

ABSTRACT

The development of information technology, especially on internet and multimedia, makes the deployment of digital media becomes easier to do. This causes frequent violations of copyright and proprietary rights, such as retrieve and modify multimedia data illegally. To resolve this problem, digital watermarking is needed. Watermarking technique is useful for the identification of the owner of the data, the copyright protection, determining the authenticity of the data, and monitoring data. There are several methods of watermarking has been used, namely DFT (Discrete Fourier Transform), DWT (Discrete Wavelet Transform), DCT (Discrete Cosine Transform), LSB (Least Significant Bit), et cetera.

This final project will discuss the design of watermarking techniques based on DWT (Discrete Wavelet Transform) and DCT (Discrete Cosine Transform) using QIM (Quantization Index Modulation) as the method of data embedding. Host audio will be divided into several frames by using DWT level 5, then the method performed for each DCT coefficient in the frames. The embedding process of bit information is done by the QIM method. This final project will be tested with several parameters, namely, BER (Bit Error Rate), SNR (Signal to Noise Ratio), PEAQ (Perceptual Evaluation of Audio Quality) based ODG (Objective Difference Grade) and MOS (Mean Opinion Score)

This final project is expected to make an imperceptible watermarking system with the value of BER is 0, SNR 30-50 dB, ODG -2 to 0 and MOS values is 4 without any attack. This method is also expected to make a robust watermarking system to variety of attack and the result of the extraction is resembling the audio host.

Keywords: *Watermarking, audio watermarking, Discrete Wavelet Transform (DWT), Discrete Cosine Transform (DCT), Quantization Index Modulation (QIM)*