

**RESEARCH PAPER**

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**IMAGE STEGANOGRAPHY USING LEAST SIGNIFICANT BIT WITH CRYPTOGRAPHY**

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**Abstract:** - To increase the security of messages sent over the internet steganography is used. This paper discussed a technique based on the LSB(least significant bit) and a new encryption algorithm. By matching data to an image, there is less chance of an attacker being able to use steganalysis to recover data. Before hiding the data in an image the application first encrypts it.

**Keywords:-** Steganography, LSB(least significant bit), Encryption, Decryption.

**INTRODUCTION**

Steganography is the art of hiding the fact that communication is taking place, by hiding information in other information. It is the art of concealing a message in a cover without leaving a remarkable track on the original message. It Pronounced "ste-g&-'nä-gr&-fe" and Derived from Greek roots<sup>7</sup>  
"Steganos" = covere "Graphie" = writing

Its ancient origins can be traced back to 440 BC.<sup>1</sup>In *Histories* the Greek historian Herodotus writes of a nobleman, Histaeus, who used steganography first time.<sup>3</sup>

The goal of Steganography<sup>1</sup> is to mask the very presence of communication making the true message not discernible to the observer. As steganography has very close to cryptography and its applications, we can with advantage highlight the main differences. Cryptography is about concealing the content of the message. At the same time encrypted data package is itself evidence of the existence of valuable information. Steganography goes a step further and makes the ciphertext invisible to unauthorized users.<sup>4</sup>

Two other technologies that are closely related to steganography are watermarking and fingerprinting . These technologies are mainly concerned with the protection of intellectual property.<sup>6</sup> But steganography is concern with the hiding of text in another information like image, text, audio, video.

**Type of steganography:**

There are 4 different types of steganography .<sup>6</sup>  
Text

- a. Image
- b. Audio
- c. Video
- d. Protocol

**Text steganography** using digital files is not used very often since text files have a very small amount of redundant data.

**Audio/Video steganography** is very complex in use.

**Image steganography** is widely use for hiding process of data. Because it is quite simple and secure way to transfer the information over the internet.

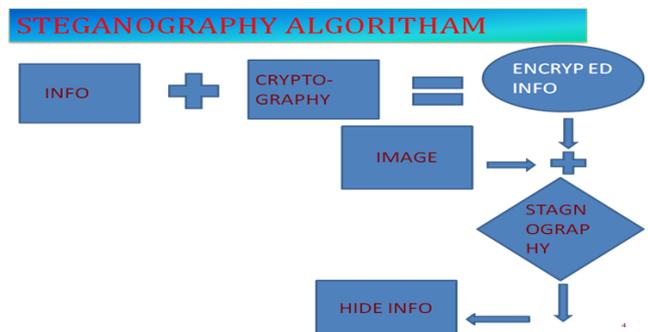
Image steganography has following types:

- a. Transform domain
  - i. Jpeg
  - b. Spread spectrum
- ii. Patch work
  - a. Image domain
  - i. LSB and MSB in BMP
  - ii. LSB and MSB in JPG

It is most efficient (in term of data hiding ) method of image steganography.

Because the intensity of image is only change by 1 or 0 after hiding the information.

Change in intensity is either 0 or 1 because the change at last bit.



**CRYPTOGRAPHY ALGORITHM**

Normal text message:- Saurabh

Key:-hello

- a. Change the key and data in to ASCII format.



**Steps To Insert Data In Image :-**

- a. Take an input image.
- b. Find out the pixel values.
- c. Select the pixel on which we want to insert data.

This process of selection of pixel is done as user's choice he may choose pixel continuous or alternate or at a fixed distance.

- i. Insert the data values in pixels eg.

For example a grid for 3 pixels of a 24-bit image can be as follows:

```
00101101 00011100 11011100
10100110 11000100 00001100
11010010 10101101 01100011
```

When the number **200**, which binary representation is **11001000**, is embedded into the least significant bits of this part of the image, the resulting grid is as follows:

```
00101101 00011101 11011100
10100110 11000101 00001101
11010010 10101100 01100011
```

**DISCUSSION AND FUTURE WORK**

In today's world, we often listen a popular term "Hacking". Hacking is nothing but an unauthorized access of data which can be collected at the time of data transmission. With respect to steganography, Steganography along with Cryptography may be some of the future solution for this above mentioned problem. In the near future, the most important use of steganographic techniques will probably be lying in the field of digital watermarking. Content providers are eager to protect their copyrighted works against illegal distribution and digital watermarks provide a way of tracking the owners of these materials. Although it will not prevent the distribution itself, it will enable the content provider to start legal actions against the violators of the copyrights, as they can now be tracked down.

**CONCLUSION**

This paper is a short introduction to the world of steganography. We have shown how the simplest methods work and how they can be explored. We have used symmetric encryption algo to provide more security. Research in this field has already begun. Next to steganography, one of the most active fields of research is mass detection tools for hidden contents. The problems are

really big. At first, known statistical tests are fragile and for many embedding schemes we still do not know which properties to test. At second, the today traffic in public networks is so overwhelming, that is too hard to rigorously check each file.

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**Short Bio Data for the Author**



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