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Video Steganography Using GUI in MATLAB

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ABSTRACT: Preventing unauthorized access, use, disclosure or destruction of data is gaining importance in the Digital world. Steganography and data hiding have become necessary for information security. Steganography is the practice of concealing a file, message, image, or video within another file, message, image, or video. The paper referenced has proposed a secure video steganography algorithm using linear block code. The algorithm requires a video to be converted into frames and changing the pixel positions. The message which is to be transmitted must be converted into one-dimension, XOR and Hamming code are applied to this message. Then this encoded message is embedded in the scrambled video frames. These frames are reconstructed and sent to the receiver. The receiver can extract information using the same key as the sender side. The receiver has to disassemble the video, use XOR and hamming code to reconstruct the correct intended message.

KEYWORDS: Digital Video, Data Hiding, Information Hiding.

I. INTRODUCTION

Steganography, an ancient practice of concealing sensitive information within seemingly innocuous carriers, has seamlessly transitioned into the digital realm, finding extensive application in modern contexts. Video steganography, a specialized branch of this art, entails embedding covert data within video files, offering a clandestine avenue for communication, copyright protection, and data concealment. Leveraging the robust multimedia processing capabilities of MATLAB, this paper introduces a graphical user interface (GUI) solution for implementing video steganography, providing users with an intuitive platform to seamlessly select video files, apply embedding algorithms, adjust parameters, and extract concealed information with ease. Beyond simplifying the process, the GUI facilitates visualization of the embedding procedure, enhancing user comprehension and engagement. By offering a comprehensive demonstration of its functionality, users are empowered to explore and harness the full potential of MATLAB in the domain of video steganography, unveiling a realm of secure communication and information concealment.

II. LITERATURE REVIEW

Video steganography project using a GUI in MATLAB would typically involve exploring existing research on video steganography techniques, MATLAB implementations, and graphical user interface design principles. You'll want to look into academic papers, journals, and conference proceedings that discuss various methods, algorithms, and tools relevant to your project. Pay attention to the latest advancements, strengths, and limitations of different approaches to inform your own implementation. Summarize previous research efforts that combine video steganography with GUI development in Matlab. Discuss the methodologies used in these studies, including the embedding and extraction processes, GUI design principles, and usability evaluations. Video Steganography project using a GUI in MATLAB would typically involve exploring existing research on video steganography techniques, MATLAB implementations, and graphical user interface design principles. Compare different implementations in terms of efficiency, usability, and security. Summarize previous research efforts that combine video steganography with GUI development in Matlab. Discuss the methodologies used in these studies, including the embedding and extraction processes, GUI design principles, and usability evaluations. Video Steganography project using a GUI in MATLAB would typically involve exploring existing research on video steganography techniques, MATLAB implementations, and graphical user interface design principles. Compare different implementations in terms of efficiency, usability, and security.

III. EXISTING SOLUTION

In this solution, they developed a user-friendly interface using Matlab's GUI development tools to enable users to embed and extract secret data within video files easily. Their solution likely incorporates various steganographic techniques, such as LSB embedding or transform domain techniques, allowing users to choose the method that best

suits their requirements through the GUI. Additionally, the GUI may offer options for setting parameters like embedding rate, robustness, and encryption keys to customize the steganography process according to user preferences. The interface is designed to guide users through the steganography process step by step, from selecting the cover video file and secret data to specifying embedding parameters and executing the embedding or extraction process. Visual feedback and progress indicators may be included to enhance user experience and provide transparency into the steganography operation. The solution might also include features for evaluating the quality of the stego video and assessing the effectiveness of the embedding process. This could involve metrics such as PSNR (Peak Signal-to-Noise Ratio) or SSIM (Structural Similarity Index) to compare the original and stego videos and measure the distortion introduced by the embedding process.

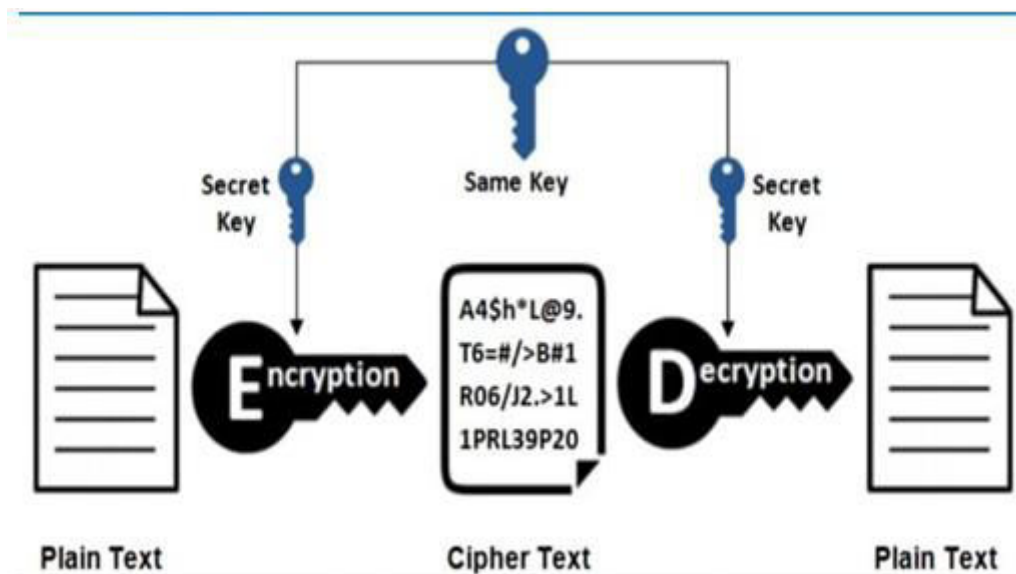
IV. PROPOSED SOLUTION

The proposed solution entails developing a user-friendly graphical interface in Matlab for video steganography. Users can select a cover video and input the data they wish to hide within it. Various steganographic algorithms are integrated, allowing users to choose their preferred method of data embedding. The interface guides users through the embedding process, resulting in a stego video file with hidden data. Additionally, extraction functionality enables users to recover hidden data from stego videos. Quality evaluation metrics are provided to assess the integrity of the stego video. Documentation and help resources are available to support users, while security measures such as encryption and error handling ensure data protection throughout the process.

V. METHODOLOGY

The methodology for implementing video steganography using a GUI in MATLAB involves several key steps to ensure effective concealment and extraction of secret information within video files. Firstly, the graphical user interface (GUI) is designed to provide users with an intuitive platform for interaction, allowing seamless selection of video files and application of embedding algorithms. Once a video file is chosen, the embedding process begins by encoding auxiliary data into the video content, generating an intermediate signal that incorporates both the auxiliary data and human perception attributes of the content signal. This intermediate signal is then combined with the original video signal to effect encoding, ensuring robustness against common content degradation methods such as lossy compression, scaling, and analog-to-digital conversion. Throughout the process, users have the flexibility to adjust parameters according to their preferences and requirements. Finally, the GUI facilitates the extraction of concealed information from the encoded video file, enabling users to retrieve the embedded data with ease. Through clear visualization and step-by-step instructions, the methodology ensures a seamless and user-friendly experience for implementing video steganography using MATLAB and the provided GUI.

VI. USER FLOW DIAGRAM



VII. CONCLUSION

. The proposed system results in hiding the encrypted information into the video clips. Each frame hides 3-bits of data. The proposed video Steganography is tested by taking different size of videos and different size of secret data. The proposed system shows that no noticeable noise is introduced in the encrypted video. It is similar to that of original video. The stego video is sent to the receiver, who knows the secret key. The existence of secret information is impossible to detect. Hence the data is transferred safely and securely to the destination. The DES algorithm used to encrypt data is simplest but efficient algorithm for encryption. Although it is simple and most common techniques are used, but it provides fast and efficient way to transfer data securely.

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