

网络与信息安全

扩散映射置乱与超混沌系统组合图像加密算法

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摘要 提出一个基于扩散与位平面Arnold映射相结合的彩色图像置乱,以及采用Chen系统产生的混沌序列加密的图像加密算法。先由Logistic系统构造的二维非线性动力系统产生的混沌序列形成扩散矩阵和Arnold映射矩阵,然后在基色上对彩色图像进行扩散,并在不同的位平面对彩色图像进行置乱,最后用Chen系统产生的混沌序列对置乱后的图像进行加密。该算法实现简单,能够抵御多种攻击,且容易用硬件实现。

Abstract A combined image encryption algorithm was presented. The algorithm combined linear diffusion approach with Arnold mapped to disorder the image, and hyperchaotic sequences was used to encrypt the image. The mapped matrix and diffusion matrix were made up of chaotic sequences that were produced by the Logistic dynamic system, and they were used for disordering the color image to produce a disordered image on different bit planes to disorder the pixels. The disordered image was encrypted by means of the hyperchaotic sequences that were produced by the Chen's system. The algorithm is simple and able to resist a variety of attacks, and can be easily implemented by hardware.

关键词 [彩色图像加密](#) [Arnold映射](#) [灰度值扩散](#) [位平面置乱](#) [Chen系统](#)

Key words color image encryption; Arnold map; grey diffusion; bit plane disorder; Chen's system

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