

ABSTRACT

In this digital era, any informations can be accessed easily by anyone in the form of data. These activity could bring a problem such as copyright. For solving these problem, technique called watermark is used. Watermark is a sign that can be embedded in a data. The focus of this final project is digital audio.

In this final project, the audio watermarking system that is used are Multibit Spread Spectrum (Multibit SS) technique for embedding based on Discrete Wavelet Transform (DWT) and Discrete Cosine Transform (DCT). Based on these design, the quality will be measured and implemented on Raspberry Pi. By using this system design, DWT is used to embed the watermark in a high frequency, DCT transform is used to change the domain of the signal from time domain to frequency domain. Spread Spectrum is used by spreading watermark bits into audio signal that act as a host. Multibit SS is used by representating one Pseudo Noise Code (PN Code) for some watermark bits. This design system will be implemented on Raspberry Pi, because of its portable and real-time characteristic.

The result from this system using watermark 10×10 and 5 host audio show the robustness of the audio watermarking to the attack of filter, resampling, linear speed change, noise, equalizer, echo, MP3 compression, MP4 compression, delay, wireless dan wired. The result of implementation on Raspberry Pi has shown a good result. The good result is shown by BER's value 0, SNR's value variation from 16 dB to 27 dB for each hosts which is categorized as good because it's still around 20 dB, and ODG's value from -1.7 to -3.5 for each host and enough capacity for copyright protection which is 6.67 bps.

Keywords : *Audio Watermarking, DCT, DWT, Spread Spectrum, Multibit SS, Raspberry Pi*