ABSTRACT

In the era of globalization and the use of the Internet en masse, sharing and distribution of data media can be done freely and easily. Watermarking is one of the solution to maintain the owner's data media authenticity from parties who are not responsible by embed data in the form of copyright tags whose existence is unknown by someone other than the original owner. Beside that, the quality of the desired data will decrease if the copyright is forcibly removed from the original data.

In this final project, with the title "Design of Mono-Audio Watermarking System Based on Fast Fourier Transform (FFT) with Hybrid Methods of Lifting Wavelet Transform (LWT) and Centroid", the design of an audio watermarking system will use the Lifting Wavelet Transform (LWT) method that divides the signal into high and low subband. Fast Fourier Transform (FFT) will convert the shared signal from time domain to frequency and vice versa. Then signal will be optimized with the Centroid method, to determine the central point of the signal amplitude so that the embedding process results more stable and resistant value to various attacks. For audio performances can be seen from standard parameters in watermarking process that is BER, SNR, OGD and C.

The result of this research is ODG = -3,6508, SNR = 30,4422 dB and payload capacity (C) = 86,1328 bps. Watermarked audio is also tested with various attacks such as Low Pass Filter, Band Pass Filter, Noise, Resampling Time Scale Modification, Linear Speed Change, Pitch Shifting, Equalizer, Echo, MP3 and MP4 Compression before optimized with average BER value = 0.367419355 and after the optimization results average BER value = 0.1909.

Keyword: *Watermarking, Lifting Wavelet Transform, Fast Fourier Transform, Centroid.*