Abstract

In cyber space digital data are easily accessed information and difficult to be monitored. It influences data ownership and copyright. Everyone can easily copy or change the copyright of that digital data. To overcome this situation, a technique is required to protect the copyright of the data. One way is to implement data hiding technique (*Steganography*), which is watermarking. Watermarking is a technique to hide data in digital data (image, audio, video), but the presence is invisible to human senses.

In this final asssignment, watermarking technique is implemented in digital image using *Discrete Cosine Transform* (DCT)and *Just Noticeable Distortion* (JND). The goal is to achieve a fine and robust watermarked image perceptibility.

The JND value is calculated before the embedding process in domain frequency. The watermarked image will be in good quality if the PSNR value is > 30 dB and >55 dB for extracted image. Factor that influence perceptibility and robustness is scale factor which is defined by automatic scale, maximum value of absolut middle frequency substracted by JND. Embedding watermark image in middle frequency robusts to sharpening JPEG compression noise with best compression ratio >70%, but susceptible to Gaussian noise.

Keywords: *Watermarking, DCT, JND, Sharpening, JPEG compression, Gaussian noise*