Enhancement of Data Security Using LSB Steganography Technique And AES Cryptographic Algorithm

Movika Sangwan
Dept of Computer Science & Engineering
BPS Mahila Vishwavidhyalya, Sonepat, Haryana, INDIA

Abstract- *In today's modern era, security of data plays a vital role in our life. Data which we use for communication must be secure. This research provides a framework of image steganography to enhance the security. In this research paper Steganography is used to hide the data in image using LSB (Least steganography bit) technique from Spatial domain technique to change the data into an image by replacing the least significant bit of the image with the data and (Advanced encryption standard) cryptography algorithm to encrypt and decrypt the data to enhance the security.*

Keywords- Steganography, LSB technique, spatial domain technique, AES cryptography algorithm.

I. INTRODUCTION

In this era, everyone wants to keep their information secure. When people want to communicate over network, their communication is not secure. Then steganography and cryptography are two methods which could be used to provide a secure communication. Cryptography is used to encrypt and decrypt the data. Data is known as encrypted data when original data is converted into secret data using encryption key. And the encrypted data can be decrypted and back to the original message. In steganography technique, the secret message is hide from the intruder in a Image. When Sender Sends A Message To The receiver then the message encrypted into secure message using AES algorithm first, then the message encode into image then the receiver first decode the message from the image then receiver decrypt that message and got original message.

II. STEGANOGRAPHY

Steganography is not only means to hide the data but it is also very useful for secure transmission. Steganography can hide the data in many forms i.e. it can hide the data in

- Image
- Audio
- Video
- Text

In this research paper, the data is hiding in the image by using LSB technique from the spatial domain steganography. Here LSB technique is the least significant bit which is a part of spatial domain steganography; it is a technique of steganography which is used to hide the data in a image.

- **Spatial Domain Technique:** Spatial Domain Technique is a technique of steganography which is used to hide the data in a image. This research paper includes this technique because it is very high capable and very easy realization. Here this comprises the LSB technique.
- **LSB Technique:** LSB technique is the part of spatial domain technique which is used for hiding the data in a image. LSB hide the data into a image by replacing the least significant bit of a image with the bits of the data.

III. CRYPTOGRAPHY

Cryptography is not only used to defend the data from intruder but it is very useful for user authentication. Cryptography changes the plain message into secret message by Encryption and Decryption.

Cryptography uses two types of keys:

- Secret key
- Public key
-
In this research paper, cryptography uses AES algorithm:

AES Algorithm: AES stands for Advance Encryption Standard. AES is a symmetric block cipher that can encrypt data blocks of 128 bits using symmetric keys 128. AES encrypt the data blocks of 128 bits in 10, 12 and 14 round depending on the key size. AES encryption is fast and flexible.

AES allows a 128 bit data length that can be divided into four basic operational blocks.

PROPOSED WORK:

This proposed work model shows the working of image steganography with all the components.

Model of proposed work:
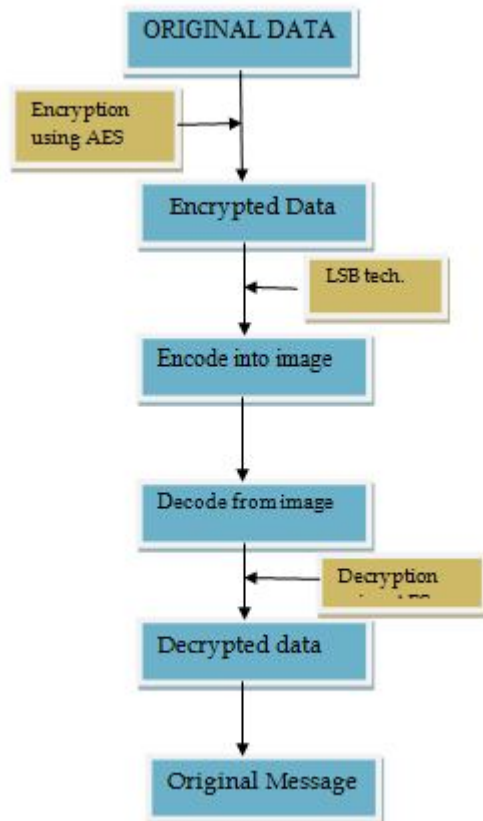
- MESSAGE is the plain message that sender wants to send.
- Then the sender encrypts that message using AES algorithm.
- Then the message encode into an image by using LSB technique from the spatial domain technique.
- Then receiver decodes the message from the image.
- Then the message decrypted and got original message sends by sender without the disturbance from the intruder.
- Got original message.

IV. PROPOSED ALGORITHM

STEP 1: Original data is Movika Sangwan. On which AES cryptographic algorithm are used to encrypt the data and converted into encrypted data.

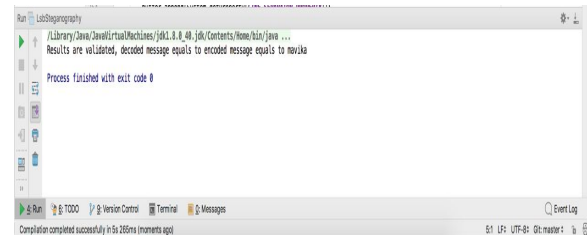**STEP 2:** Then this encrypted data encode into this image

Using LSB technique, which replaces the bits of data with the pixels of the image.

STEP 3: Then the data decode from the image again using LSB technique.

STEP 4: Then decrypt the data after decode from the image using AES algorithm.

OUTPUT: This output shows the result of the latest algorithm for data hiding in image.

V. APPLICATIONS OF PROPOSED WORK:

This paper uses IntelliJ IDEA for image steganography. Original message first convert into 16 bytes and then encrypt that message after encryption, that encrypted message encode the message into image using LSB technique and then decode the message from the image and then decrypt that message and receiver got the original message with security.

VI. CONCLUSION

Security of the transmission is very important in this generation. This paper gives complete security of the message by hiding the message in a image. This paper uses LSB technique to encode the message into image and AES algorithm to encrypt and decrypt that message. These both techniques are used for effective security. And also it is very useful in storage area, it stores more data in less storage.

REFERENCES

[1] Jasleen kaur and Deepankar Verma,” Steganography Techniques –A Review Paper”, International Journal of Emerging Research in Management &Technology ISSN:

2278-9359 (Volume-3, Issue-5) May 2016.

[2] Pratiksha Sethi and V. Kapoor," A Secured System for Information Hiding in Image Steganography using Genetic Algorithm and Cryptography", International Journal of Computer Applications (0975 – 8887) Volume 144 – No.9, June 2016.

[3] Ako Muhammad Abdullah and Roza Hikmat Hama Aziz," New Approaches to Encrypt and Decrypt Data in Image using Cryptography and Steganography Algorithm", International Journal of Computer Applications (0975 – 8887) Volume 143 – No.4, June 2016.

[4] Siti Dhalila Mohd Satar, Nazirah Abd Hamid, Fatimah Ghazali, Roslinda Muda, Mustafa Mamat, and Pang Kok An,"Secure Image Steganography using Encryption Algorithm", Annual Int'l Conference on Intelligent Computing, Computer Science & Information Systems (ICCSIS-16) April 28-29, 2016 Pattaya (Thailand).

[5] Meena kumari ,"Data Hiding with Cryptography and Steganography", International Journal of Emerging Technology and Advanced Engineering Website: www.ijetae.com (ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 6, Issue 6, June 2016).

[6] Rituparna Halder, Susmit Sengupta, Sudipta Ghosh, Debashish Kundu," A Secure Image Steganography Based on RSA Algorithm and Hash-LSB Technique", IOSR Journal of Computer Engineering (IOSR-JCE) e-ISSN: 2278-0661,p-ISSN: 2278-8727, Volume 18, Issue 1, Ver. IV (Jan – Feb. 2016), PP 39-43.

[7] Rajani, Muhammad Tauheed Khan," Data Hiding In Digital Image Processing Using Steganography: A Review",2014 IJEDR | Volume 2, Issue 3 | ISSN: 2321-9939.

[8] Arvind Kumar, Km. Pooja," Steganography- A Data Hiding Technique," International Journal of Computer Applications (0975 – 8887) Volume 9– No.7, November 2010.

[9] Palak Mahajan," Steganography: A Data Hiding Technique", International Journal of Advanced Research in Computer Science and Software Engineering, Volume 4, Issue 11, November 2014 ISSN: 2277 128X.

[10] Aarti Mehndiratta," Data Hiding System Using Cryptography & Steganography: A Comprehensive Modern Investigation", International Research Journal of Engineering and Technology (IRJET), Volume- 02 Issue-01, Apr-2015.

[11] Harleen kaur and Surinder kaur,"Data Hiding Using MLSB Steganography", International Journal of Advanced Research in Computer Science and Software Engineering Volume 5, Issue 1, January 2015.

[12] Mr. Vikas Tyagi," Data Hiding in Image using least significant bit with cryptography", International Journal of Advanced Research in Computer Science and Software Engineering ,Volume 2, Issue 4, April 2012 ISSN: 2277 128X.

[13] Champakamala .B.S, Padmini.K, Radhika .D. K," Least Significant Bit algorithm for image steganography", International Journal of Advanced Computer Technology (IJACT) ISSN: 2319-7900

[14] Pria Bharti and Roopali Soni," A New Approach of Data Hiding in Images using Cryptography and Steganography", International Journal of Computer Applications (0975 – 8887) Volume 58– No.18, November 2012.

[15] B. Smithal and K.A. Navas' Spatial, "Domain- High Capacity Data Hiding in ROI Images", IEEE - ICSCN 2007, MIT Campus, Anna University, Chennai, India. Feb. 22-24, 2007. pp.528-533.