

ABSTRACT

Audio Watermarking is an insertion method on an audio as a marker of copyright. This method inserts a watermark in the form of information provided that it does not damage the Audio itself. This technique is one way to solve the problem of copyright infringement.

The embedded watermark not only has the condition to not damage the audio but also has robustness, imperceptibility and good capacity as well. In this final project, the writer uses the combined method of Lifting Wavelet Transform, Fast Fourier Transform, QR Decomposition and Reconstruction, and Cartesian-Polar Transformation based on Quantization Index Modulation and analyzed by using Compressive Sampling method.

Audio watermarking generated from this final project are parameter 2 has average value of ODG is -1.97930, average value of SNR is 34.8472, and average value of BER is 0.272168 and parameter 3 has average value of ODG is -2.807, average value of SNR 23.51582, and average value of BER is 0.238495. Audio watermarking in the best parameters, parameter 3, has robustness to Low Pass Filter, Resampling, Linear Speed Change, and MP3 Compression based on the BER value obtained $\leq 10\%$. The audio quality is calculated subjectively obtained by MOS value of 3.726 for parameter 2 and 3.793 for the parameter 3.

Keywords: *Audio Watermarking, Lifting Wavelet Transform (LWT), Fast Fourier Transform (FFT), QR Decomposition, Cartesian Polar Transform (CPT), Quantization Index Modulation (QIM), Compressive Sampling (CS).*