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论文与报告

基于视觉掩蔽效应的图像扩散

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摘要

提出一种基于视觉掩蔽效应的图像扩散算法. 结合人类视觉系统的特性, 利用图像上下文像素的非均质性度量定义了新的噪声掩蔽函数, 可以有效地区分噪声和边缘特征, 由此得到的噪声可见度函数作为各向异性扩散的扩散系数. 算法同时利用了图像的局部梯度信息和较大邻域的上下文信息, 可以在滤除噪声的同时更加有效地保留图像的重要特征, 而且避免了传统算法梯度阈值的选取问题. 实验结果表明, 本文算法在去噪保边性能上优于一些典型的扩散算法.

关键词 各向异性扩散 视觉掩蔽效应 非均质性 人类视觉系统 图像去噪

分类号

Image Diffusion Based on Visual Masking Effect

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Abstract

An image diffusion algorithm based on visual masking effect is proposed. In view of properties of human visual system, inhomogeneity underlying an image is employed to define a novel noise masking function. It is a measure of contextual discontinuities, and could efficiently distinguish noise from edges. The resultant noise visibility function is used as diffusivity function of anisotropic diffusion. Due to the combined use of local spatial gradient and contextual information of larger neighborhood, the proposed algorithm could preserve nontrivial features more efficiently while removing noise. Further, it avoids the difficulty of estimating the gradient threshold in traditional algorithms. Comparative experiments certify that the proposed algorithm outperforms several existing typical diffusion methods in terms of noise removal and feature preservation.

Key words Anisotropic diffusion visual masking effect inhomogeneity human visual system image denoising

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