

ABSTRACT

The ease of accessing digital images is one of the positive impacts of technological advancement. However, the negative impact of this ease is that images are vulnerable to misuse by unauthorized parties. To avoid such unwanted events, an image must be protected by a security system. Watermarking is a technique that can be used to protect an image by hiding information within the image.

The watermarking method used in this final project is Skewed Histogram Shifting and prediction error. The watermark will be embedded if the prediction error generated is 0, and will be embedded in Positive Histogram Skewed (PHS) or Negative Histogram Skewed (NHS). Embedding in PHS pixels will shift to the right, while embedding in NHS pixels will shift to the left.

The reversible technique in this research was successfully on images without underflow and overflow conditions. The recovered images have a reconstruction PSNR of infinity and a BER of 0. The images that were not successfully recovered have a high reconstruction PSNR, greater than 90 dB, and a BER of 0. The test data used consisted of 10 images with a size of 512x512. This reversible watermarking system is robust against speckle noise attacks when the host image is compressed with a variance of 1×10^{-3} and 1×10^{-4} , resulting in average BERs of 0.1404 and 0, respectively. Additionally, when the host image is compressed with a density of 1×10^{-4} , the system is also robust against salt and pepper noise attacks, with an average BER of 0.1159.

Keyword: *Watermarking, Data Hiding, Reversible Watermarking, Watermarking Image, Histogram Shifting.*