



IMAGE STEGANOGRAPHY

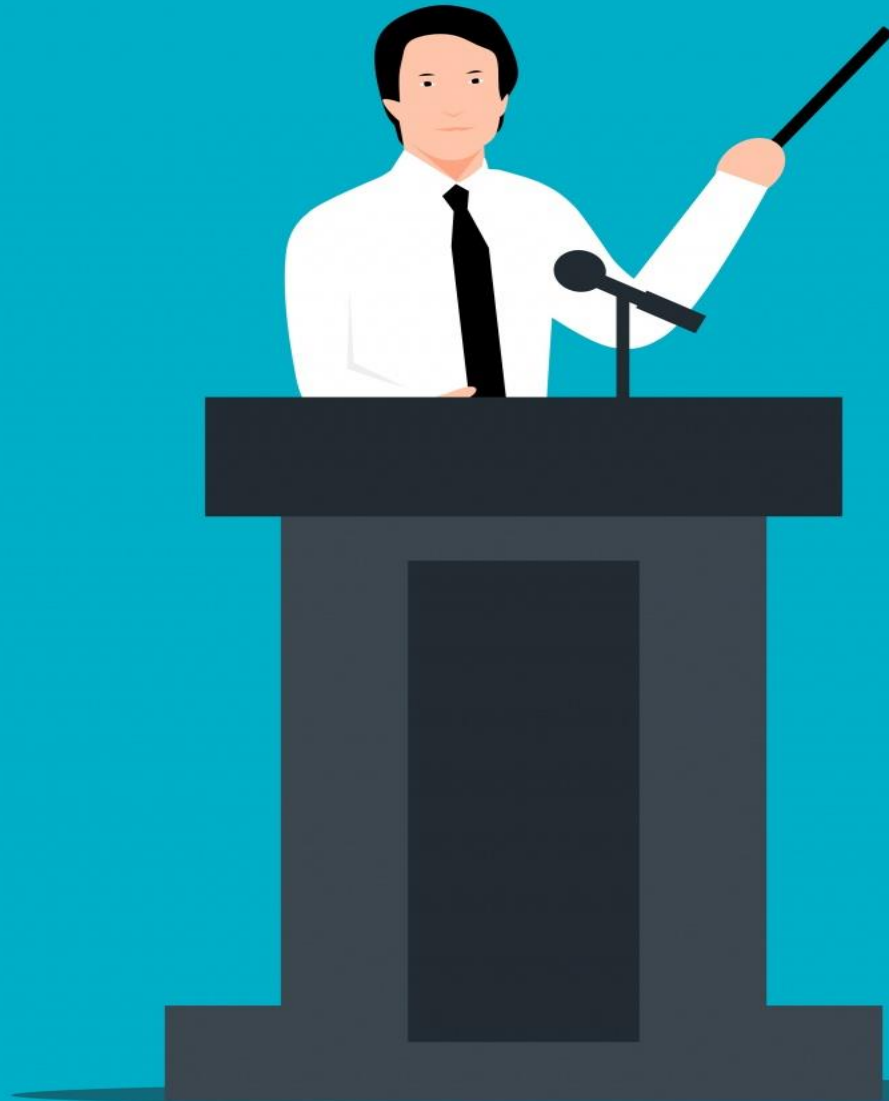


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Introduction

- Steganography is an art of hiding information.
- The main objective of Steganography is mainly concerned with the protection of contents of the hidden information.
- Images are ideal for information hiding because of the large amount of redundant space is created in the storing of images.

Steganography



- **Steganography is derived from the Greek words - stegano (meaning hidden or covered) and the graph (meaning to write).**
- **Steganography is the practice of hiding a file, image, or video within another file, message, image or video.**
- **Steganography can also be referred as 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 BEST WAY

- The use of Steganography can be combined with encryption as an extra step for hiding or protecting data.
- Cryptography is often used to supplement the security offered by steganography. Cryptography algorithms are used to encrypt secret data before embedding it into cover files.
- Cryptography can be used as extra layer of security even over the existence of file ie. Steganography

TYPES OF STEGANOGERAPHY

We have used for different types of Steganography techniques :

1. Text in Image
2. Image in Image
3. Audio in Image
4. Video in Image

Image Steganography

- Image in Image come under Image Steganography.
- Hiding the data by taking the cover object as the image is known as image steganography. In digital steganography, images are widely used cover source because there are a huge number of bits present in the digital representation of an image. There are a lot of ways to hide information inside an image. Common approaches include:

1. **Least Significant Bit Insertion**
2. Masking and Filtering
3. Redundant Pattern Encoding
4. Encrypt and Scatter

Least Significant Bit (LSB)

- ✓ **LSB** algorithm is a classic Steganography method used to conceal the existence of secret data inside a “public” cover. The LSB or “Least Significant Bit”, in computing terms, represents the bit at the unit’s place in the binary representation of a number.
- ✓ For example, we can represent the decimal number 170 in binary notation as 10101010. As shown in the figure, the least significant bit, in this case, is 0.

1	0	1	0	1	0	1	0
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- ✓ In the simplistic form, LSB algorithm replaces the LSB of each byte in the “carrier” data with one bit from the “secret” message.

- Each pixel contains three values which are Red, Green, Blue, these values range from 0 to 255, in other words, they are 8-bit values. [4] Let's take an example of how this technique works, suppose you want to hide the message "hi" into a 4x4 image which has the following pixel values:
- [(225, 12, 99), (155, 2, 50), (99, 51, 15), (15, 55, 22), (155, 61, 87), (63, 30, 17), (1, 55, 19), (99, 81, 66), (219, 77, 91), (69, 39, 50), (18, 200, 33), (25, 54, 190)]
- Using the ASCII Table, we can convert the secret message into decimal values and then into binary: 0110100 0110101.
- Now, we iterate over the pixel values one by one, after converting them to binary, we replace each least significant bit with that message bits sequentially
- e.g 225 is 11100001, we replace the last bit, the bit in the right (1) with the first data bit (0) and so on.
- This will only modify the pixel values by +1 or -1 which is not noticeable at all. ☑
- The resulting pixel values after performing LSBs is as shown below: [(224, 13, 99), (154, 3, 50), (98, 50, 15), (15, 54, 23), (154, 61, 87), (63, 30, 17), (1, 55, 19), (99, 81, 66), (219, 77, 91), (69, 39, 50), (18, 200, 33), (25, 54, 190)]



CONCLUSION

- Hiding a message with steganography methods reduces the chance of a message being detected.
 - In and of itself, steganography is not a good solution to secrecy, but neither is simple substitution and short block permutation for encryption. But if these methods are combined, you have much stronger encryption routines.
 - Like any tool, steganography is neither inherently good nor evil, it is the manner in which it is used which will determine whether it is a benefit or a detriment to our society.
- Introduction Steganographic layer Image Steganography •LSB algorithm Types of Steganography.



THANK YOU

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