ABSTRACT

The development of increasingly advanced technology makes it easier for people to duplicate and distribute digital audio content without the owner's knowledge, especially in the digital world. This makes designed watermarking used to protect copyright owners in particular in the audio data.

In this study, designed and realized system watermarking for digital audio to keep the copyright owner of audio by inserting image information into an audio file and extract audio ter-Watermark by using FFT (Fast Fourier Transform) and SVD (Singular Value Decomposition).

The FFT (Fast Fourier Transform) method is the carrier of an image from spatial space to the frequency space and the SVD method (Singular Value Decomposition) is one of the mathematical tools used to represent a matrix and is capable of performing various analyzes and computations. Tests on the audio pitch-Watermark done without attacks and attacks that testing with low pass filter, resampling, and equalizer. Testing is also done without using Singular Value Decomposition method to know the quality comparison of Robustness and Imperceptibility.

Based on the Watermarking audio implementation, Watermarking audio with Fast Fourier Transform and Singular Value Decomposition methods can insert images and produce the best Watermark audio performance with the best BER 0%, SSIM 1, and 69db highest SNR values.

Keywords: Audio Watermarking, Fast Fourier Transform, Singular Decomposition Value.