

A BLIND WATERMARKING ALGORITHM BASED ON HYPERCHAOS AND COSET BY QUANTIZING WAVELET TRANSFORM COEFFICIENTS

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ABSTRACT. *In this paper, a blind digital watermarking algorithm based on two dimensional hyperchaotic sequences and coset by quantizing wavelet transform coefficients is proposed. The algorithm is based on discrete wavelet transform and communication model with side information. The algorithm uses a suitable scale factor to scale a host image, constructs cosets for embedding a watermark according to the scale version of the host image. Our scheme makes a tradeoff between imperceptibility and robustness while achieving large watermark capacity. The extraction algorithm is a blind detection algorithm which retrieves the watermark without the host image. In this paper, we also propose a new method that encrypts a watermark by hyperchaotic sequences to overcome the drawback of chaotic sequences which key space is smaller than that of hyperchaotic sequences and improve the algorithm security. Experimental results indicate that the proposed algorithm possesses good imperceptibility, large capacity, and robustness against general signal processing attacks.*

Keywords: Hyperchaos, Discrete wavelet transform, Digital watermarking, Blind watermarking algorithm, Image encryption

1. Introduction. Robust digital watermarking is an emerging research area that has received a considerable amount of attention and became a feasible solution to copyright protection in recent years [1]. Most digital watermarking methods have been proposed in the last few years [2-7]. Generally speaking, robustness and imperceptibility that are in conflict with each other are two basic requirements of the effective digital watermarking system. It is a tradeoff problem that robustness of a watermarking method is improved and perceptual quality of the contents is degraded. Hence, the main goal of a watermarking method is to improve robustness and watermark capacity while keeping watermark imperceptible. This presents a great challenge. Recent research has focused on achievable robustness and imperceptibility of various watermarking methods based on discrete wavelet transform (DWT). However, there at least exist three problems in many watermarking methods based on DWT. The first problem is that when embedded watermark