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# Medical Image Computing and Computer-Assisted Intervention – MICCAI 2006

9th International Conference  
Copenhagen, Denmark, October 1-6, 2006  
Proceedings, Part I

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# Preface

The 9th International Conference on Medical Image Computing and Computer Assisted Intervention, MICCAI 2006, was held in Copenhagen, Denmark at the Tivoli Concert Hall with satellite workshops and tutorials at the IT University of Copenhagen, October 1-6, 2006.

The conference has become the premier international conference with in-depth full length papers in the multidisciplinary fields of medical image computing, computer-assisted intervention, and medical robotics. The conference brings together clinicians, computer scientists, engineers, physicists, and other researchers and offers a forum for the exchange of ideas in a multidisciplinary setting.

MICCAI papers are of high standard and have a long lifetime. In this volume as well as in the latest journal issues of Medical Image Analysis and IEEE Transactions on Medical Imaging papers cite previous MICCAIs including the first MICCAI conference in Cambridge, Massachusetts, 1998. It is obvious that the community requires the MICCAI papers as archive material. Therefore the proceedings of MICCAI are from 2005 and henceforth being indexed by Medline.

A careful review and selection process was executed in order to secure the best possible program for the MICCAI 2006 conference. We received 578 scientific papers from which 39 papers were selected for the oral program and 193 papers for the poster program.

The papers were evaluated by 3 independent scientific reviewers. Reviewer affiliations were carefully checked against author affiliations to avoid conflicts of interest, and the review process was run as a double blind process. A special procedure was devised for papers from the universities of the organizers upholding a double blind review process also for these papers. A total of 98 % of the reviews we asked for were received.

The MICCAI program committee consisted of the local organizers, 2 internationally selected co-chairs, and 15 internationally selected area chairs, each a leading expert in his/her field. Each area chair was assigned 40 papers from which he/she formed a recommendation for the program committee based on the scientific reviews as well as their own assessment.

The entire program committee met in Copenhagen for 2 full days in May 2006. At this meeting all 578 papers and their corresponding reviews were printed and discussed. In a first round of discussions the area chairs were divided into 5 groups of 3. From their joint pool of 120 papers each group identified 12 potential oral papers, 28 poster papers, and 16 potential poster papers. In the second round the oral program was made from the resulting 60 potential oral papers. Oral papers were selected based on their quality, total coverage of MICCAI topics, and suitability for oral presentation. In parallel the remaining 80 potential poster papers were considered and 33 papers were accepted for poster presentations.

The entire procedure was designed such that the papers were selected by paper to paper comparison forcing the committee members to argue for the decision in each individual case.

We believe a careful and fair selection process has been carried out for MICCAI 2006. Each paper was examined by 3 reviewers, and further scrutinized by 3-8 program committee members. Our thanks go to the reviewers and area chairs for their hard work and enthusiasm, and to the two program co-chairs David Hawkes and Wiro Niessen for their dedication to putting together the program.

This year's MICCAI was augmented by more workshops than previously. Twelve independent workshops were held prior and subsequent to the conference. These workshops served as a forum for MICCAI subfields and made room for many more presentations due to their parallel programs. The workshops were organized for all scientific and most practical matters by the workshop chairs. We thank the workshop organizers for suggesting, arranging, and managing these excellent workshops. It is our hope that we will see multiple workshops also at future MICCAI conferences. Three tutorials were also provided by leading experts in their fields of research.

We thank the two keynote speakers Terry Jernigan, UCSD and Copenhagen University Hospital, Hvidovre, Denmark and Thomas Sinkjær, Director, Center for Sensory-Motor Interaction, Aalborg University, Denmark. A series of sponsors helped make the conference possible. For this they are thanked. Finally, we thank our 3 general co-chairs Anthony Maeder, Nobuhiko Hata, and Olaf Paulson, who provided insightful comments and invaluable support during the entire process of planning MICCAI 2006.

The greater Copenhagen region in Denmark and the Skåne region in Southern Sweden are connected by the Øresund Bridge. The region hosts 14 universities and a large concentration of pharmaceutical and biotech industry as well as 26 hospitals. This makes Copenhagen the capital of one of the most important life science centers in Europe.

It was our great pleasure to welcome delegates from all over the world to Denmark and the city of Copenhagen. It is our hope that delegates in addition to attending the conference took the opportunity to sample the many excellent cultural offerings of Copenhagen.

We look forward to welcoming you to MICCAI 2007 to be held October 29 - November 2 in Brisbane, Australia and chaired by Anthony Maeder.

# Organization

The university sponsors for MICCAI 2006 were the IT-University of Copenhagen, the Technical University of Denmark, and the University of Copenhagen.

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# Student Awards

Every year MICCAI awards outstanding work written and presented by students. Both oral and poster presentations are eligible for the awards, and the awards are presented to the winners in a public ceremony at the conference.

## MICCAI 2005 – Palm Springs

At MICCAI 2005 five prizes each valued at 500 USD sponsored by Northern Digital Incorporation (NDI) were awarded in the following categories

*Image segmentation and analysis:* Pingkun Yan, MRA Image Segmentation with Capillary Active Contour

*Image registration:* Ashraf Mohamed, Deformable Registration of Brain Tumor Images via a Statistical Model of Tumor Induced Deformation

*Computer assisted interventions and robotics:* Henry C. Lin, Automatic Detection and Segmentation of Robot Assisted Surgical Motions

*Simulation and visualization:* Peter Savadjiev, 3D Curve Inference for Diffusion MRI Regularization

*Clinical applications:* Srinivasan Rajagopalan, Schwarz Meets Schwann: Design and Fabrication of Biomorphic Tissue Engineering Scaffolds

## MICCAI 2004 – St. Malo

At MICCAI 2004 four prizes each valued at 600 Euros sponsored by Northern Digital Incorporation (NDI) were awarded in the following categories

*Image segmentation and processing:* Engin Dikici, Quantification of Delayed Enhancement MR Images

*Image registration and analysis:* Dimitrios Perperidis, Spatio-Temporal Free-Form Registration of Cardiac MR Image Sequences

*Image guided therapy and robotics:* Danail Stoyanov, Dense 3D Depth Recovery for Soft Tissue Deformation During Robotically Assisted Laparoscopic Surgery

*Image Simulation and Display:* Davide Valtorta, Dynamic Measurements of Soft Tissue Viscoelastic Properties with a Torsional Resonator Device

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