

Image Steganography

Minor Project Synopsis

Bachelor of Technology

Information Technology

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Contents

1	Introduction	iii
1.1	How is it different from cryptography?	iii
2	Image steganography	v
2.1	How is it done.	v
3	AES Algorithm	vi
4	Objective	vii
5	Feasibility of Study	viii
5.1	Need of Image steganography: -	viii
5.2	Uses of Image steganography	viii
5.3	Significance of Image steganography.	viii
6	Methodology	ix

1 Introduction

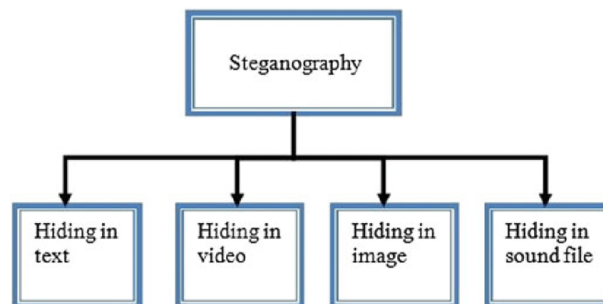
Steganography comes from the Greek word, It means covered or secret writing.

“Steganos- meaning hidden or covered”

“Grap- meaning to write”

Steganography is the technique of hiding secret data within an ordinary, non-secret, file or message in order to avoid detection; the secret data is then extracted at its destination. The use of steganography can be combined with encryption as an extra step for hiding or protecting data. The word steganography is derived from the Greek.

Steganography can be used to conceal almost any type of digital content, including text, image, video or audio content; the data to be hidden can be hidden inside almost any other type of digital content.



1.1 How is it different from cryptography?

Cryptography and steganography are both methods used to hide or protect secret data. However, they differ in the respect that cryptography makes the data unreadable, or hides the meaning of the data, while steganography hides the existence of the data. cryptography is similar to writing a letter in a secret language: people can read it, but won't understand what it means. However, the existence of a (probably secret) message would be obvious to anyone who sees the letter, and if someone either knows or figures out your secret language, then your message can easily be read.

If you were to use steganography in the same situation, you would hide the letter inside a pair of socks that you would be gifting the intended recipient of the letter. To those who don't know about the message, it would look like there was nothing more to your gift than the socks. But the intended recipient knows what to look for, and finds the message hidden in them.

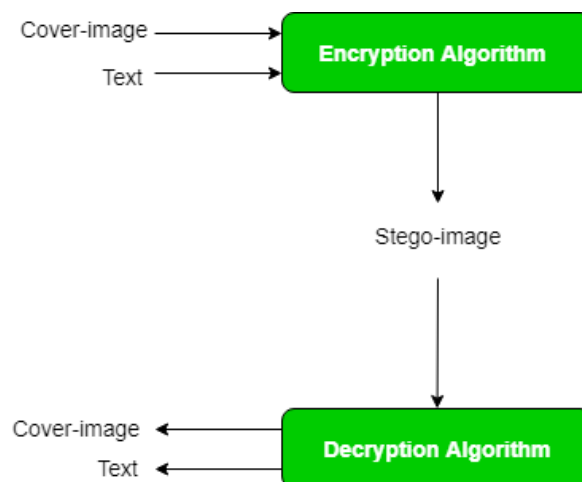
2 Image steganography

As the name suggests, Image Steganography refers to the process of hiding data within an image file. The image selected for this purpose is called the cover image and the image obtained after steganography is called the stego image.



2.1 How is it done.

An image is represented as an $N \times M$ (in case of greyscale images) or $N \times M \times 3$ (in case of color images) matrix in memory, with each entry representing the intensity value of a pixel. In image steganography, a message is embedded into an image by altering the values of some pixels, which are chosen by an encryption algorithm. The recipient of the image must be aware of the same algorithm in order to know which pixels he or she must select to extract the message.



3 AES Algorithm

Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S National Institute of Standards and Technology (NIST) in 2001. AES is widely used today as it is a much stronger than DES and triple DES despite being harder to implement.

Points to remember:-

1. AES is a block cipher.
2. The key size can be 128/192/256 bits.
3. Encrypts data in blocks of 128 bits each.

That means it takes 128 bits as input and outputs 128 bits of encrypted cipher text as output. AES relies on substitution-permutation network principle which means it is performed using a series of linked operations which involves replacing and shuffling of the input data.

4 Objective

1. To The main objective of Steganography is to communicate securely in such a way that the true message is not visible to the observer.
2. Image Steganography allows for two parties to communicate secretly and covertly.
3. It allows for copyright protection on digital files using the message as a digital watermark.
4. It is a form of data hiding and can be executed in clever ways

5 Feasibility of Study

5.1 Need of Image steganography: -

Steganography is a method of hiding secret data, by embedding it into an audio, video, image, or text file. It is one of the methods employed to protect secret or sensitive data from malicious attacks.

5.2 Uses of Image steganography

Image Steganography is another free program for hiding your information in image files. You can hide text messages or files inside an image file. Just select the source file in which you want to hide the secret message and then select the file to hide or write the text message to hide.

5.3 Significance of Image steganography.

The purpose of steganography is covert communication—to hide the existence of a message from a third party. Knowledge of steganography is of increasing importance to individuals in the law enforcement, intelligence, and military communities.

6 Methodology

In this project we use some tools like:-

1. NetBeans IDE is a free, open source, integrated development environment (IDE) that enables you to develop desktop, mobile and web applications.
2. Android app
3. Java Programming Language.
4. Images
5. AES algorithm.

References

- [1] `https:https://www.geeksforgeeks.org`
- [2] `https:https://www.slideshare.net/`