Least Significant Bit Steganography and its Steganalysis
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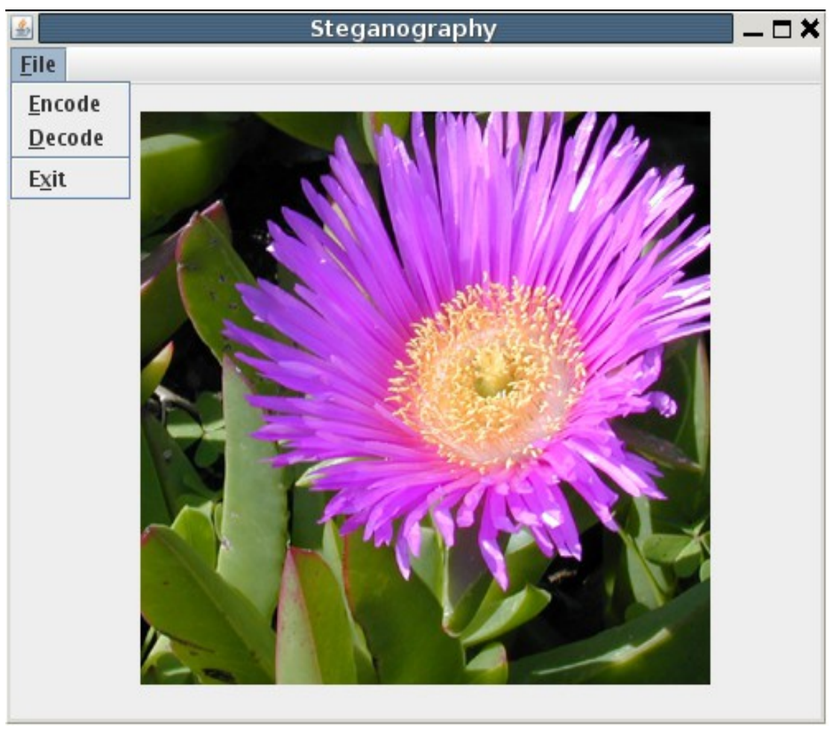
Abstract

Image Steganography has become more viable because of the “noise” found in most image formats. Least Significant Bit (LSB) steganographical techniques can covertly encode a message without visibly altering an image. A program that enables encoding and extraction into an image file was coded in conjunction with a Graphical User Interface (GUI) to facilitate use. The following is an image of the GUI with an image covertly containing the Declaration of Independence :



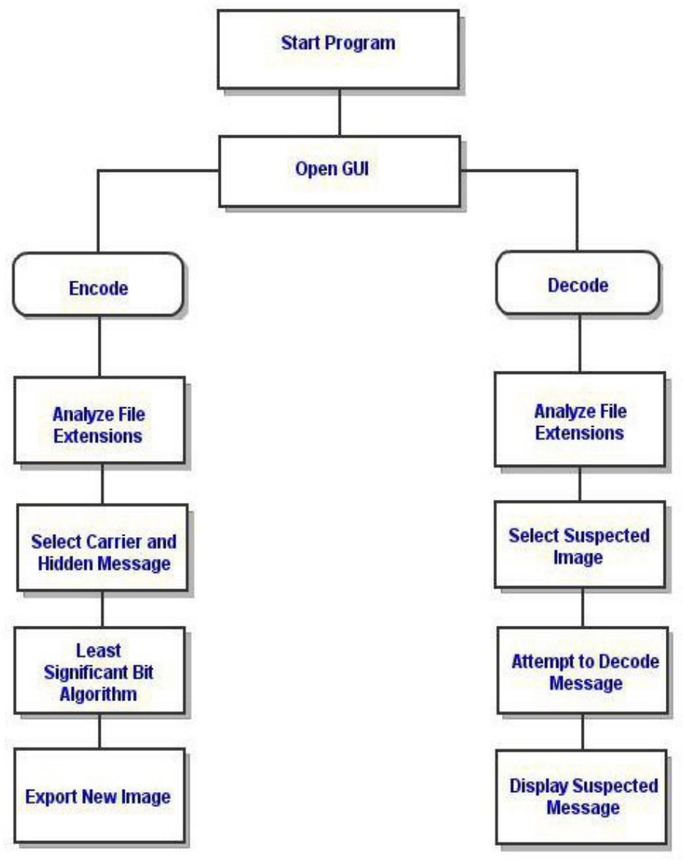
Introduction

Steganography has existed since the time of the Ancient Greeks and continues to be used for secure and covert communication. The initial method was unobtrusively concealing a sent message was to shave the hair of a servant, inscribe the desired message, wait for the hair to grow back, and then send the servant to the recipient.

Steganography is opposite of encryption, in which a message is made unintelligible, because the message is openly transmitted through public means. The concealment of the fact that a message is even being transferred is the true essence of steganography.

Procedure

Lossless image formats are best for encoding. To do this, a technique called Least Significant Bit encoding is employed to edit numerous bits of the image and placing parts of binary code that can be compiled by the reader to form a text message. The program reads the entire binary composition of the image into an array. The least significant bits are then altered and compiled together into a new matrix that is saved as a new image. In order to detect encoding and to decode the message, the program attempts to reverse the LSB. If successful, the extracted image is displayed.



Results

An advanced implementation of steganography that passes at least a visual inspection will be able to be used and will not incite the suspicions of someone intercepting the message. If the decoding feature is used, it will display what is purportedly being hidden in a GUI.