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An improved hiding information by modifying selected DWT coefficients in video steganography

Ferda Ernawan[1,2]

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Abstract
The rapid expansion of information technology enables users to transfer data or files via the internet in a short time. Steganography is the art of embedding secret information or messages in multimedia data. Video is the most popular medium in steganography to transmit data from sender to receiver. Video has a larger hiding capacity and it provides large redundancy space in video frame sequences. The objective of this research is to embed into the selected video frames based on a new hiding technique with the discrete wavelet transform (DWT). The selected video frames based on scene change detection were chosen for hiding data to minimise the visibility effect on the stego-video. DWT was computed to decompose the selected video frame into sub-bands, the approximation coefficient matrix of two-level DWT was selected to embed the data. The proposed scheme was compared to the existing schemes in terms of imperceptibility. The experimental results showed that the proposed technique achieved high SSIM and PSNR values. The proposed scheme achieved an SSIM value of 0.990 and a PSNR value of 46.09 dB. In addition, the proposed steganography scheme produced good robustness against MPEG-4 compression whereby the message can be fully recognized.

Keywords Hiding information · Video steganography · Discrete wavelet transform · Extracting data · Steganography

1 Introduction

Steganography is a concealing technique to convey secret messages through digital multimedia. It is used to transmit confidential data for communication [1, 2]. Steganography technique can be applied to multimedia data such as text file, image, audio, or video data [3, 4]. Video is the best medium to hide messages and it is difficult to be noticed by human visual systems due to the sequence of image frames. Video becomes the best medium

✉ Ferda Ernawan
ferda1902@gmail.com

[1] Faculty of Computing, Universiti Malaysia Pahang Al-Sultan Abdullah, 26600 Pekan, Pahang, Malaysia

[2] Faculty of Information Technology, Universitas Nusa Mandiri, Jakarta, Indonesia