

Preface

This volume contains articles from the Brain Lesion (BrainLes) workshop as well as the Brain Tumor Segmentation (BRATS) and Ischemic Stroke Lesion Segmentation (ISLES) challenges, which were held jointly at the Medical Image Computing for Computer-Assisted Intervention (MICCAI) Conference on October 5, 2015.

The presented works address computer scientific and clinical researchers working on glioma, multiple sclerosis (MS), cerebral stroke, and traumatic brain injuries. This compilation does not claim to provide a comprehensive understanding from all points of view; however, the authors present their latest advances in segmentation, disease prognosis, and other applications to the clinical context.

The volume is divided into three parts: The first part comprises the submissions to the BrainLes workshop, the second contains a selection of papers regarding methods presented at the BRATS challenge, and the third part includes a selection of papers on methods presented at the ISLES challenge.

The aim of the first part is to provide an overview of new advances in medical image analysis in all of the aforementioned brain pathologies. The contributions bring together researchers from the medical image analysis domain, neurologists, and radiologists working on at least one of these diseases. The aim is to consider neuroimaging biomarkers used for one disease applied to the other diseases. This session did not have a specific dataset to be used.

The second part focuses on the papers from the BRATS challenge. In order to gauge the current state of the art in automated brain tumor segmentation and compare different methods, a large dataset of magnetic resonance imaging (MRI) scans of brain tumors was made available. The participants at the challenge compared the results obtained with their methods against manual segmentations.

The third part contains descriptions of the algorithms participating in ISLES, which aimed to provide a fair and direct comparison of methods for ischemic stroke lesion segmentation from multispectral MRI images. A public dataset of diverse ischemic stroke cases and a suitable automatic evaluation procedure were made available for the following two tasks: subacute ischemic stroke lesion segmentation and acute stroke outcome/penumbra estimation.

We heartily hope that this volume will promote further exciting research on brain lesions.

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Brainlesion: Glioma, Multiple Sclerosis, Stroke and
Traumatic Brain Injuries

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