

[2007-0547]基于等级结构的二值文本图像认证水印算法

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收稿日期 修回日期 网络版发布日期 2008-2-1 接受日期

摘要

针对二值文本图像的结构特点, 定义了度量图像中像素点“可翻转性”的像素扩展差, 在此基础上, 提出了一种基于等级结构的用于图像完整性和所有者认证的脆弱水印算法. 根据等级结构, 将原始图像划分为多等级子块, 然后对各等级子块进行独立的水印生成和嵌入. 根据像素扩展差的大小, 将图像块内的像素点划分为“可翻转”和“不可翻转”. 将混沌调制后的“不可翻转”像素点的值映射为混沌系统的初值, 经过混沌迭代生成水印信号, 然后将水印信号替代“可翻转”的像素点, 完成水印的嵌入. 另外, 在图像的最高级子块中嵌入所有者信息, 实现对所有者的认证. 实验结果表明, 该算法具有良好的视觉透明性, 可对二值图像的均匀区域进行有效地保护, 并对图像的内容篡改进行多级检测与定位.

关键词

[图像认证](#), [所有者认证](#), [脆弱水印](#), [二值图像](#), [混沌](#)

分类号

[2007-0547]Binary document image authentication watermarking technique based on hierarchical structure

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Abstract

A concept of PSD (pixel spread deviation) is defined to measure the "flippability" of the pixels in the binary document images, and a corresponding fragile watermarking technique for image authentication and ownership verification is proposed. According to the hierarchical structure, we divide the image into blocks in a multi-level hierarchy, then calculate and embed the block watermarks in each hierarchy, respectively. The pixels in the image are divided into two groups determined by PSD, one is "the pixels that can be flipped", and another is "the pixels that cannot be flipped". The values of the pixels that cannot be flipped are mapped into the initial value of the chaotic system, and then the watermark can be obtained by iterating the chaotic system from the initial value. The pixels that can be flipped are substituted by the watermark to obtain the watermarked image. Experimental results show the imperceptibility of the watermarking process, the effective protection to the uniform regions in the binary image, and successful detection and localization of content modifications with multi-level authentication.

Key words [Image authentication](#) [ownership verification](#) [fragile watermarking](#) [binary images](#) [chaos](#)

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