Securing audio transmission based on encoding and steganography

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Article Info

ABSTRACT

One of the things that must be considered when establishing a data exchange connection is to make that communication confidential and hide the file's features when the snoopers intercept it. In this work, transformation (encoding) and steganography techniques are invested to produce an efficient system to secure communication for an audio signal by producing an efficient method to transform the signal into a red–green–blue (RGB) image. Subsequently, this image is hidden in a cover audio file by using the least significant bit (LSB) method in the spatial and transform domains using discrete wavelet transform. The audio files of the message and the cover are in *.wav format. The experimental results showed the success of the transformation in concealing audio secret messages, as well the remarkability of the stego signal quality in both techniques. A peak signal-to-noise ratio peak signal-to-noise ratio (PSNR) scored (20-26) dB with wavelet and (81-112) dB with LSB for cover file size 4.96 MB and structural similarity index metric structural similarity index metric (SSIM) has been used to measure the signal quality which gave 1 with LSB while wavelet was (0.9-1), which is satisfactory in all experimented signals with low time consumption. This work also used these metrics to compare the implementation of LSB and WAV.

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1. INTRODUCTION

Information security is a science specialized in securing information that circulates over the Internet from the risks that threaten it. The security of these data and information has become an obsession and a vital topic along with the development of technology and the means of storing and exchanging information in different ways from one site to another across the network [1]. Information security is defined as the science that works to provide information protection from the risks that threaten it. It could be also defined as the barrier that prevents attacks on information by providing the tools and means necessary to protect the information from internal or external risks [2]. Standards and measures are taken to prevent information from reaching the hands of unauthorized persons through communications and to ensure the authenticity and