Computer Vision for Biomedical Image Applications: Current Techniques and Future Trends,
An International Conference on Computer Vision Workshop

October 21, 2005

8:00 am – 8:10am: Opening

8:10 am – 8:45 am: Invited Paper: *Computational Anatomy and Computational Physiology for Medical Image Analysis*;
Nicholas Ayache, INRIA, FRANCE

8:45 am – 9:20 am: Invited Paper: *Analyzing Anatomical Structures: Leveraging Multiple Sources of Knowledge;*
Eric Grimson and Polina Golland, MIT, USA

9:20 am – 10:00 am: Invited Paper: *Advances on Medical Imaging and Computing*;
Tianzi Jiang, Xiabo Li, Gaolong Gong, Meng Liang, Lixia Tian, Fuchun Li, Yong He, Yufeng Zang, Chaozhe Zhu, Shuyu Li, and Songyuan Tang;
Chinese Academy of Sciences, CHINA

10:00 am – 12:00 pm: Poster Session I

1. *3D Statistical Shape Models to embed spatial relationship information*;
   Jurgen Fripp, CSIRO ICT Centre and University of Queensland, AUSTRALIA
   Pierrick Bourgeat, CSIRO ICT Centre, AUSTRALIA
   Andrea J.U. Mewes, Harvard Medical School and Brigham and Women's Hospital, USA
   Simon K. Warfield, Harvard Medical School and Brigham and Women's Hospital, USA
   Stuart Crozier, University of Queensland, AUSTRALIA
   Sebastien Ourselin, CSIRO ICT Centre, AUSTRALIA

2. *A Generalized Level Set Formulation of the Mumford-Shah Functional with Shape Prior for Medical Image Segmentation*;
   Lishui Cheng, Shanghai Jiao Tong University, CHINA
   Xian Fan, Shanghai Jiao Tong University, CHINA
   Jie Yang, Shanghai Jiao Tong University, CHINA
   Yun Zhu, Yale University, USA, CHINA

3. A Hybrid Eulerian-Lagrangian Approach for Thickness, Correspondence, and Gridding of Annular Tissues;
   Kelvin R. Rocha, Georgia Institute of Technology, USA

Anthony J. Yezzi, Georgia Institute of Technology, USA
Jerry L. Prince, Johns Hopkins University, USA

4. *A Hybrid Framework for Image Segmentation Using Probabilistic Integration of Heterogeneous Constraints;*
   Rui Huang, Rutgers University, USA
   Vladimir Pavlovic, Rutgers University, USA
   Dimitris N. Metaxas, Rutgers University, USA

5. *A Learning Framework for the Automatic and Accurate Segmentation of Cardiac Tagged MRI Images*;
   Zhen Qian, Rutgers University, USA
   Dimitris N. Metaxas, Rutgers University, USA
   Leon Axel, New York University, USA

6. *A Local Adaptive Algorithm for Microaneurysms Detection in Digital Fundus Images*;
   Ke Huang, Michigan State University, USA
   Michelle Yan, Siemens Corporate Research, USA

7. *A new coarse to fine framework for 3D brain MR image registration*;
   Terrence Chen, University of Illinois at Urbana-Champaign, USA
   Thomas S. Huang, University of Illinois at Urbana-Champaign, USA
   Wotao Yin, Columbia University, USA
   Xiang Sean Zhou, Siemens Corporate Research, USA

8. *A New Vision Approach for Local Spectrum Features in Cervical Images via 2D Method of Geometric Restrictionin Frequency Domain:*
   Viara Van Raad, STI Medical Systems, USA

9. *Active Contours Under Topology Control: Genus Preserving Level Sets*;
   Florent Segonne, MIT, USA
   Jean-Phillipe Pons, INRIA, FRANCE
   Eric Grimson, MIT, USA
   Bruce Fishl, MIT, USA

10. *A Novel Multifaceted Virtual Craniofacial Surgery Scheme using Computer Vision*;
    Ananda Chowdhury, Universitiy of Georgia, USA
    S. M. Bhandarkar, University of Georgia, USA
    E. W. Tollner, University of Georgia, USA
    G. Zhang, University of Georgia, USA

J.C. Yu, The Medical College of Georgia, USA
E. Ritter, The Medical College of Georgia, USA

11. *A Novel Unsupervised Segmentation Method for MR Brain Images Based on Fuzzy Methods*;
Xian Fan, Shanghai Jiao Tong University, CHINA
Jie Yang, Shanghai Jiao Tong University, CHINA
Yuanjie Zheng, Shanghai Jiao Tong University, CHINA
Lishui Cheng, Shanghai Jiao Tong University, CHINA
Yun Zhu, Yale University, USA

12. *A Pattern Classification Approach to Aorta Calcium Scoring in Radiographs*;
Marleen de Bruijne, IT University of Copenhagen, DENMARK

13. *A Topologically Faithful, Tissue-guided, Spatially Varying Meshing Strategy for Computing Patient-specific Head Models for Endoscopic Pituitary Surgery Simulation*;
M. A. Audette, AIST, JAPAN
H. Delingette, AIST, JAPAN
A. Fuchs, AIST, JAPAN
O. Astley, AIST, JAPAN
K. Chinzei AIST, JAPAN

14. *Applying Prior Knowledge in the Segmentation of 3D Complex Anatomic Structures*;
Hong Shen, Siemens Corporate Research, Inc, USA
Yonggang Shi, Boston University, USA
Zhigang Peng, University of Cincinnati, USA

15. *Automatic Extraction of Femur Contours from Hip X-ray Images*;
Ying Chen, National University of Singapore, SINGAPORE
Xianhe Ee, National University of Singapore, SINGAPORE
Wee Kheng Leow, National University of Singapore, SINGAPORE
Tet Sen Howe, Singapore General Hospital, SINGAPORE

16. *Automatic Landmarking of 2D Medical Shapes Using The Growing Neural Gas Network*;
Anastassia Angelopoulou, University of Westminster, ENGLAND
Alexandra Psarrou, University of Westminster, ENGLAND
Jose Garcia Rodriguez, Univerisidad de Alicante, SPAIN
Kenneth Revett, University of Westminster , ENGLAND

17. *Biomedical Image Classification with Random Subwindows and Decision Trees*;

Raphael Maree, Pierre Geurts, Justus Piater, and Louis Wehenkel of University of Liege, BELGIUM

18. *Combining Binary Classifers for Automatic Cartilage Segmentation in Knee MRI*;
    Jenny Folkesson, Ole Fogh Olsen, and Erik Dam, IT University of Copenhagen, DENMARK
    Claus Christiansen and Erik Dam, Center for Clinical and Basic Research, DENMARK

19. *Computer-Aided-Diagnosis (CAD) for Cervical Cancer Screening and Diagnosis: A New System Design in Medical Image Processing*;
    Wenjing Li, Viara Van Raad, Jia Gu, Ulf Hansson, Johan Hakansson, and Holger Lange of STI Medical Systemes, Honolulu, HI, USA
    Daron Ferris, Medical College of Georgia, USA

20. *Constrained Surface Evolutions for Prostate and Bladder Segmentation in CT Images*;
    Mikael Rousson, Ali Khamene, Mamadou Diallo and Frank Sauer, Siemens Corporate Research, USA
    Juan Carlos Celi, Siemens Medical Solutions, USA

21. *Curvilinear structure based mammographic registration*;
    Lionel Wai and Michael Brady, University of Oxford, ENGLAND

22. *Deformable Registration for Generating Dissection Image of an Intestine from Annular Image Sequence*;
    Suchit Pongnumkul, Ryusuke Sagawa, Tomio Echigo and Yasusui Yagi, Osaka University, JAPAN

23. *Distance-Intensity for Image Registration*;
    Rui Gan and Albert C. S. Chung, The Hong Kong University of Science and Technology, HONG KONG

24. *Efficient Population Registration of 3D Data*;
    Lilla Zollei, Eric Grimson and William Wells, Massachusetts Institute of Technology, USA
    Erik Learned-Miller, University of Massachusetts, USA
    William Wells, Brigham and Women's Hospital, USA

25. *Efficient Symbolic Signatures for Classifying Crainiosynostosis Skull Deformities*;

Jill Lin, Salvador Ruiz-Correa, Raymond W. Sze, Michael L. Cunningham, Matthew L. Speltz and Linda Shapiro, University of Washington, USA
Salvador Ruiz-Correa, Raymond W. Sze and Michael L. Cunningham, Children's Hospital and Regional Medical Center, Seattle, WA, USA

12:00 pm – 2:00 pm: Lunch

12:00 pm – 1:00 pm: Invited Speaker: *From AI (Artificial Intelligence) to IA (Interactive Analysis) in Medical Imaging/Analysis Applications – A new Industrial Perspective*;
Jian-Zhong Qian

2:00 pm – 4:00 pm: Poster Session II

1. *Elastic Interaction Models for Active Contours and Surfaces*;\
Albert C. S. Chung, Yang Xiang, Jian Ye, and W. K. Law, The Hong Kong University of Science and Technology, HONG KONG

2. *Estimating diameters of pulmonary nodules with competition-diffusion and robust ellipsoid fit*;
Toshiro Kubota, CAD, Siemens Medical Solutions, USA
Kazunori Okada, Siemens Corporate Research, USA

3. *Fast 3D Brain Segmentation Using Dual-Front Active Contours with Optional User-Interaction*;
Hua Li, Georgia Institute of Technology and Huazhong University of Science and Technology, USA and CHINA
Anthony Yezzi, Georgia Institute of Technology, USA
Laurent D. Cohen, University of Paris-Dauphine, FRANCE

4. *Improved Motion Correction of fMRI Time-Series Corrupted with Big Head Movement Using Extended Motion-Corrected Independent Component Analysis*;
Rui Laio, Siemens Corporate Research, Inc, USA
Martin McKeown, University of British Columbia, CANADA
Jeffrey Krolik, Duke University, USA

5. *Local or Global Minima: Flexible Dual-Front Active Contours*;
Hua Li, Georgia Institute of Tehnology and Huazhong University of Science and Technology, USA and CHINA
Anthony Yezzi, Georgia Institute of Technology, USA

6. *Locally Switching Between Cost Functions in Iterative Non-Rigid Registration*;

William Mullally, Margrit Betke Carissa Bellardine and Kenneth Lutchen,, Boston University, USA

7. *Multi-modal Image Registration by Quantitative-Qualitative Measure of Mutual Information*;
   Hongxia Luan and Feihu Qi, Shanghai Jiao Tong University, CHINA
   Dinggang Shen, University of Pennsylvania, USA

8. *Multi-Scale Vessel Boundary Detection*;
   Huseyin Tek, Alper Ayvaci, and Dorin Comaniciu, Siemens Corporate Research, USA

9. *Non-rigid Registration for Colorectal Cancer MR Images*;
   Sarah Bond and J. Michael Brady, University of Oxford, ENGLAND

10. *Quantizing Calcification in the Lumbar Aorta on 2-D Lateral X-Ray Images*;
    Lars Conrad-Hansen, Marleen de Bruijne, Francois Lauze and Mads Nielson, IT University of Copenhagen, DENMARK
    Laszlo B. Tanko, Center for Clinical and Basic Research, Copenhagen, DENMARK

11. *Real-time Simulation of Deformable Soft Tissue Based on Mass-Spring and Medial Representation*;
    Shaoting Zhang, Lixu Gu, Pengfei Huang and Jianfeng Xu, Shanghai Jiotong University, CHINA

12. *Registration of 3D angiographic and X-ray images using Particle Filters*;
    Charles Florin, James Williams, and Ali Khamene, Siemens Corporate Research, USA
    Nikos Paragios, Ecole Nationale des Pontset Chaussees, FRANCE

13. *Registration of PET and MR hand volumes using Bayesian Networks*;
    Derek Magee, Steven Tanner and Alan P. Jeavons, University of Leeds, ENGLAND
    Michael Waller and Dennis McGonagle, Leeds Teaching Hospitals NHS Trust, ENGLAND

14. *Segmentation and Volume Representation Based on Spheres for Non-rigid Registration*;
    Jorge Rivera-Rovelo and Eduardo Jose Bayro Corrochano, Unidad Guadalajara, MEXICO

15. *Segmentation of 3D CT Volume Images Using a Single 2-D Atlas*;
    Ding Feng, Wee Kheng Leow and Shih-Chang Wang, National University of Singapore, SINGAPORE

16. *Segmenting Brain Tumors with Conditional Random Fields and Support Vector Machines*;
    Chi-Hoon Lee, Mark Schmidt, Joerg Sander and Russsell Greiner, University of Alberta, CANADA
    Albert Murtha and Aalo Bistritz, Cross Cancer Institute, Edmonton, CANADA

17. *Segmenting Cardiopulmonary Images using Manifold Learning with Level Sets*;
    Qilong Zhang and Robert Pless, Washington University, USA

18. *Shape Based Segmentation of Anatomical Structures in Magnetic Resonance Images*;
    Kilian M. Pohl, John Fisher and W. Eric L. Grimson, Massachusetts Institute of Technology, USA
    Ron Kikinis and William M. Wells, Harvard Medical School and Brigham and Women's Hospital, USA

19. *Simultaneous Segmentation and Motion Recovery in 3D Cardiac Image Analysis*;
    Zhuang Ling, CHINA

20. *Spatial and Temporal Analysis for OI Data Using CWT and tICA*;
    Yadong Liu, Guohua Zang, Lirong Yan, Ming Li, Zongtan Zhou and Dewen Hu, National University of Defense Technology, CHINA
    Fayi Liu, Xiangya, Medical College of Center South University
    Dewen Hu, Chinese Academy of Sciences, CHINA

21. *Stereo Matching and 3-D Reconstruction for Optic Disk Images*;
    Zhang Kai, CHINA

22. *Total Variation Based Iterative Image Reconstruction*;
    Guoqiang Yu, CHINA

23. *Voronoi-Based Segmentation on Manifolds*;
    Ray Jones and Polina Golland, Massachusetts Institute of Technology, USA
    Anne Carpenter, Whitehead Institute for Biomedical Research, USA

24. *Parcellating the Intra-Splenium Based on the Traced Fiber from Tractography*;
Gaolang Gong, Tianzi Jiang and Fuchun Lin, Institute of Automation Chinese Academy of Sciences, CHINA
Sheng Xie, Peking University First Hospital, CHINA

25. *Motion Compensation and Plane Tracking for Kinematic MR-Imaging*;
Daniel Bystrov, Vladimir Pekar, Kirsten Meetz, Heinrich Schulz, and Thomas Netsch, Philips Research, GERMANY

4:00 pm – 4:40 pm: Invited Speaker: *Tracking of Migrating and Proliferating Cells in Phase-Contrast Microscopy Imagery for Tissue Engineering*;
Takeo Kanade and Kang Li, Carnegie Mellon University, USA

4:40 pm – 5:20 pm: Invited Paper: *Cardiology meets image analysis: just an application or can image analysis usefully impact cardiology practice?*;
Alison Noble, University of Oxford, ENGLAND

5:20 pm – 6:00 pm: Invited Paper: *Computer Vision Algorithms for Retinal Image Analysis: Current Results and Future Directions*;
Charles V. Stewart, Rensselaer Polytechnic Institute, USA

6:00 pm: Closing