

ABSTRACT

The rapid development of technology is making the exchange of digital data more easily and quickly, such as through the internet media. But the other side, the impact of the ease of getting digital data, someone can do interrupt, interception, and modification to the digital data. To ensure the security and confidentiality of data required a technique to secure the data, one of this is steganography.

In this final project, color image steganography scheme based on Discrete Wavelet Transform (DWT) and QR decomposition is proposed to embed secret message into color host image in certain color space and layer. Firstly, the host RGB image is converted to certain color space. The layer in which the secret message is embedded also can be selected. After the selected layer of image in certain color space is transformed by DWT, further divided to 8×8 non-overlapping pixel blocks. Then, each selected pixel block is decomposed by QR decomposition and the elements in the matrix R is quantified for embedding secret message information. The secret message is embedded into the R matrix of QR decomposition of color host image using LSB method, where the selected position is determined according to the Fibonacci number are used for estimating the embedding strength and location.

In this final project, the resulting stego image has the value of $BER = 0$, $CER = 0$, $SSIM = 1$ and $PSNR > 50$ dB, when the stego image is not given any attack. In certain types of attacks such as Gaussian, salt and pepper, resize, and cropping, the resulting of secret messages can still be read even if there is little damage with $BER = 0.01$. However, for some other types of attacks such as JPG compression, LPF, median filter, histogram, rotate, the resulting of secret messages has $BER = 0.2$, so messages cannot be recognized and interpreted.

Keywords: Image Steganography, Discrete Wavelet Transform (DWT), QR decomposition, Least Significant Bit (LSB), Fibonacci Sequence.