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Machine Learning in Medical Imaging

Second International Workshop, MLMI 2011
Held in Conjunction with MICCAI 2011
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Proceedings

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Preface

The Second International Workshop on Machine Learning in Medical Imaging (MLMI) 2011 was held at Westin Harbour Castle, Toronto, Canada, on September 18, 2011 in conjunction with the 14th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI).

Machine learning plays an essential role in the medical imaging field, including computer-aided diagnosis, image segmentation, image registration, image fusion, image-guided therapy, image annotation and image database retrieval. With advances in medical imaging, new imaging modalities and methodologies—such as cone-beam/multi-slice CT, 3D ultrasound imaging, tomosynthesis, diffusion-weighted MRI, positron-emission tomography (PET)/CT, electrical impedance tomography and diffuse optical tomography—as well as new machine-learning algorithms/applications are demanded in the medical imaging field. Single-sample evidence provided by the patient's imaging data is often not sufficient to provide satisfactory performance. Because of large variations and complexity, it is generally difficult to derive analytic solutions or simple equations to represent objects such as lesions and anatomy in medical images. Therefore, tasks in medical imaging require learning from examples for accurate representation of data and prior knowledge.

MLMI 2011 was the second in a series of workshops on this topic. The main aim of this workshop is to help advance scientific research within the broad field of machine learning in medical imaging. This workshop focuses on major trends and challenges in this area, and it presents work aimed at identifying new cutting-edge techniques and their use in medical imaging. We hope the series of workshops becomes a new platform for translating research from the bench to the bedside.

The range and level of submissions for this year's meeting were of very high quality. Authors were asked to submit full-length papers for review. A total of 74 papers were submitted to the workshop in response to the call for papers. Each of the 74 papers underwent a rigorous double-blinded peer-review process, with each paper being reviewed by at least two (typically three) reviewers in the Program Committee composed of 50 known experts in the field. Based on the reviewing scores and critiques, the 44 best papers (59%) were accepted for presentation at the workshop and chosen to be included in this Springer LNCS volume. The large variety of machine-learning techniques necessary for and applied to medical imaging was well represented at the workshop.

We are grateful to the Program Committee for reviewing submitted papers and giving constructive comments and critiques, to authors for submitting high-quality papers, to presenters for excellent presentations, and to all those who supported MLMI 2011 by attending the meeting.

July 2011

Kenji Suzuki
Fei Wang
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