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Proceedings

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Volume Editors

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Preface

The nineteenth biennial International Conference on Information Processing in Medical Imaging (IPMI) was held July 11–15, 2005 in Glenwood Springs, CO, USA on the Spring Valley campus of the Colorado Mountain College. Following the successful meeting in beautiful Ambleside in England, this year's conference addressed important recent developments in a broad range of topics related to the acquisition, analysis and application of biomedical images.

Interest in IPMI has been steadily growing over the last decade. This is partially due to the increased number of researchers entering the field of medical imaging as a result of the Whitaker Foundation and the recently formed National Institute of Biomedical Imaging and Bioengineering. This year, there were 245 full manuscripts submitted to the conference which was twice the number submitted in 2003 and almost four times the number of submissions in 2001. Of these papers, 27 were accepted as oral presentations, and 36 excellent submissions that could not be accommodated as oral presentations were presented as posters. Selection of the papers for presentation was a difficult task as we were unable to accommodate many of the excellent papers submitted this year. All accepted manuscripts were allocated 12 pages in these proceedings.

Every effort was made to maintain those traditional features of IPMI that have made this conference a unique and exciting experience since the inaugural meeting in 1969. Papers were presented in single-track sessions, followed by discussions that did not have time limits. Although unlimited discussion ruins carefully planned meal schedules, many participants welcome the rich, detailed descriptions of essential techniques that often emerge from the discussions. For that reason, IPMI is often viewed as a true workshop in contrast to the constrained schedules of most conferences.

The main focus at IPMI has always been to encourage the participation of new investigators, loosely described as students, postdocs, and junior faculty under 35 years of age who are presenting at IPMI for the first time. To broaden participation in the discussion, we continued the "discussion group" idea introduced by Chris Taylor and Alison Noble in 2003. Small groups of new investigators led by Scientific Committee members met before each session to discuss the papers to be presented and formulate questions and comments to be raised during the session. We were lucky to have Carl Jaffe from the National Cancer Institute, to give a plenary talk on recent advances and open problems in cancer imaging research.

The setting and dress have always been casual, which promotes collegiality and an exchange of information unfettered by the usual formalities. This year the conference was held on the Spring Valley campus of the Colorado Mountain College, where attendees stayed together in the university housing. The causal approach helps organizers keep costs low, thus encouraging young investigator

participation. The tradition of carrying on discussion into the evening was continued. We provided bus service to downtown Glenwood Springs where attendees enjoyed the local bars, relaxed in the hot springs, and took strolls through the beautiful downtown area. On Wednesday afternoon, attendees bonded during a 13-mile bike ride along the scenic Colorado River, relaxed in the hot springs, or visited the ski resort town of Aspen. Later that evening, everyone enjoyed a pleasant dinner at the elegant Rivers restaurant, and those who wanted stayed late into the night on the porch overlooking the Roaring Fork River.

IPMI is a unique meeting for which we, the members of the IPMI board, and many other participants hold a true affection. While it was a great deal of work, we were delighted to be given the opportunity to organize this meeting and continue the IPMI tradition. We are looking forward to a more relaxed participation at IPMI 2007 in the Rolduc Abbey in The Netherlands!

July 2005

Gary E. Christensen
Milan Sonka

Acknowledgements

The nineteenth IPMI conference was made possible by the efforts of many hard-working individuals and generous organizations. First, the organizers wish to thank the Scientific Committee for their critical reviews that determined the content of the program. We appreciate their detailed and thoughtful comments considering they were asked to review an average of 12 full manuscripts in a little more than 3 weeks' time. We also extend our gratitude to all authors who submitted papers to the conference and our regrets to those we turned down. We are grateful to the members of the Paper Selection Committee who shared with us the difficult task of assimilating the referees' comments and choosing the papers to include in the conference. We greatly appreciate the help, guidance and insights provided by Chris Taylor from his experience with planning the previous IPMI conference.

We thank David Risely for his support of the CAWS Web-based conference administration system that greatly simplified many of the organizational tasks associated with this conference. We gratefully acknowledge the assistance of the Conference and Event Services staff at the Colorado Mountain College, particularly Mary Lehrman and Stephanie Owston who helped coordinate the on-site conference logistics. We would like to thank Kim Sherwood for general administrative support including communication with authors and attendees. We thank Xiujuan Geng, Mona Haeker and Dinesh Kumar for taking time from their research to compile the proceedings.

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The Whitaker Foundation
The National Institute of Biomedical Imaging and Bioengineering
The Obermann Center for Advanced Studies, The University of Iowa
Department of Electrical Engineering, The University of Iowa
College of Engineering, The University of Iowa

Francois Erbsmann Prize Winners

1987 (Utrecht, The Netherlands): **John M. Gauch**, University of North Carolina, Chapel Hill, NC, USA
J.M. Gauch, W.R. Oliver, S.M. Pizer: Multiresolution shape descriptions and their applications in medical imaging

1989 (Berkeley, CA, USA): **Arthur F. Gmitro**, University of Arizona, Tucson, AZ, USA
A.F. Gmitro, V. Tresp, V. Chen, Y. Snell, G.R. Gindi: Video-rate reconstruction of CT and MR images

1991 (Wye, Kent, UK): **H. Isil Bozma**, Yale University, New Haven, CT, USA
H.I. Bozma, J.S. Duncan: Model-based recognition of multiple deformable objects using a game-theoretic framework

1993 (Flagstaff, AZ, USA): **Jeffrey A. Fessler**, University of Michigan, Ann Arbor, MI, USA
J.A. Fessler: Tomographic reconstruction using information-weighted spline smoothing

1995 (Brest, France): **Maurits K. Konings**, University Hospital, Utrecht, The Netherlands
M.K. Konings, W.P.T.M. Mali, M.A. Viergever: Design of a robust strategy to measure intravascular electrical impedance

1997 (Poultney, VT, USA): **David Atkinson**, Guy's Hospital, London, UK
D. Atkinson, D.L.G. Hill, P.N.R. Stoyle, P.E. Summers, S.F. Keevil: An autofocus algorithm for the automatic correction of motion artifacts in MR images

1999 (Visegrad, Hungary): **Liana M. Lorigo**, Massachusetts Institute of Technology, Cambridge, MA, USA
L.M. Lorigo, O. Faugeras, W.E.L. Grimson, R. Keriven, R. Kikinis, C.-F. Westin: Co-dimension 2 geodesic active contours for MRA segmentation

2001 (Davis, CA, USA): **Viktor K. Jirsa**, Florida Atlantic University, FL, USA
V.K. Jirsa, K.J. Jantzen, A. Fuchs, J.A. Scott Kelso: Neural field dynamics on the folded three-dimensional cortical sheet and its forward EEG and MEG

2003 (Ambleside, UK): **Guillaume Marrelec**, INSERM, France.
G. Marrelec, P. Ciuciu, M. Pélégrini-Issac, H. Benali: Estimation of the hemodyamic response function in event-related functional MRI: directed acyclic graphs for a general Bayesian inference framework

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