LSB Steganography Using Android Phone

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Abstract— **Steganography is an important in information security and safety. Now a days information sharing and transfer has increases exponentially. This technology existence for hidden secret data inside cover object. Through BPCS algorithm we can place the information, secret data without changing image quality. In this paper RSA algorithm is used for data encryption and decryption. Through LSB algorithm image steganography embedded the secret in the least significant bit of pixels values of cover image.**

Keywords—— **Steganography, BPCS, Cover image, Android, RSA LSB, secret data.**

I. INTRODUCTION

Now days Internet is used for data transmission because of fast development modern technology. But in this technology some potential problem is such as they copy and corruption of digital information. Therefore information security is more important. Information hiding is one of the solution for secret information without destroyed or stolen. The secret information embeds into a digital medium that medium is known as stego medium. In stego medium illegal party will be unable to detect the secret information [2].

In recent year camera smartphone is become popular consumer. Many people use that to record their information or secret like photos and other information [1].

As an important branch information hiding steganography is mainly used the cover media as image, audio and video [3].

II. ALGORITHMS

a) LSB

LSB (least significant bit) substitution adjusting the least significant bit pixels of the image in which store the data. It is simple approach for embedding secret into the image. The least significant bits insertion varies due to the vary number of bits in image. For an 8 bit image, the least significant bit i.e. the last bit means 8th number bit of each byte of the carrier image become to the bit of secret message. In this way for 24 bit image, colours of each component like RGB (Red, Green and Blue) are changed.

To illustrate LSB algorithm. We provide the one example. Suppose cover image has two pixel values following;

(1010 0000 0010 0011 0100 0111)
(0101 1111 0011 1100 0111 1100)
Also assume the secret bits are: 110111_2. After embedding secret bits, pixels value get change. That pixel values are:

(1010 000**1** 0010 001**1** 0100 011**0**)

(0101 111**1** 0011 110**1** 0111 110**0**)
The underlined bits shows that can be change from original value. Only three bits in the carrier image get changed. That means half bit gets changed while embedding the secret image.

 The LSB methods having the limit of size for the secret data to eighth of the size of cover image. After embedding the secret in cover image after that original image can't be changed by visually.

b) RSA

 RSA is developed by Rivest , Shamir, Adleman(RSA)at MIT. RSA is a block cipher in which the plaintext and cipher text are integers between 0 to n-1 for some n .A typical size for n is 1042 bits .RSA algorithm used for encryption and decryption purpose in this paper.

Following are the steps for key generation using RSA algorithm:
 1. Pick two large prime numbers p and q, p!=q;
 2. Calculate n = p*q;
 3. Calculate A (n) = (p-1) (q-1);
 4. Pick e, so that gcd (e, A (n)) = 1,1<e<A(n);
 5. Calculate d, so that d*e mod A (n) = 1, i.e. d is the multiplicative inverse of e in mod A (n);
 6 .Get public key as Ku= {e, n};
 7. Get private key as Kr= {d, n};

c) BPCS

BPCS is the Bit Plane Complexity Segmentation. In BPCS algorithm cover image is divided into a bit planes and these planes are correlated to each other.

BPCS technology is used for embed the information in bit plane format. The ultimate goal of BPCS is embed as much more data as possible into a cover image without any changes in the image.

BPCS algorithm described as follows:
1. Cover image is divided into 24 different bit planes all bit planes divided into 8*8 bits it known as Bit Plane Blocks.
2. Calculate the complexity Alpha of every block.
3. Then Calculate the min alpha,
- If,
Complexity of bit plane block > min alpha
- Then
Secret information form into block
- Else,
Complexity of bit plane block < min alpha
- Then,
Take new block to replace original

With the help of above steps we can embed the information or secret into cover image. With the help of this algorithm we can place the information into small place.
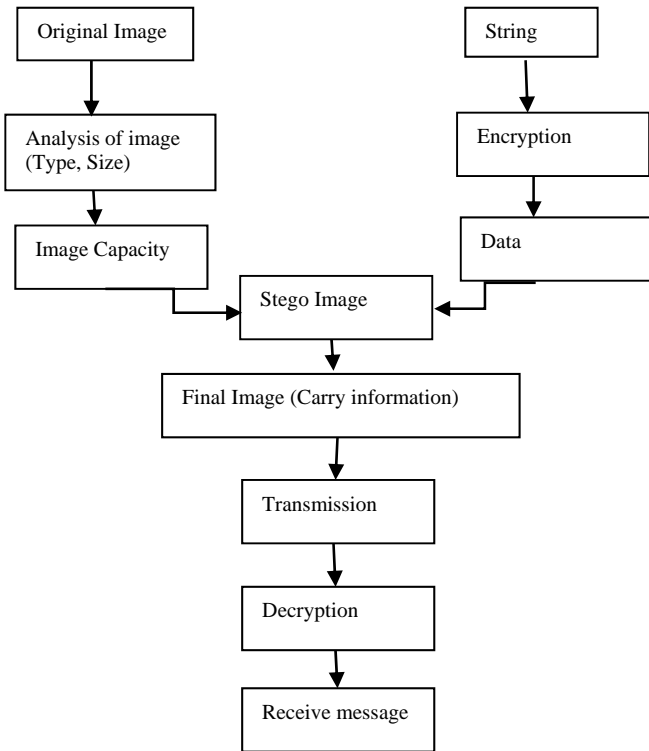
III PROPOSED SYSTEM ARCHITECTURE

Figure1. Architecture of proposed system

Proposed system which is a combination of LSB, RSA and BPCS where the application is developed for secure the secret data.

Architecture consists of encryption phase, decryption phase and transmission phase.

In this steganography first we can accessing bits of image through RGB (Red, Green and Blue) pixel model into byte. Then accessing the bits of text file. After that inserting the text bits into the image and last extracting text from modified image.

1 .Encryption Phase:

In encryption phase two files are used one is a secret file which is use for transmission purpose and the other is carrier file that is image .In encryption phase the data is encoded into image using Least Significant Bit and BPCS.
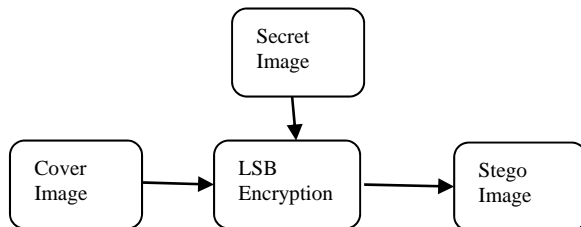

Figure 2.Encryption Phase

2 .Decryption Phase:
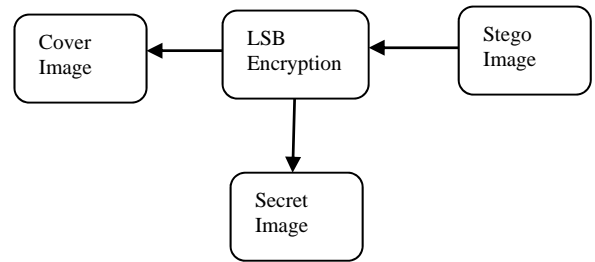
Decryption phase is reverse of encryption phase.

Figure3.Decryption Phase

In decryption phase use the same password which was used in encryption phase. It is helpful for unauthorized access. With the help of RSA algorithm we can decrypt the information which had encoded and finally get the message.

3. Transmission Phase:

Transmission phase is one of the important term to send the data at the destination securely.

In this way we can communicate securely with the help of steganography.

IV CONCLUSION

In this paper we analysed the performance of different algorithm i.e. LSA, RSA and BPCS.

To overcome the drawbacks of traditional system and to secure the data in faster manner with high speed and better performance, the system of Steganography technique giving better performance over individual techniques of Android Application is being developed.

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