

ABSTRACT

The rapid advancement in technology and information indeed ease the digital data exchange to protect the confidentiality of an information. One of which is to use the digital watermarking technique. The method itself is by inserting a watermark inside the digital data so it has a copyright protection. Watermark is usually shown as a logo image, signature or audio. Within this final task, the watermark process will be using some methods such as LWT (Lifting Wavelete Transform), DCT (Discrete Cosine Transform), SVD (Singular Value Decomposition), QIM (Quantization Index Modulation) and Genetic *Algorithm*.

Segmented Host audio with a (* wav.file) format will be through LWT method which its role is to divide the host audio into low and high domain signals in order to determine where to insert the data's watermark position. Next, the DCT process signal that has been divided is transformed into the frequency domain. Afterwards, SVD works to extract signals in regions that has a great power to give endurance towards the insertion scheme being used. In this research, data insertion system uses three schemes by framing different positions. In the insertion process, it will be carried out using the QIM method, then are being tested with several attacks like LPF, time scale modification, resampling, and etc. Hence, it could be optimized by using a genetic algorithm in able to resolve the optimal parameters through comparing the original host and watermarked host.

Optimization obtained the most optimal parameters that produce fitness = 2.6279, ODG = -0.5130, SNR = 90.0842, BER = 0 and with frame length 32, decomposition level 2, threshold of 0.4, 32 bit audio depth and quantity QIM 15 bits. The type of attack used is Time Scale Modification, in scheme III.

Keywords: Audio watermarking, Wavelete Lifting Transform, Discrete Cosine Transform, Singular Value Decomposition, Quantization Index Modulation, Genetic algorithms