

Simultaneous Whole-Brain Segmentation and White Matter Lesion Detection Using Contrast-Adaptive Probabilistic Models - DTU Orbit (09/11/2017)

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In this paper we propose a new generative model for simultaneous brain parcellation and white matter lesion segmentation from multi-contrast magnetic resonance images. The method combines an existing whole-brain segmentation technique with a novel spatial lesion model based on a convolutional restricted Boltzmann machine. Unlike current state-of-the-art lesion detection techniques based on discriminative modeling, the proposed method is not tuned to one specific scanner or imaging protocol, and simultaneously segments dozens of neuroanatomical structures. Experiments on a public benchmark dataset in multiple sclerosis indicate that the method's lesion segmentation accuracy compares well to that of the current state-of-the-art in the field, while additionally providing robust whole-brain segmentations.

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