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**IPCAI 2019, June 18-19, Rennes, France**

**Program**

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| **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. Mwikirize, J.L. Nosher, 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** | | |

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| **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) |

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| **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. Liebmann, 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 Multimodel 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) |

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| **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. Plantefeve, 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. Simpfendörfer, 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** |

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





