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 $\frac{45^\circ}{0}$. 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.

References


Index Terms

Computer Science Security

Keywords

Discrete Wavelet Packets Transform Coif5
Pseudo Random Sequence

Robustness

Correlation

Entropy