



IPCAI 2019, June 18-19, Rennes, France

Program

Tuesday, June 18		Wednesday, June 19	
08:30	Opening for IPCAI 2019	8:00	Selected Oral Presentation I
08:40	Interventional Imaging		
09:20	Surgical Planning and Simulation; System and Software		
10:00	Coffee Break/Poster Session (II and SS)	10:00	Coffee Break/Poster Session (LA)
10:30	Tracking and Navigation	10:30	Selected Oral Presentation II
11:15	Augmented Reality, Advanced Intraoperative Visualization and User Interface		
12:00	Lunch and Poster Session (TN, AU, SDS, and RV)	12:30	Lunch and Poster Session
13:30	Surgical Data Science	1:30	Long Abstract Presentations
14:15	Interventional Robotics, Evaluation and Validation	14:30	Plenary Discussion
15:00	IPCAI Award I	15:00	IPCAI Award II and Closing
15:30	Coffee Break and Poster Session	15:30	Coffee Break and Poster Session

Tuesday, June 18

08:30	Opening for IPCAI 2019 Chairs: Raphael Sznitman, Kanako Harada, Elvis Chen
08:40	Short Presentation 1: Interventional Imaging Chair: Ilker Hacihaliloglu
II-1	Towards Intraoperative Use of Ambient Mass Spectrometry Imaging for Cardiac Tissue R. Ellis, D. Tomalty, A. Santilli, J. Rudan, M. Kaufmann, G. Bisleri Queen's University (Canada)
II-2	Learning Needle Tip Localization from Digital Subtraction in 2D Ultrasound C. Mwirize, J.L. Noshier, I. Hacihaliloglu Rutgers University (USA)
II-3	Catheter Localization in 3D Ultrasound Using Voxel-of-Interest-based ConvNets for Cardiac Intervention H. Yang, C. Shan, A.F. Kolen, P. H. N. de With Eindhoven University of Technology (Netherlands)
II-4	Uncertainty-aware Performance Assessment of Optical Imaging Modalities with Invertible Neural Networks T. Adler, L. Ardizzone, A. Vemuri, J. Groehl, T. Kirchner, L. Ayala, S. Wirkert, J. Kruse, C. Rother, U. Köthe, L. Mair-Hein DKFZ Heidelberg (Germany)
II-5	Implicit Domain Adaptation with Conditional Generative Adversarial Networks for Depth Prediction in Endoscopy A. Rau, P. Edwards, O. Ahmad, P. Riordan, M. Janatka, L. Lovat, D. Stoyanov University College London (UK)
II-6	Estimation of Tissue Oxygen Saturation based on Image to Image Translation Q. Li, J. Lin, N. Clancy, D. Elson Imperial College London (UK)

09:20	Short Presentation 2: Surgical Planning and Simulation, System and Software Chair: Caroline Essert
SS-1	Flexible and Comprehensive Patient-Specific Mitral Valve Silicone Models with Chordae Tendinae Made From 3D-Printable Molds S. Engelhardt, B. Preim, M. Karck, I. Wolf, R. De Simone, S. Sauerzapf University of Applied Sciences Mannheim (Germany)
SS-2	Towards an Automatic Preoperative Pipeline for Image-Guided Temporal Bone Surgery J. Fauser, I. Stenin, Markus Bauer, W.-H. Hsu, J. Kristin, T. Klenzner, J. Schipper, A. Mukhopadhyay TU Darmstadt (Germany)
SS-3	Dynamic, Patient-Specific Mitral Valve Modelling for Percutaneous Valve Repair Planning O. Ginty, J. Moore, P. Carnahan, M. Eskandari, M. Monaghan, T. Peters Robarts Research Institute (Canada)
SS-4	Automatic Biplane Left Ventricular Ejection Fraction Estimation with Mobile Point-of-care Ultrasound Using Multi-task Learning and Adversarial Training M. Jafari, H. Girgis, N. Van Woudenberg, Z. Liao, R. Rohling, K. Gin, P. Abolmaesumi, T. Tsang University of British Columbia (Canada)
SS-5	Prediction of Laparoscopic Procedure Duration Using Unlabeled, Multimodal Sensor Data S. Bodenstedt, M. Wagner, L. Mündermann, H. Kenngott, B. Müller-Stich, S. Torge Mees, J. Weitz, S. Speidel NCT Dresden (Germany)
10:00	Coffee Break

10:30	Short Presentation 3: Tracking and Navigation Chair: Stamatia Giannarou
TN-1	Limits of Electromagnetic Tracking for High Precision Interventions D. Kügler, H. Krumb, J. Bredemann, I. Stenin, J. Kristin, T. Klenzner, J. Schipper, R. Schmitt, G. Sakas, A. Mukhopadhyay Technische Universität Darmstadt (Germany)
TN-2	Flexible Needle and Patient Tracking using Fractional Scanning for Reduced Dose in Interventional CT Procedures G. Medan, L. Joskowicz Hebrew University of Jerusalem (Israel)
TN-3	Deformable Multi-Modal Registration for Navigation in Beating-Heart Cardiac Surgery J. Peoples, G. Bisleri, R. Ellis Queen's University (Canada)
TN-4	Immersive Virtual Reality Environment for Medicine L. Groves, P. Carnahan, D. Allen, T. Peters, E. Chen Robarts Research Institute (Canada)
TN-5	Learning Soft-Tissue Behavior of Organs for Surgical Navigation with Convolutional Neural Networks M. Pfeiffer, C. Riediger, J. Weitz, S. Speidel NCT Dresden (Germany)
TN-6	On the Feasibility of 3D/4D Ultrasound Transperineal Image-Guidance for Robotic Radical Prostatectomy P. Mathur, G. Samei, K. Tsang, J. Lobo, S. Salcudean University of British Columbia (Canada)

11:15	Short Presentation 4: Augmented Reality, Advanced Intraoperative Visualization, and User Interface Chair: Marta Kersten
AU-1	Interactive Flying Frustums (IFFs): Spatially-Aware Surgical Data Visualization J. Fotouhi, M. Unberath, T. Song, W. Gu, A. Johnson, G. Osgood, M. Armand, N. Navab Johns Hopkins University (USA)
AU-2	Pedicle Screw Navigation using Surface Registration on the Microsoft HoloLens F. Liebmman, S. Roner, M. von Atzigen, D. Scaramuzza, R. Sutter, J. Snedeker, M. Farshad, P. Fürnstahl Balgrist University Hospital Zurich (Switzerland)
AU-3	Automatic tissue classification in textured models: A novel approach to intraoperative integration of structured light scanning B. Chan, J. Auyeung, J. Rudan, P. Mousavi, M. Kunz Queen's University (Canada)
AU-4	A Novel Gaze-supported Multimodal Human Computer Interaction for Ultrasound Machines H. Zhu, S. Salcudean, R. Rohling University of British Columbia (Canada)
AU-5	Deep Neural Maps for Unsupervised Visualization of High Grade Cancer in Prostate Biopsies A. Sedghi, M. Pesteie, S. Azizi, G. Javadi, P. Yan, S. Xu, J.T. Kwak, P. Pinto, I.B. Turkbey, P. Choyke, B. Wood, R. Rohling, P. Abolmaesumi, P. Mousavi Queen's University (Canada)
AU-6	A "Pick-Up" Stereoscopic Camera with Visual-Motor Aligned Control for the da Vinci Surgical System: A Preliminary Study A. Avinash, A.E. Abdelaal, P. Mathur, S. Salcudean University of British Columbia (Canada)
12:00	Lunch Break and Poster Session I

13:30	Short Presentation 5: Surgical Data Science Chair: Nicola Reike
SDS-1	Weakly Supervised Method for Spatio-Temporal Tool Tracking in Laparoscopic Videos C. Nwoye, D. Mutter, J. Marescaux, N. Padoy University of Strasbourg (France)
SDS-2	Teacher/Student Approach for Semi-Supervised Surgical Phase Recognition T. Yu, D. Mutter, J. Marescaux, N. Padoy University of Strasbourg (France)
SDS-3	Objective Assessment of Intraoperative Technical Skill in Capsulorhexis with Temporal Neural Networks T.S. Kim, M. O'Brien, S. Zafar, G.D. Hager, S. Sikder, S. S. Vedula Johns Hopkins University (USA)
SDS-4	Visual Domain Adaptation with Self-Training for Face Detection in the Operating Room T. Issenhuth, V. Srivastav, A. Gangi, N. Padoy CAMMA (France)
SDS-5	Active Learning using Deep Bayesian Networks for Surgical Workflow Analysis S. Bodenstedt, D. Rivoir, A. Jenke, M. Wagner, S.T. Mees, J. Weitz, S. Speidel NCT Dresden (Germany)
SDS-6	Video-based Surgical Skill Assessment using Deep Neural Networks I. Funke, S.T. Mees, J. Weitz, S. Speidel NCT Dresden (Germany)

14:15	Short Presentation 6: Interventional Robotics, Evaluation and Validation Chair: Amber Simpson
RV-1	Design Optimization of A Contact-Aided Continuum Robot for Endobronchial Interventions Based on Anatomical Constraints L. Ros Freixedes, A. Gao, N. Liu, G.-Z. Yang Imperial College London (UK)
RV-2	Preliminary Study of An RNN Based Active Interventional Robotic System (AIRS) in Retinal Microsurgery C. He, I. Iordachita Johns Hopkins University (USA)
RV-3	Leveraging RSF and PET Images for Prognosis of Multiple Myeloma at Diagnosis L. Morvan, T. Carlier, C. Bailly, B. Jamet, C. Bodet-Milin, F. Kraeber-Bodéré, P. Moreau, C. Touzeau, D. Mateus CRCINA INSERM (France)
RV-4	An In-vivo Porcine Dataset and Evaluation Methodology to Measure Soft-Body Laparoscopic Liver Registration Accuracy with an Extended Algorithm that Handles Collisions R. Modrzejewski, T. Collins, B. Seeliger, A. Bartoli, A. Hostettler, J. Marescaux IHU Strasbourg (France)
RV-5	Fully Auto Automatic Self-gated 4D-MRI Construction from Free-breathing 2D Acquisitions Applied on Liver Images L. Vazquez Romaguera, N. Olofsson, R. Planteveve, E. Lugez, J. De Guise, S. Kadoury École Polytechnique de Montreal (Canada)
15:00	IPCAI Awards I
15:30	Coffee Break and Poster Session 2

Wednesday, June 19	
08:00	Selected Podium Presentation 1: Interventional Imaging, Surgical Planning and Simulation, System and Software, Tracking and Navigation Chairs: Ingerid Reinersten and Toby Collins
10:00	Coffee Break
10:30	Selected Podium Presentation 2: Augmented Reality, Advanced Intraoperative Visualization and User Interface, Surgical Data Science, Interventional Robotics, Evaluation and Validation Chairs: Danail Stoyanov and Matthieu Chabanas
12:30	Lunch and Poster Session 3
13:30	Short Presentation: Long Abstracts Chairs: Cristian A. Linte
LA-1	Localizing Dexterous Surgical Tools in X-ray for Image-based Navigation C. Gao, M. Unberath, R. Taylor, M. Armand Johns Hopkins University (USA)
LA-2	Evaluation of Head Segmentation Quality for Treatment Planning of Tumor Treating Fields in Brain Tumors R. Shamir, Z. Bomzon Novocure (Israel)
LA-3	Psychophysiological Data and Computer Vision to Assess Cognitive Load and Team Dynamics in Cardiac Surgery R.D. Dias, S. Yule, L. Kennedy-Metz, M. Zenati Harvard Medical School (USA)
LA-4	Unity and VTK for VR Medical Image Analysis - an Initial Clinical Evaluation G. Wheeler, S. Deng, N. Toussaint, K. Pushparajah, J. Schnabel, T. Peters, J. Simpson, A. Gomez King's College London (UK)

LA-5	EM Navigation of a Raman Spectroscopy Needle for Prostate Cancer Confirmation: Preliminary ex-vivo Study in 3D Slicer R. Shams, F. Picot, G. Sheehy, C. Menard, J.-F. Carrier, F. Leblond, S. Kadoury Polytechnique Montreal (Canada)
LA-6	Combining Visual Cues and Interactions for 3D-2D Registration in Liver Laparoscopy Y.E. Lopez, E. Özgür, L. Calvet, B. Le Roy, E. Buc, A. Bartoli Université Clermont-Auvergne (France)
LA-7	Novel Instrument Design for Electromagnetic Navigation Bronchoscopy H. Jaeger, S. Hinds, T. Langø, E.F. Hofstad, O.V. Solberg, H. Leira, J. Scheltes, P. Cantillon-Murphy University College Cork (Ireland)
LA-8	OP 4.1: A User-Centered Platform for the Operation Room of the Future K. März, L. Mündermann, M. Nolden, T. Simpfendorfer, C. Gasch, T. Ross, S. Onogur, J. Metzger, C. Feldmann, J. Fallert, M. Hohenfellner, L. Maier-Hein DKFZ (Germany)
LA-9	EchoBot: An Open-Source Robotic Ultrasound System A. Østvik, L. Bo, E. Smistad SINTEF / NTNU (Norway)
LA-10	3D Ultrasound Image Guidance System for Focal Liver Tumor Therapies D. Gillies, J. Bax, K. Barker, L. Gardi, D. Tessier, N. Kakani, A. Fenster Robarts Research Institute (Canada)
LA-11	Miniature C-arm Simulator Using Wireless Accelerometer Based Tracking D. Allen, T. Peters, C. Clarkes, E. Chen Robarts Research Institute (Canada)
14:30	Plenary Discussion

15:00	IPCAI Awards II and Closing
15:30	Coffee Break and Poster Session 3

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