图形、图像、模式识别

一种新的数字图像置乱方法

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摘要　　常见的基于位置空间的数字图像置乱方法存在不能改变图像统计特性的缺陷，同时置乱过程缺乏随机性，保密性不高。针对以上问题，提出了一种新的数字图像色彩空间置乱方法。该方法基于快速数论变换，置乱速度快，变换矩阵形式不固定，逆变换矩阵求解简单，恢复图像完全无损，且通过选取合适的参数，经过一次迭代就可以达到满意的置乱效果。实验结果表明，置乱后的图像接近白噪声，提高了保密信息的迷惑性，同时还原图像易于实现，有较好的实用性。

关键词　　信息隐藏　图像置乱　数论变换

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Novel digital image scrambling method

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Abstract

Common image scrambling methods based on position space can't change the statistical property of an image，and these methods have to face with severe security problems because of using fixed form matrices.The paper presents a novel scrambling method based on color space and fast number theoretic transformation.It has the following advantages：The form of transformation matrix is unfixed，it is easy to calculate the invertible matrix，restoring image is lossless，and by choosing appropriate parameters this method can reach preferable scrambling effect after only one time iterating，so it has the less calculated capacity.The results show that the scrambled image is like white noise，new method improves the secrecy property of an image and reduces the attacker's notice.It is easy to realize and has application value in the field of image hiding.

Key words　information hiding　image scrambling　number theoretic transformation

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