Universiti Teknologi MARA

Steganography: Concealing Texts Within an Image Using Least Significant Bit Technique on BMP Image Format

Farabi Aizat Bin Mohd Aminnuddin

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Faculty of Computer and Mathematical Sciences

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STUDENT DECLARATION

I certify that this report and the research to which it refers are the product of my own work and that any ideas or quotation from the work of other people, published or otherwise are fully acknowledged in accordance with the standard referring practices of the discipline.

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FARABI AIZAT BIN MOHD AMINNUDDIN

2016584237

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ABSTRACT

In security system, there is an information hiding technique used to conceal the information which is called steganography. Steganography is a technique used to hide covert messages without raising suspicion from the other recipients on the communication. Some of the steganography tools nowadays were using one color channel only to embed the secret messages in image. However, hiding secret messages into only one color channel can degrade the image quality which might be a reason for secret messages to be detected easily. In this research, secret messages were embedded into different color channels of the image. The objective of this research is to investigate the effects of various channel combinations and text file sizes on the quality of BMP image. Furthermore, this research also aims to evaluate the optimal picture quality of BMP image based on color channels and size of texts using the Peak Signal-to-Noise Ratio (PSNR) and Mean Squared Error (MSE) value. This research used Least Significant Bits (LSB) as the algorithm to embed the messages. The messages were in text file format (txt) and the image format used was in bitmap (BMP). There were seven scenarios tested regarding the color channel combination and size of text files. From the experimental results, it was found that the optimal channel and optimal size of text file that gave the highest (PSNR) value of the image is the Blue channel with 10KB size of text file. This research provides an insight to future researchers in understanding how the different size of text files hidden into variety of color channel combinations could result in the differences of image quality.

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