ABSTRACT

The development of technology and information very fast causing the dissemination of information from all scopes in various forms of data can be spread quickly. Telemedicine is a health service technology with the electronic exchange of medical data information that is carried out between patients and doctors remotely. The existence of this convenience will increase security threats, and authentication of the information sent. Medical image is an image that is privacy and sensitive, so watermarking is needed to overcome this problem. Watermarking is a way of embedding digital data into other digital data. One of the schemes that can be used as a solution is the reversible watermarking scheme.

This final assignment aims to design a reversible watermarking scheme on medical images. In the embedding process, the first step is to enlarge the host image using Pixel to Block (PTB). Then determine the level of decomposition that will be used in the Integer Wavelet Transform (IWT). Looking for estimates using the host image to find out the number of watermark pixels that can be embedded. The watermark image in binary form will be given the addition of zero padding. The estimation results and the watermark image enter the Histogram Shifting (HS) process, then the IWT inverse process. In the extraction process, the watermarked image enter the IWT process, followed by the HS process to extract the watermark. The last step is doing the IWT inverse process to get the reconstructed host image.

Experiments and data retrieval on proposed scheme resulted in PSNR 1, PSNR 2, SSIM 1, SSIM 2, and C from the host image each reach 59.8 dB; 108.34 dB; 0.99; 1; and 0.22 bpp. BER and NC value of the resulting extraction watermark are 0 and 1. This scheme is a fragile watermarking, so it is only quite resistant to several attacks, namely the addition of noise when the variance is small, filtering (median, and mean), and geometry attacks (cropping, and translation).

Keywords : *watermarking, reversible watermarking, medical image, Pixel To Block (PTB), Histogram Shifting (HS), Integer Wavelet Transform (IWT).*