

ABSTRACT

At this time the rapid development of computer technology digital products such as images, audio, video and other database files are widespread on the internet and can be accessed freely. Copyright, interpolation or falsification of digital works and illegal duplication have an impact on current technological developments. Medical image security is very necessary to prevent the actions of someone who wants to damage a medical image or modify a medical image when transferring medical information through transmission media. Transferring medical information through a transmission medium is known as Telemedicine. One way to overcome the illegal duplication is to use watermarking techniques. Watermarking is the process of embedding a watermark in the form of information into a digital image.

In this final project, a watermarking scheme for medical images is designed using the Fast Discrete Curvelet Transform (FDCuT), All Phase Discrete Cosine Biorthogonal Transform (APDCBT), and Singular Value Decomposition (SVD) methods. With this scheme, the wrapping-based FDCuT can have a shorter time for system processing. The medical image watermarking process is divided into two stages, namely embedding and extraction. The embedding stage produces an output in the form of a watermarked medical image and the extraction stage produces a watermarked image without damaging the host image. Watermark in the form of binary images and medical images in the form of grayscale images. The watermark is inserted into the medical image by means of image decomposition.

The purpose of the watermarking scheme based on the FDCuT, APDCBT, and SVD methods is to be able to secure and protect medical images from several attacks. The results of this study, the system can produce PSNR values of 43.977 dB and SSIM 0.97, while BER 0 and NC 1. This shows that the proposed watermarking scheme has good quality and is exactly the same as the original watermark image.

Keywords: Watermarking, Medical Image, Fast Discrete Curvelet Transform, All Phase Discrete Cosine Biorthogonal Transform, Singular Value Decomposition.