanaa, Dr.Krishna Mohata [2].They proposed a novel reversible data hiding technique which poses both security and authentication for additional data stored in the encrypted images. Also proposed work is separable, the receiver can extract the original image or extra embedded data or both according to the keys hold by the receiver. On the other hand the receiver can verify the data hided by the data hider, such that the work proposes both security and authentication.

Fangjun Huang, Jiwu Huang, Yun Qing Shi[3].They proposed a framework in detail, how to realize RDH algorithms in encrypted domain, and the security analysis of the proposed framework. the plain image is firstly divided into sub-blocks. Then, via a specific stream cipher, the divided image is encrypted with the encryption key key-1. After that, the sub-blocks of the stream encrypted image are permutated with the permutation key key-2, and the encrypted image is obtained. Additional data are reversibly embedded into the encrypted image by the server manager (or channel administrator) with the data hiding key key-3. proposed DHS or PEHS based approaches.In the receiving end, there are two cases. In the first case, the receiver will decrypt the image with the decryption keys (i.e., key-2 and key-1) directly, and the decrypted image is similar to the original host image. In the second case, firstly the additional hidden data is extracted and meanwhile the encrypted image is reversibly recovered with data hiding key-3. Then the restored encrypted image is decrypted to obtain the original host image with the decryption keys (i.e., key-2 and key-1).

III. RESULTS AND DISCUSSION

Proposed Work

Steganography is a technique that facilitates hiding of a message that is to be kept secret inside other messages. This result in the concealment of the secret Message itself. In this project, we can hide the secret data such as audio file inside the cover data such as image of any object to forms a stegno data.

At Sender End, first we have to perform Encryption function on secret data (audio file) then hide encrypted audio file in a cover data. After all, send this stegno cover data to the intended recipients.

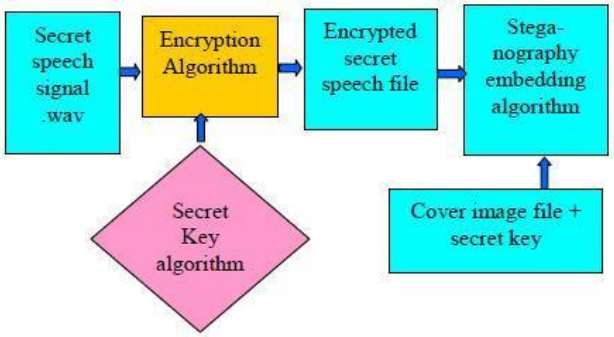

Figure 1. Encryption at transmitter end

Now at the receiver end, stegano cover data is reached without any damage. Hera, primarily the process of extraction should be takes place on stegno cover data. After the completion of this process decryption function is performed on the respected stegno cover data. So that the intended recipient should get the respected audio file.

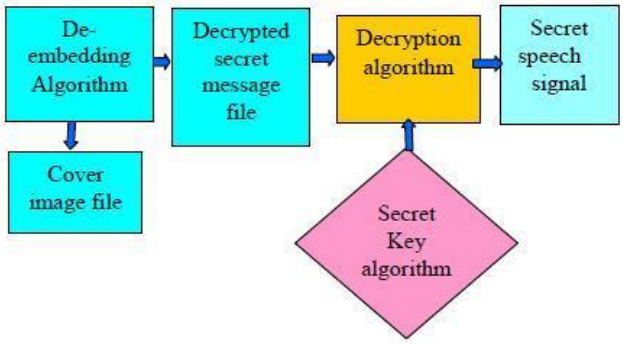

Figure 2. Decryption at Receiver end

A. Analysis of Problem

In the field of secure data transmission different methods are present which basically built on the priority of strong assumptions. In the literature review sections we have been observed no. of proposed algorithms based upon the priority & their algorithm can enhance the security of transmitted images, audio and video files, written text etc. appreciably, but practically in some physical conditions the assumed model may fail & may provide physically invalid output results. The algorithm provides the higher degree of security in the transmission of files or documents from sender to receiver, but sometimes the unauthorized person can be able to hack the a secret audio file.

B. Methodology Used

We will go to perform the encryption process on secret speech signal data bite level to achieve greater strength of encryption which is hidden inside the cover image. The encryption algorithm applied with embedding method is the robust secure method for data hiding. Following are the design steps to obtain the proposed work.

Step 1. First we have to select any images which act as a cover data.
Step 2. Here it should be noted that we can select any image for cover data.
Step 3. Now, we have to perform the encryption function on secret data.
Step 4. Then we have to hide some secret messages such as audio file or written text behind this cover data.
Step 5. After doing all this steps we get a secure stegno cover data.
Step 6. Now, at the receiver side the given data should be extracted from secure stegno cover data.
Step 7. We get an encrypted image from extracted data.
Step 8. At last, we get a secret audio file or text by performing the decryption function on extracted image. By using proposed algorithm we make this process more secure and authentic.

IV. CONCLUSION

The original image and steno image with encrypted secret speech file hide inside the cover image. In this paper a robust method to encrypt a secret speech signal message inside cover image is developed. The secret key is generated within the encryption algorithm directly according to the entered letters and numbers at transmitter end. The secret data will be received by the authorized person at receiver end only when the secret key is entered correctly. Every time a new secret key will be generated though the same secret signal entered as the key developed is stored in the database and compared at transmitter end. This encryption method generates a robust encryption secret key which provides optimized security for hiding the secret speech data within the cover image.

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