

## ABSTRACT

Along with the development of internet network and multimedia technology resulted in the deployment of information in the form of data, text, video, images, and sound become easier. If the internet and multimedia network increasingly grows, it's make easier to modify it. This case make a lot of violation copyright and proprietary rights such as piracy on music or digital audio content. So with this problem to maintain digital ownership rights it's required watermark techniques. Watermark techniques are very important because its protect multimedia ownership, copyright identification, data authentication, user identification, and data monitoring.

Watermarking is the process of inserting information into one of data host such as images, sounds, and video so that information (watermark) later can be extracted and detected that information to prevent and control the distribution of digital data protected by copyright. In digital watermarking, if the information inserted into a digital audio then it's called audio watermarking. This final project will discuss the design of audio watermarking system with LWT (Lifting Wavelet Transform), cepstrum, and DST (Discrete Sine Transform) methods and compressive sampling with the embedding process using SMM (Statistical Mean Manipulation) and QIM (Quantization Index Modulation).

The selection of LWT method in this final project because LWT is robust against attacks such as linear speed change and TSM, but less robust against attacks such as resampling, pitch shifting, echo, and noise. Ceptrum is used to obtain large capacity in watermarking data storage, and DST is expected to save cost and computation time. The audio watermarking system performed in this study produces audio quality with an average SNR of 28.87 dB, average BER 0.36651, average ODG -2.86832, and MOS 4.08 against all audio genres tested.

Keywords: Audio Watermarking, Lifting Wavelet Transform, Discrete Wavelet Transform, Cepstrum, Compressive Sampling.