Abstract: A Study on Color-Texture Image Watermarking Based on Texture Analysis

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Abstract

Nowadays, texture images have been presented and used in a great deal of industry and life application and copyright protection of texture images has become urgent problem. With this reason, we propose a color-texture image watermarking algorithm utilizing texture properties. The proposed algorithm selects suitable blocks to embed a watermark by using energy and homogeneity properties of grey level co-occurrence matrices as an input of the fuzzy c-means clustering algorithm. To embed a watermark, we firstly perform discrete wavelet transform (DWT) on the selected blocks and choose one of DWT subbands. Then, we finally embed a watermark into discrete cosine transformed blocks with a gain factor. In this study, we also explored the impact of DWT subbands and gain factors with respect to imperceptibility and robustness against various watermarking attacks. Experimental results showed that the proposed algorithm achieved higher values of peak signal-to-noise ratio (47.66 dB to 48.04 dB), lower values of M-SVD (8.84 to 15.6), and higher values of normalized correlation (0.7193 to 1) for all of watermarking attacks when we embedded a watermark into the HH band with a gain factor α=42.

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