ABSTRACT

Digital watermarking is a technique of hiding digital information or watermark into a multimedia product or host images. Inside the process of digital watermarking have an impact on the imperceptibility of host images and robustness of watermark. The problem between imperceptibility and robustness in digital watermarking is an unavoidable problem.

A method of digital watermarking using Discrete Wavelet Transform combined with particle swarm optimization served to solve this problem. In this method, watermark is embeded in the vertical subband (HL). Furthermore, Particle Swarm Optimization is used to train scaling factor to get the highest possibility for watermark robustness without reduce the imperceptibility of host images.

Imperceptibility quality assessment conducted by Universal Quality Index (UQI) robustness and quality with Normalized Correlation (NC), each of UQI and NC has a range of values between 0 and 1, 1 is the best value. Based on the results of tests performed, UQI and NC values were obtained in the range of 0.9, and this shows that the method is capable and can produce good quality of imperceptibility and robustness in digital watermarking.

Key Word : *Digital Watermarking, Discrete Wavelet Transform, Particle Swarm Optimization, Scaling Factor, Universal Quality Index, Normalized Correlation*