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**Wavelet packets-based digital watermarking for image verification and authentication.** (English) [Zbl 1145.94311](#)  
Signal Process. 83, No. 10, 2117-2132 (2003).

Summary: We present a novel watermarking scheme to ensure the authenticity of digital images. Our authentication technique is able to detect malicious tampering of images even if they have been incidentally distorted by basic image processing operations. The image protection is achieved by the insertion of a secret author's identification key in the image wavelet coefficients by their selective quantization. Our system uses characteristics of the human visual system to maximize the embedding weights while keeping good perceptual transparency. We develop an image-dependent method to evaluate, in the wavelet domain, the optimal quantization step allowing the tamper proofing of the image. The nature of multiresolution discrete wavelet decomposition allows the spatial and frequency localization of image tampering. Experimental results are presented to demonstrate the capacity of our system to detect unauthorized modification of images, to show its robustness to image compression and high security levels and to compare it with publicly available image authentication software.

**MSC:**

- 94A08 Image processing (compression, reconstruction, etc.) in information and communication theory
- 94A62 Authentication, digital signatures and secret sharing
- 42C40 Nontrigonometric harmonic analysis involving wavelets and other special systems
- 94A11 Application of orthogonal and other special functions

Cited in **2** Documents

**Keywords:**

image authentication; digital watermarking; wavelet packets; tamper proofing; digital security

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