Multimedia Encryption, Transmission and Authentication

Edited by

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Chapter 18

Wavelet Digital Watermarking System Design and Performance Evaluation

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18.1 Introduction

Nowadays, it is easy to obtain, manipulate, distribute and store multimedia contents due to evolution of Internet, excellent multimedia tools and low-cost storage devices. Research community and industry has shown extensive interests in developing and implementing possible solutions via digital watermarking. Digital watermarking is distinctive depending on its techniques and applications. In general, digital watermarking is distinguished according to media type (image, audio, video and etc.), visibility (visible and invisible), robustness level (fragile, semi-fragile and robust) and the need for original data (blind, semi-blind and non-blind). The scope of this research is invisible digital image watermarking for gray-scale images using Discrete Wavelet Transform (DWT). The system consists of watermark embedding, attacks and watermark extraction. A new method called subband matching was proposed and implemented. For this method, the 1-level DWT coefficients of the watermark image were embedded in 2-level DWT coefficients of the cover image for the same matching subbands. System design consists of introductory details of system input, embedding and extraction processes and system output for the proposed methods. Second section is dedicated to describe evaluations of digital watermarking system.

18.2 SYSTEM DESIGN

As far as the scope of this chapter is concerned, the system design considerations were categorized into the following:

18.2.1 System Input

The system requires two inputs, an image to host the watermark or simply referred as a cover image while an image as the watermark to be embedded in the cover image. In this chapter,