



Thesis Title	Image Watermarking Using DWT-DCT
Research Field	
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Abstract

The rapid growth of digital networks and multimedia systems caused an increase and proliferation of digital data which is created an urgent need for techniques to protect the rights of copyright and ownership of multimedia objects. One of these techniques is a digital watermarking that have been developed for the protection of digital images from illegal manipulation. So far, there are two leading techniques of digital watermarking : spatial domain and transform domain which mainly includes Discrete Wavelet Transform (DWT), Discrete cosine Transform (DCT). Most of watermarking algorithms employ wavelet due to its advantage such as : excellent time – frequency feature, wavelet transform understands Human Visual System (HVS) model more closely than the DCT and wavelet high robustness to common signal processing.

Watermarking using DCT technique is preferred due to its advantages such as : good robustness against various non-malicious attacks like compression, cropping, rotating and its good variance compaction property. This thesis introduce a combination of DWT scheme and DCT-based watermark recovering without the need of original image for retrieving the watermark.

Any watermark system must meet three requirements, imperceptibility, robustness and security. The DWT-DCT technique meet these requirements. When the watermark is embedded in the original image, the watermarked image is not different from the original image (i.e the watermark is imperceptible). When the watermarked image is subjected to attacks such as : JPEG compression, additive noise, median filtering, resizing and wiener filtering the watermark image is successfully retrieved. The security is achieved by encrypting the watermark with advanced encryption standard (AES), so if the attacker obtain the watermark, he will find it encrypted and he dose not own the secret key to know the copyright information inside watermark.

Fifteen different images are used with two size (256x256) and (512x512) which are used to embed the watermark (size : 200x200). In the case of (256x256) image the extracted watermark is distorted, while in the case of (512x512) image the extracted watermark is successfully retrieved and its robust against attacks.

Peak Signal To Noise Ratio (PSNR)and bit Correct Ratio (BCR)measurements are used to evaluates and these measurements are affected by the gain factor, threshold, subband and image size.

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