ABSTRACT

In this era of globalization, the rapid development of technology and the internet is vital because it is a place for exchanging and downloading various useful information. However, behind the many benefits that we get from the internet, there are also problems that arise such as copyright infringement and the illegal distribution of data in the music industry. One solution to protect the copyright of an audio data is using audio watermarking technique. This technique is a process of embedding information (watermark) into an audio file that cannot be realized by human senses, so that the copyright of the audio file is not misused.

In this final project, an audio watermarking system is designed using the insertion method of Multibit Spread Spectrum (Multibit SS) based on Stationary Wavelet Transform (SWT) and Discrete Cosine Transform (DCT) as a signal decomposition process. To select the right subband at the time of the watermark insertion, SWT transformation and DCT transformation are used to convert the audio host signal from time domain to frequency domain. Multibit SS embedding method is used in this system design so that the watermark security is guaranteed by spreading the watermark bits on the audio host and by representing the Pseudo Noise Code (PN Code) for several watermark bits.

The audio watermarking system design is simulated in Matlab software and the result of this system design is the resilience of the audio watermarking system against tested attacks such as Filtering, Resampling, Compression, Pitch Shifting, Time Scale Modification, Echo and Linear Speed Change. The results of the attack test obtained the quality of resistance (robustness) BER value of 0.013, SNR value is 14 dB, the ODG value is -1.13, with watermark capacity up to 172.26 and average MOS value of 4.1.

Keywords*: Audio Watermarking, Multibit SS, SWT, DCT.*