



Session 5

13:30-15:45 Third Oral Session

- › Determination of Pelvic Orientation from Ultrasound Images Using Patch-SSMs and a Hierarchical Speed of Sound Compensation Strategy

Steffen Schumann, Marc Puls, Timo Ecker, Tobias Schwaeegli, Jan Stifter, Klaus-A. Siebenrock, Guoyan Zheng

- › Ultrasound Servoing of Catheters for Beating Heart Valve Repair

Samuel Kesner, Shelten Yuen, Robert Howe

- › Towards a verified simulation model for radio-frequency ablations

Andreas Weihusen, Lisa Hinrichsen, Thomas Carus, Rainer Dammer, Richard Rascher-Friesenhausen, Tim Kroeger, Heinz-Otto Peitgen, Tobias Preusser

- › Early clinical evaluation of a computer assisted planning system for deep brain surgeries: 1 year of clinical assistance

Pierre-Francois D'Haese, Srivatsan Pallavaram, Rui Li, Todd Shanks, Peter Zahos, Joseph Neimat, Peter Konrad, Benoit Dawant

15:45-16:00 Coffee Break

16:00-17:00 Interactive Poster Session

IPCAI 2010

IPCAI 2010, the 1st International Conference on Information Processing in Computer-Assisted Interventions, will be held on June 23 in Geneva, Switzerland (co-located with CARS). Based on a highly selective double anonymous review process, IPCAI is aiming at organizing an event in which the best conference articles in computer assisted interventions are reviewed, selected, presented, and actively discussed.

Venue

IPCAI 2010 will be co-located with CARS 2010 at the University Medical Center in Geneva, Switzerland, one of the leading cities in health care.

Executive Committee

- › Nassir Navab, CAMP/TU Munich, Germany
- › Russell Taylor, JHU, USA
- › Kensaku Mori, Nagoya University, Japan
- › Pierre Jannin, INRIA/INSERM, Rennes, France and MNI-McGill, Montreal, Canada
- › Leo Joskowicz, Hebrew University, Israel
- › Dave Hawkes, UCL, UK

Organization

- › Martin Groher, CAMP/TU Munich, Germany
- › Martin Horn, CAMP/TU Munich, Germany
- › Marco Feuerstein, Nagoya University, Japan



IPCAI
Information Processing in Computer
Assisted Interventions

1st International Conference on
Information Processing in
Computer-Assisted
Interventions
Geneva, Switzerland, June 23



Program

8:30-8:35 **Opening statements**

Session 1

8:35-8:55 **First set of short 5 minutes presentations**

- › Visualization and Planning of Neurosurgical Interventions with Straight Access

Nikhil Navkar, Nikos Tsekos, Jason Stafford, Jeffrey Weinberg, Zhigang Deng

- › Active Multispectral Illumination and Image Fusion for Retinal Microsurgery

Raphael Sznitman, Seth Billings, Diego Rother, Daniel Mirotu, Yi Yang, Jim Handa, Peter Gehlbach, Jim Kang, Gregory Hager, Russell Taylor

- › An iterative framework for improving the accuracy of intraoperative intensity-based 2D/3D registration for image-guided orthopedic surgery

Yoshito Otake, Mehran Armand, Ofri Sadowsky, Robert Armiger, Peter Kazanzides, Russell Taylor

- › Automatic phases recognition in pituitary surgeries by microscope images classification

Florent Lalys, Laurent Riffaud, Xavier Morandi, Pierre Jannin

Session 2

8:55-10:05 **First Oral Session**

- › C-arm tracking by intensity-based registration of a fiducial

Pascal Fallavollita, Purang Abolmaesumi, Cliff Burdette, Danny Song, Gabor Fichtinger

- › First Animal Cadaver Study for Interlocking of Intramedullary Nails under Camera Augmented Mobile C-arm: A Surgical Workflow Based Preclinical Evaluation

Lejing Wang, Juergen Landes, Simon Weidert, Tobias Blum, Anna von der Heide, Ekkehard Euler, Nassir Navab

10:05-10:20 **Coffee Break**

Session 3

10:20-10:45 **Second set of short 5 minutes presentations**

- › Robot-Assisted Laparoscopic Ultrasound

Caitlin Schneider, Gregory Dachs, Christopher Hasser, Michael Choti, Simon DiMaio, Russell Taylor

- › New Kinematic Metric for Quantifying Surgical Skill For Flexible Instrument Manipulation

Jagadeesan Jayender, Raul San Jose Estepar, Kirby Vosburgh

- › GPU-Accelerated Robotic Intra-Operative Laparoscopic 3D Reconstruction

Markus Moll, Hsiao-Wei Tang, Luc Van Gool

- › A Minimally Invasive Multimodality Image-Guided (MIMIG) Molecular Imaging System for Peripheral Lung Cancer Intervention and Diagnosis

Tiancheng He, Zhong Xue, Kelvin K. Wong, Miguel Valdivia y Alvarado, Yong Zhang, Weixin Xie, Stephen T.C. Wong

- › Simulating Dynamic Ultrasound using MR-derived Motion Models to assess Respiratory Synchronisation for Image-Guided Liver Interventions

Erik-Jan Rijkhorst, Daniel Heanes, Freddy Odille, David Hawkes, Dean Barratt

Session 4

10:45-12:30 **Second Oral Session**

- › Rapid Image Registration of Three-dimensional Trans-esophageal Echocardiography and X-ray Fluoroscopy for the Guidance of Cardiac Interventions

Gang Gao, Graeme Penney, Nicolas Gogin, Pascal Cathier, Aruna Arujuna, Matt Wright, Dennis Caulfield, Aldo Rinaldi, Reza Rezavi, Kawal Rhode

- › Patient Specific Modeling and Analysis of the Mitral Valve using 3D-TEE

Phillippe Burlina, Chad Sprouse, Daniel DeMenthon, Anne Jorstad, Ray Juang, Francisco Contijoch, Theodore Abraham, David Yuh, Elliot McVeigh

- › Evaluation of a 4D Cone-Beam CT Reconstruction Approach using an Anthropomorphic Phantom

Ziv Yaniv, Jan Boese, Marily Sarmiento, Kevin Cleary

12:30-13:30 **Lunch**

IPCAI 2010

www.ipcai.org

IPCAI 2010, the 1st International Conference on Information Processing in Computer-Assisted Interventions is based on a highly selective anonymous review process. IPCAI aims at organizing an event in which the best conference articles in computer assisted interventions are reviewed, selected, presented, and actively discussed. It consists in long talks **with almost unlimited time for discussions with questions prepared by committee members** in a constructive and interactive friendly atmosphere. It is fully dedicated to Computer Assisted Interventions with different points of view: methodological and/or technical innovation, validation, clinical evaluation, system integration, and ergonomics. Papers will be published in LNCS Springer proceedings. More info at <http://www.ipcai.org>

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Visualization and Planning of Neurosurgical Interventions with Straight Access

Nikhil Navkar¹, Nikos Tsekos¹, Jason Stafford², Jeffrey Weinberg², Zhigang Deng¹

¹ *University of Houston, Houston, TX*

² *University of Texas, MD Anderson Cancer Center, Houston TX*

Active Multispectral Illumination and Image Fusion for Retinal Microsurgery

Raphael Sznitman¹, Seth Billings¹, Diego Rother¹, Daniel Mirotta¹, Yi Yang¹, Jim Handa², Peter Gehlbach², Jim Kang¹, Gregory Hager¹, Russell Taylor¹

¹ *Johns Hopkins University*

² *Johns Hopkins University, The Johns Hopkins University School of Medicine*

An iterative framework for improving the accuracy of intraoperative intensity-based 2D/3D registration for image-guided orthopedic surgery

Yoshito Otake¹, Mehran Armand¹, Ofri Sadowsky¹, Robert Armiger², Peter Kazanzides¹, Russell Taylor¹

¹ *The Johns Hopkins University*

² *The Johns Hopkins University Applied Physics Laboratory*

Automatic phases recognition in pituitary surgeries by microscope images classification

Florent Lalys¹, Laurent Riffaud², Xavier Morandi³, Pierre Jannin¹

¹ INSERM, U746, Faculty of Medicine CS 34317, F-35043 Rennes, France INRIA, VisAGeS Unit/Project, F-35042 Rennes, France University of Rennes I, CNRS, UMR 6074, IRISA, F-35042 Rennes, France

² Department of Neurosurgery, Pontchaillou University Hospital, F-35043 Rennes, France

³ INSERM, U746, Faculty of Medicine CS 34317, F-35043 Rennes, France INRIA, VisAGeS Unit/Project, F-35042 Rennes, France University of Rennes I, CNRS, UMR 6074, IRISA, F-35042 Rennes, France Department of Neurosurgery, Pontchaillou University Hospital, F-35043 Rennes, France

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C-arm tracking by intensity-based registration of a fiducial

Pascal Fallavollita¹, Purang Abolmaesumi², Cliff Burdette³, Danny Song⁴, Gabor Fichtinger¹

¹ Queen's University

² University of British Columbia

³ Acoustic MedSystems Inc.

⁴ John Hopkins Hospital

First Animal Cadaver Study for Interlocking of Intramedullary Nails under Camera Augmented Mobile C-arm: A Surgical Workflow Based Preclinical Evaluation

Lejing Wang¹, Juergen Landes², Simon Weidert², Tobias Blum¹, Anna von der Heide², Ekkehard Euler², Nassir Navab¹

¹ Chair for Computer Aided Medical Procedures (CAMP), TU Munich, Germany

² Trauma Surgery Department, Klinikum Innenstadt, LMU Munich, Germany

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Robot-Assisted Laparoscopic Ultrasound

Caitlin Schneider¹, Gregory Dachs², Christopher Hasser², Michael Choti¹, Simon DiMaio², Russell Taylor¹

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New Kinematic Metric for Quantifying Surgical Skill For Flexible Instrument Manipulation

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GPU-Accelerated Robotic Intra-Operative Laparoscopic 3D Reconstruction

Markus Moll¹, Hsiao-Wei Tang², Luc Van Gool³

¹ Katholieke Universiteit Leuven, ESAT-PSI/IBBT, Department of Electrical Engineering

² Katholieke Universiteit Leuven, PMA, Department of Mechanical Engineering

³ Katholieke Universiteit Leuven, ESAT-PSI/IBBT, Department of Electrical Engineering ETH Zurich, D-ITET/Computer Vision Laboratory

A Minimally Invasive Multimodality Image-Guided (MIMIG) Molecular Imaging System for Peripheral Lung Cancer Intervention and Diagnosis

Tiancheng He¹, Zhong Xue², Kelvin K. Wong², Miguel Valdivia y Alvarado², Yong Zhang², Weixin Xie³, Stephen T.C. Wong²

¹ *The Center for Bioengineering and Informatics, The Methodist Hospital Research Institute and Department of Radiology, The Methodist Hospital, Weil Cornell Medical College, Houston, Texas, USA. Intelligent Information Institute, Shenzhen University, Shenzhen, China.*

² *The Center for Bioengineering and Informatics, The Methodist Hospital Research Institute and Department of Radiology, The Methodist Hospital, Weil Cornell Medical College, Houston, Texas, USA.*

³ *Intelligent Information Institute, Shenzhen University, Shenzhen, China.*

Simulating Dynamic Ultrasound using MR-derived Motion Models to assess Respiratory Synchronisation for Image-Guided Liver Interventions

Erik-Jan Rijkhorst, Daniel Heanes, Freddy Odille, David Hawkes, Dean Barratt

Centre for Medical Image Computing, University College London

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Gang Gao¹, Graeme Penney¹, Nicolas Gogin², Pascal Cathier², Aruna Arujuna¹, Matt Wright¹, Dennis Caulfield³, Aldo Rinaldi³, Reza Rezavi¹, Kawal Rhode¹

¹ *King's College London*

² *Philips Research*

³ *Guys & St. Thomas NHS Trust*

Patient Specific Modeling and Analysis of the Mitral Valve using 3D-TEE

Philippe Burlina, Chad Sprouse, Daniel DeMenthon, Anne Jorstad, Ray Juang, Francisco Contijoch, Theodore Abraham, David Yuh, Elliot McVeigh

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Ziv Yaniv¹, Jan Boese², Marily Sarmiento², Kevin Cleary¹

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¹ *Inselspital, University of Bern*

² *Smith & Nephew Orthopaedics AG*

Ultrasound Servoing of Catheters for Beating Heart Valve Repair

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School of Engineering and Applied Sciences, Harvard University

Towards a verified simulation model for radiofrequency ablations

Andreas Weihusen¹, Lisa Hinrichsen², Thomas Carus³, Rainer Dammer², Richard Rascher-Friesenhausen^{1,2}, Tim Kroeger¹, Heinz-Otto Peitgen¹, Tobias Preusser¹

¹ *Fraunhofer MEVIS*

² *Bremerhaven University of Applied Sciences*

³ *Cuxhaven Hospital*

Early clinical evaluation of a computer assisted planning system for deep brain surgeries: 1 year of clinical assistance

Pierre-Francois D'Haese¹, Srivatsan Pallavaram¹, Rui Li¹, Todd Shanks², Peter Zahos³, Joseph Neimat⁴, Peter Konrad⁴, Benoit Dawant¹

¹ *Department of Electrical and Computer Engineering, Vanderbilt University*

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15:45-16:00 Coffee Break

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