



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## Artificial neural network based fast edge detection algorithm for mri medical images (Article)

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### Abstract

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Currently, magnetic resonance imaging (MRI) has been utilized extensively to obtain high contrast medical image due to its safety which can be applied repetitively. To extract important information from an MRI medical images, an efficient image segmentation or edge detection is required. Edges are represented as important contour features in the medical image since they are the boundaries where distinct intensity changes or discontinuities occur. However, in practices, it is found rather difficult to design an edge detector that is capable of finding all the true edges in an image as there is always noise, and the subjectivity of sensitiveness in detecting the edges. Many traditional algorithms have been proposed to detect the edge, such as Canny, Sobel, Prewitt, Roberts, Zerocross, and Laplacian of Gaussian (LoG). Moreover, many researches have shown the potential of using Artificial Neural Network (ANN) for edge detection. Although many algorithms have been conducted on edge detection for medical images, however higher computational cost and subjective image quality could be further improved. Therefore, the objective of this paper is to develop a fast ANN based edge detection algorithm for MRI medical images. First, we developed features based on horizontal, vertical, and diagonal difference. Then, Canny edge detector will be used as the training output. Finally, optimized parameters will be obtained, including number of hidden layers and output threshold. The edge detection image will be analysed its quality subjectively and computational. Results showed that the proposed algorithm provided better image quality while it has faster processing time around three times time compared to other traditional algorithms, such as Sobel and Canny edge detector. © 2017 Institute of Advanced Engineering and Science. All rights reserved.

### Author keywords

Artificial neural network   Canny edge detector   Edge detection   MRI images

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
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