ABSTRACT

Audio watermarking is one of a watermarking that used in audio information. Audio watermarking is an embedding watermark process to an audio. It usually used to prevent of copyright. In watermarking, it will proceed by addition of bit synchronization and compressive sampling. Meanwhile, in host audio will proceed by several methods. All the processes are performed to meet the parameters on watermarking

In this final assignment, the processes use several methods, that are Lifting Wavelet Transform (LWT), Discrete Sine Transform (DST), Singular Value Decomposition (SVD), and Cartesian-Polar Transform (CPT). In LWT process will be the selection of sub-band frequency. After selecting sib-band frequency, DST method will transform time domain to frequency domain. After that, SVD method will be decompose a matrix into 3 matrices. It resulting in the extraction of data in one of the matrices for watermark to embedded. The last method is CPT, the selection of the two highest values of the diagonal matrix in the SVD process will be consider as the polar coordinate. It will decompose into two components using the Polar-to-Cartesian transformation.

The result of designing watermarking on this final project without any attack is obtained BER = 0,0156, ODG = -0,3818, and SNR = 29,1885. After that, each audio is give some attacks to be test of watermarking resistance. It performed optimization to generate optimal parameters. This examination obtain an optimal parameter with an average BER is 0,1769. Meanwhile, the best parameter is generated by bass.wav audio. It has BER = 0, SNR = 29,1886, and ODG = -3,8589 in Delay attack, MP3 Compression, Linear Speed Change, Resampling, and Low Pass Filter.

Keywords: LWT, DST, SVD, CPT, SNR, BER, ODG, MOS, Audio Watermarking.