Abstract

In this paper, we present a new method of digital image watermarking in wavelet domain using Discrete Wavelet Packet Transform (DWPT) analysis of the host image. The discrete wavelet
packet decomposition is chosen to utilize all high frequency components in order to make the
watermarking more imperceptible using Coif5 as wavelet basis. According to the characteristics
of Human Visual System (HVS), human eyes are less sensitive in high frequency bands having
orientation of $45^\circ$, Therefore; the binary watermark is embedded in the high frequency
diagonal components of wavelet packet decomposition tree which have maximum entropy.
Watermarking is achieved by generating a pseudo-random sequence and then embedding it
into wavelet coefficients according to the watermark bit pattern. Performance of the proposed
scheme is evaluated on a variety of images including Lena, Boat, Cameraman and a textured
image of Brodatz database. The results show that, the proposed scheme provides good level of
imperceptibility as well as robustness against various attacks such as JPEG compression,
Filtering, Noise addition, Cropping etc. and competes well with existing methods.

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A Robust Wavelet Packet Based Blind Digital Image Watermarking using HVS characteristics


Index Terms

Computer Science Security

Keywords

Discrete Wavelet Packets Transform Coif5
Pseudo Random Sequence

Robustness

Correlation

Entropy