Lecture Notes in Computer Science 9958

Commenced Publication in 1973
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Clinical Image-Based Procedures

Translational Research in Medical Imaging

5th International Workshop, CLIP 2016
Held in Conjunction with MICCAI 2016
Athens, Greece, October 17, 2016
Proceedings

Springer

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ISSN 0302-9743 ISSN 1611-3349 (electronic)
Lecture Notes in Computer Science
ISBN 978-3-319-46471-8 ISBN 978-3-319-46472-5 (eBook)
DOI 10.1007/978-3-319-46472-5

Library of Congress Control Number: 2016934443

LNCS Sublibrary: SL6 – Image Processing, Computer Vision, Pattern Recognition, and Graphics

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Printed on acid-free paper

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The registered company is Springer International Publishing AG
The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

Preface

On October 17, 2016, The International Workshop on Clinical Image-Based Procedures: From Planning to Intervention (CLIP 2016) was held in Athens, Greece, in conjunction with the 19th International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI). Following the tradition set in the last four years, this year's edition of the workshop was as productive and exciting a forum for the discussion and dissemination of clinically tested, state-of-the-art methods for image-based planning, monitoring, and evaluation of medical procedures as in yesteryears.

Over the past few years, there has been considerable and growing interest in the development and evaluation of new translational image-based techniques in the modern hospital. For a decade or more, a proliferation of meetings dedicated to medical image computing has created the 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 and to complement other technology-focused MICCAI workshops on computer-assisted interventions, the major focus of CLIP 2016 was on filling 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 clinical data or already in use and evaluated by clinical users. Once again, the event brought together world-class researchers and clinicians who presented ways to strengthen links between computer scientists and engineers and surgeons, interventional radiologists, and radiation oncologists.

In response to the call for papers, 16 original manuscripts were submitted for presentation at CLIP 2016. Each of the manuscripts underwent a meticulous double-blind peer review by three members of the Program Committee, all of them prestigious experts in the field of medical image analysis and clinical translations of technology. A member of the Organizing Committee further oversaw the review of each manuscript. In all, 62 % of the submissions (i.e., 10 manuscripts) were accepted for oral presentation at the workshop. The accepted contributors represented eight countries from four continents: Europe, North America, Asia, and Australia. The three highest-scoring manuscripts were nominated to compete for the best paper award at the workshop. The final standing (first, second, and third) will be determined by votes cast by workshop participants, excluding the workshop organizers. The three nominated papers are:

- "Personalized Optimal Planning for the Surgical Correction of Metopic Craniosynostosis," by Antonio R. Porras, Dženan Zukić, Andinet Equobahrie, Gary F. Rogers, Marius George Linguraru, from the Children's National Health System in Washington, DC, USA
- "Validation of an Improved Patient-Specific Mold Design for Registration of In-Vivo MRI and Histology of the Prostate," by An Elen, Sofie Isebaert, Frederik

De Keyzer, Uwe Himmelreich, Steven Joniau, Lorenzo Tosco, Wouter Everaerts, Tom Dresselaers, Evelyne Lerut, Raymond Oyen, Roger Bourne, Frederik Maes, Karin Haustermans, from the University of Leuven, Belgium

- "Stable Anatomical Structure Tracking for Video-Bronchoscopy Navigation," by Antonio Esteban Lansaque, Carles Sanchez, Agns Borrs, Antoni Rosell, Marta Diez-Ferrer, Debora Gil, from the Universitat Autonoma de Barcelona, Spain.

We would like to congratulate warmly all the nominees for their outstanding work and wish them best of luck for the final competition. We would also like to thank our sponsor, MedCom, for their support.

Judging by the contributions received, CLIP 2016 was a successful forum for the dissemination of emerging image-based clinical techniques. Specific topics include various image segmentation and registration techniques, applied to various part of the body. The topics further range from interventional planning to navigation of devices and navigation to the anatomy of interest. Clinical applications cover the skull, the cochlea, cranial nerves, the aortic valve, wrists, and the abdomen, among others. We also saw a couple of radiotherapy applications this year. The presentations and discussions around the meeting emphasizes 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.

As always, the workshop featured two prominent experts as keynote speakers. Underscoring the translational, bench-to-bedside theme of the workshop, Prof. Georgios Sakas of TU Darmstadt gave a talk on how to turn ideas into companies. Dr. Pavlos Zoumpoulis of Diagnostic Echotomography delivered a talk on his work related to ultrasound. We are grateful to our keynote speakers for their participation in the workshop.

We would like to acknowledge the invaluable contributions of our entire Program Committee, many members of which have actively participated in the planning of the workshop over the years, and without whose assistance CLIP 2016 would not have been possible. 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 organizers for supporting the organization of CLIP 2016.

August 2016

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