A Steganography Application with a Graphical Interface (Whisper)

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This project focuses on information security, specifically steganography and cryptography. In today's world, where access to information has become increasingly easy, we identified a need to provide users with a secure way to store and transmit files. Our aim is to deliver a user-friendly application that ensures information protection while maintaining simplicity in its use.

Although similar software solutions already exist, *Whisper* stands out by offering greater accessibility and user-friendliness. Unlike conventional tools created primarily for cybersecurity experts—such as *StegHide*, which often come with complex interfaces— *Whisper* is designed to be intuitive for the average user. The application allows users to conceal a chosen file (text or image) within another file (text, image, or audio). This enhances the secure storage, transmission, and uploading of information. Moreover, this technology ensures that it is virtually impossible to detect the presence of hidden data (text or image) within the final file.

The following technologies were employed in the development of this project: Python (including libraries such as Stegano, PyQt5, Qt Designer, Pillow, Shutil, Crypto.Cipher/AES), as well as a custom-developed module named *ImageSteganography*. To briefly explain the operating principle of *ImageSteganography*, it is essential to consider the bit structure of an image. An image comprises three primary color channels (RGB), each ranging from 0 to 255 bits. Our module analyzes each bit, identifies the least significant bits (those that do not affect the image's quality or visual appearance), and replaces them with bits from the "secret file."

References:

[1] AES Documentation

[2] Pillow Documentation

[3] Qt designer doc

[4] Youtube

[5] chatGPT