

一种基于灰度形态学的小波域边缘检测算法

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摘要:根据灰度数学形态学良好的边缘检测特点以及小波的多分辨特性提出了一种效果更为良好的边缘检测算法。首先将待检测图像进行小波多尺度分解, 得到了低频信息、中频信息和对角信息; 然后对低频部分同时做膨胀和腐蚀边缘检测, 并对得到的结果求其平均值; 最后将得到的结果代替低频部分联合中频部分和对角细节部分做小波逆变换, 得到边缘信息较强的图像, 再做二值化操作即得到最后的边缘轮廓。最后选择一合适的模版对其进行细化。实验结果证明, 这种检测结果比目前已经存在的检测算法效果好。而且使用简便。

关键词:[小波变换](#) [灰度形态学](#) [自适应](#) [边缘检测](#) [结构元素](#)

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A Novel Edge- Detection Algorithm in Wavelet Gray - Scale Morphology

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Abstract:In this paper, a better effective edge detection algorithm is presented based on the good boundary performance of gray - scale mathematical morphology, as well as the multi - resolution of wavelet decomposition. Firstly, the image which will be detected is done with multi - scale wavelet decomposition, and then, the low - frequency part and details are obtained. Secondly, the low- frequency part and details are edge-detected using dilation and erosion at the same time, further, the results are averaged. Lastly, the final result which is representative of the low - frequency is done with inverse wavelet transform joined with other details including middle - frequency and diagonal information, strong edge information of image is received, what is more, much dearer edge contour is obtained through binary operation. If the result has some noise, opening and closing operation will be used. The

experimental results proved that this method is more effective than other ones, and simple to use.

Key words:wavelet transform; gray- scale morphology; self adaptive; edge detection;structure element