

ABSTRACT

Protection of patient data is one of the important issues in the field of health care. The Electronic Patient Record (EPR) is an electronic-based collection of patient health information. The EPR must be protected from unauthorized parties, errors in diagnosing patients, and verifying the authenticity of the data. This can be achieved using watermarking techniques. Watermarking is the process of permanently embed an information into a digital image. The watermarking technique will insert information called a watermark, which can be in the form of patient data, hospital logo or other informations without being noticed by an unauthorized party, and only indicates ownership of the host. Host can be in the form of images, audio or video.

In this final project designs a watermarking scheme on medical images using Fast Discrete Curvelet Transform (FDCuT), Discrete Cosine Transform (DCT), Singular Value Decomposition (SVD) and Compressive Sensing (CS) methods which can have a good level of robustness. The system to be designed consists of two processes, the first process is watermark embedding and the second process is watermark extraction.

This final project research is in the form of a watermarking system using MATLAB with the best alpha value parameter of 25, 60% CS compression, and a watermark image in the form of patient identity. This research produces a PSNR value of 57.3295 dB, SSIM 0.9998, NC 1.0000, BER 0.00000, and Capacity 0.0005. This scheme system has a good robustness level. Watermarking scheme system is resistant to JPEG compression attacks with quality values of 40, 50, 60, 70, 80, and 90, speckle noise, salt&pepper noise, gaussian noise, flipping, blurring, sharpening, histogram equalization and rotation 90°.

Keywords : *Electronic Patients Record, Watermarking, Fast Discrete Curvelet Transforms, Discrete Cosine Transform, Singular Value Decomposition, Compressive Sensing.*