Accepted Manuscript

Review

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PII: S1434-8411(17)31213-X
DOI: http://dx.doi.org/10.1016/j.aeue.2017.05.025
Reference: AEUE 51896

To appear in: *International Journal of Electronics and Communications*

Received Date: 27 August 2015
Revised Date: 8 December 2016
Accepted Date: 16 May 2017

Please cite this article as: Q. Su, B. Chen, A novel blind color image watermarking using upper Hessenberg matrix, *International Journal of Electronics and Communications* (2017), doi: http://dx.doi.org/10.1016/j.aeue.2017.05.025

A novel blind color image watermarking using upper Hessenberg matrix

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Abstract: It is a challenging work to design a blind color image watermarking scheme for protecting copyright, which is different from the existing schemes used binary image or grayscale image as watermark and is also different from other non-blind watermarking schemes. In this paper, we analyze the feature of the upper Hessenberg matrix, and propose a blind color image watermarking scheme using upper Hessenberg matrix of Hessenberg transform. Arnold transform is used to improve the security, and the MD5-based Hash pseudo-random algorithm is also used to improve the robustness. In the process of watermark embedding, the encrypted watermark information is embedded into the biggest energy element of the Hessenberg matrix by quantization technique. In the process of watermark extraction, the watermark is extracted from the attacked host image with blind manner. Simulation results show that the proposed scheme outperforms other related methods in the aspects of the invisibility, robustness, capacity and computational complexity.

Keywords : Hessenberg transform; Hessenberg matrix; Color image watermark; Blind watermarking

1. Introduction

With the widespread popularity of Internet and the rapid development of multimedia technology, illegal copying, tampering, modifying digital copyright have become more and more

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