A Novel Information Security System based on Steganography and Compression Techniques for Higher Education Institutions

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Abstract

With the advancement of technology and the methods of information storage and exchange, the security of information and data became a vital issue for many institutions, especially higher education institutions. This paper introduces a novel and efficient information security system based on steganography and compression techniques to address the issues related to the security and efficient transmission of secret data in higher education institutions. In this system, the Lempel Ziv Welch (LZW) compression technique is used to compress the data to be hidden, to reduce their size and thereby reduce the percentage of distortion that may occur to the cover image. In addition, a new data hiding algorithm has been developed depending on the second bit, where data are hidden based on LSB without making any changes to the values of the second bit. If any changes are made, these will be only within LSB, which reduces the distortion in the cover image and increases the similarity between the cover image before and after hiding. In the retrieval stage, hidden data are retrieved from the second bit only. The proposed system performance was evaluated in terms of MSE (mean square of error), PSNR (peak signal-to-noise ratio), PD (pixel distortion) and BER (bit error rate). The experimental results
confirm the efficiency of the proposed system that achieves good results with higher PSNR and lower MSE.

References


Index Terms

Computer Science Security
Keywords

Steganography, Data Compression, LZW Algorithm