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# Image Based Steganography Using LSB Method and Java Based Encryption

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**ABSTRACT**

LSB is one of the well know methods for steganography. Using only steganography for security of message might be harmful in certain cases. Some of the other technologies can also be embedded with steganography for better security of messages. A lot of researchers have suggested encryption with steganography. The present paper is presenting algorithm of LSB method of steganography with the use of java for encryption.

*Keywords:-* Image based steganography, LSB method, image encoding algorithm, image decoding algorithm.

## I. INTRODUCTION

The proposed method is combination of one of the popular method of steganography which is LSB with the beauty of cryptography APIs of Java.

**Algorithm of LSB method of steganography**[17]

There might be two different phases of LSB method, embedding phase and extracting phase. Algorithms of both of the phases are given below:

**A. Embedding phase**

**Procedure:**

Step 1: Extract all the pixels from the given image and store them in some array named (imagearray).

Step 2: Extract all the characters from the given text file(message file) and store it in the array called (messagearray).

Step 3: Retrieve the characters from the Stego key and store them in a array called Keyarray. A stego-key is used to control the hiding process so as to restrict detection and/or recovery of the embedded data.

Step 4: Take first pixel and characters from Key-array and place it in first component of pixel. If there are more characters in Keyarray, then place rest in the first component of next pixels.

Step 5: Place some terminating symbol to indicate end of the key. '0' has been used as a terminating symbol in this algorithm.

Step 6: Place characters of messageArray in each component of next pixels by replacing it.

Step 7: Repeat step 6 till all the characters has been embedded.

Step 8: Again place some terminating symbol to indicate end of data.

Step 9: Obtained image will hide all the characters that input.

**B. Extraction phase**
**Procedure:**

Step 1: Consider three arrays. Let they be imagearray, Keyarray and messagearray.

Step 2: Extract all the pixels from given image and store it in the array called imagearray.

Step 3: Now, start scanning pixels from first pixel and extract key characters from first component of the pixels and place it in Keyarray. Follow Step3 up to terminating symbol, otherwise follow step 4.

Step 4: If this extracted key match with the key entered by the receiver, then follow Step 5, otherwise terminate the program by displaying message "Key is not matching".

Step 5: If the key is valid, then again start scanning next pixels and extract secret message characters from first component of next pixels and place it in Character array. Follow Step 5 till up to terminating symbol, otherwise follow step 6.

Step 6: Extract secret message from messagearray.

## II. ENCRYPTION USING JAVA

Encryption is the process of converting plain data (plaintext) into some other format that appears to be random and meaningless (cipher text). Decryption is the process of translating cipher text back to original format of text (plaintext). To encrypt more than a small amount of data, symmetric encryption is used. Java uses javax.crypto package for encryption and decryption. Here central class is Cipher, which is used to encrypt and decrypt

data. CipherInputStream and CipherOutputStream are utility classes that use a Cipher object to encrypt or decrypt streaming data. SealedObject is another important utility class that uses a Cipher object to encrypt an arbitrary serializable Java object. The KeyGenerator class creates the SecretKey objects used by Cipher for encryption and decryption. SecretKeyFactory encodes and decodes SecretKey objects. The KeyAgreement class enables two or more parties to agree on a SecretKey in such a way that an eavesdropper cannot determine the key. The Mac class computes a message authentication code (MAC) that can ensure the integrity of a transmission between two parties who share a SecretKey. A MAC is akin to a digital signature, except that it is based on a secret key instead of a public/private key pair[18].

### Algorithm For Encryption Using Java

1. Take string to be Encrypt.
2. Calculate key for encryption
   a. Use SecretKeySpec.
   b. SecretKeySpec's constructor take user define bytes array to generate Key
3. Create Cipher's object basis on key.
4. It encrypts string data and Encodes using Base64Encoder.
5. And return encrypted message.

### Algorithm For Decryption Using Java

1. Take string to be Decrypt.
2. Get key for decryption
3. Create Cipher's object basis on key.
4. It decrypts string data and decodes using Base64Encoder.
5. And return Decrypted message.

## III. CONCLUSION

The present paper discusses algorithm for LSB and encryption/decryption. Also the paper introduces the APIs which are provided by java for cryptography.

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