

Implementation of Steganographic Techniques

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Danny Friedheim

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.

Expected Results

I expect to have a working C++ program capable of inserting hidden messages into WAVE files and extracting them later. I can already do so now in a simple way, so the more significant expected result is to design a method of data storage within the WAVE file to make the message completely undetectable.

Sample Screenshot

```
dfriedhe@oedipus:~/seniorresearch$ ./a.out sample2.wav -i hidden_message
RIFF 424100 WAVE
file type is RIFF
file is a WAV
filesize is 424100 bytes
compression code is 1
num of channels 2
stereo
sample bit rate 44100
data
ldata chunk reached
datasize: 423488
44
16
size is 30
data read successfully
dfriedhe@oedipus:~/seniorresearch$ ./a.out output2.wav -x
Message extracted:
hidden message
dfriedhe@oedipus:~/seniorresearch$
```

Procedures and Methods

So far 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 `-x` or extract method finds the message in a given file and displays it.