Michael F. Insana
Richard M. Leahy (Eds.)

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Information Processing in Medical Imaging

17th International Conference, IPMI 2001
Davis, CA, USA, June 2001
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Preface

The 17th biennial International Conference/Workshop on Information Processing in Medical Imaging (IPMI) was held June 18–22, 2001, on the campus of the University of California, Davis. Following the successful meeting in beautiful Visegrád, Hungary, this year's conference summarized important developments in a broad range of topics regarding the acquisition, analysis, and application of information from medical images.

Seventy-eight full manuscripts were submitted to the conference; of these, twenty-two were accepted as oral presentations in six sessions of three or four papers each. Thirty-two excellent submissions that could not be accommodated as oral presentations were presented as posters. Manuscripts from oral presentations were limited to 14 pages, whereas those from poster presentations were limited to 7 pages.

Every effort was made to maintain those traditional features of IPMI that have made this conference a unique and exciting experience since the first in 1969. First, papers are presented in single-track sessions, followed by discussion that is unbounded with respect to the schedule. 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 workshop in contrast to the constrained schedules of most conferences.

Second, the focus at IPMI has been to encourage the participation of young investigators, loosely described as students, postdocs, and junior faculty under 35 years of age who are presenting at IPMI for the first time. Looking back to our first encounters at IPMI in the 1980's, we co-chairs remember the challenge and thrill of having our senior colleagues probe deeply into the science and engineering that authors spent so much time advancing and refining. Truly, this format nurtures new talent in a way that encourages the brightest investigators to engage and advance medical image science.

Third, the setting and dress has always been casual, which promotes collegiality and an exchange of information unfettered by the usual formalities. This year, the conference was held on the UC Davis campus, where attendees stayed together in the university housing. The causal approach helps organizers keep costs low, thus encouraging young investigator participation. Of course, the tradition of carrying on discussion into the evening over a beer, this year at Cantina del Cabo in Davis, was a pleasant experience for many. We also took Wednesday afternoon off to enjoy tours in the wine country of Northern California and dinner at the elegant Soga's restaurant.

We organizers also assumed the responsibility of looking forward by encouraging new topics, new authors, and new format elements. First, most sessions at this conference opened with a half-hour talk by a senior investigator who introduced the topics. With the diversity of topics, the depth of presentation, and a

large number of young investigators, the co-chairs thought it would be helpful to experiment with session introductions that provided a high-level review of the topic.

Second, we invited a plenary speaker, Sanjiv Gambhir from UCLA, to review the exciting advances in multimodality molecular imaging. Sam's interests involve the use of mutiple imaging techniques, including X-ray CT, autoradiography, optical-flourescence imaging, and PET, to explore biochemical and physiological processes in animals and humans. These exciting new techniques include the use of molecular probes, e.g., radiolabelled antisense oligonucleotides, for in vivo imaging of gene expression with PET. The future of medical imaging will require those of us developing methodologies to extend our systems and techniques to include the molecular nanoscale, a formidable challenge indeed.

Third, we were happy and surprised by many outstanding submissions in the areas of image quality assessment, molecular and diffusion tensor imaging, and fMRI/EEG/MEG approaches. These three of six session topics reflect the organizers' and program committee's desire to extend the topics of IPMI beyond its traditional strengths in image analysis and computer vision, while maintaining an emphasis on mathematical approaches. These changes are experimental and may not survive to become part of the IPMI tradition. Nevertheless, we hope the attendees view these experiments as reflections of the sense of adventure that characterizes IPMI's approach to imaging research.

At the time of year we are writing this preface, threats of rolling blackouts loom ominously throughout our state during the summer months. Perhaps the conference staff should be looking into bicycle powered generators to run the LCD projectors and air conditioners. Instead we have limited our preparation to hoping that California can transcend third-world status before June, while we eagerly await the scientific program and hope it can approach the exciting, enriching experiences provided to us by our conference co-chair predecessors.

March 2001

Michael F. Insana
Richard M. Leahy

Acknowledgements

The XVIIth IPMI conference was made possible by the efforts of many hard-working individuals and generous organizations. First, the organizers wish to thank the Scientific Program Committee for their critical reviews that determined the content of the program. Considering they were asked to review an average of 10 full manuscripts in December near the holidays, their efforts were truly heroic. We also extend our gratitude to all authors who submitted papers to the conference, and our regrets to those we turned down, often because of time constraints.

We gratefully acknowledge the assistance of the Conference and Event Services staff at UC Davis, particularly Teresa Brown who coordinated most aspects of conference logistics. Michael Insana wishes to thank Terry Griffin at UCD who helped organize communications with authors and attendees. Richard Leahy expresses his gratitude to David Shattuck, Karim Jerbi, and Evren Asma at USC for taking time from their research to provide expert assistance in compiling and checking the proceedings.

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JM Gauch, WR Oliver, SM Pizer: Multiresolution shape descriptions and their applications in medical imaging.

1989 11th IPMI, Berkeley, CA, USA
Arthur F. Gmitro, Dept. of Radiology, University of Arizona, Tucson, AZ, USA
AF Gmitro, V Tresp, V Chen, Y Snell, GR Gindi: Video-rate reconstruction of CT and MR images.

1991 12th IPMI, Wye (Kent), UK
H. Isil Bozma, Dept. of Electrical Engineering, Yale University, New Haven, CT, USA
HI Bozma, JS Duncan: Model-based recognition of multiple deformable objects using a game-theoretic framework.

1993 13th IPMI, Flagstaff, AZ, USA
Jeffrey A. Fessler, Division of Nuclear Medicine, University of Michigan, Ann Arbor, MI, USA
JA Fessler: Tomographic reconstruction using information-weighted spline smoothing.

1995 14th IPMI, Brest, France
Maurits K. Konings, Dept. of Radiology and Nuclear Medicine, University Hospital Utrecht, The Netherlands
MK Konings, WPTM Mali, MA Viergever: Design of a robust strategy to measure intravascular electrical impedance.

1997 15th IPMI, Poultney, VT, USA
David Atkinson, UMDS, Radiological Sciences, Guy's Hospital, London, UK
D Atkinson, DLG Hill, PNR Stoyle, PE Summers, SF Keevil: An autofocus algorithm for the automatic correction of motion artifacts in MR images.

1999 16th IPMI, Visegrád, Hungary
Liana M. Lorigo, Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge MA, USA
LM Lorigo, O Faugeras, WEL Grimson, R Keriven, R Kikinis, C-F Westin: Co-dimension 2 geodesic active contours for MRA segmentation.

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