

# DeepMSWeb: A Web-Based Decision Support System via Deep Learning for Automatic Detection of MS Lesions

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**Abstract**— Multiple Sclerosis (MS) is a common neurological disorder in recent years. The diagnosis process of the disease starts with the accurate and precise detection of lesions from MR images. In addition, important achievements are achieved with computer aided decision support systems, which are used as an auxiliary secondary tool in the detection of MS. In this study, we present a web-based decision support system (DeepMSWeb) developed via deep learning for the detection of MS lesions on a publicly-available dataset. Mask R-CNN architecture, one of the deep learning models, is used in the infrastructure of DeepMSWeb, and the developed web application has a flexible and user-friendly interface. In addition, experimental studies are carried out with DeepMSWeb on the dataset consisting of MR images for the detection of MS lesions, and the detection accuracy of the application is supported by similarity measurement metrics. Radiologists who have experienced DeepMSWeb are confirmed that DeepMSWeb can be used as a decision support system for the detection of MS lesions. In addition, it is evaluated that DeepMSWeb can be used in different screen sizes, is easy to use and is as fast as decision support tool.

**Keywords**— *multiple sclerosis, MS lesion detection, decision support system, web-based application, deep learning, Mask R-CNN*