ABSTRACT

The next development of information technology, to make the Internet as a media in the exchange of digital information. One of them in the area of Telemedicine. Telemedicine utilizing advances in telecommunications technology to exchange health information and provide health care without limit of geographical boundaries and time. On the concept of Telemedicine in medical image data to diagnosis and patient data fully using the Internet for the transmission of health information.

Behind sophisticated data exchange on Telemedicine there is information that should be protected patient data privacy. Data from diagnosis and patient data transmitted over the Internet, where there are a bug that can be exploited by irresponsible people that like duplicating medical image data, patient data theft and other things that can harm patients' privacy rights. Therefore we need a watermarking in medical images so that patient data can be embedded into a single unit with the medical images. With watermarking process medical images and patient data can meet patient privacy and may be safer than an attempt to duplicating the image data and patient data theft by irresponsible parties.

This thesis will conduct medical image watermarking inserted data in the form of patient data such as images and text using the Discrete Wavelet Transform (DWT) and Single Value Decomposition (SVD) in the medical image watermarking process. Watermarking in this thesis using the non-blind watermarking. Which is extraction process requires a host image and watermark image. Watermark data inserted into the image of the host in the form of images containing patient data and there is also a test scenario if the patient data such as text, so that the output of watermarked image that already contains patient data. This thesis is implemented using software Matlab 2015b.

In this thesis will be to analyze the influence of sub-band DWT, DWT level, the value of the performance scale factor SVD watermarking. The parameters used are the Peak Signal to Noise Ratio (PSNR), the correlation coefficient and computing time. Test scenarios included attack scheme be a form rotate, scaling, cropping. Based on the IEEE paper with title A Study of DWT and SVD-based Watermarking Algorithms for Patient Privacy in Medical Images (2013), DWT method has advantages in computing time and imperceptibility while SVD has advantages in robustness and capacity data inserted.

Conclusions in this thesis that in order to produce the best watermarked image using a sub band HH with a scaling factor of 0.1 SVD is to achieve 44 dB PSNR. Level one and level two DWT has an equivalent result watermarked image. Attacks rotation LL sub band robust large corner (special) and the sub-band HH can robust in small corners. On the cropping attack sub band LL robust well. While the scaling attack sub band HH robust well. For the text as watermark, on each sub-band insertion produce watermarked image quality that is equivalent to 43 dB PSNR. For text extraction, that can be extracted with the perfect amount of characters is less than 32 characters and is done at the sub bands other than HH. Sub-band LL, LH and HL can survive against rotation and scaling. While the sub-band LH can be resistant to cropping.

Keywords: non-blind watermarking, discrete wavelet transform, singular value decomposition