Implementation of Steganographic Techniques
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Abstract

The purpose of this project is to design a steganographic program in C++ capable of hiding a message within a WAVE file, and then later extracting the hidden message. It should be able to work with any WAVE formatted sound file, and the message ideally will not be detectable.

Background

Steganography is the art of hiding a message or data within another set of data, such as an image, sound file, or computer program. The idea is that the presence of the message is unknown, as opposed to cryptography where the presence of the message is known, but it is unreadable. The WAVE file format is a sound file format composed of various “chunks” of data. By utilizing this “chunk” organization of the files, data can be hidden rather easily in the file without detection.

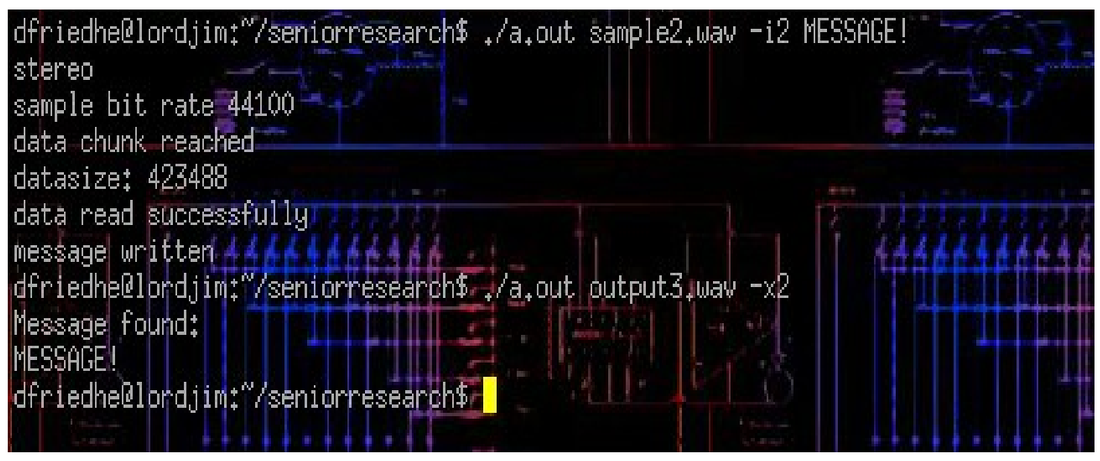
Procedures and Methods

My methods are all run by command-line arguments. That way, the same program can be run multiple times to do different things, based on which flags are used. The –i or input method inserts a message into the “fmt” chunk of the WAVE file. This keeps the data within the file completely intact, resulting in a playable and almost identical replica of the original file. The -i2 is a more complex method that hides the message better by putting it in the actual data by a method called least significant bit replacement. The –x or extract method finds the message in a given file and displays it, as does the -x2 method for messages hidden using -i2.

Expected Results

I expect to have a working C++ program capable of inserting hidden messages into all WAVE files and extracting them later. Not only should the resulting files still be playable and sound identical to the originals, but they should also look similar down to the byte level (e.g. same formatting options within the file, etc.)

Sample Screenshot



Larger Purpose

This and many other steganographic programs have many uses in the worlds of intelligence and espionage. By hiding a text message within a seemingly innocent audio file, an undercover agent could transmit data over an unsecured connection without a great risk of discovery.