

## ABSTRACT

*In this Final Project will be proposed blind watermarking Method to Grayscale or Coloured Image(RGB) using Haar Discrete Wavelet Transform for Watermark embedding dan using Hidden Markov Model for Watermark detection in Watermarked Image without knowing the original watermark. These steps consist of two main steps, which are Embedding Step dan Extraction Step. Embedding process is initiated with preprocessing toward Watermark image before embedded into host image. This encoding process is known as Direct Sequence Spread Spectrum. Spread watermark image is then embedded into 2-level decomposed host image. Spread Watermark is embedded into one of the subband. Then the extraction is done by training the embedded Wavelet Coefficients. This training process uses Baum-Welch Learning to estimate the parameters of HMM to produce a model for Maximum Likelihood Detection. The performance of Watermarking System is tested using two criteria that is imperceptibility and robustness. Those two criteria are measured using PSNR and BER.*

*Experiment result shows that the best subband is HH with embed constant 1 using the HVS method Xie Perceptual Model. Ideal watermark size according to experiment is 32x32 using two kind of DWT Haar and Daubechies 2. Experiment also shows the imperceptibility performance using average value of PSNR is 42.7525 dB and robustness performance using the attacks AWGN, Salt and Pepper, Gaussian Noise, Median Cut, Dithering, JPEG Compression, Gaussian Sharpen, Sharpen, Brightness, Contrast, Gamma, and Histogram Equilization with average value of BER is 5.003444 %.*

***Key Words: Watermarking, Discrete Wavelet Transform, Hidden Markov Model, Spread Spectrum, Imperceptibility, Robustness.***