

# A Removable Visible Watermark for Digital Images

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**Abstract.** Visible watermarking schemes are among the techniques being used to protect intellectual property rights (IPRs). To provide authorized users better visibility, a new research issue called removable visible watermarking has been proposed recently. In this paper, an enhancement of Huang and Tang's scheme is proposed to achieve removability. Authorized users can simply remove an embedded watermark by using the received secret stream to reconstruct the original image. However, malicious users can only obtain reconstructed images by using blind guessing, and those will be of poor image quality. The experimental results confirm that the difference in image quality generated by unauthorized and authorized users can range up to 19 dB. Furthermore, the secret stream for reconstructing the original image in our scheme can be shortened to 192 bytes by using our proposed secret stream shortening algorithm.

**Keywords:** Removable visible watermark, vector quantization

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