

# Preface

In the four years of its existence, MICCAI has developed into the premier annual conference on medical image computing and computer-assisted intervention. The single-track conference has an interdisciplinary character, bringing together researchers from both the natural sciences and various medical disciplines. It provides the international forum for developments concerning all aspects of medical image processing and visualization, image-guided and computer-aided techniques, and robot technology in medicine.

The strong interest in MICCAI is confirmed by the large number of submissions we received this year, which by far surpassed our expectations. The arrival of the shipload of papers just before the deadlines (one in the European and the other in the American time zone) was a particularly enjoyable experience, as was the whole procedure of preparing the scientific programme. Both the quantity and quality of the submissions allowed us to compose a volume of high quality papers, which we are sure will contribute to the further development of this exciting field of research.

As for the hard numbers, in total 338 submissions were received. Next to full papers, short communications were solicited for works in progress, hardware prototypes, and clinical case studies. Long papers were reviewed by three or four reviewers and short papers by two or three reviewers. The final selection of papers was carried out by the Programme Board. Out of the 246 long papers, 36 were accepted for oral presentation and 100 as full posters. An additional 75 of the long papers, and 47 out of 92 short papers were accepted as short posters. We are indebted to the the Scientific Review Committee and the Programme Board for their timely and high-quality reviews. The entire review procedure was carried out electronically. We are very grateful for the dedicated work performed by Shirley Baert and Josien Pluim in setting up and maintaining the web based review system, which made our task substantially easier.

We are very pleased to welcome delegates attending MICCAI 2001 in Utrecht. It is a small and friendly city with a beautiful centre and nice atmosphere, even if it rains (which it usually does in October). We hope that the conference proves to be both scientifically and socially an enjoyable and stimulating experience. For researchers who are unable to attend, we hope that the proceedings provide a valuable record of the scientific programme and we look forward to meeting you at the next MICCAI, which will be held in Tokyo, Japan, in 2002.

# Conference Organizing Committee

Fourth International Conference on  
Medical Image Computing and Computer-Assisted Intervention  
Utrecht, The Netherlands  
14-17 October 2001

## General Chair

Max A. Viergever                      University Medical Center Utrecht,  
The Netherlands

## Co-chairs

Takeyoshi Dohi                      University of Tokyo, Japan  
Michael W. Vannier                  University of Iowa, USA

## Programme Chair

Wiro J. Niessen                      University Medical Center Utrecht,  
The Netherlands

## Programme Board

Nicholas Ayache	INRIA, Sophia Antipolis, France
James S. Duncan	Yale University, New Haven, USA
David J. Hawkes	King's College London, UK
Ron Kikinis	Harvard Medical School, Boston, USA
J. B. Antoine Maintz (tutorials)	Utrecht University, The Netherlands
Lutz.-P. Nolte	University of Bern, Switzerland
Kenneth Salisbury	Stanford University, USA
Jun-Ichiro Toriwaki	University of Nagoya, Japan
Dirk Vandermeulen	Catholic University Leuven, Belgium

## **Conference Managers**

Sandra Boeijink  
Caroline Hop

University Medical Center Utrecht,  
The Netherlands

## **Local Organizing Committee**

Margo Agterberg  
Shirley Baert  
Gerard van Hoorn  
Marjan Marinissen  
Josien Pluim  
Luuk Spreuwewers  
Koen Vincken  
Theo van Walsum

University Medical Center Utrecht,  
The Netherlands

## Scientific Review Committee

John Adler	Stanford University Medical Center, USA
Amir Amini	Washington University, St. Louis, USA
Ludwig Auer	ISM, Salzburg, Austria
Shirley Baert	University Medical Center Utrecht, The Netherlands
Christian Barillot	IRISA, Rennes, France
Jan Blankensteijn	University Medical Center Utrecht, The Netherlands
Leendert Blankevoort	Academic Medical Center Amsterdam, The Netherlands
Michael Brady	University of Oxford, UK
Michael Braun	University of Technology, Sydney, Australia
Ivo Broeders	University Medical Center Utrecht, The Netherlands
Elizabeth Bullitt	University of North Carolina, Chapel Hill, USA
Aurelio Campilho	University of Porto, Portugal
Philippe Cinquin	University of Grenoble, France
Kevin Cleary	Georgetown University Medical Center Washington DC, USA
Jean Louis Coatrieux	INSERM, Rennes, France
Alan Colchester	University of Kent at Canterbury, UK
Louis Collins	Montreal Neurological Institute, Canada
Christos Davatzikos	Johns Hopkins University, Baltimore, USA
Brian Davies	Imperial College, London, UK
Takeyoshi Dohi	University of Tokyo, Japan
Kunio Doi	University of Chicago, USA
Norberto Ezquerra	Georgia Institute of Technology, Atlanta, USA
Aaron Fenster	J.P. Robarts Research Institute, London, Canada
Michael Fitzpatrick	Vanderbilt University, Nashville, USA
Robert Galloway	Vanderbilt University, Nashville, USA
James Gee	University of Pennsylvania, Philadelphia, USA
Guido Gerig	University of North Carolina, Chapel Hill, USA
Frans Gerritsen	Philips Medical Systems, Best, The Netherlands
Maryellen Giger	University of Chicago, USA
Michael Goris	Stanford University Medical Center, USA
Eric Grimson	Massachusetts Institute of Technology, Cambridge, USA
Alok Gupta	Siemens Corporate Research, Princeton, USA
Marco Gutierrez	University of Sao Paulo, Brasil
Pierre Hellier	INRIA, Rennes, France
Marcel van Herk	The Netherlands Cancer Institute, The Netherlands

Derek Hill	King's College London, UK
Karl Heinz Höhne	University of Hamburg, Germany
Xoji Ikuta	Nagoya University, Japan
Branislav Jaramaz	UPMC Shadyside Hospital, Pittsburgh, USA
Ferenc Jolesz	Harvard Medical School, Boston, USA
Leo Joskowicz	Hebrew University of Jerusalem, Israel
Nico Karssemeijer	University Hospital Nijmegen, The Netherlands
Christoph Kaufmann	National Capital Area Medical Simulation Center, Bethesda, USA
Erwin Keeve	Research Center Caesar, Bonn, Germany
Burt Klos	Catharina Hospital, Eindhoven, The Netherlands
Stephane Lavallée	PRAXIM, La Tronche, France
Boudewijn Lelieveldt	Leiden University Medical Center, The Netherlands
Heinz Lemke	Technical University Berlin, Germany
Murray Loew	George Washington University, Washington DC, USA
Anthony Maeder	Queensland University of Technology, Brisbane, Australia
Isabelle Magnin	INSA de Lyon CREATIS, France
Sherif Makram-Ebeid	Philips Research PRF, Paris, France
Armando Manduca	Mayo Clinic, Rochester, USA
Jean-Francois Mangin	Service Hospitalier Frederic Joliot, Orsay, France
Calvin Maurer Jr.	Stanford University, USA
Tim McInerney	Ryerson University, Toronto, Canada
Chuck Meyer	University of Michigan, Ann Arbor, USA
Michael Miga	Vanderbilt University, Nashville, USA
Ralph Mösges	University of Cologne, Germany
Sandy Napel	Stanford University, USA
Mads Nielsen	IT University of Copenhagen, Denmark
Robert Nishikawa	University of Chicago, USA
Allison Noble	University of Oxford, UK
Herke-Jan Noordmans	University Medical Center Utrecht, The Netherlands
Wieslaw Nowinski	Kent Ridge Digital Labs, Singapore
Silvia Olabarriaga	Federal University of Rio Grande do Sul, Brasil
Charles Pelizzari	University of Chicago, USA
Franjo Pernuš	University of Ljubljana, Slovenia
Terry Peters	University of Western Ontario, London, Canada
Stephen Pizer	University of North Carolina, Chapel Hill, USA

Josien Pluim	University Medical Center Utrecht, The Netherlands
Jerry Prince	Johns Hopkins University, Baltimore, USA
Petia Radeva	Autonomic University Barcelona, Spain
Hans Reiber	Leiden University Medical Center, The Netherlands
Richard Robb	Mayo Clinic, Rochester, USA
Christian Roux	ENST Bretagne-INSERM, Brest, France
Daniel Rueckert	Imperial College, London, UK
Tim Salcudean	University of British Colombia, Vancouver, Canada
Yoshinobu Sato	Osaka University, Japan
Wolfgang Schlegel	German Cancer Research Center, Heidelberg, Germany
Julia Schnabel	King's College London, UK
Achim Schweikard	Technical University München, Germany
Ramin Shahidi	Stanford University, USA
Pengcheng Shi	Hong Kong University of Science and Technology, Hong Kong
Milan Sonka	University of Iowa, USA
Luuk Spreeuwerts	University Medical Center Utrecht, The Netherlands
Larry Staib	Yale University, New Haven, USA
Paul van der Stelt	Academic Center for Dentistry Amsterdam, The Netherlands
Siegfried Stiehl	University of Hamburg, Germany
Paul Suetens	Catholic University Leuven, Belgium
Gabor Székely	Swiss Federal Institute of Technology, Zürich, Switzerland
Shinichi Tamura	Osaka University, Japan
Charles Taylor	Stanford University, USA
Chris Taylor	University of Manchester, UK
Russell Taylor	Johns Hopkins University, Baltimore, USA
Demetri Terzopoulos	New York University, USA
Jean-Philippe Thirion	HealthCenter Internet Services Europe, Valbonne, France
Jocelyne Troccaz	University of Grenoble, France
Jay Udupa	University of Pennsylvania, Philadelphia, USA
Michael Unser	Swiss Federal Institute of Technology, Lausanne, Switzerland
Michael Vannier	University of Iowa, USA
Baba Vemuri	University of Florida, USA

Frans Vos	Delft University of Technology, The Netherlands
Albert Vossepoel	Delft University of Technology, The Netherlands
Theo van Walsum	University Medical Center Utrecht, The Netherlands
Simon Warfield	Brigham and Women's Hospital, Boston, USA
Juergen Weese	Philips Hamburg, Germany
Harrie Weinans	University of Rotterdam, The Netherlands
Sandy Wells	Harvard Medical School, Boston, USA
Guang-Zhong Yang	Imperial College, London, UK
Alistair Young	University of Auckland, New Zealand
Alex Zijdenbos	Montreal Neurological Institute, Canada
Karel Zuiderveld	Vital Images, Plymouth, USA

## MICCAI Board

Nicholas Ayache	INRIA, Sophia Antipolis, France
Alan C. F. Colchester	University of Kent at Canterbury, UK
Anthony M. DiGioia	UPMC Shadyside Hospital, Pittsburgh, USA
Takeyoshi Dohi	University of Tokyo, Japan
James Duncan	Yale University, New Haven, USA
Karl Heinz Höhne	University of Hamburg, Germany
Ron Kikinis	Harvard Medical School, Boston, USA
Stephen M. Pizer	University of North Carolina, Chapel Hill, USA
Richard A. Robb	Mayo Clinic, Rochester, USA
Russell H. Taylor	Johns Hopkins University, Baltimore, USA
Jocelyne Troccaz	University of Grenoble, France
Max A. Viergever	University Medical Center Utrecht, The Netherlands