À Trous Wavelet Decomposition Applied to Image Edge Detection

Xiaodong Zhang and Deren Li

National Laboratory for Information Engineering in Surveying, Mapping and Remote Sensing, Wuhan University
129 Luoyu Road, Wuhan, 430079 P. R. China

Abstract

Detecting image edge is considered as a key step in many complicated processing methods such as image segmentation, image recognition, and feature extraction. Many methods of detecting image edges have been developed, but almost every method has its restriction in application of image processing. In this paper, disadvantages and advantages of some classic methods for image edge detection are thoroughly discussed. Base on the analysis, a new À trous wavelet decomposition algorithm is applied to detecting image edge. From the experimental results, we can find that the edges detected by our À trous wavelet decomposition method are better than those processed by the classic Sobel, and Robert methods. In addition, when the original image is stained by noise, the new method almost is not disturbed, on the contrary, the classic algorithms are sensitive to noise. However, besides the advantages of the new method of detecting image edge, we also find out a shortcoming, the disadvantage need to further research for improving the result.