学术探讨

一种二维DCT彩色图像数字水印的新算法

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摘要　　作为版权保护的重要手段，数字水印技术已得到了广泛的研究和应用，但实用的彩色图像数字水印技术不多，特别是灰度级水印信号的嵌入算法不多。文中充分考虑到人类视觉系统特点，采用YIQ色彩空间，将灰度图像水印信号自适应嵌入载体的亮度分量Y的DCT系数中，并根据人类视觉掩蔽特征，在较复杂的块嵌入量增加。此外，采用Amold变换将水印图像进行置乱，消除像素的空间相关性，使算法抗攻击能力增强。实验结果证明：文中算法对叠加噪声、JPEG压缩、几何剪切、图像增强等攻击均具有较好的鲁棒性。

关键词　　离散余弦变换,YIQ色彩空间,Amold变换,彩色载体图像,数字水印

分类号

A New Algorithm of 2-Dimension Color Image Digital Watermarking

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Abstract

　As a main method for copyright protection, the techniques of digital watermarking have been widely researched and used. However the practical techniques in color image digital watermarking is lesser studied, especially for the embedding algorithm of grayscale watermarking signal. Considering the characteristic of Human Visual System (HVS), proposed method in this paper adopts YIQ color space, and embeds a grayscale image into the luminance Y of the color image by using discrete cosine transform, and increases the bit embedding quantity in more complex blocks. In addition, through Amold transform, the watermarking image is hashed to eliminate the spatial correlation among pixels, which enhances the algorithm's anti-attack ability. The experimental results show that the proposed watermarking scheme is robust for various attacks such as noise adding, JPEG compression, cropping, and image enhancement.

Key words　discrete cosine transform (DCT)　YIQ color space　Amold transform　color host image　digital watermarking

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