

Preface

On September 14, 2014, The Third International Workshop on Clinical Image based Procedures: Translational Research in Medical Imaging (CLIP 2014) was held in Boston, MA, USA in conjunction with the International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2014). The successful meeting was a productive and exciting forum for the discussion and dissemination of clinical applications of medical imaging, state-of-the-art methods for image-based planning, and development and evaluation of new medical procedures and therapies. The workshop was co-organized by Childrens National Health System, Fraunhofer IGD and IDM@NTU, Nara Institute of Science and Technology, and Universitat Pompeu Fabra.

Over the past few years, there has been a considerable and growing interest in the development and evaluation of new translational image-based techniques in the modern hospital. For a decade or more, the outstanding proliferation of medical image applications has created a need for greater study and scrutiny of the clinical application and validation of such methods. New strategies are essential to ensure a smooth and effective translation of computational image-based techniques into the clinic. For these reasons and to complement other technology focused MICCAI workshops on computer-assisted interventions, CLIP's major focus was on translational research filling the gaps between basic science and clinical applications.

A highlight of the workshop was the subject of strategies for personalized medicine to enhance diagnosis, treatment, and interventions. Members of the medical imaging community were encouraged to submit work centered on specific clinical applications, including techniques and procedures based on comprehensive clinical image data or already in use and evaluated by clinical users. The event brought together over 40 world-class researchers and clinicians who presented ways to strengthen links between computer scientists and engineers, and surgeons, interventional radiologists, and radiation oncologists.

In the tradition of our previous workshops, CLIP 2014 was a successful venue for the dissemination of emerging image-based clinical techniques, the analysis of the current uptake of advanced computational imaging techniques, and the discussion of the main hurdles for their clinical translation and how to overcome them. Specific topics included pre-interventional image segmentation and classification (to support diagnosis and clinical decision making), shape analysis for anatomical modeling, interventional and surgical planning and analysis of dynamic images, and evaluation, visualization, and simulation techniques for image based procedures. Clinical applications covered brain diseases, cardiac defects, orthopedics, inflammatory diseases, blood vessels, cochlear defects, and cancer of the head and neck, breast, prostate,

and lung in adults and children. During two keynote sessions, clinical highlights were presented and discussed by Pedro del Nido, MD, Chairman of the Department of Cardiovascular Surgery at Boston Children's Hospital and William E. Ladd Professor of Child Surgery at Harvard Medical School (minimally invasive robotic surgery on the beating heart), and Thomas Bortfeld, PhD, Director of the Physics Division at Massachusetts General Hospital and Professor in the Department of Radiation Oncology at Harvard Medical School (imaging radiation and proton therapy). We are grateful to our keynote speakers for their compelling presentations and vibrant participation in workshop discussions.

In response to the call for papers, 26 original manuscripts were submitted for presentation at CLIP 2014. Each of the manuscripts underwent a meticulous double-blind peer review by a minimum of two members of the Program Committee, prestigious experts in the field of medical image analysis and clinical translations of technology. Seventy-three percent or 19 of the manuscripts were accepted for presentation at the workshop: 12 or 46 % as long oral presentations, and 7 as short oral and poster contributions. Contributors represented three continents: Europe, North America, and Asia. The six papers with the highest review score were nominated to be considered as best papers. From them, the three best papers were chosen by votes cast by workshop participants who had attended all six presentations of the nominated papers (workshop organizers excepted). As a result, three awards were presented. The first place went to Juan Cerrolaza, Sergio Vera, Alexis Bagué, Mario Ceresa, Pablo Migliorelli, Marius George Lingurar, and Miguel Ángel González Ballester from Children's National Health System in Washington, DC, USA, and Alma IT Systems and Universitat Pompeu Fabra in Barcelona, Spain for their work in shape modeling of the cochlea and surrounding risk structures for minimally invasive cochlear implant surgery. The second place was presented to Amit Shah, Oliver Zettinig, Tobias Maurer, Cristina Precup, Christian Schulte zu Berge, Jakob Weiss, Benjamin Frisch, Nassir Navab from Technische Universität München in Germany for their advancements on multimodal image-guided prostate biopsy. The third place was conferred on Nishant Uniyal, Farhad Imani, Amir Tahmasebi, Peter Choyke, Baris Turkbey, Peter Pinto, Bradford Wood, Sheng Xu, Jin Tae Kwak, Pingkun Yan, Jochen Kruecker, Shyam Bharat, Harsh Agarwal, Purang Abolmaesumi, Parvin Mousavi, Mehdi Moradi from University of British Columbia, Vancouver, BC, Canada, Queen's University, Kingston, ON, Canada, Philips Research North America, Briarcliff Manor, NY, USA, and National Institutes of Health, Bethesda, MD, USA for their contributions to ultrasound-based predication of prostate cancer in MRI-guided biopsy. We would like to congratulate warmly all the prize winners for their outstanding work and exciting presentations and thank our sponsors, EXOCAD and MedCom, and HEAR-EU for their support.

We would also like to acknowledge the invaluable contributions of our entire Program Committee without whose assistance CLIP 2014 would not have been as successful and stimulating. Our thanks also go to all the authors in this volume for the high quality of their work and the commitment of time and effort. Finally, we are

grateful to the MICCAI 2014 organizers, and particularly Polina Golland, Nobuhiko Hata, Georg Langs, Mehdi Moradi, Sonia Pujol, and Martin Styner, for supporting the organization of CLIP 2014.

October 2014

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Clinical Image-Based Procedures. Translational
Research in Medical Imaging

Third International Workshop, CLIP 2014, Held in
Conjunction with MICCAI 2014, Boston, MA, USA,
September 14, 2014, Revised Selected Papers

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M. (Eds.)

2014, XII, 160 p. 72 illus., Softcover

ISBN: 978-3-319-13908-1