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Wei-Liang Tai, Zi-Jun Liao

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Image Self-Recovery With Watermark Self-Embedding

Wei-Liang Tai[1, *] and Zi-Jun Liao[2]

[1, 2] Department of Information Communications,

Chinese Culture University, Taipei, Taiwan

[1, *] dwl@ulive.pccu.edu.tw, [2]A5102921@ulive.pccu.edu.tw

Abstract

In this paper, an effective image authentication method for image tamper detection and self-recovery is proposed. We embed the fragile watermark of one block which consists of authentication data and recovery data into the other block according to the embedding sequence generated by chaotic map. To reduce the smoothing blocking effect of recovered images, we use the wavelet transform rather than the average as recovery data to enhance the image contrast. In the tamper detection process, a hierarchical tamper detection strategy is adopted to achieve high tamper detection accuracy. To solve tampering coincidence problem, a two-level self-recovery scheme is proposed by considering the 3×3 block-neighborhood. Simulation results demonstrate that the proposed scheme can effectively resist collage attack and constant-average attack, while sustaining superior accuracy of tamper localization. Furthermore, the results show that the tampered images can be effectively self-recovered with a high visual contrast.

Keywords: Fragile watermarking, wavelet, image authentication, self-recovery.

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