ABSTRACT

Pirating process or digital product duplication is still happening oftentimes in this globalization Era. This happens because information moves easily especially on the internet. That is why a solution is needed to protect those information data of a digital media, which is watermarking. Watermarking is a technique which embeds information into digital media where the information that is embedded is strong against attacks.

In this final project, there will be designed an audio watermarking system by combining lifting wavelet transform and discrete cosine transform methods also using genetic algorithm optimization. Research about audio watermarking has been done many times before, but trials is still done to find the optimum parameters that produce good imperceptibly and robustness.

The process in this final project is the host audio divided into low and high domain by LWT to determine the location of insertion, divided by 3 schemes with different framing location, then change the signal into frequency domain by DCT so the watermark inaudible by human, the insertion process with the QIM method, and the attacking results in optimization by Genetic Algorithm to obtain optimal parameters.

Research concludes that using genetic algorithm get optimal parameters obtained are frame length of 1024 pixels, 5 decompotition level, 1 threshold value, 16 bit depth, and 4 bits of quantitation number from rock audio and from 22kHz resampling attack at B scheme. Watermarked audio in rock host with the optimal parameters robust to LPF, noise, resampling, and mp3 compression attacks because it has BER below 10%.

Keyword: *Audio Watermarking, Discrete Cosine Transform, Lifting Wavelet Transform, Quantization Index Modulation, Genetic Algorithm.*