The challenge of automatic MS lesion segmentation in MR image

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Abstract

Multiple Sclerosis (MS) is an autoimmune, chronic and disabling disease of the human central nervous system, histologically characterized by multifocal areas of inflammatory demyelination within white matter (WM) and grey matter (GM). The current MS diagnostic criteria include cerebral and spinal Magnetic Resonance Imaging (MRI) to demonstrate the dissemination in space and time of inflammatory lesions. A segmentation of the lesions brings important information about the status of the illness. Manual segmentation is difficult and time-consuming, while automated methods are challenging because small lesions can be hardly distinguished from image noise and artifacts. In this work an automated approach for segmentation of MS lesions in 3D MRI images based on joint histogram thresholding and comparison using multiple co-registered MR sequences is presented.