

Multimedia Encryption, Transmission and Authentication

Edited by

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Chapter 19

An Improved Wavelet Digital Watermarking Software Implementation

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19.1 Introduction

There are quite a number of researches in proposing digital image watermarking using Discrete Wavelet Transform (DWT). However, it is clearly observed that each of them is individually distinctive in terms of its scopes and applications [1][2][3]. The proposed system was thoroughly explained in this chapter. This includes general work flow, proposed algorithms for both original method and improved method, which were named as subband matching and selective subband matching, respectively and various attacks performed for evaluation. Modification was made to the algorithms where only selected matching subbands were used in embedding and extracting the watermark in this improved method. These methods were compared and tested against attacks in MATLAB and by using standard benchmark, Stirmark. Experimental results of the proposed methods' performance were analyzed using Peak Signal to Noise Ratio (PSNR) calculations and Structural SIMilarity (SSIM) index for watermark imperceptibility and robustness, respectively. The improvement could be seen in quality of the watermarked image (imperceptibility) and of extracted watermark (robustness).

19.2 GENERAL WORK FLOW

The general work flow of the watermarking system for both methods is depicted in Figure.19.1. A cover image is embedded with a watermark to produce a watermarked image. Imperceptibility is determined through visual inspection and PSNR between watermarked image and original cover image. Attacks are performed separately on the watermarked image using Stirmark, thus resulting as attacked-watermarked images accordingly. The attacked-watermarked image is then used to extract the watermark. The extracted watermark is