PROGRESS IN BIOMEDICAL OPTICS AND IMAGING
Vol. 8, No. 31

Medical Imaging 2007

Image Processing

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Editors

18–20 February 2007
San Diego, California, USA

Sponsored by
SPIE—The International Society for Optical Engineering

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SPIE—The International Society for Optical Engineering

Volume 6512
Part One of Three Parts

The International Society for Optical Engineering

Proceedings of SPIE—The International Society for Optical Engineering, 9780819466303, v. 6512

The papers included in this volume were part of the technical conference cited on the cover and title page. Papers were selected and subject to review by the editors and conference program committee. Some conference presentations may not be available for publication. The papers published in these proceedings reflect the work and thoughts of the authors and are published herein as submitted. The publisher is not responsible for the validity of the information or for any outcomes resulting from reliance thereon.

Please use the following format to cite material from this book:
Author(s), "Title of Paper," in *Medical Imaging 2007: Image Processing*, edited by Josien P. W. Pluim, Joseph M. Reinhardt, Proceedings of SPIE Vol. 6512 (SPIE, Bellingham, WA, 2007) Article CID Number.

ISSN 1605-7422
ISBN 9780819466303

Published by
SPIE—The International Society for Optical Engineering
P.O. Box 10, Bellingham, Washington 98227-0010 USA
Telephone 1 360/676-3290 (Pacific Time) · Fax 1 360/647-1445
http://www.spie.org

Printed in the United States of America.

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Pagination: Proceedings of SPIE follow an e-First publication model, with papers published first online and then in print and on CD-ROM. Papers are published as they are submitted and meet publication criteria. A unique, consistent, permanent citation identifier (CID) number is assigned to each article at the time of the first publication. Utilization of CIDs allows articles to be fully citable as soon they are published online, and connects the same identifier to all online, print, and electronic versions of the publication.

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Introduction

These proceedings contain the papers presented at the Image Processing Conference of the 2007 SPIE Medical Imaging Symposium held February 17–22 at the Town and Country Hotel in San Diego, California. This year saw the introduction of a separate Computer-Aided Diagnosis conference, which was reflected in a substantial drop in the number of submissions to the Image Processing conference. The number of submissions was 229 (compared to 381 last year). Combined with the 179 submissions to the CAD conference, however, the total number is a clear improvement over last year.

A total of 110 posters and 62 oral presentations were accepted this year. The high quality of the submissions made the paper selection process extremely difficult, and in the end we were limited by the available timeslots for oral presentations and space for poster presentations. The acceptance rate this year was 75%.

The first day of the conference ended with the evening workshop, which drew a very large audience. The workshop was a continuation of the evaluation theme of last year (on image segmentation). This year's workshop was entitled "Validation in Image Registration Methods" and was organized by Dr. Pierre Jannin of the Université de Rennes I (France). Dr. Jannin opened the workshop with practical advice on the important aspects of registration accuracy assessment and on the components of validation protocols. He was followed by Dr. J. Michael Fitzpatrick of Vanderbilt University, who explained fiducials, targets, and localization and registration errors in the validation of rigid registration. He also announced the opportunities for testing rigid registration algorithms using the recently rejuvenated Retrospective Image Registration Evaluation (RIRE) web site. The third presentation focused on the validation of non-rigid registration. Dr. Daniel Rueckert of Imperial College London (UK) addressed various criteria to evaluate non-rigid registration performance (e.g., accuracy, robustness, and consistency). The workshop was concluded by Dr. Gary Christensen of the University of Iowa. He presented NIREP, the Non-Rigid Image Registration Evaluation Project, which provides both data and metrics for the evaluation of non-rigid registration methods.

Another crowd-drawing event was this year's keynote address by Dr. Michael Brady, BP Professor of Information Engineering at the University of Oxford (UK). Dr. Brady is internationally renowned for both his scientific and entrepreneurial accomplishments. He founded the Robotics Laboratory and the Medical Vision Laboratory at Oxford. Furthermore, he founded or is involved in numerous companies, such as Mirada Solutions Limited (now Siemens Molecular Imaging) and, more recently, Ixico. Dr. Brady is known for his research on a wide range of medical imaging topics: ophthalmology, oncological image analysis, molecular imaging, and brain image analysis. Additionally, Dr. Brady has an impressive track

record in robotics and general image analysis methods. His keynote address focused on the value and promise of imaging for oncology. Imaging can aid in detection, in decision making for treatment, in treatment, and in follow-up. In particular, Dr. Brady stressed the importance of knowledge building and knowledge incorporation of all components involved: knowledge of image formation, of anatomy, and of disease processes.

The poster session was held on Sunday and Monday this year. One cum laude poster and ten honorable mention posters were selected from the student posters. The award-winning poster papers are marked in these proceedings.

Finally, we wish to thank the multitude of people who have put a great deal of time and effort into making Image Processing 2007 a success. First of all, we are very grateful to the members of our program committee, who reviewed the submissions (with a very short deadline), chaired sessions at the conference, judged posters, and provided feedback and suggestions to help maintain and improve the quality of the conference. Secondly, we would like to thank the staff at SPIE for their work in organizing the Medical Imaging Symposium and publishing the proceedings. Last, but certainly not least, we acknowledge all of the authors, for they are the ones that performed the research, gave the presentations, and wrote the papers that made the conference and these proceedings possible.

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