ABSTRACT

The rapid development of technology provides convenience in obtaining digital data information. This results in a lot of misuse of digital data including illegal distribution and copyright infringement or falsification of data ownership. Digital watermarking is one solution to copyright protection. Audio watermarking is part of digital watermarking, which is a watermark insertion technique that contains information from audio data into the audio host.

In this final project an audio watermarking system is designed with Quantization Index Modulation (QIM) and Spread Spectrum (SS) methods based on Discrete Wavelet Transform (DWT), Discrete Cosine Transform (DCT), Singular Value Decomposition (SVD), Cartesian-Polar Transform (CPT)). DWT is the process of decomposing the host signal into two parts, namely low frequency and high frequency signals. Then the signal will be transformed from the time domain into the frequency domain using DCT. Then the signal will be decomposed into three matrices to separate the power called the SVD process. CPT is the transformation from cartesian coordinates into polar coordinates. The watermark insertion of the QIM method will be carried out at the low frequency subband, while at the high frequency subband the watermark will be inserted using the SS.

The results of this design are an audio waterming system with an ODG value of -1.96, SNR of 28.2512 dB and BER of 0.07. The system has robustness because it is resistant to attacks such as LPF, BPF, noise, resampling, TSM, Linear Speed Change, Pitch Shifting, Equalizer, Echo, and MP3 Compression.

Keywords: Audio *Watermarking, Discrete Wavelet Transform, Discrete Cosine Transform, Singular Value Decomposition, Cartesian-Polar Transform, Quantization Index Modulation, Spread Spectrum.*