Multimedia Encryption, Transmission and Authentication

Edited by

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Contents

Chapter 21

An Evaluation of Transform Domain Watermarking and its application to Intellectual Properties of images

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21.1. INTRODUCTION

Transform domain as emerged as a powerful tool for transforming digital signals from one domain to another. Over 80% of all Digital Signal Processing (DSP) applications require some form of domain transformation representation or processing (Edwards, 2006,; Proakis & Manolakis, 2004). Transform is simply mapping from one set of coordinates to another (Parker, 2006)

For example, a rotation is a transform; the rotated coordinate system is different from the original, but each coordinate in original signal has a corresponding coordinate in the rotated signal. For audio, image, and video compression algorithm, transform coding is the one of the most building blocks for processing with the input media (Goyal, 2001), that is why transform domain watermarking is frequently encounter the literature. In the early schemes of watermarking, spatial domain is the commonly used. Watermarking in the spatial domain means that the watermark is embedded directly into the image, by modifying the arrays or add a pseudorandom noise pattern to the luminance values of it pixels. Some of the techniques use in spatial domain watermarking are LSB, Patchwork, Chaotic map, feature points etc. However this approaches are vulnerable to attacks like compression, geometric distortion, image degradation and are computational inefficient.

To obtain better imperceptibility as well as robustness, the addition of the watermark is done intransformed domain. Scientists exploited the benefits of transform domain transformation like Discrete Cosine Transform (DCT) (Chu, 2003 & Al-Gindy *et al.* 2008). Discrete Fourier Transform (DFT), Sang & Alam (2008). Discrete Hartley transform Hadamard Transform, and Discrete Wavelet Transform (Chun-Hsien & Kuo-Cheng, 2010; Agarwal & Goyal,