ABSTRACT

Transmission of medical image nowadays is often done using computer networks to transmit examination data. The information sent includes rotgen image, where data is easily duplicated or spread to other parties. So, we need a way for the ownership identity can be inserted into rontgen image. One of the methods for inserting identity in rontgen image is image watermarking method where on this research will be done with Discrete Wavelet Transform method for watermarking, Compressive Sensing method for compression, and Orthogonal Matching Pursuit Method for reconstruction.

The purpose of this research is designing and simulating image watermarking to rontgen images with Discrete Wavelet Transform method juxtaposed with image compression with Compressive Sensing Method. The Process of designing image watermarking through a few step. First, the host image is decomposed with Discrete Wavelet Transform to give watermark image a room for embedding process. Before the watermark image can be embedded, watermark image was compressed by Compressive Sensing methods. After compression, the watermark image is embed to host image and given an attack to test the robustness. Furthermore, the extraction process is carried out to separate the watermark image and host image. The watermark image that has been extracted will be reconstructed into the original image using Orthogonal Matching Pursuit Method.

The best results obtained by the watermarking simulation system before being attacked get PSNR of watermarked image of 46,4105 dB, PSNR of extraction of 28,2362 dB, NC of 0,9842, SSIM of 0,9942, and the persentage of BER of 0,5648%. While the best results after optimization get the value of the test parameter with an average PSNR of extraction of 17.5342 dB, the percentage of BER of 14.1610%, NC of 0.8210. The results of optimization are obtained based on changes in size of rontgen image, size of watermark image, embedding coefficient, and compression ratio.

Keywords: ***Watermarking, Rontgen, Compressive Sensing, Orthogonal Matching Pursuit, Discrete Wavelet Transform***