

Steganography

The purpose of this assignment was to study the concepts behind steganography: the art of hiding files within another file. While there exist many methods for conducting steganography, the most popular is the Least Significant Bit (LSB) method. In LSB, the smallest bit of the original bytes are changed to match the bits of the file to be hidden. This method can be very difficult to discover without explicitly looking - particularly in terms of the file size. As opposed to LSB, my algorithm simply appends the file to be hidden to the source file. This type of steganography can be broken quite easily by analyzing the header of the file but would easily slip past an untrained eye.

My application deals specifically with wave audio files (.wav) and has capability of hiding both text files (.txt) and jpeg image files (.jpg). The algorithm strips the header from the wave file, determines how long the wave file is in bytes, and then appends the bytes of the text/image file to the end of the wave file. This method works because all audio players will stop reading at the header-specified length meaning there are no audio irregularities or emptiness. Furthermore, the algorithm is exceptionally simple in both insertion and extraction. The most prominent limitations of the application currently is the inability to handle files other than txt and jpg.

When devising the algorithm, the initial plan was to use the Least Significant Bit method. However, as more research was done into the wave file format, it became increasingly more difficult. Because wave files are read in chunks, there are significantly less bits that are capable of changing without causing irregularities. If an audio file has 8 bit chunks, only 1 bit of information can be hidden per byte of audio. If an audio file has 16 bit chunks, as is more normal, only 1 bit of information can be hidden per 2 bytes of audio. In a 16 bit chunk wave file, a wave file of 40 megabytes can only hide a file of 2.5 megabytes or smaller. While this is fine for simple formats like text, it becomes

significantly more problematic when working with multimedia files. As such, the append method was preferred.