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Robust image watermarking algorithm based on QWT and QSVD using 2D Chebyshev-logistic map. (English) [Zbl 07463994]  
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Summary: In this paper, a novel watermarking algorithm based on quaternion wavelet transform (QWT) and quaternion singular value decomposition (QSVD) is proposed for copyright protection. Firstly, color images are converted from RGB space to YCbCr space. Then one-level QWT transform is applied to the luminance component Y. The LL component is split into 4 × 4 non-overlapping blocks. Every block is decomposed by QSVD, and the bits of watermark are embedded in singular vectors or singular values. Moreover, 2D Chebyshev-Logistic map is proposed to encrypt the watermarks and scramble the embedding positions. In the watermarking extraction process, both blind and semi-blind watermarking extraction methods are introduced. Experiments show that proposed watermarking algorithm has good robustness against common attacks and has good invisibility.

MSC:

94A62 Authentication, digital signatures and secret sharing
94A08 Image processing (compression, reconstruction, etc.) in information and communication theory
94A60 Cryptography
68P25 Data encryption (aspects in computer science)
42C40 Nontrigonometric harmonic analysis involving wavelets and other special systems

Keywords:

quaternion wavelet transform

Full Text: DOI

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