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光电工程

基于深度优先遍历的图像边缘检测方法

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摘要 图像边缘识别是图像处理的重要组成。提出一种基于深度优先遍历的梯度分割算法，这种算法首先构造像素点的数据结构，然后从图像任意点出发，估算该点附近的像素点并获取梯度值，如果该点满足边缘点的特征，则从该点出发深度遍历寻找垂直于梯度方向上的边缘点，并标记访问过的点。如果该方向上没有满足条件的点则回退，从某个具有仅次于最大梯度值的方向继续遍历，并标记开始遍历的点为角点，直至遍历全图。该算法将图像的边缘点和角点明显地分割出来，便于识别，对带有不同类型的噪声图像进行处理也可取得较满意效果。

关键词 图像处理 深度优先遍历 边缘检测 检测算子

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Edge recognition method for image segmentation based on depth-first traversal

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Abstract Image edge recognition is an important part of image processing. A gradient segmentation algorithm based on the depth-first traversal of images is presented. In this method, the data structure of the pixel is defined firstly, the four pixels around an arbitrary point of an image are estimated and the gradient values of the pixels are acquired. If the pixel satisfies the feature of an edge, the edge perpendicular to the directions of gradient is processed by depth-first traversal, and the pixels are marked at the same time. If there is no pixel to satisfy the feature in the direction, it will withdraw, and then the depth-first traversal will be implemented from the direction next to the maximum gradient, marking the pixel as corner, until the traversal of the whole image is completed. The experimental results show that edges and corners of an image can be segmented clearly and easily identified.

Key words image processing depth-first traversal edge recognition recognition operator

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