Abstract

This paper introduced a combined cryptography and steganography model to increase the security and the embedding capability of the standard colored images. Cryptography is used in this technique to provide more security. For this purpose we used a secret key (same for sender and receiver) for encryption and decryption process. Only sender and receiver can encrypt and decrypt the whole message by this secret key. For steganography we use genetic algorithm, optimal pixel adjustment process, integer to integer wavelet transform in frequency domain, inverse integer to integer wavelet transform. Genetic algorithm is applied here to achieve a mapping function of 8*8 matrix with minimum error difference between the input and the final image. In GA we use the block based mapping method because by using it we can preserve the input image properties. After it we employed the optimal pixel adjustment process for increasing the hiding capacity of the proposed algorithm in comparison to other existing algorithms. OPA process adjusts all the pixels of image optimally. MATLAB simulation results present that the hiding capacity and imperceptibility of image increase simultaneously. By using the optimization technique such as GA we can choose the best block size to reduce the computation cost and also increase the peak signal to noise ratio.

Index Terms

Computer Science Security

Keywords

Cryptography Steganography Genetic algorithm Mapping function Optimal Pixel Adjustment process
Peak signal to noise ratio

MATLAB