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Image Stegnography

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Abstract: *Steganography is the art of hiding the fact that communication is taking place, by hiding information in other information. Many different carrier file formats can be used , but digital images are the most popular because of their frequency on the internet. For hiding secret information in images, there exists a large variety of steganography techniques some are more complex than others and all of them have respective strong and weak points. Different applications may require absolute invisibility of the secret information, while others require a large secret message to be hidden.This project report intends to give an overview of image steganography, its uses and techniques.It also attempts to identify the requirements of a good steganography algorithm and briefly reflects on which steganographic techniques are more suitable for which applications.*

Keywords: Image steganography, steganalysis, hiding capacity, imperceptibility, security

I. INTRODUCTION

Steganography is the process of hiding a secret audio/video/text within a larger one in such a way that someone cannot know the presence or contents of the hidden audio/video/text. Steganography is, many times, confused with cryptography as both the techniques are used to secure information. The difference lies in the fact that steganography hides the data so that nothing appears out of ordinary while cryptography encrypts the text, making it difficult for an out sider to infer anything from it even if they do attain the encrypted text. Both of them are combined to increase the security against various malicious attacks.

II. LITERATURE SURVEY

Sr. No	Title of paper	Author	Findings
1	Image Steganography: A Review of the Recent Advances	Nandhini Subramanian1, Omar Elharrouss1	To explore and discuss various deep learning methods available in image steganography field. Deep learning techniques used for image steganography can be broadly divided into three categories traditional methods, Convolutional Neural Network-based and General Adversarial Network-based methods. Along with the methodology, an elaborate summary on the datasets used, experimental set-ups considered and the evaluation metrics commonly used are described in this paper.

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2	A New High Capacity Image Steganography Method Combined With Image Elliptic Curve Cryptography and Deep Neural Network	Xintao Duan 1, Daidou Guo	We propose a new high capacity image steganography method based on deep learning. The Discrete Cosine Transform is used to transform the secret image, and then the transformed image is encrypted by Elliptic Curve Cryptography to improve the anti-detection property of the obtained image. To improve steganographic capacity, the SegNet Deep Neural Network with a set of Hiding and Extraction networks enables steganography and extraction of full-size images.
3.	Reversible Image Steganography Scheme Based on a U-Net Structure	XINTAO DUAN 1, KAI JIA1, BAOXIA LI1,	We propose a new image steganography scheme based on a U-Net structure. First, in the form of paired training, the trained deep neural network includes a hiding network and an extraction network; then, the sender uses the hiding network to embed the secret image into another full-size image without any modification and sends it to the receiver.
4.	Detection of Image Steganography Using Deep Learning and Ensemble Classifiers	Mikołaj Płachta, Marek Krzemie´n , Krzysztof Szczypiorski and Artur Janicki	The problem of detecting JPEG images, which have been steganographically manipulated, is discussed. The performance of employing various shallow and deep learning algorithms in image steganography detection is analyzed. The data, images from the BOSS database, were used with information hidden using three popular steganographic algorithms: JPEG universal wavelet relative distortion (J-Uniward), nsF5, and uniform embedding revisited distortion (UERD) at two density levels. Various feature spaces were verified, with the discrete cosine transform residuals (DCTR) and the Gabor filter residuals (GFR) yielding best results.

III. OBJECTIVE

- To explore techniques of hiding data using encryption module of this projectTo extract techniques of getting secret data using decryption module.
- Steganography refers to the practice of concealing a message (with no traceability) in a manner that it will make no meaning to anyone else except the intended recipient, while cryptography, on the other hand, refers to the art of converting a plaintext (message) into an unreadable format.
- The purpose of audio steganography is to cover confidential data in digital audio for confidentiality. To embed the secret image into the audio signal is the objective of the proposed audio steganography.

IV. TOOLS AND TECHNOLOGY

Due to Software project we use embedded python

SOFTWARE DESCRIPTION

OpenStego: This program is an open-source steganography tool. Xiao Steganography: Xiao hides secret files in WAV or BMP files. Crypture: This application is a command-line tool used to conduct steganography. NoClue: This application is an open-source tool that hides text information in both video and image carrier .

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V. ACTIVITY DIAGRAM

5.1 ACTIVITY DIAGRAM

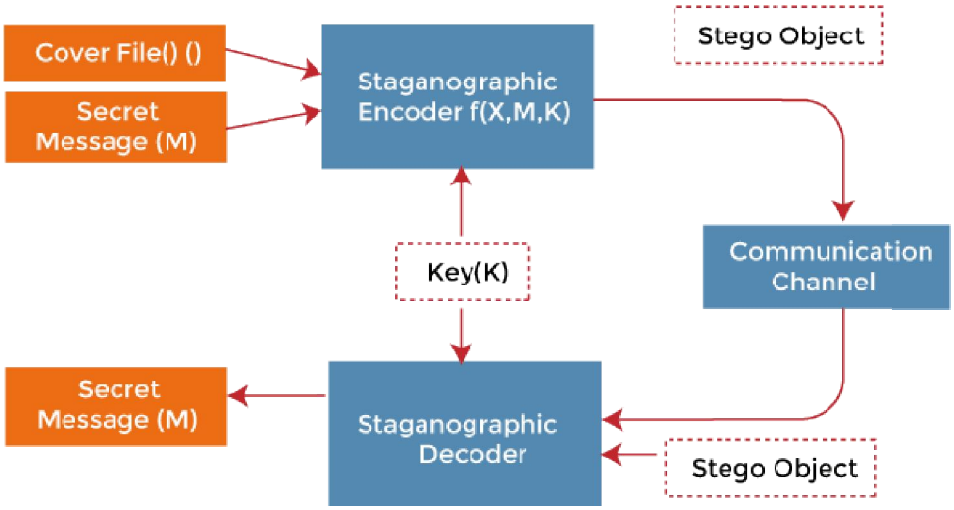
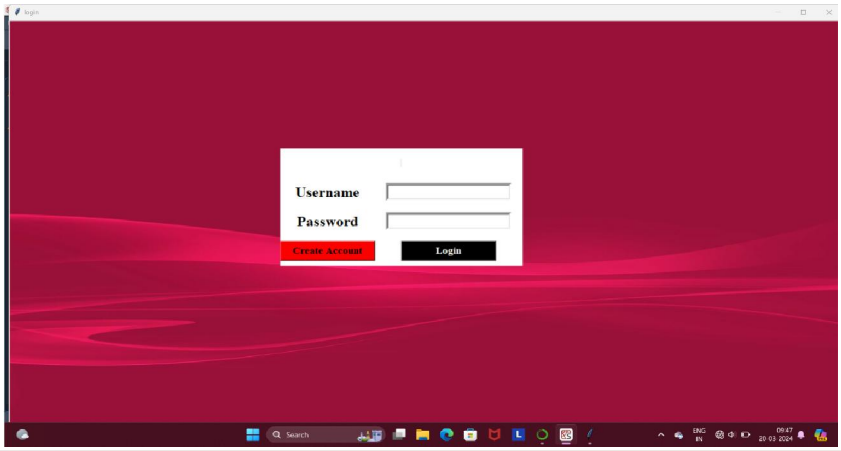
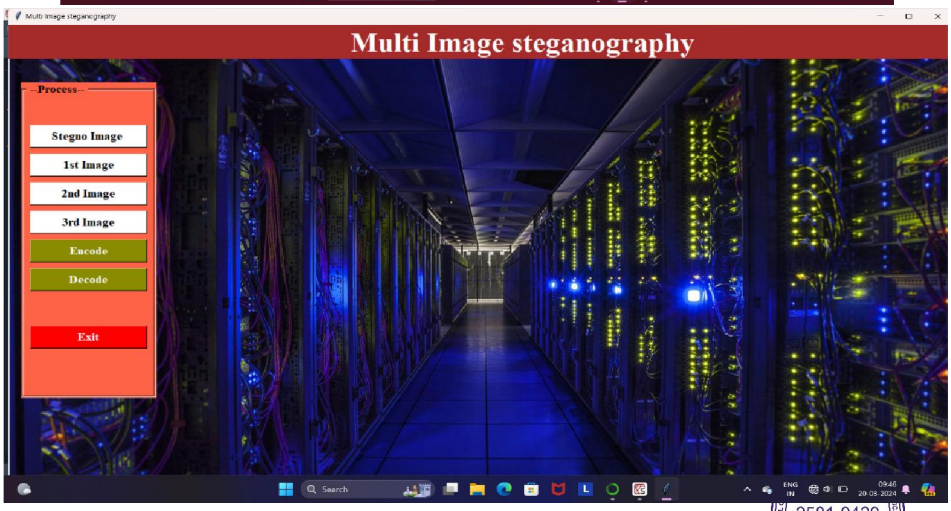


FIG. ACTIVITY DIAGRAM

5.2 DASHBOARD PAGES





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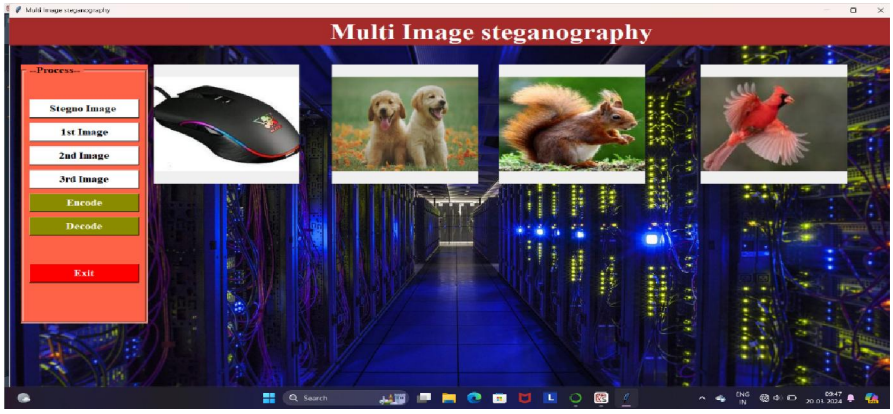

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VI. ADVANTAGES AND APPLICATIONS

6.1 Advantages:

Difficult to detect, only receiver can detect.
Can be applied differently in digital image file.

6.2 Applications:

This system can be used by the multiple peoples to get the counselling sessions online.

VII. CONCLUSION AND FUTURE SCOPE

CONCLUSION

This paper discards the information embedding of the least significant bits of the image, but uses an end-to-end approach to hide one image onto another and has lower pixel distortion. Experimental results show that this method has significant advantages in both visual effect and steganography capacity. The next step in this paper will combine the process of image delivery with the generative adversarial networks, taking the form of passing image parameters to the receiver. The receiver extracts the transmitted secret image through the pre-trained model, and in the form of double encryption, ensures that the secret message cannot be detected by the attacker during the transmission process, and the information is secure.

FUTURE SCOPE:

Machine Learning Integration: Future steganography techniques may be **Advanced Encryption Techniques:** As computing power increases, more sophisticated encryption techniques may be developed to enhance the security of hidden messages within images. This could involve quantum-resistant algorithms or other cutting-edge cryptographic methods.

Average machine learning algorithms for both embedding and detecting hidden information. These algorithms could adapt to evolving detection methods, making it more challenging to identify steganographic content.

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