Abstract

Rapid development in multimedia networks help people to duplicate and distribute multimedia content easier, especially digital images. This means that watermarking gains more important role as authentication technique for copyright protection. In this final project, an image watermark system using Spread Spectrum, Discrete Wavelet Transform (DWT) dan Principal Component Analysis (PCA) will be implemented and analyzed.

In this final project, the input image will be converted into frequency domain using one level 2-D DWT to get the subbands. The subbands then will be divided into blocks. PCA will be implemented for each block get the Principal Component (PC) score coefficients. Watermark will be embeded in PC score for each block using spread spectrum. After that, the new coefficients will be reconstructed using reverse PCA dan reverse DWT to get watermarked image.

From the test result we obtained that two-fold increase in alpha value will decrease the quality of watermarked image about ±6 dB but increase the robustness from attacks. Whereas the addition of principal component score column used will increase the embedding capacity but decrease the quality of watermarked image about ±3 dB for each twofold increment of principal component score column used. We also obtained that watermark embedding in HL and LH subband are robust from brightness, contrast, noise, and JPEG compression attacks even though not as good as HH for brightness/contrast attack or LL for JPEG compression attacks.

Keyword: *watermarking, dwt, pca, spread spectrum, non-blind*