



### 基于Unit-Linking PCNN的灰度图像边缘检测

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#### Gray image edge detection based on Unit Linking PCNN

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#### 摘要

利用Unit-Linking PCNN模型, 结合最小交叉熵准则, 边缘检测预处理, 均匀分块处理, 将灰度图像分割成二值图像, 在二值分割图基础上实施Unit-Linking PCNN边缘检测. 边缘检测预处理以块状增强方式增强了图像对比度, 强化了图像边缘; 均匀分块处理实现了灰度图像的近似多阈值分割. 分析了边缘检测预处理中各步骤的作用, 比较了不同均匀分块数目对边缘检测结果的影响. 与Canny算子和相关文献结果相比, 该研究检测的边缘体现了更丰富的图像细节, 且神经元模型参数对图像边缘检测结果的影响较不敏感. 仿真结果表明, 该方法具有较理想的灰度图像边缘检测结果, 具有较好适用性.

关键词: [Unit-Linking PCNN](#) [灰度图像边缘检测](#) [最小交叉熵](#) [边缘检测预处理](#)

#### Abstract:

Using Unit Linking PCNN, minimum cross entropy rule, edge detection pre processing and process of image dividing blocks, gray image is segmented into binary image. Based on this binary image, it is made edge detection using Unit Linking PCNN. Edge detection pre processing increases contrast of image and strengthen the edge of image through blocks enhancement. Process of image dividing blocks realizes approximate multi threshold segmentation of gray image. Effect of each step in edge detection pre processing is analyzed, and the influences of the results of edge detection with different numbers of dividing blocks are compared. Compared with correlative result using Canny operator and others in the existing references, edge detection shows more image details, the parameters of the proposed are less sensitive to the results of image edge detection. Computer simulation results show that our methods have both preferable results

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of gray image edge detection and fine applicability.

Key words:

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