

## ABSTRACT

In the era of increasingly advanced technological development, there are many advantages and disadvantages that can be obtained. Easy downloading and dissemination of information also supports daily activities. However, on the other hand, various problems arise as many technology users do not consider the consequences that can arise from actions such as plagiarizing or even falsifying data or documents. For that, a problem solving is required. A data or document needs to be given a special mark that can indicate its originality. Digital watermarking is one of the appropriate solutions that can be done to prevent unwanted things from happening. Through digital watermarking, data or document owners can embed a special message as a sign of the authenticity of their data or documents.

In this Final Project, the digital watermarking process is implemented. Watermark insertion is done on a medical image. The watermarking system is designed using the Multibit Spread Spectrum technique in which the watermark bits are inserted and spread into a medical image. This can be done by using the distribution. In this Final Project, the Uniform distribution, Gaussian distribution, and Hadamard matrix are compared to find out which distribution is capable of producing watermarked medical images that are more resistant to attack.

Research in this Final Project shows that a watermarking system that uses a Uniform distribution and a Gaussian distribution tends to be able to produce a watermarked image that is resistant to attack and has its quality tested through the parameter Peak Signal to Noise Ratio (PSNR)  $\geq 30$  dB, Structural Similarity Index Measure (SSIM)  $\approx 1$ , Bit Error Rate (BER) = 0, and Mean Opinion Square (MOS) = 5.

**Keywords:** *Digital Watermarking, Image Watermarking, Multibit Spread Spectrum.*