Abstract

Watermarking is a concept of hiding data or pattern into a document or a cover signal (host signal) which is usually used for copyright protection, tamper proofing, annotation/labeling or feature location.

In this final project zero-watermarking method was implemented in audio data. Zero-watermarking works by saving a binary pattern that establishes a correlation between watermark and audio data into the watermark key instead of modified the audio data by embedding watermark data into it in order to prevent audio quality degradation. Zero-watermarking method was implemented in frequency domain by using the combination of DWT and DCT.

The experiments and analysis shows that zero-watermarking method had maximum imperceptibility level which is indicated by infinite SNR value of watermarked audio. The experiments also shows that zero-watermarking method is relatively robust against echo addition, bandpass filtering and resampling but weak against mp3 compression. Zero-watermarking method has several limitation such as : it can't be used for copyright protection because of it's ambiguity, big watermark key's size and it can't be implemented for systems that require public key.

Keywords : *zero-watermarking*, audio, DWT, DCT, *imperceptibility*