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## Abstract

A reversible data hiding method using integer wavelet transform with embedded zero-tree wavelet for gray scale images is proposed. The proposed method merges traditional data hiding technique that depends on integer wavelet transform into the EZW image compression algorithm. It can recover the secret message again from the last pass of bit-stream of EZW robustly. This is due to shifting parts of histogram of high frequency subbands in the invertible integer-to-integer wavelet domain of EZW to make space for data hiding. The effect of embedded secret message into EZW coefficients on both of the compression ratio of coding algorithm and stego-image quality is discussed. Experimental results give high visual quality of stego-images at high payloads. The compression ratio of coding algorithm is affected by about 2% on average because of hiding process. Both of secret message and the original cover

image are reconstructed without any loss.

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## Index Terms

Computer Science

Signal Processing

**Keywords**

Integer Wavelet Transform (IWT); Embedded Zero-Tree Wavelet (EZW); Data Hiding; Histogram Shifting; Stego-Image