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Clinical Image-Based Procedures

Translational Research
in Medical Imaging

Second International Workshop, CLIP 2013
Held in Conjunction with MICCAI 2013
Nagoya, Japan, September 22, 2013
Revised Selected Papers

Editors

Marius Erdt
Fraunhofer IDM@NTU
Singapore
Singapore

Marius George Linguraru
Raj Shekhar
Children's National Medical Center
Washington, DC
USA

Cristina Oyarzun Laura
Stefan Wesarg
Klaus Drechsler
Fraunhofer IGD
Darmstadt
Germany

Miguel Angel González Ballester
ICREA – Universitat Pompeu Fabra
Barcelona
Spain

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Preface

On September 22, 2013, the Second International Workshop on Clinical Image-based Procedures: Translational Research in Medical Imaging (CLIP 2013) was held in Nagoya, Japan, in conjunction with the 16th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI). This successful workshop was a productive and exciting forum for the discussion and dissemination of clinically tested, state-of-the-art methods for image-based planning, monitoring, and evaluation of medical procedures.

Over the past few years, there has been considerable and growing interest in the development and evaluation of new translational image-based procedures in the modern hospital. For a decade or more, a proliferation of meetings dedicated to medical image computing has created a need for greater study and scrutiny of the clinical application and validation of such methods. New attention and new strategies are essential to ensure a smooth and effective translation of computational image-based techniques into the clinic. For these reasons, the major focus of CLIP 2013 was on translational research filling the gaps between basic science and clinical applications.

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. The event brought together some 50 world-class researchers and clinicians who presented ways to strengthen links between computer scientists and engineers as well as surgeons, interventional radiologists, and radiation oncologists.

Thus, CLIP 2013 was a successful forum for the dissemination of emerging image-based clinical techniques. Specific topics included pre-interventional image segmentation and classification (to support diagnosis and clinical decision making), interventional and surgical planning and analysis of dynamic images, and evaluation, visualization, and correction techniques for image-based procedures. Clinical applications covered orthopedics, the skull and the brain, blood vessels, abdominal organs, endoscopic interventions, and cancer in adults and children. The presentations and discussions around the meeting emphasized current challenges and emerging techniques in image-based procedures, strategies for clinical translation of image-based techniques, the role of computational anatomy and image analysis for surgical planning and interventions, and the contribution of medical image analysis to open and minimally invasive surgery. During two keynote sessions, clinical highlights were presented and discussed by Prof. Makoto Hashizume, MD PhD, from Kyushu University School of Medicine in Japan (minimally invasive robotic surgery), and Prof. Nobuhiko Sugano, MD PhD, from Osaka University Graduate School of Medicine, Japan (computer-assisted orthopedic surgery). We are grateful to our keynote speakers for their compelling presentations. We would also like to acknowledge the European

Commission research project HEAR-EU (grant number HEALTH-F2-2012-304857) for providing support for the participation of the keynote speakers.

In response to the call for papers, 26 original manuscripts were submitted for presentation at CLIP 2013. Each of the manuscripts underwent a meticulous double-blind peer review by a minimum of two members of the Program Committee, all of them prestigious experts in the field of medical image analysis and clinical translations of technology. Finally, 50 % of the manuscripts (i.e., 13 papers) were accepted for oral presentation at the workshop, and an additional six papers were accepted for poster presentation combined with a short oral summary of their work, bringing the overall acceptance rate to 73 %. The six papers with the highest review score were nominated to be considered as best papers. The three best papers were chosen by votes cast by workshop participants who had attended all six presentations of the nominated papers (excluding workshop organizers). As a result, three awards were presented. First place went to Xin Kang, Jihun Oh, Emmanuel Wilson, Timothy Kane, Craig Peters, and Raj Shekhar from Children's National Medical Center in Washington, DC, USA for their work on a novel stereoscopic augmented reality system for laparoscopic surgery. Second place was presented to Adrian Schneider, Christian Baumberger, Mathias Griessen, Simon Pezold, Jörg Beinemann, Philipp Jürgens, and Philippe C. Cattin from Universität Basel, Switzerland, for their work on landmark-based surgical navigation. Third place was conferred on Carles Sánchez, Jorge Bernal, F. Javier Sánchez, and Debora Gil from Universitat Autònoma de Barcelona in Spain for their advancements regarding lumen center detection in gastrointestinal and respiratory endoscopy. We would like to congratulate warmly all the prize winners for their outstanding work and exciting presentations and thank our sponsors, EXOCAD and MedCom, for their support.

We would like to acknowledge the invaluable contributions of our entire Program Committee without whose assistance CLIP2013 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 their commitment of time and effort. Finally, we are grateful to the MICCAI organizers, and particularly Hongen Liao, Akinobu Shimizu, Pierre Jannin, and Simon Warfield for supporting the organization of CLIP 2013.

December 2013

Miguel A. González Ballester
 Klaus Drechsler
 Marius Erdt
 Marius George Linguraru
 Cristina Oyarzun Laura
 Raj Shekhar
 Stefan Wesarg

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