Abstract

The development of digital technology which is going so fast today makes users duplicate and transmit data more easily. On digital system, data duplication can produce new data which is so similar with the original one. Therefore, the data protection system is always needed to avoid data from unauthorized thing. The protection on sending digital data could be implemented by using the steganography method which the original data will be unified with another data.

The digital image steganography which formatted in bitmap using *dual-tree complex wavelet transform* as one of tools in matematic for doing the signal decompotition becomes different frequency components had been implemented on this final assigment.

The *dual-tree complex wavelet transform* is a relatively recent enhacement to *real wavelet transform* or DWT (*Discrete Wavelet Transform*) which known as well. In spite of its efficient computational algorithm, *real wavelet transform* suffers from four fundamental, intertwined shortcoming such as : oscillations, shift variance, aliasing and lack of directionality which can be solved by *dual-tree complex wavelet transform.*

The simulation results demonstrate its good performance of the robustness and invisibility. *Mean Square Error (MSE), Signal To Noise Ratio (PSNR) and Mean Opinion Score (MOS)* are the parameter for system performance. Based on the noise adding and compressed simulation, the LL subband get the best performance for signal processing attacking for each mixing coefficient. The optimal mixing coefficients matrix is [0.99 0.01]. It gets a good performance which PSNR above 30 dB and MSE almost reached 0% for every simulation, hidden image size and hidden image detail.

Keywords: *Steganography, Dual Tree Complex Wavelet Tramsform, ICA (Independent Component Analysis)*