论文

# 基于ICA的智能数字水印技术

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摘要
该文提出了一种基于智能信息分析方法--独立分量分析的智能数字水印新算法。水印嵌入之前先对其进行预处理，嵌入过程可以在图像任意作用域中实现，并给出了小波域中的一种闭环嵌入方法。水印嵌入的强度由小波域视觉模型决定。在不需要任何原始图像、水印和攻击类型等信息的情况下，该算法不仅可以检测到水印而且可以完全提取水印，实现了真正意义上的水印盲检测，并对多个水印嵌入的情况也可以进行水印提取。水印检测的精确程度取决于图像与水印之间的独立性以及所采用的密钥。实验过程中攻击由通用水印测试软件Stirmark产生，实验数据证明本文提出的水印算法对Stirmark提供的各种攻击剪切、滤波、图象压缩、删行、删列、几何攻击以及多种攻击同时存在时都具有很好的鲁棒性。

关键词 独立分量分析 智能数字水印技术 Stirmark

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## Intelligent Digital Watermarking Technique Based on ICA

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Abstract

A new blind intelligent image watermarking technique proposed in this paper adopts intelligent information disposal-independent component analysis. The characteristics of the human visual system are incorporated into the watermark embedding and a closed-loop embedding in discrete wavelet transform domain is proposed. The watermark is rearranged by chaotic before embedded, and it can be detected and extracted correctly not merely be detected without any information about the original image, watermark and attack. It can also extract the multiple embedded watermarks. The accuracy of watermark extraction depends on the key and the statistical independence between the original images and watermark. Experimental results demonstrate that the proposed intelligent watermarking technique is robust with respect to traditional image processing including cropping, filtering, image compression and geometric distortions such as rotation, scaling. It even has a good robustness against combination of several attacks. All attacks are produced by popular watermark test software-Stirmark.

Key words Independent Component Analysis(ICA) Intelligent watermarking technique Stirmark

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