UNIVERSITI TEKNOLOGI MARA

PERFORMANCE ANALYSIS OF DIGITAL WATERMARKING ON MEDICAL IMAGES

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ABSTRACT

Digital watermarking technique is a method used to embed messages into digital multimedia contents with the purpose of concealing the presence messages from naked eyes. This research project implements digital watermarking technique on grey scale medical images using Least Significant Bit (LSB) algorithm. The patient information such as patient personal data and diagnostic result are embedded into the medical images before transmitting to receivers as part of telemedicine process. The purposed project is tested in term of image quality using PSNR and MSE for watermarked medical images after the transmission. The transmission consists of three different mediums- WhatsApp, Gmail and Dropbox, all watermarked medical images are sent and evaluated. The entire processes are run in MATLAB R2019b. The results analysis obtained shows that medical images sent thru Dropbox is better compared to the other two mediums because it has the highest PSNR and lowest MSE values that indicated the medical images are in a good condition.

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INTRODUCTION

1.1   Research Background

Steganography is the act of embedding data into other to transfer it securely over the communication network. The intention of steganography is to prevent the detection of presence message and create a covert channel. Steganography often used in media such as image, video, audio and text. Image is the most favoured hiding objects for steganography technique which is where the message will be embedded in a digital image known as cover image through an embedding algorithm by using secret key. The outcome of stego image is transmitted to the receiver. Furthermore, the processed can be extract using algorithm with the same key. JPEG, BMP and PNG are suitable formats to hide secret messages for image steganography.

Video steganography is the technique of combining audio and image to hide various type of files or data into digital video format. In audio steganography, the information is embedded into digital audio signal which resulted in small changes of binary sequence of the audio file. Audio steganography is less popular due to their larger size compared to image steganography. It is often use in MP3, MIDI and etc.

Hiding information in a text can be considered as one of the simplest methods of steganography but it can be very important. The information is hide in every letter of every word of a text message. Text steganography can be divided into three categories namely random and statistical generation, linguistic method, and format-based method.