ABSTRACT

As a common communications media, the Internet is vulnerable to eavesdropping, theft, and falsification of information. Therefore, exploitation of the Internet by strategic sectors such as business, banking, or government is in need of a secure system that can be realized by applying the methodology of hiding information (information-hiding methodology) that is steganography.

This thesis has the objective to establish a steganographic system using Invisible Ink-Quantization Index Watermarking. This method was chosen because it has a value of a great imperceptibility and fidelity. The system has built in the frequency domain where the Discrete Wavelet Transform (DWT) is used as a two-dimensional transformation technique. Image medium / carrier used in the form of RGB images with a resolution of 512x512 and a message that will be embedded in the form of text files and grayscale images. In addition, this final project aims to measure the performance of the system in the process of embedding and extracting of the message by using a parameter value of PSNR, MSE and BER. Additionally this system will be tested resistance to attack in the form of signal processing such as AWGN and Salt Pepper noising, cropping, scaling, rotate, and JPEG compression.

Objective test results showed that the best stego image quality, characterized by the highest PSNR value of 68.0413 dB and 61.3778 dB, obtained by selecting the image that baboon.bmp as stego medium embedded by text message of 500 characters or picture with a resolution of 32x32 using the stepsize of 4.5. Testing result of stego image robustness against attack shows that the stego-image is not robust against noising AWGN with 30 dB SNR, scaling, rotate, cropping, and JPEG compression with QF> 100. While the results of subjective tests showed that the image quality of stego get excellent category with a value of 4.92 for the embedded text and 4.63 for embedded image. MOS results of stego-image robustness against attacks showed that the stego image has poor quality with an average value of 2.23.

From the analysis and testing can be concluded that the steganographic system is built to generate stego image with good quality with an average MOS value of 4.67, and the average PSNR of 53.7 dB and has a maximum payload of half of the sample image of the medium. However, the stego-image is still susceptible to signal processing in the form of cropping, rotate and scaling. Key words: data hiding, steganography, digital invisible ink, quantization index watermarking, stego image.

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