



## 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	<b>Towards Intraoperative Use of Ambient Mass Spectrometry Imaging for Cardiac Tissue</b> R. Ellis, D. Tomalty, A. Santilli, J. Rudan, M. Kaufmann, G. Bisleri Queen's University (Canada)
II-2	<b>Learning Needle Tip Localization from Digital Subtraction in 2D Ultrasound</b> C. Mwirize, J.L. Noshier, I. Hacihaliloglu Rutgers University (USA)
II-3	<b>Catheter Localization in 3D Ultrasound Using Voxel-of-Interest-based ConvNets for Cardiac Intervention</b> H. Yang, C. Shan, A.F. Kolen, P. H. N. de With Eindhoven University of Technology (Netherlands)
II-4	<b>Uncertainty-aware Performance Assessment of Optical Imaging Modalities with Invertible Neural Networks</b> 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	<b>Implicit Domain Adaptation with Conditional Generative Adversarial Networks for Depth Prediction in Endoscopy</b> A. Rau, P. Edwards, O. Ahmad, P. Riordan, M. Janatka, L. Lovat, D. Stoyanov University College London (UK)
II-6	<b>Estimation of Tissue Oxygen Saturation based on Image to Image Translation</b> Q. Li, J. Lin, N. Clancy, D. Elson Imperial College London (UK)

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

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

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

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

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

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

LA-5	<b>EM Navigation of a Raman Spectroscopy Needle for Prostate Cancer Confirmation: Preliminary ex-vivo Study in 3D Slicer</b> R. Shams, F. Picot, G. Sheehy, C. Menard, J.-F. Carrier, F. Leblond, S. Kadoury Polytechnique Montreal (Canada)
LA-6	<b>Combining Visual Cues and Interactions for 3D-2D Registration in Liver Laparoscopy</b> Y.E. Lopez, E. Özgür, L. Calvet, B. Le Roy, E. Buc, A. Bartoli Université Clermont-Auvergne (France)
LA-7	<b>Novel Instrument Design for Electromagnetic Navigation Bronchoscopy</b> 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	<b>OP 4.1: A User-Centered Platform for the Operation Room of the Future</b> 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	<b>EchoBot: An Open-Source Robotic Ultrasound System</b> A. Østvik, L. Bo, E. Smistad SINTEF / NTNU (Norway)
LA-10	<b>3D Ultrasound Image Guidance System for Focal Liver Tumor Therapies</b> D. Gillies, J. Bax, K. Barker, L. Gardi, D. Tessier, N. Kakani, A. Fenster Robarts Research Institute (Canada)
LA-11	<b>Miniature C-arm Simulator Using Wireless Accelerometer Based Tracking</b> D. Allen, T. Peters, C. Clarkes, E. Chen Robarts Research Institute (Canada)
14:30	<b>Plenary Discussion</b>

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

**IPCAI is generously supported by the following industry partners**



