Preface

This is the second MICCAI – the flagship international conference for medical image computing and computer-assisted intervention. MICCAI was created by merging three closely related and thriving conference series – VBC (Visualisation in Biomedical Computing), MRCAS (Medical Robotics and Computer Assisted Surgery) and CVRMed (Computer Vision, Virtual Reality and Robotics in Medicine) – to provide a single focus for the presentation of high-quality research in this important multi-disciplinary area. The first MICCAI was held in Boston, USA in October 1998. It attracted a large number of excellent submissions and was extremely well attended. The meeting went a long way towards meeting its ambitious objectives of bringing together the best theoretical and applied work in this rapidly emerging field, and encouraging constructive dialogue between computer scientists and clinicians.

We are delighted to report a similar level of interest in MICCAI 99. A total of 213 full-length papers were submitted, covering a broad range of topics. Of these 133 were accepted for inclusion in the conference – 49 as oral presentations and 84 as posters. All the selected papers appear in these proceedings. Each paper was reviewed by four members of the Scientific Review Committee, selected for scientific or clinical expertise of relevance to the subject matter. Final decisions were made by the Programme Committee, following closely the advice of the reviewers. We are indebted to the members of the Scientific Review Committee for the time they devoted to the review process and for their well-informed and generally detailed feedback to authors.

The result is another volume of high-quality papers that we hope will contribute to the development of this important and exciting area. We are also indebted to the dedicated team of staff and students at Manchester who helped to put together the proceedings, particularly Angela Castledine, Alan Brett, Mike Rodgers, Danny Allen, Christine Beeston, Karen Davies, Tony Lacey, and Chris Wolstenholme. We are very pleased to welcome delegates to Cambridge and hope that you will find MICCAI an enjoyable and stimulating experience. For readers unable to attend the conference, we hope that you will find this a valuable record of the scientific programme, and look forwards meeting you at MICCAI 2000, which will be held in Pittsburgh, USA.

September 1999

Chris Taylor and Alan Colchester
Proceedings Editors
MICCAI99
Conference Organising Committee

Second International Conference on Medical Image Computing and Computer-Assisted Intervention
Cambridge, England
September 19–22, 1999

General Chair

Alan Colchester
University of Kent at Canterbury and Guy’s Hospital, London, UK

Co-chairs

Mike Brady
University of Oxford, UK
Jun-Ichiro Toriwaki
University of Nagoya, Japan

Programme Chair

Chris Taylor (Chair)
University of Manchester, UK

Programme Committee

Nicholas Ayache
INRIA Sophia Antipolis, France
Richard D Bucholz
St Louis University School of Medicine, USA
Brian Davies
Imperial College, UK
Tony DiGioia
Shadyside Hospital, Pittsburgh, USA
James Scott Duncan
Yale University, USA
Guido Gerig
University of North Carolina, USA
David Hawkes
Guy’s Hospital, UK
Max A Viergever
Utrecht University, Netherlands

Clinical Advisory Committee Chair

Tony DiGioia
Shadyside Hospital, Pittsburgh, USA

Tutorials

Guido Gerig
University of North Carolina, USA
Industrial Liaison

Nicholas Ayache  INRIA Sophia Antipolis, France
Mike Brady  University of Oxford, UK
Bart ter Haar Romeny  University of Utrecht, Netherlands
Jocelyne Troccaz  University of Grenoble, France
Nigel John (coordinator)  University of Manchester, UK

Local Organising Committee

Richard Prager  University of Cambridge, UK
Andrew Gee  University of Cambridge, UK

Scientific Review Committee

James Anderson  Johns Hopkins School of Medicine, USA
Takehide Asano  Chiba University School of Medicine, Japan
Gerard A Ateshian  Columbia University, USA
Nicholas Ayache  INRIA Sophia Antipolis, France
Isabelle Bloch  Ecole Nationale Superieure des Telecommunications, France
Fred Bookstein  University of Michigan, USA
Mike Brady  University of Oxford, UK
Richard D Bucholz  St Louis University School of Medicine, USA
Steve Charles  University of Tennessee, USA
Philippe Cinquin  Institut Albert Bonniot, France
Ela Claridge  University of Birmingham, UK
Court Cutting  New York University, USA
Paolo Dario  ARTS Lab, Italy
Brian Davies  Imperial College, UK
Scott Delp  Stanford University, USA
Tony DiGioia  Shadyside Hospital, Pittsburgh, USA
Takeyoshi Dohi  University of Tokyo, Japan
James Scott Duncan  Yale University, USA
Norberto Ezquerra  Universidad Politecnica de Catalunya, Spain
Elliot Fishman  The Johns Hopkins Hospital, USA
J Michael Fitzpatrick  Vanderbilt University, USA
Henry Fuchs  University of North Carolina, USA
Toshio Fukuda  Nagoya University, Japan
Guido Gerig  University of North Carolina, USA
Sarah Gibson  Mitsubishi Electric Research Lab, USA
Eric L Grimson  MIT AI Lab, USA
Blake Hannaford  University of Washington, USA
Dave Hawkes  Guy’s Hospital, UK
Derek Hill  Guy’s Hospital, UK
<table>
<thead>
<tr>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Karl Heinz Hohne</td>
<td>University Hospital Eppendorf, Germany</td>
</tr>
<tr>
<td>Koji Ikuta</td>
<td>Nagoya University, Japan</td>
</tr>
<tr>
<td>Branislav Jaramaz</td>
<td>UPMC Shadyside, USA</td>
</tr>
<tr>
<td>Chris Johnson</td>
<td>University of Utah, USA</td>
</tr>
<tr>
<td>Ferenc Jolesz</td>
<td>Brigham and Women’s Hospital, USA</td>
</tr>
<tr>
<td>Leo Joskowicz</td>
<td>Hebrew University of Jerusalem, Israel</td>
</tr>
<tr>
<td>Takeo Kanade</td>
<td>Carnegie Mellon University, USA</td>
</tr>
<tr>
<td>Lou Kavoussi</td>
<td>Brady Urological Institute, USA</td>
</tr>
<tr>
<td>Peter Kazanzides</td>
<td>Integrated Surgical Systems, USA</td>
</tr>
<tr>
<td>Ron Kikinis</td>
<td>Brigham and Women’s Hospital, USA</td>
</tr>
<tr>
<td>Andres Kriete</td>
<td>University Clinic Giessen, Germany</td>
</tr>
<tr>
<td>Stephane Lavallee</td>
<td>PRAXIM, France</td>
</tr>
<tr>
<td>Heinz Lemke</td>
<td>Technical University Berlin, Germany</td>
</tr>
<tr>
<td>Robert J Maciunas</td>
<td>University of Rochester Medical Center, USA</td>
</tr>
<tr>
<td>Gregoire Malandain</td>
<td>INRIA, France</td>
</tr>
<tr>
<td>Jean-Francois Mangin</td>
<td>Service Hospitalier Frederic Joliot, France</td>
</tr>
<tr>
<td>Maurilio Marcacci</td>
<td>Laboratorio di Biomeccanica, Italy</td>
</tr>
<tr>
<td>Dwight Meglan</td>
<td>Mitsubishi Electric, USA</td>
</tr>
<tr>
<td>Dimitris Metaxas</td>
<td>University of Pennsylvania, USA</td>
</tr>
<tr>
<td>Chuck Meyer</td>
<td>University of Michigan, USA</td>
</tr>
<tr>
<td>Brent D Mittelstadt</td>
<td>Integrated Surgical Systems, USA</td>
</tr>
<tr>
<td>Heinrich Muller</td>
<td>Universitat Dortmund, Germany</td>
</tr>
<tr>
<td>Alison Noble</td>
<td>University of Oxford, UK</td>
</tr>
<tr>
<td>Lutz-P Nolte</td>
<td>M.E. Muller Institute, Switzerland</td>
</tr>
<tr>
<td>Wieslaw Nowinski</td>
<td>Kent Ridge Digital Labs, Singapore</td>
</tr>
<tr>
<td>Michael Peshkin</td>
<td>Northwestern University, USA</td>
</tr>
<tr>
<td>Stephen Pizer</td>
<td>University of North Carolina, USA</td>
</tr>
<tr>
<td>Rob Playter</td>
<td>Boston Dynamics Inc (BDI), USA</td>
</tr>
<tr>
<td>Jerry L Prince</td>
<td>Johns Hopkins University, USA</td>
</tr>
<tr>
<td>Klaus Radermacher</td>
<td>Helmholtz-Institute f. Biomedizinische Technik, Germany</td>
</tr>
<tr>
<td>Richard Robb</td>
<td>Mayo Clinic, USA</td>
</tr>
<tr>
<td>Jean-Marie Rocchisani</td>
<td>Hopital Avicenne, France</td>
</tr>
<tr>
<td>Joseph Rosen</td>
<td>Dartmouth-Hitchcock Medical Centre, USA</td>
</tr>
<tr>
<td>Ichiro Sakuma</td>
<td>University of Tokyo, Japan</td>
</tr>
<tr>
<td>Tim Salcudean</td>
<td>University of British Columbia, Canada</td>
</tr>
<tr>
<td>Kenneth Salisbury</td>
<td>Intuitive Surgical, Inc, USA</td>
</tr>
<tr>
<td>Rick Satava</td>
<td>Yale Laproendoscopic Surgery Center, USA</td>
</tr>
<tr>
<td>Achim Schweikard</td>
<td>TU Munchen, Germany</td>
</tr>
<tr>
<td>H Siegfried Stiehl</td>
<td>University of Hamburg, Germany</td>
</tr>
<tr>
<td>Paul Suetens</td>
<td>KU Leuven, Belgium</td>
</tr>
<tr>
<td>Gabor Szekely</td>
<td>Swiss Federal Institute of Technology, Switzerland</td>
</tr>
<tr>
<td>Mark A Talamini</td>
<td>Johns Hopkins University, USA</td>
</tr>
<tr>
<td>Russ Taylor</td>
<td>John Hopkins University, USA</td>
</tr>
<tr>
<td>Frank Tendick</td>
<td>University of California San Francisco, USA</td>
</tr>
<tr>
<td>Demetri Terzopoulos</td>
<td>University of Toronto, Canada</td>
</tr>
</tbody>
</table>
Jean-Philippe Thirion  FOCUS Imaging, France
Andrew Todd-Pokropek  University College London, UK
Jun-Ichiro Toriwaki  Nagoya University, Japan
Jocelyne Troccaz  Laboratoire TIMC, France
Jay Udupa  University of Pennsylvania, USA
Dirk Vandermeulen  University Hospital Gasthuisberg, Belgium
Michael Vannier  University of Iowa, USA
Baba Vemuri  University of Florida, USA
Max A Viergever  Utrecht University, Netherlands
Simon Warfield  Brigham & Womens Hospital, USA
William Wells  Massachusetts Institute of Technology, USA
Tian-ge Zhuang  Shanghai Jiao Tong University, China
James Zinreich  The Johns Hopkins Hospital, USA
MICCAI Conference Series

MICCAI Board

Nicholas Ayache  INRIA Sofia Antipolis, France
Alan Colchester  University of Kent at Canterbury & Guy’s Hospital, London, UK
Toni Digioia  Shadyside Hospital, Pittsburgh, USA
Takeyoshi Dohi  University of Tokyo, Japan
Jim Duncan  Yale University, USA
Eric Grimson  MIT Artificial Intelligence Laboratory, USA
Karl-Heinz Höhne  University of Hamburg, Germany
Ron Kikinis  Brigham and Women’s Hospital, Boston, USA
Steve Pizer  University of North Carolina, USA
Richard Robb  Mayo Clinic, USA
Russ Taylor  Johns Hopkins Hospital, Baltimore, USA
Jocelyne Troccaz  University of Grenoble, France
Taylor, C.; Colchester, A. (Eds.)
1999, XLII, 1242 p. 657 illus., 54 illus. in color. In 2 volumes, not available separately., Softcover
ISBN: 978-3-540-66503-8