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Abstract

ROBUST AND HIGH CAPACITY DIGITAL IMAGE WATERMARKING WITH DISCRETE WAVELET PACKET AND COSINE TRANSFORM

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In this thesis, we proposed two digital image watermarking schemes which are based on quantization method with blind detection for copyright verification. In order to balance robustness of extracted watermark and high capacity of digital image watermarking, we tried to combine quantization method with different transforms.

First at all, we use quantization method and discrete wavelet packet transform (DWPT) as our algorithm. The binary watermarks are embedded in the wavelet domain of an image using the DWPT and quantization of the selected dominant coefficients. The blind watermarking detection is employed for copyright verification. Experimental results indicate that the proposed method is robust to various attacks such as JPEG compression and Gaussian noise.

Second, a robust and high capacity digital image watermarking scheme with blind detection for copyright verification is proposed. Discrete cosine transform (DCT) and quantization of the selected dominant coefficients is developed in this case. This system is capable of embedding 4096 bits of information in images with dimensions 512 x 512 pixels. The image is first converted into the m x m block-DCT domain. Then, the watermark which is a logo image is embedded in this entire m x m block-DCT domain of an image. The blind watermarking detection is also employed for copyright verification. Experimental results show that the proposed method is robust to various attacks such as JPEG compression, Gaussian lowpass filter and zooming.