

## **PRELIMINARY PROGRAM**

*This program is subject to change.  
Latest updates are made available via our website at [www.cars-int.org](http://www.cars-int.org)  
Date of last update: May 31, 2017*

<b>CARS 2017 Opening</b>
--------------------------

Wednesday, June 21, 2017  
Room Barcelona

### **CARS 2017 Opening**

#### **18:00 Welcome**

**Javier Herrero Jover, MD, PhD**, President CARS 2017

**Heinz U. Lemke, PhD**, CARS Organizer

**Hubertus Feussner, MD**, Co-chair, 10<sup>th</sup> Clinical Day

**Leonard Berliner, MD**, Chair, Computer Assisted Radiology, 31<sup>st</sup> International Congress and Exhibition (CAR)

**Pierre Jannin, PhD**, President, 21<sup>st</sup> Annual Conference of the International Society for Computer Aided Surgery (ISCAS)

**Hiroyuki Yoshida, PhD**, Chairman, 19<sup>th</sup> International Workshop on Computer-Aided Diagnosis (CAD)

**Christos Angelopoulos, DDS**, Chairman, 23<sup>rd</sup> Computed Maxillofacial Imaging Congress (CMI)

**Kensaku Mori, PhD**, 8<sup>th</sup> International Conference on Information Processing in Computer-Assisted Interventions (IPCAI)

#### **Keynote Lecture:**

#### **Computer Aided Surgery – the Role of Robotics and AI**

Guang-Zhong Yang, PhD, Imperial College London (UK)

#### **19:15 Reception**

## 10<sup>th</sup> CARS Clinical Day

Chairmen: **Leonard Berliner, MD (USA), Eric vanSonnenberg, MD (USA), Hubertus Feussner, MD (D)**

Wednesday, June 21, 2017  
Room Barcelona

### 9:00 Innovations in Imaging and Interventional Radiology (IR)

#### Session Chairs:

Giuseppe Esposito, MD (USA), Luis Donoso-Bach MD, PhD (E), Leonard Berliner, MD (USA)

### 9:00 Current Trends in Medical Education: Advancing Knowledge-Based Medicine

**Invited Speaker:** Eric vanSonnenberg, University of Arizona College of Medicine, AZ; David Geffen School of Medicine at UCLA, CA (USA)

### 9:15 Artificial Intelligence in the Diagnosis of Stroke Patients

**Invited Speaker:** Luis Donoso-Bach, MD, PhD, University of Barcelona (E)

### 9:30 3D Ultrasound-Guided Focal Liver RF or Microwave Ablation System

**Invited Speaker:** Aaron Fenster, PhD, University of Western Ontario, London, ON (CDN) [46]

### 9:45 New embolization quantification tool for transarterial hepatic chemoembolization

F. Michaud, R. Plantefève, S. Kadoury, G. Soulez, Université de Montréal (CDN) [296]

### 10:00 Adaptive parameter adjustment to create hepatoma feeding arteriogram from CT during aortography for transcatheter arterial chemoembolization

T. Shinohara, K. Murotani, S. Hosokawa, H. Minamiguchi, N. Kawai, M. Sato, Kindai University, Kinokawa-shi, Wakayama Medical University (J) [294]

### 10:15 Molecular Imaging as a Guide for Cancer Treatment: Focus on PET/CT

**Invited Speaker:** Giuseppe Esposito, Georgetown Univ. Medical Center, Washington, DC (USA)

### 10:30 Synergism of Ultrasound and MRI in Interventional Radiology (TBD)

**Invited Speaker:** Andreas Melzer, MD, ICCAS, Leipzig (D)

10:45 Break

### 11:00 Innovations in Surgery

#### Session Chairs:

Hubertus Feussner, MD (D); Horatio D'Agostino, MD (USA)

### 11:00 Computer- and Telematics-Assisted Surgery at the German Society of Surgery (CTAC): Towards Surgery 4.0

**Invited Speaker:** Hubertus Feussner, MD, Technical University of Munich (D)

### 11:15 Computer- and Telematics-Assisted Surgery at the German Society of Surgery (CTAC): Offensive 2025

**Invited Speaker:** Hubertus Feussner, MD, Technical University of Munich (D)

### 11:30 Image-guided Interventions: Multispecialty Expanding Horizons

**Invited Speaker:** Horatio D'Agostino, MD, LSU Health Sciences Center- Shreveport, LA (USA)

### 11:45 Technological Applications in Radioguided Surgery and Intervention

**Invited Speaker:** Sergi Vidal-Sicart, MD, PhD, University Clinic Barcelona (E)

### 12:00 The Future: Impact of Engineering/Informatics in Radiology and Surgery

#### Session Chairs:

Kris Kandarpa, MD (USA), Russell H. Taylor, PhD (USA)

### 12:00 Digital Patient Modeling: A Perspective

**Invited Speaker:** Leonard Berliner, MD, New York Presbyterian-Brooklyn Methodist Hosp., Brooklyn, NY (USA)

### 12:15 Medical Robotics and Computer-Integrated Interventional Medicine

**Invited Speaker:** Russell H. Taylor, PhD, Johns Hopkins University, Baltimore, MD (USA)

### 12:30 NIBIB-sponsored Research: Engineering & Informatics in Biomedical Imaging & Surgery

**Invited Speaker:** Krishna Kandarpa, MD, PhD, NIH, Bethesda, MD (USA)

12:45 Break

### 14:00 Towards the Vision and Spirit of CARS

#### Session Chairs:

Heinz U. Lemke, PhD (D), Leonard Berliner, MD (USA), Hubertus Feussner, MD (D)

### 14:00 The role of Innovators and Lead Users in clinical investigations/innovations

Heinz U. Lemke, PhD, International Foundation of CARS, Kuessaberg (D), Leonard Berliner, MD, New York Presbyterian-Brooklyn Methodist Hosp., Brooklyn, NY (USA)

### Computer Assisted Radiology and Minimally Invasive Therapy (CARMIT)

### 14:15 Evaluation of a robotic system for irreversible electroporation (IRE) of malignant liver tumors: initial results

**Invited Presentation:**

L. P. Beyer, B. Pregler, K. Michalik; C. Niessen, M. Dollinger, M. Müller, H. J. Schlitt, C. Stroszczyński, P. Wiggermann, University Medical Center Regensburg (D)

**14:30 Computer-aided evaluation of low-dose and low-contrast agent third-generation dual-source CT angiography prior to transcatheter aortic valve implantation (TAVI)**

**Invited Presentation:**

P. Dankerl, M. Hammon, H. Seuss, M. Tröbs, A. Schuhbaeck, M. M. Hell, A. Cavallaro, S. Achenbach, M. Uder, M. Marwan, Friedrich-Alexander-Universität Erlangen, Nürnberg (D)

**Computer Assisted Orthopaedic Surgery (CAOS)**

**14:45 Analysis of acetabular orientation and femoral anteversion using images of three-dimensional reconstructed bone models**

**Invited Presentation:**

J. Park, J.Y. Kim, H.D. Kim, Y.C. Kim, A. Seo, M. Je, J.U. Mun, B. Kim, Il H. Park, S.Y. Kim, Kyungpook National University, Daegu, Kyungpook National University Hospital, Korea Advanced Institute of Science and Technology, Daejeon, Changwon Gyeongsang, National University (ROK)

**15:00 Feasibility of laser-guided percutaneous pedicle screw placement in the lumbar spine using a hybrid-OR**

**Invited Presentation:**

P. H. Richter, F. Gebhard, M. Salameh, K. Schuetze, M. Kraus, Ulm University, Donau-Ries Hospital Donauwoerth (D)

**Computer Assisted Head and Neck Surgery (CAHNS)**

**15:15 Intraoperative navigation in complex head and neck resections: indications and limits**

**Invited Presentation:**

S. Catanzaro, C. Copelli, A. Manfuso, K. Tewfik, N. Pederneschi, L. Cassano, R. Cocchi, Hospital Casa Sollievo della Sofferenza, Foggia (I)

15:30 Break

**16:00 Panel Discussion**

**Chairs:** Heinz U. Lemke, PhD (D), Leonard Berliner, MD (USA), Hubertus Feussner, MD (D)

Participants: Clinical Day Speakers Leonard Berliner, MD (USA), Eric vanSonnenberg, MD (USA), Andreas Melzer, MD (D), Hubertus Feussner, MD (D), Kris Kandarpa, MD (USA), Russell H. Taylor, PhD (USA), Horatio D'Agostino, MD (USA), Giuseppe Esposito, MD (USA), Luis Donoso-Bach MD, PhD (E), Speakers of IR, CARMIT, CAOS and CAHNS papers.

**16:00 Moving into the Future of Radiology and Surgery**

Discussion open to the audience

Topics:

1. Résumé of presentations on Clinical Investigations/Innovations. What do clinicians need from the Computer Science/Engineering community?
2. Improving Outcomes / Value-Based Medicine / Obstacles for Lead Users
3. Emerging Technologies / Intelligent Systems in the OR / Deep Learning

17:00 End of Session

**Computer Assisted Radiology**  
**31<sup>st</sup> International Congress and Exhibition on Computer Assisted Radiology**  
Chairman: **Leonard Berliner, MD (USA)**  
Co-Chair: **Kiyonari Inamura, PhD (J)**

Thursday, June 22, 2017  
Room Berlin

**8:15 Digital Radiography and Computed Tomography**

**Session Chairs:**

Michael H. Friebe, PhD (D), Elizabeth Beckmann, BSc (UK)

**8:15 Low-budget limited angle computed tomography device based on a miniaturized x-ray tube and stationary high-resolution flat panel detector**

A. van Oepen, S. Abdurahman, M. Friebe, Otto-von-Guericke-Universität, Magdeburg (D) [227]

**8:30 Feasibility study of portable tomosynthesis system at uncertain acquisition trajectory**

T. Ohnishi, K. Sato, M. Sekine, H. Haneishi, Chiba University (J) [289]

**8:45 Dynamic chest radiography for pulmonary function diagnosis based on temporal changes in lung density: an animal-based study**

R. Tanaka, S. Sanada, T. Tani, N. Nitta, T. Tabata, N. Matsutani, S. Muraoka, S. Kaneko, S. Noji, T. Yoneyama, Kanazawa University; Shiga University of Medical Science, Otsu; Konica Minolta, Inc, Hachioji (J) [25]

**9:00 Study of substance identification and effective atomic number visualization in mammography using photon-counting technique**

R. Suzuki, S. Tomida, A. Nakajima, A. Ihori, S. Koyama, T. Yamakawa, S. Yamamoto, M. Okada, Y. Koderu, Nagoya University; Job Corp., Yokohama (J) [128]

**9:15 Identification and differentiation of resected breast tissue specimens using a cadmium telluride series photon-counting X-ray detector**

M. Sasaki, A. Nakajima, A. Ihori, H. Nishide, S. Koyama, T. Yamakawa, S. Yamamoto, M. Okada, M. Mizutani, Y. Koderu, Nagoya University; Gifu University of Medical Science; Job Corp., Yokohama; Mikawa Breast Cancer Clinic (J) [118]

**9:30 Sequential radiologic changes of subchondral fatigue fracture of the femoral head in young healthy adults**

S. M. Kim, S. J. Lim, K. Kim, Y. S. Park, Seoul Medical Center; Samsung Medical Center, Seoul (ROK) [56]

**9:45 A new imaging technique in mammography using a CdTe-series photon-counting detector**

A. Nakajima, R. Suzuki, A. Ihori, S. Koyama, T. Yamakawa, S. Yamamoto, M. Okada, Y. Koderu, Nagoya University; Job Corporation, Yokohama (J) [117]

10:00 Break

Thursday, June 22, 2017  
Room Berlin

**10:15 Magnetic Resonance Imaging**

**Session Chair:**

Andreas Melzer, MD (D)

**10:15 Dynamic phantom and automated analysis software tool for QA in magnetic resonance angiography**

K. Sergunova, A. Petraikin, S. Morozov, S. Kim, A. Gromov, D. Semenov, E. Akhmad, Research and Practical Center of Medical Radiology, Moscow (RUS) [188]

**10:30 Comparison of noise reducing T2-map reconstruction methods in MRI imaging of Achilles tendon**

P. A. Regulski, J. Zieliński, B. A. Borucki, K. S. Nowinski, University of Warsaw; Medical University of Warsaw (PL) [252]

**10:45 An Integrated MR Imaging Coil and Body-Mounted Robot for MR-guided Pediatric Arthrography**

R. Monfaredi, W. Loew, C. Ireland, R. Pratt, R. Giaquinto, C. Dumoulin, K. Sharma, K. Cleary, Children's National Health System, Washington, DC; Cincinnati Children's Hospital Medical Center (USA) [78]

**11:00 Volume-to-slice registration of fetal 3D magnetic resonance and 2D ultrasound data**

V. Zimmer, N. Hahner, E. Eixarch, E. Gratacós, M. González Ballester, G. Piella, Universitat Pompeu Fabra; Fetal i+D Medicine Research Center, Barcelona (E) [211]

**11:15 Real-time MRI/US fusion using inside-out tracking of virtually generated markers (ORtoMVM) for hepatic interventional procedures**

S. Balakrishnan, M. Friebe, Technical University of Munich; Otto von Guericke University, Magdeburg (D) [281]

11:30 Break

Thursday, June 22, 2017  
Room Berlin

**14:00 Segmentation**

**Session Chairs:**

Theo van Walsum, PhD (NL), Horst-Karl Hahn, PhD (D)

**14:00 Examining the robustness of liver segmentation using deep learning and unsupervised pre-training of a feature extractor**

A. Haensch, M. Harz, A. Schenk, I. Endo, C. Jacobs, H. K. Hahn, H. Meine; Fraunhofer MEVIS, Bremen (D); Yokohama City Univ. (J); Radboud Univ. Medical Center, Nijmegen (NL) [207]

**14:15 Automated segmentation of complete 3D liver model including arterial hepatic vasculature and biliary tree anatomy from a single multiphase MR scan**

O. Ivashchenko, E. J. Rijkhorst, L. C. ter Beek, B. Pouw, N. J. Hoetjes, J. Nijkamp, K. F. Kuhlmann, T. J. Ruers, Netherlands Cancer Institute, Amsterdam (NL) [95]

**14:30 Generic Model-Based Segmentation Approach – Application for Liver Segmentation from Clinical Data**

R. Kosarev, C. Bychenkov, S. Chaplygin, A. Kolsanov, sMedX; SamSMU, Samara (RUS) [218]

**14:45 False positive reduction of abdominal artery segmentation from CT volumes based on deep convolutional neural networks**

M. Oda, T. Yamamoto, Y. Yoshino, K. Mori, Nagoya University (J) [184]

**15:00 Fully automatic segmentation of abdominal aortic thrombus in post-operative CTA images using deep convolutional neural networks**

K. López-Linares, N. Aranjuelo, L. Kabongo, G. Maclair, N. Lete, P. Leskovsky, A. García-Familiar, I. Macía, M. A. González Ballester, Vicomtech - IK4, Biodonostia Health Research Institute, San Sebastian; Univ. Pompeu Fabra, Barcelona (E) [18]

**15:15 Contour segmentation of the intima, media and adventitia layers in intracoronary OCT images - Application to fully-automatic detection of healthy wall regions**

T. van Walsum, G. Zahnd, A. Hoogendoorn, N. Combaret, A. Karanasos, E. Péry, L. Sarry, P. Motreff, W. Niessen, E. Regar, G. van Soest, F. Gijzen, Erasmus Medical Center Rotterdam (NL); University of Clermont-Ferrand (F) [299]

**15:30 Brain lesion segmentation from MR-image using Fuzzy C-means in Shearlet domain**

A. Chakrabarti, S. Ghoshal, P. Chatterjee, S. Banu, University of Calcutta, Kolkata (IND) [286]

15:45 Break

Thursday, June 22, 2017

Room Berlin

**16:00 Segmentation and Registration**

**Session Chairs:**

Kensaku Mori, PhD (J), Dan Stoyanov, PhD (UK)

**16:00 Pectoralis muscle and subcutaneous adipose tissue segmentation on CT images based on convolutional networks**

R. Moreta-Martinez, J. Onieva-Onieva, J. Pascau, R. San Jose Estepar, Brigham and Women's Hospital, Boston, MA (USA); Instituto de Investigacion Sanitaria Gregorio Marañon, Madrid (E) [260]

**16:15 A robust algorithm to measure acetabular rim plane for evaluating hip orientation**

C. Lee, J. Jang, Y. Kim, Y. S. Kim, Hanyang University, Seoul (ROK); Kyushu University, Fukuoka (J) [160]

**16:30 Catheter Segmentation in X-Ray Fluoroscopy Using Convolutional Neural Networks**

T. van Walsum, P. Ambrosini, D. Ruijters, W.J. Niessen, A. Moelker' Erasmus Medical Center Rotterdam; Philips Healthcare, Best (NL) [421]

**16:45 CASPER: Computer-Aided Segmentation of Periodically-Excited Regions - A Learning-based Tracking of an Invisible Needle in Ultrasound**

P. Beigi, R. Rohling, S.E. Salcudean, G.C. Ng, Univ. of British Columbia, West Vancouver, BC (CDN); Philips Ultrasound, Bothell, WA (USA) [350]

**17:00 A Benchmark for Endoluminal Scene Segmentation of Colonoscopy Images**

J. Bernal, D. Vázquez, F. Javier Sánchez, G. Fernández-Esparrach, A. López, A. Romero, M. Drozdal, A. Courville, Univ. Autonoma de Barcelona; Hospital Clinic i Provincial (E); Univ. de Montreal; Ecole Polytechnique de Montreal (CDN) [423]

**17:15 Registration between Chest CT fluoroscopy and Volumetric CT using SURF for Detection of Similar**

J. Kim, J. G. Lee, N. Kim, Univ. of Ulsan College of Medicine, Seoul (ROK) [135]

**17:30 An Automatic, Robust and Closed Form Mini-RSA System for Intraoperative C-Arm Calibration**

H. Esfandiari, J. F. Martinez, A. González Álvarez, P. Guy, J. Street, C. Anglin, A. J. Hodgson, University of British Columbia, Vancouver, British Columbia; University of Calgary (CDN) [256]

17:45 Break

Friday, June 23, 2017

Room Berlin

**8:15 Computer Assisted Radiology and Minimally Invasive Therapy**

**Session Chair:**

Javier Pascau, PhD (E), Terry Peters, PhD (CDN)

**8:15 A safety module for active joint limit avoidance and intuitive hand guidance of a robotic ultrasound system**

I. Kuhlemann, F. Ernst, University of Luebeck (D) [165]

**8:30 Docking guidance of a mobile accelerator using an optical tracker for IOERT procedures Feasibility study**

E. Marinetto, J. G. Victores, M. García Sevilla, M. Muñoz, F. Calvo, C. Balaguer, M. Desco, J. Pascau, Universidad Carlos III de Madrid; Instituto de Investigación Sanitaria Gregorio Marañón (E) [172]

**8:45 Statistical motion modeling with surface similarity maximization for respiration compensation in thoraco-abdominal radiotherapy**

D. Xiao, Q. Hu, F. Jia, Shenzhen Institutes of Advanced Technology, Shenzhen (CHN) [62]

**9:00 Trans-oral miniature X-ray radiation delivery system with endoscopic optical feedback**

A. Boese, F. Johnson, T. Ebert, A. Mahmoud Pashazadeh, C. Arens, M.H. Friebe, Otto-von-Guericke-University Magdeburg (D) [319]

**9:15 Clinical Realization of Rapid Dose Sculpting for Image-Guided Stereotactic Radiosurgery**

L. Ma, J. Chiu, S. Luan, A. Sahgal, Univ. of California San Francisco; Arizona Univ.; Univ. of New Mexico (USA); Univ. of Toronto (CDN) [10]

**9:30 Augmented Reality Ultrasound Guidance System: a case study in system development and a cautionary tale**

G. Ameri, J.S.H. Baxter, D. Bainbridge, T.M. Peters, E.C.S. Chen, Robarts Research Institute; Western University, London, ON (CDN) [422]

9:45 Break

Saturday, June 24, 2017

Room Berlin

**14:00 Radiological Informatics and Telemedicine**

**Session Chair:**

Russell Andrews, MD (USA)

**14:00 Exploratory Visualization for Process Optimization in Radiology**

D. Brodbeck, M. Degen, T. Heye, Univ. of Applied Sciences and Arts Northwestern Switzerland, Muttenz; Univ. Hospital Basel (CH) [164]

**14:15 Automatic Reporting of Lesion Location in Mammograms**

G. Amit, E. Barkan, N. M. Shani, A. Zlotnick, M. D. Kovacs, J. J. Reicher, M. A. Trambert, M. A. Reicher, IBM Research, Haifa (IL); Medical University of South Carolina, Charleston, SC; Stanford Hospital and Clinics (USA) [133]

**14:30 Trans-border Telemedicine Practices: An Institutional Experience**

S. Mishra, R. Daman, I. Singh, V. Singh, K. Pathak, Sanjay Gandhi PG Institute of Medical Sciences, Lucknow (IND) [195]

**14:45 Disaster response: leveraging technology for global healthcare progress**

R. Andrews, L. Quintana, T. Khan, NASA Ames Research Center, Los Gatos, CA (USA); Valparaiso University Medical Center, Valparaiso (RCH); Northwest General Hospital & Medical School; Peshawar (PAK) [126]

15:00 Break

**Computer Assisted Radiology and Surgery**  
Chairs: **Heinz U. Lemke, PhD (D), Ramin Shahidi, PhD (USA)**

Thursday, June 22, 2017  
Room Berlin

**11:45 Endoscopy**

**Session Chair:**

Miguel A. Gonzalez Ballester, PhD (E)

**11:45 Real-Time Polyp Detection in Colonoscopy Videos: A Preliminary Study For Adapting Still Frame-based Methodology To Video Sequences Analysis**

Q. Angermann, J. Bernal, C. Sanchez-Montes, M. Hammami, G. Fernandes-Esparrach, X. Dray, O. Romain, F.J. Sanchez, A. Histace, Univ. of Cergy Pontoise; Hopital Lariboisiere Paris (F); Hospital Clinic i Provincial; Univ. Autonoma de Barcelona (E) [334]

**12:00 Microwave endoscopy for colorectal cancer prevention**

M. Guardiola, M. Ceresa, J. Romeu, G. Fernández-Esparrach, M. A. Gonzalez Ballester, O. Camara, Univ. Pompeu Fabra; Univ. Politècnica de Catalunya; Univ. de Barcelona (E) [208]

**12:15 Performance of Common Clustering Methods in Segmenting Vascular Pathologies in Capsule Endoscopy Images**

R. Noorda, V. Naranjo, V. Pons, Univ. Politècnica de Valencia; Hospital Universitari i Politècnic La Fe, Valencia (E) [292]

**12:30 Intravascular Endoscopy Improvement through Narrow Band Imaging**

A. Boese, A. Karthasseril Sivankutty, M.H. Friebe, Otto-von-Guericke-Univ. Magdeburg (D) [322]

**12:45 New Tools for Digital Surgical Microscopy**

N. Gard, S. Jurk, A. Schneider, P. Kauff, P. Eisert, J.-C. Rosenthal, Fraunhofer Heinrich-Hertz-Institut, Berlin; ARRI, München (D) [336]

13:00 Break

Friday, June 23  
Room Berlin

**9:45 9<sup>th</sup> EPMA / IFCARS Workshop on Clinical Decision and Support Systems**

**Session Chairs:**

Olga Golubnitschaja, MD (D), Steffen Oeltze-Jafra, PhD (D)

**9:45 Computerized clinical decision support for the tumor board**

**Invited Speaker:** A. Dietz, MD, Univ. Hospital Leipzig (D)

**10:00 Integrating clinical viewpoints into the digital patient model for laryngeal cancer**

M. Stoehr, M. A. Cypko, H. U. Lemke, A. Dietz, Universitätsklinikum Leipzig; Univ. of Leipzig; IFCARS, Kuessaberg (D) [88]

**10:15 Quality management of therapy decision models based on multi-entity Bayesian Networks**

M. A. Cypko, S. Oeltze-Jafra, M. Stoehr, A. Dietz, L. Berliner, H. U. Lemke, University of Leipzig; Univ Hospital Leipzig; IFCARS, Kuessaberg (D); New York Methodist Hospital (USA) [157]

10:30 Break

Friday, June 23  
Room Berlin

**10:45 18<sup>th</sup> IFCARS / SPIE / ISCAS Joint Workshop on the Digital Operating Room**

**Chairmen:** Osman M. Ratib, MD, PhD (CH), Heinz U. Lemke, PhD (D)

**Session Chairs:**

Thomas Neumuth, PhD (D), Yoshihiro Muragaki, MD, PhD (J)

**10:45 Smart Cyber Operation Theater (SCOT): Surgery managed under judgement of the "Strategy Desk"**

K. Hongo, T. Goto, Y. Fujii, J. Okamoto, Y. Muragaki, G. Mukumoto, H. Okuda, Shinshu University School of Medicine, Matsumoto (J) [57]

**11:00 Development of the Surgical strategy desk for decision-making support during glioma surgery**

J. Okamoto, G. Mukumoto, H. Okuda, K. Masamune, I. Hiroshi, Y. Muragaki, Tokyo Women's Medical University; Denso Corp., Kariya (J) [293]

**11:15 Intraoperative Prioritization and Consistent Presentation of Clinical Information**

E. Schreiber, S. Franke, T. Neumuth, University of Leipzig (D) [151]

**11:30 Multi-perspective qualitative evaluation of an integrated operating room based on IEEE 11073 SDC**

M. Rockstroh, S. Franke, M. Hofer, A. Will, M. Kasparick, B. Andersen, T. Neumuth, Univ. of Leipzig; Univ. Hospital Leipzig; Schleswig-Holstein Univ. Hospital, Univ. of Rostock, Univ. of Luebeck (D) [337]

**11:45 Performance Evaluation of Real-time Video Streaming Integrated in OpenIGTLink**

L. Chen, J. Tokuda, Brigham and Women's Hospital, Boston, MA (USA) [262]

**12:00 ROS-IGTL-Bridge: An open network interface for image guided therapy using the ROS environment**

T. Frank, A. Krieger, S. Leonard, N.A. Patel, J. Tokuda, Leibniz Univ. Hannover (D); Children's National Medical Center, Washington, DC; Johns Hopkins Univ., Baltimore, MD; Worcester Polytechnic Institute (USA) [343]

**12:15 Application of activity semantics and BPMN 2.0 in the generation and modeling of generic surgical process models**

J. Neumann, M. Wiemuth, O. Burgert, T. Neumuth, Univ. of Leipzig; Reutlingen University (D) [167]

**12:30 Application fields for the new Object Management Group (OMG) Standards Case Management Model and Notation (CMMN) and Decision Management Notation (DMN) in the perioperative field**

O. Burgert, M. Wiemuth, D. Junger, M.A. Leitritz, J. Neumann, T. Neumuth, Reutlingen Univ.; Univ. Eye Hosp. Tuebingen; Univ. of Leipzig (D) [447]

**12:45 The application of Surgical Procedure Manager (SPM) – the first experience with FESS**

K. Feige, G. Strauss, I. Gollnick, IRDC GmbH, Leipzig (D) [186]

13:00 Break

Friday, June 23, 2017

Room Berlin

**2<sup>nd</sup> Symposium on Multidisciplinary Computational Anatomy - CAD / IFCARS / ISCAS Joint Session**

Chairs:

Makoto Hashizume, MD (J), Hiroyuki Yoshida, PhD (USA), Heinz U. Lemke, PhD (D)

**14:00 Computational Anatomy-1**

**Session Chairs:**

Makoto Hashizume, MD (J), Hiroyuki Yoshida, PhD (USA)

**14:00 Scale-seamless registration and visualization - from clinical level to laboratory level**

**Invited Speaker:** Kensaku Mori, PhD, Nagoya Univ. (J) [445]

**14:15 Automated classification of lung tumors using PET/CT and microscopic images**

A. Teramoto, T. Tsukamoto, Y. Kiriya, M. Tsujimoto, H. Toyama, K. Imaizumi, H. Fujita, Fujita Health Univ. Toyoake; Gifu Univ.(J) [450]

**14:30 Automatic Classification of Lung Nodules on MDCT Images With Temporal Subtraction Technique**

Y. Yoshino, T. Miyajima, H. Lu, J. Tan, H. Kim, S. Murakami, T. Aoki, R. Tachibana, Y. Hirano, S. Kido, Kyushu Institute of Technology; University of Occupational & Environment Health; Fukuoka; National Institute of Technology, Yamaguchi Univ. (J) [306]

**14:45 Multi-organ segmentation in abdominal CT using 3D fully convolutional networks**

H. Roth, M. Oda, Y. Hayashi, H. Oda, K. Mori, Nagoya University (J) [43]

**15:00 Multiple intracranial aneurysms: A direct hemodynamic comparison between ruptured and unruptured vessel malformations**

P. Berg, O. Beuing, Otto von Guericke Univ.; Univ. Hospital, Magdeburg (D) [327]

**15:15 MRI-based deep learning for in situ monitoring of Achilles tendon regeneration process**

N. Kapinski, J. Zielinski, B. Borucki, K. Nowiński, University of Warsaw (PL) [28]

15:30 Break

**16:00 Computational Anatomy-2**

**Session Chairs:**

Kensaku Mori, PhD (J), Heinz Lemke, PhD (D)

**16:00 Construction of multi-scale spatiotemporal model of pancreas tumor from pathology images and time series MR images**

V. Triquet, H. Hontani, M. Kugler, T. Yokota, H. Kobayashi, C. Iwamoto, K. Ouchida, M. Hashizume, Nagoya Institute of Technology; Kyushu University, Fukuoka (J) [451]

**16:15 Reconstruction of patient-specific fiber arrangement of skeletal muscles from clinical CT: Preliminary evaluation using Visible Korean Human dataset**

Y. Sato, Y. Otake, F. Yokota, N. Fukuda, M. Takao, S. Takagi, N. Yamamura, L. O'Donnell, C. F. Westin, C. Min Suk, N. Sugano, Nara Inst. of Science and Technology; Osaka Univ.; Univ. of Tokyo (J); Brigham and Women's Hospital (USA); Ajoy Univ. School of Medicine, Suwon (ROK) [452]

**16:30 An X-ray Free Method of Accurately Identifying Elbow Flexion-extension Axis for the Placement of Hinged External Fixator**

J. Song, H. Ding, W. Han, J. Wang, G. Wang, Tsinghua University, Beijing; Beijing Ji Shui Tan Hospital (CHN) [321]

**16:45 Forceps for Measuring Forces Intraoperatively to Acquire Biological and Treatment Information during Laparoscopic Surgery**

E. Kobayashi, D. Kim, K. Saito, R. Sato, K. Hara, J. Arata, K. Kiguchi, M. Hashizume, I. Sakuma, The University of Tokyo; Teikyo Heisei Univ.; Kyushu Univ. (J) [453]

**17:00 Modeling of plaque development in the coronary arteries**

N. Filipovic, V. Isailovic, Z. Milosevic, D. Nikolic, I. Saveljic, M. Nikolic, B. Cirkovic-Andjelkovic, M. Radovic, T. Exarchos, D. Fotiadis, G. Pelosi, O. Parodi, University of Kragujevac (SB); FORTH, Ioannina (GR); National Research Council Pisa (I) [261]



**17:15 An Automated Palpation Ultrasound Machine for Breast Cancer Diagnosis**

P. L. Yen, Y. C. Lin, National Taiwan University, Taipei (RC) [264]

17:30 Break

Saturday, June 24, 2017

Room Berlin

**8:15 Biopsy, Ablation and Pathology**

**Session Chairs:**

Leonard Berliner, MD (USA), Michael Legg, PhD (AUS)

**8:15 Structured reporting in oncology**

**Invited Speaker:** Michael Legg, University of New South Wales, Caringbah, Sydney NSW [466]

**8:30 Digital Pathology Image Analysis**

**Invited Speaker:** Ulysses G. Balis, MD, University of Michigan, Ann Arbor, MI (USA) [468]

**8:45 An Accuracy Assessment of Hybrid Image Navigation System with MR and Ultrasound to Assist Needle Puncture**  
A. Yamada, S. Naka, J. Tokuda, T. Tani, S. Morikawa, Shiga University of Medical Science, Otsu (J); Brigham and Women's Hospital, Boston, MA (USA) [282]

**9:00 Evaluation of a novel navigation system for bronchoscopy using a deformable lung phantom**

L. Gruionu, C. Ciobirca, C. Streba, A. Saftoiu, T. Lango, G. Gruionu, Univ. of Craiova; Univ. of Medicine and Pharmacy Craiova (RO); Copenhagen Univ. (DK); SINTEF, Trondheim (N); Harvard Medical School (USA) [201]

**9:15 A novel deep convolutional decision tree schema to distinct breast tumor subtypes in microscopic biopsy images**  
T. Rodríguez, J. Torrents-Barrena, D. Puig, Universitat Rovira i Virgili, Tarragona (E) [45]

**9:30 Image Fusion Techniques in Clinical Biopsy and Ablation**

B. Wood H. Amalou, S. Xu, National Institutes of Health, Bethesda, MD (USA) [258]

**9:45 An Adaptive Steerable Needle based on a Loop-Shaped Flexible Arm**

A. Yamada, S. Naka, N. Nitta, S. Morikawa, S. Tani, T. Tani, Shiga University of Medical Science, Otsu (J) [276]

10:00 Break

Saturday, June 24, 2017

Room Berlin

**10:15 3D Printing**

**Session Chair:**

Ramin Shahidi, PhD (USA), Javier Herrero Jover, MD, PhD (E)

**10:15 Preliminary accuracy study of 3D bioprinted scaffolds for regenerative cartilage therapies**

J. C. Gómez-Blanco, F. M. Sánchez-Margallo, V. Álvarez, J. García, A. Macías, J. B. Pagador, Jesus Uson Minimally Invasive Surgery Centre, Cáceres; Universidad de Extremadura, Badajoz (E) [85]

**10:30 Patient-specific scaphoid replacement out of the 3D-printer – Idea and first pre-clinical results**

P. Honigmann, R. Schumacher, F. Thieringer, R. Marek, F. Büttner, J. Homa, M. Haefeli, Kantonsspital Baselland Liestal; Univ. Hospital Basel; Univ. of Applied Sciences and Arts Northwestern, Muttenz; Kantonsspital Baden (CH); Lithoz GmbH, Vienna (A) [225]

**10:45 Enhanced Preoperative Planning for Pediatric Tumor Excision via 3-D Printing**

C. Velazco, J. Ryan, E. Garvey, D. Ostlie, K. Davenport, Mayo Clinic, Phoenix; AZ; Phoenix Children's Hospital (USA) [170]

**11:00 Development of silicone surgical guide for partial nephrectomy with 3D printing and injection molding : ex-vivo study with fresh postmortem pig**

H. K. Song, G. B. Kim, C. S. Kim, Y. S. Kyung, N. K. Kim, Asan Medical Center, Seoul (ROK) [275]

**11:15 Interventional x-ray imaging guided from anatomical models**

M. Flexman, A. Panse, Philips Research North America, Cambridge, MA (USA) [223]

11:30 Break

Saturday, June 24, 2017

Room Berlin

**11:45 Rehabilitation**

**Session Chairs:**

Kevin Cleary, PhD (USA), Sally Evans, MD (USA)

**11:45 An integrated scenario unifying precision orthopaedic surgery and precision orthopaedic rehabilitation**

**Invited Speaker:** Paolo Dario, PhD, Scuola Superiore Sant'Anna (I)

S. Mazzoleni, G. Ciuti, T. Sun, Z. Song, J. S. Dai, S. Wang, Scuola Superiore Sant'Anna, Pontedera (I); Tianjin University (CHN); King's College London (UK) [283]

**12:00 Hippotherapy simulator for children with cerebral palsy**

K. Cleary, O. Morozova, J. Burton, R. Monfaredi, S. Evans, Children's National Health System, Washington, DC (USA) [91]

**12:15 Development of a three degree-of-freedom Robotically-assisted Ankle Rehabilitation System for Children with Cerebral Palsy**

R. Monfaredi, H. Fooladi Talari, C. Coley, K. Cleary, S. Evans, Children's National Health System, Washington, DC (USA) [219]

12:30 Break

Saturday, June 24, 2017

Room Berlin

**15:15 IHE Surgery Meeting**

**Chairs:**

Heinz U. Lemke, PhD (D), Erik Schreiber, MSc (D)

**16:15 DICOM WG24 Meeting**

**Chair:**

Leonard Berliner, MD (USA)

# 21<sup>st</sup> Annual Conference of the International Society for Computer Aided Surgery

President: Pierre Jannin, PhD (F)

Thursday, June 22, 2017  
Room Barcelona

## 8:30 ISCAS Welcome

### 8:35 Medical Robotics and Instrumentation 1

#### Session Chairs:

Alvaro Bertelsen, PhD (E), Byung-Ju Yi, PhD (ROK)

#### 8:35 Can Needle-Sized Robots Help Surgeons Save Lives?

**Invited Speaker:** Robert Webster, Vanderbilt University, Nashville, TN (USA) [446]

#### 9:00 Facial nerve monitoring during robotic cochlear implementation: first patient experience

J. Ansó, O. Scheidegger, L. Perroud, M. Caversaccio, K. Gavaghan, S. Weber, ARTORG Center for Biomedical Engineering; Univ. of Bern; CAScination AG; Inselspital Bern (CH) [255]

#### 9:15 Suction-fixing and stiffness-tuning manipulator for laparoscopic liver resection

J. Kim, Y. Nakajima, K. Kobayashi, The University of Tokyo (J) [51]

#### 9:30 Computational Model to Steer Super-Elastic Needle for an MRI guided breast intervention robot

S. B. Park, J. Lee, K. Lee, Y. H. Jo, National Cancer Center, Goyang-si; Seoul National University (ROK) [132]

#### 9:45 Multi-Degree-Of-Freedom Laparoscopic Surgical Manipulator using Large Deformation of Elastic Components

J. Arata, K. Yuki, S. Oguri, R. Nakadate, K. Kiguchi, M. Hashizume, Kyushu University, Fukuoka (J) [54]

#### 10:00 Compact forceps manipulator with spherical-coordinate linear and circular telescopic rail mechanism for endoscopic surgery

T. Kawai, H. Hayashi, Y. Nishizawa, A. Nishikawa, R. Nakamura, H. Kawahira, M. Ito, T. Nakamura, Osaka Institute of Technology, Osaka (J) [298]

10:15 Break

Thursday, June 22, 2017  
Room Barcelona

### 10:30 Medical Robotics and Instrumentation 2

#### Session Chair:

Jumpei Arata, PhD (J)

#### 10:30 Development of a stiffness calculation algorithm using the output of the grasping forceps with sensors for identification of tumor

K. Kuwana, K. Saito, K. Yamamoto, A. Nakai, H. Nakamura, T. Dohi, Tokyo Denki Univ.; The Univ. of Tokyo; Touchence Inc.; St. Marianna Univ. School of Medicine, Kanagawa (J) [192]

#### 10:45 Development of a clinically specialized miniaturized slave robot platform for spinal surgery

W. Bai, Q. Cao, Y. Lin, P. Wang, Y. Huang, Shanghai Jiao Tong University, Shanghai (CHN) [217]

#### 11:00 High accuracy drilling with an image guided light weight robot: autonomous vs intuitive feed control

S. Tauscher, A. Fuchs, F. Baier, L.A. Kahrs, T. Ortmaier, Leibniz University, Hannover (D) [365]

#### 11:15 An Automatic Markerless Registration Method of Neurosurgical Robotics Based on an Optical Camera

F. Meng, F. Zhai, B. Zeng, H. Ding, G. Wang, Tsinghua University School of Medicine, Beijing (CHN) [351]

#### 11:30 A Stereoelectroencephalography Electrode Implantation Surgical Robot with Augmented Reality Visualization

B. Zeng, F. Meng, H. Ding, G. Wang, Tsinghua University, Beijing (CHN) [325]

11:45 Break

Thursday, June 22, 2017  
Room Barcelona

### 12:00 Poster Session 1

#### Session Chairs:

Makoto Hashizume, MD (J), Kevin Cleary, PhD (USA)

Posters # 048 - # 061

Thursday, June 22, 2017  
Room Barcelona

### 14:00 9th ISCAS Surgical Workshop

#### Moderators:

Kevin Cleary, PhD (USA), Xavier Tarrado, PhD (E)

## **Fetal Surgery**

Eduard Gratacós, MD, Hosp Sant Joan de Deu, Barcelona (E)

### **Collaboration between surgeons and engineers: incorporating technology in laparoscopic pediatric surgery**

Katherine Davenport, MD, University of Arizona, Phoenix (USA)

### **Use of 3D Prototypes for Complex Surgical Oncologic Cases**

Lucas Krauel MD, Hospital Sant Joan de Déu, Barcelona (E)

### **3D-models in Complex Orthopaedic Surgery**

Pedro Doménech, MD, PhD, Hospital Sant Joan de Déu, Barcelona (E)

### **Augmented reality for improved surgical visualization in the operating room**

Raj Shekhar, PhD, Children's National Health System, Washington, DC (USA)

### **New methods of imaging evaluation on chest wall anomalies**

Manuel López, MD, Hospital Vall d'Hebron, Barcelona (E)

15:30 Break

Thursday, June 22, 2017

Room Barcelona

## **16:00 Surgical/Interventional Navigation**

### **Session Chairs:**

Juan Antoni Hueto Madrid, MD (E), Elvis C.S. Chen, PhD (CDN)

### **16:00 Surgical applications of virtualization of craniofacial skeleton**

**Invited Speaker:** Juan Antoni Hueto Madrid, MD, Hospital General Universitari Vall d'Hebrón, Barcelona (E) [454]

### **16:15 Accuracy of pedicle screw placement in spine surgery using a computer-assisted navigation system**

S. Mazzoleni, M. Tenucci, M. Galgani, G. Ciuti, G. Calvosa, P. Dario, Scuola Superiore Sant'Anna, Pontedera (I); Ospedale S.Maria Maddalena, Volterra (I) [29]

### **16:30 Orbital decompression in thyroid-associated orbitopathy with computer aided surgery**

A. Baumann, G. Dorner, Medical University of Vienna (A) [205]

### **16:45 Three-dimensional modeling, preoperative diagnosis, and patient-specific implant design for orbital wall reconstruction**

H. A. Kim, Y. Kim, H. Cho, W. S. Jeong, J. W. Choi, S. Park, Korea Institute of Science and Technology; Asan Medical Center, Seoul (ROK) [120]

### **17:00 Technical Trial of GPGPU Volume Reconstruction by using a Tablet PC for Practical Clinical Navigation System**

S. Onogi, R. Nakadate, J. Arata, T. Akahoshi, T. Ikeda, M. Hashizume, Kyushu University, Fukuoka (J) [190]

### **17:15 Electromagnetically navigated tumor excision in non-palpable breast cancer**

T. Ungi, G. Gauvin, A. Lasso, C. T. Yeo, T. Vaughan, C. J. Engel, G. Fichtinger, J. Rudan, Queen's University, Kingston, ON (CDN) [77]

### **17:30 Minimally invasive image-guided scoliosis method – A hybrid tracking approach**

R. E. Ellis, M. Kunz, B. Chan, A. Kashigar, D. Borschneck, Queen's University, Kingston, Ontario (CDN) [80]

17:45 Break

## **18:00 YINS Presentations**

Friday, June 23, 2017

Room Barcelona

## **8:30 Endoscopic Surgery**

### **Session Chair:**

Stefanie Speidel, PhD (D)

### **8:30 A method for going from 2D laparoscope to 3D acquisition of surface landmarks by software**

T. Nguyen, M. Garbey, A. Huang, V. Fikfak, B. Dunkin, Houston Methodist Research Institute, TX (USA) [297]

### **8:45 Implementing Wireless Four-Camera Panoramic Vision with Cancer-Tracking for In Vivo Laser Microscopic Surgery Treatment**

C.-H. Cheng, P.-H. Lin, Y.-H. Cheng, Feng Chia University, Taichung (CHN) [346]

### **9:00 Fast calibration of electromagnetically tracked oblique-viewing rigid endoscopes**

X. Liu, C.E. Rice, R. Shekhar, Children's National Medical Center, Washington, DC; Princeton Univ. (USA) [338]

Friday, June 23, 2017

Room Barcelona

## **9:15 Poster Session 2**

### **Session Chairs:**

Leo Joskowicz, PhD (IL), Purang Abolmaesumi, PhD (CDN)

Posters # 062 - # 075

10:15 Break

Friday, June 23, 2017  
Room Barcelona

### **10:45 Image Guided Therapy and Interventions**

#### **Session Chairs:**

David Hawkes, PhD (UK)

#### **10:45 Active models for image guided interventions: application to interventions in the prostate and breast**

**Invited Speaker:** David Hawkes, PhD, University College London (UK) [459]

#### **11:00 A novel OCT guided laser ablation system for precision treatment**

Y. Fan, B. Zhang, W. Chang, H. Liao, Tsinghua University School of Medicine, Beijing (CHN) [352]

#### **11:15 Insertion depth influence on the performance of in-silico cochlear implantation models**

N. Mangado, M. Ceresa, P. Mistrik, M. A. González Ballester, Universitat Pompeu Fabra, Barcelona (E); MED-EL, Innsbruck, (A); ICREA, Barcelona (E) [158]

#### **11:30 Surgical planning system for twin-to-twin transfusion syndrome fetal surgery**

M. Ceresa, J. Torrents-Barrena, A. Alises, N. Masoller, E. Eixarch, E. Gratacós, M. A. Gonzalez Ballester, Universitat Pompeu Fabra, Barcelona; Universitat de Barcelona (E) [204]

#### **11:45 Liver ultrasound portal vein classification for navigation of liver-tumor resection surgery**

Z. Li, P. Zhu, Hitachi, Ltd., Tokyo (J) [214]

12:00 Break

### **12:15 ISCAS General Assembly**

13:15 Break

Friday, June 23, 2017  
Room Barcelona

### **14:00 Surgical and Interventional Navigation**

#### **Session Chairs:**

Alfred M. Franz, PhD (D), Alvaro Bertelsen, PhD (E)

#### **14:00 Clinical applications of modeling, planning and simulation in the endovascular treatment of cerebral aneurysms**

**Invited Speaker:** Juan Miguel Macho Fernández, MD, Hospital Clinic Barcelona (E) [462]

#### **14:15 A surgical navigation system using sulci recognition and diffusion tensor images in glioma surgery**

T. Noguchi, I. Sato, T. Nagai, Y. Fujino, H. Yamada, T. Suzuki, M. Tamura, Y. Muragaki, K. Masamune, Future Univ. Hakodate; Murakumo Corp.; Tokyo Women's Medical Univ.; Japan Association for the Advancement of Medical Equipment, Tokyo (J) [131]

#### **14:30 The use of real-time tumor tracking to perform navigation guided breast conserving surgery: feasibility of the CALYPSO system TM in breast phantoms**

N. Janssen, R. Eppenga, M. J. Vrancken Peeters, F. van Duijnhoven, H. Oldenburg, J. van der Hage, E. Rutgers, J. J. Sonke, K. Kuhlmann, T. Ruers, J. Nijkamp, Antoni van Leeuwenhoek Hospital - Netherlands Cancer Institute, Amsterdam (NL) [136]

#### **14:45 Image Guidance for Sacral Neuromodulation**

R. López-Velazco, D. García-Mato, G. Rodríguez-Lozano, M. García-Sevilla, E. Marinetto, D. García-Olmo, M. Desco, M. Ortega López, J. Pascau, Instituto de Investigación Sanitaria Gregorio Marañón; Hospital Fundación Jiménez Díaz, Madrid (E) [213]

#### **15:00 Surgical navigation and 3D printing in hemipelvic osteotomy**

V. García-Vázquez, G. Rodríguez-Lozano, R. Pérez-Mañanes, J. A. Calvo, R. Moreta-Martínez, J. M. Asencio, M. Desco, J. Pascau, Instituto de Investigación Sanitaria Gregorio Marañón; Hospital General Universitario Gregorio Marañón; Universidad Complutense de Madrid; Universidad Carlos III de Madrid; CIBERSAM, Madrid (E) [221]

Friday, June 23, 2017  
Room Barcelona

### **15:15 User Interfaces**

#### **Session Chairs:**

Caroline Essert, PhD (F), Javier Pascau, PhD (E)

#### **15:15 Can you feel it: An early experience with simulated vibration to recreate glenoid reaming**

J. Strelzow, J. Kusins, L. Ferriera, M. E. Lebel, Univ. of Western Ontario, Edinburgh (UK); Shinshu Univ., Matsumoto (J); Inst. of Tokyo Women's Medical Univ., Tokyo (J) [24]

#### **15:30 An efficiency study of gesture interaction using a new touchless interface and a traditional desktop interface for intraoperative use**

K. Košič, B. Šumak, University of Maribor (SLO) [50]

**15:45 Recognizing of hand pose in basic surgical tasks using depth images**

H. Gaibin, Y. Nakajima, The University of Tokyo (J) [53]

**16:00 Proposal for identification and modeling of surgical processes using pre-operative and intra-operative information in awake surgery for glioma**

T. Nagai, I. Sato, T. Noguchi, Y. Fujino, H. Yamada, K. Yoshimitsu, Y. Muragaki, K. Masamune, Future Univ. Hakodate; Murakumo Corporation, Tokyo; Tokyo Women's Medical Univ. (J) [199]

**16:15 A Survey of Auditory Display in Image-Guided Interventions**

D. Black, C. Hansen, A. Nabavi, R. Kikinis, H. Hahn, Jacobs Univ.; Fraunhofer MEVIS; Univ. of Bremen; Otto von Guericke Univ. Magdeburg; International Neuroscience Institute, Hannover (D); Brigham and Women's Hospital, Boston (USA) [231]

16:30 Break

Friday, June 23, 2017

Room Barcelona

**16:45 Virtual and Augmented Reality**

**Session Chairs:**

Amber Simpson, PhD (USA)

**16:45 Kidney deformation evaluation for augmented reality surgical navigation of laparoscopic partial nephrectomy: an animal experiment**

X. Zhang, T. Wang, E. Kobayashi, H. Kiyomatsu, H. Tsukihara, J. Wang, Beihang University, Beijing (CHN); The University of Tokyo (J) [13]

**17:00 Virtual Reality for Neurosurgical Intervention in Epilepsy**

D. Pacheco, R. Zucca, X. Arsiwalla, D. Dalmazzo, A. Principe, R. Rocamora, P. Verschure, Universitat Pompeu Fabra; Hospital del Mar; Barcelona (E) [295]

**17:15 Augmented Reality Surgical Navigation with Ultrasound-assisted Registration for Spinal Puncture: A Pilot Study**

L. Ma, Z. Zhao, F. Chen, B. Zhang, L. Fu, H. Liao, Tsinghua University, Beijing; Tsinghua Changgung Hospital (CHN) [353]

**17:30 In vivo robustness analyses of intraoperative registration with fluorescent markers**

E. Stenau, T. Simpfendorfer, M. Azizian, W. P. Liu, K. K. Anderson, D. Bergman, O. Mohareri, J. M. Sorger, D. Teber, L. Maier-Hein, German Cancer Research Center, Heidelberg; Univ. of Heidelberg (D); Intuitive Surgical Inc., Sunnyvale (USA) [69]

17:45 End of Session

**20:00 ISCAS Social Event**

Saturday, June 24, 2017

Room Barcelona

**8:45 Neurosurgery 1**

**Session Chairs:**

Gerardo Conesa Bertrán, MD (E)

**8:45 Surgical Simulation in the Era of Competency Based Neurosurgical training**

**Invited Speaker:** Sandrine de Ribaupierre, MD, University of Western Ontario, London, ON (CDN) [460]

**9:00 Retrospective Evaluation and SEEG Trajectory Analysis for Interactive Multi-trajectory Planning Assistant**

D. Scorza, L. Plaino, G. Amoroso, G. Arnulfo, M. Narizzano, L. Kabongo, E. De Momi, F. Cardinale, Vicomtech, San Sebastian (E); Polytechnico di Milano; Niguarda Hospital Ca' Granda, Milan; Univ. of Genova (I) [345]

**9:15 SYLVIUS: Multi-modal 3D platform for planning and analysis of epilepsy surgery**

I. Delgado-Martínez, A. Higuera-Esteban, J. Ojeda, L. Serrano, A. Principe, R. Rocamora, L. Serra, G. Conesa, Univ. Autònoma de Barcelona; Galgo Medical S.L., Barcelona (E) [368]

**09:30 Virtual 3D Model Utilized in Mapping of Subdural Electrodes for Epilepsy Surgery**

S. Todorova, V. Jewells, H. Shin, E. Hadar, Stanford Univ. School of Medicine, Stanford, CA; Univ. of North Carolina (USA) [362]

**9:45 Computational Framework for Evaluating Surgical Outcomes in Cranial Vault Remodeling for Craniosynostosis and Framework Validation in Metopic Craniosynostosis Severity Model**

D. Khechoyan, Y. Li, S. Karani, B. French, J. Phillips, B. Yuan, R. Goldman, Children's Hospital of Colorado, Aurora; Rice Univ., Houston; MIT, Boston (USA); The Hospital for Sick Children, Toronto (CDN) [236]

**10:00 Long-Term Changes in Head Shape in Patients with Untreated Craniosynostosis**

J. Phillips, D. Khechoyan, D. Smith, E. Zeliner, S. Alshaqsi, S. Karani, The Hospital for Sick Children, Toronto, Ontario (CDN); Colorado Children's Hospital, Denver; MIT, Cambridge (USA) [259]

**10:15 Blood Vessel Recognition with Microscopic Image toward Automated Anastomosis**

Y. Kurose, A. Nakazawa, K. Harada, H. Nakatomi, N. Saito, E. Watanabe, A. Morita, N. Sugita, M. Mitsuishi, The University of Tokyo; The University of Tokyo Hospital; Jichi Medical University Hospital, Tochigi; Nippon Medical School Hospital, Tokyo (J) [424]

10:30 Break

Saturday, June 24, 2017  
Room Barcelona

### **10:45 Neurosurgery 2**

#### **Session Chairs:**

Sandrine de Ribaupierre, MD

#### **10:45 Robotic Surgical Microscope for Neurosurgery**

Y. Horise, J. Okamoto, K. Yoshimitsu, H. Iseki, K. Masamune, Y. Muragaki, Tokyo Women's Medical Univ.; Waseda Univ., Shinjuku (J) [163]

#### **11:00 Role of preoperative DTI tractography for surgical management of gliomas**

M. Tamura, T. Maruyama, J. F. Mangin, I. Sato, M. Nitta, T. Takakura, K. Yoshimitsu, Y. Konishi, J. Okamoto, S. Ikuta, K. Masamune, T. Kawamata, H. Iseki, Y. Muragaki, Tokyo Women's Medical Univ.; Future Univ. Hakodate (J); Neurospin, Gif/Yvette (F) [272]

#### **11:15 When Form meets Function: merging intraoperative MRI ,DTI and navigation with functional electrophysiological monitoring in brain surgery**

C. R. Wirtz, M. Pedro, J. Coburger, R. König, A. Pal'a, University of Ulm; Ulm University, Günzburg (D) [90]

#### **11:30 Verifying tract-specific streamlines generated via diffusion tensor imaging of the cervical spinal cord**

S. McLachlin, C. Whyne, M. Hardisty, Sunnybrook Health Sciences Centre, Toronto, ON (CDN) [245]

#### **11:45 Assessment of patient-to-image registration accuracy using a skull phantom in neurosurgical procedures**

I. P. Machado, P. Batista, H. Carvalho, J. Martins, Instituto Superior Técnico; Hospital de Santa Maria; Lisbon (P) [19]

#### **12:00 Retrospective volumetric analysis using intraoperative MR imaging for 122 WHO grade III gliomas: Threshold of the extent of resection**

Y. Fujii, Y. Muragaki, T. Maruyama, M. Nitta, T. Saito, S. Ikuta, H. Iseki, K. Hongo, T. Kawamata, Tokyo Women's Medical University, Shinjuku-ku Tokyo; Shinshu University, Matsumoto (J) [31]

12:15 Break

Saturday, June 24, 2017  
Room Barcelona

### **14:00 Poster Session 3**

#### **Session Chair:**

Kensaku Mori, PhD (J)

Posters # 076 - # 090

Saturday, June 24, 2017  
Room Barcelona

### **15:00 Orthopaedics**

#### **Session Chairs:**

Nobuhiko Sugano, MD (J), Francisco Maculé Beneyto, MD (E)

#### **15:00 Computer assisted hip surgery**

**Invited Speaker:** Nobuhiko Sugano, MD, Osaka University (J) [461]

#### **15:15 Aspherical Hip Kinematics Measured with Optoelectronic Surgical Navigation**

S. Zakani, J.F. Rudan, R.E. Ellis, Univ. of British Columbia, Vancouver; Queen's Univ., Kingston, ON (CDN) [303]

#### **15:30 Intra-Operative Fiducial-Based CT/Fluoroscope Image Registration Framework for Image-Guided Robot-Assisted Joint Fracture Surgery**

G. Dagnino, I. Georgilas, S. Morad, P. Gibbons, P. Tarassoli, R. Atkins, S. Dogramadzi, Univ. of the West of England; Univ. Hospitals Bristol (UK) [324]

#### **15:45 Lessons from periodic comparison of surgical outcomes after total knee arthroplasty: imageless navigation vs conventional technique**

K. J. Oh, Y. Suk Tae, Konkuk University Medical Center, Seoul (ROK) [75]

16:00 Break

Saturday, June 24, 2017  
Room Barcelona

### **16:15 Surgical Education, Training and Assessment**

#### **Session Chairs:**

NN

#### **16:15 Quantitative evaluation of intestinal suture training process using forceps movement measurement from video by image processing**

N. Fukatsu, S. Aoki, T. Yamaguchi, M. Uemura, M. Hashizume, R. Nakamura, Chiba University; Kyushu University; Japan Agency for Medical Research and Development, Tokyo; Japan Science and Technology Agency, Saitama (J) [129]

**16:30 A virtual framework to evaluate osseous fixation pathways in the spine**

S. McLachlin, D. Pelletier, A. Keren, J. Finkelstein, C. Whyne, Sunnybrook Health Sciences Centre, Toronto, ON (CDN) [249]

**16:45 Laparoscopic training system with quantitative skill assessment and instruction module based on trajectory analysis of surgical instruments**

T. Yamaguchi, T. Sugino, R. Nakamura, Chiba University; Science and Technology Agency, PRESTO, Saitama (J) [22]

**17:00 Is proprioception a key sensory modality to be successful in laparoscopy training?**

C. T. Ninon, S. Jérôme, University Pierre and Marie Curie, Paris (F) [222]

**17:15 Eye gaze behaviour watching an advanced laparoscopic procedure: experts vs. novices comparison**

J. F. Ortega Morán, A. Toribio Silva, J. B. Pagador, P. Sánchez González, E. J. Gómez Aguilera, F. M. Sánchez Margallo, Jesús Usón Minimally Invasive Surgery Centre, Cáceres (E) [87]

**17:30 Development of a haptic and visual assisted training simulation concept for complex bone drilling in minimally invasive hand surgery**

J. Maier, S. Haug, M. Huber, U. Katzky, S. Neumann, J. Perret, M. Prinzen, K. Weber, T. Wittenberg, R. Wöhl, U. Scorna, C. Palm, OTH Regensburg; Univ. Hospital Regensburg; szenaris GmbH, Bremen; SeeFront GmbH, Hamburg; Haption GmbH, Aachen; Fraunhofer Inst. for Integrated Circuits IIS, Erlangen (D) [9]

17:45 ISCAS Closing Session



## 19<sup>th</sup> International Workshop on Computer-Aided Diagnosis

Chairman: **Hiroyuki Yoshida, PhD (USA)**

Thursday, June 22, 2017  
Room Estocolmo

### 8:00 Deep Learning in CAD 1

#### Session Chairs:

Janne Nappi, PhD (USA), Kunio Doi, PhD (USA)

#### ~~08:00 Automatic Lung Nodule Detection in Chest Radiographs Using Deep Learning Architecture~~

~~Z. Fang, D. Jiang, Y. Mao, D. Yao, Y. Shi, Z. Song, Fudan University, Shanghai (CHN) [329]~~

~~cancelled~~

#### 08:15 A comparison of conventional and deep learning methods of image classification on a database of chest radiographs

V. Kovalev, A. Kalinovsky, V. Liauchuk, A. Shukelovich, United Institute of Informatics, Minsk (BY) [173]

#### 08:30 Examining the ability of convolutional neural networks to detect lesions in lung CT images

V. Liauchuk, V. Kovalev, A. Kalinovsky, A. Tarasau, A. Gabrielian, A. Rosenthal, United Inst. of Informatics, Minsk; Scientific and Practical Center for Pulmonology and Tuberculosis, Minsk (BY); National Inst. of Allergy and Infectious Diseases, Bethesda, MD (USA) [196]

#### 08:45 Emphysema detection and classification using a multi-scale deep convolutional neural network

D. Bermejo, R. San José-Estépar, M. J. Ledesma-Carbayo, Universidad Politécnica de Madrid (E); Brigham and Women's Hospital, Boston (USA) [235]

#### 09:00 Computer-aided classification of diffuse lung disease patterns using convolutional neural network

K. Murakami, S. Kido, N. Hashimoto, Y. Hirano, K. Wakasugi, K. Inai, Yamaguchi University, Ube; Panasonic Corporation, Kyoto; Fukui University (J) [147]

#### 09:15 Computer-aided prediction of overall survival of patients with rheumatoid arthritis-associated interstitial lung disease based on deep learning

H. Yoshida, R. Nasirudin, C. Watari, J. Nappi, T. Hironaka, Harvard Medical School, Boston, MA (USA) [285]

9:30 Break

Thursday, June 22, 2017  
Room Estocolmo

### 9:45 Deep Learning in CAD 2

#### Session Chairs:

Hiroyuki Yoshida, PhD (USA), Martin Fiebich, PhD (D)

#### 9:45 Deep learning in CAD

Invited Speaker: TBA

#### 10:15 Computer-aided detection of serrated polyps with a deep convolutional neural network in CT colonography

J. Näppi, P. Pickhardt, D. Kim, T. Hironaka, H. Yoshida, Massachusetts General Hospital, Boston, MA; University of Wisconsin, Madison (USA) [96]

#### 10:30 Multi-slice ensemble deep learning of electronic cleansing for computer-aided detection of colonic lesions in multi-spectral CT colonography

R. Tachibana, J. J. Näppi, T. Hironaka, S. H. Kim, H. Yoshida, National Institute of Technology, Yamaguchi (J); Massachusetts General Hospital, Boston, MA (USA); Seoul National University Hospital (ROK) [169]

#### 10:45 Endocytoscope image classification using deep convolutional neural networks

M. Oda, Y. Hoshiyama, M. Misawa, Y. Mori, K. Takeda, S. E. Kudo, K. Mori, Nagoya University; Showa University (J) [193]

#### 11:00 Iterative Semi-Supervised Learning for Automatic Annotation of Diffuse Lung Diseases Using Deep Autoencoder and SVM

S. Mabu, N. Hashimoto, S. Kido, M. Obayashi, T. Kuremoto, Y. Hirano, Yamaguchi University (J) [316]

11:15 Break

Thursday, June 22, 2017  
Room Estocolmo

### 11:30 Lung and Breast CAD

#### Session Chairs:

Shoji Kido, PhD (J), Ruey-Feng Chang, PhD (CHN)

#### 11:30 Feature Fusion for Lung Nodule Classification

A. Farag, A. Ali, A. Farag, S. Elshazly, The University of Louisville (USA) [347]

#### 11:45 Quantitative CT texture and shape analysis: which features can differentiate benign and malignant pulmonary nodules?

R. Casale, B. Maris, G. Addonisio, P. Orlando, P. Fiorini, Hospital San Tommaso dei Battuti, Portogruaro; University of Verona; Hospital San Donà di Piave (I) [177]

**12:00 The application of a vessel suppressed function incorporated with lung opacity analysis for the significant increase of nodule detectability in CT**

S. Lo, M. Freedman, S. K. Mun, Virginia Tech, Arlington, VA (USA) [104]

**12:15 Effects of different types of gold standard on computer-assisted detection of lung nodules using voxel-based classification**

Y. Nomura, N. Hayashi, S. Hanaoka, M. Nemoto, T. Takenaga, S. Miki, T. Yoshikawa, O. Abe, The University of Tokyo Hospital (J) [32]

**12:30 computer-aided prediction of axillary lymph node status using breast ultrasound**

R. F. Chang, Y. W. Lee, Y. S. Huang, C. S. Huang, W. K. Moon, S. H. Lee, M. S. Bae, A. Yi, J. M. Chang, National Taiwan University; National Taiwan University Hospital, Taipei (RC); Seoul National University Hospital (ROK) [30]

12:45 Break

Thursday, June 22, 2017

Room Estocolmo

**14:00 Special Session on Musculoskeletal CAD**

**Session Chairs:**

Mansoor Fatehi, MD (IR), Paulo Mazzonicini Azevedo-Marques, PhD (BR)

**14:00 Musculoskeletal CAD: trends and challenges**

**Invited Speaker:** Mansoor Fatehi, MD, Medical Imaging Informatics Research Center, Tehran (IR) [464]

**14:15 Multi-segmentation and cooperative classification models improve the identification of malignant vertebral compression fractures in MRI**

P. M. Azevedo-Marques, P. Casti, A. Mencattini, M. H. Nogueira-Barbosa, L. Frighetto-Pereira, E. Martinelli, C. Di Natale, Universida of Sao Paulo, Ribeirao Preto (BR); University of Rome Tor Vergata (I) [108]

**14:30 Computer-aided classification of inflammatory sacroiliitis in magnetic resonance imaging**

P. M. Azevedo-Marques, M. Calil Faleiros, E. J. Rivero Zavala, J. R. Ferreira Junior, V. Faeda Dalto, R. Luppino Assad, P. Louzada Júnior, M. H. Nogueira-Barbosa, Universida of Sao Paulo, Ribeirao Preto (BR) [4]

**14:45 Computer-aided diagnosis of sacroiliitis in CT scans: method and preliminary results**

L. Joskowicz, E. Hochman, A. Mayer, I. Eshed, The Hebrew University of Jerusalem; Sheba Medical Center, Ramat Gan (IL) [36]

15:00 Break

Thursday, June 22, 2017

Room Estocolmo

**15:30 Brain CAD and Pathology CAD**

**Session Chair:**

Hiroshi Fujita, PhD (J), Martin Fiebich, PhD (D)

**15:30 Ischemic stroke detection by a comparative analysis of regions in CT images using fuzzy techniques**

N. Gordillo-Castillo, A. Davis-Ortiz, E. Montseny-Massip, Univ. of Ciudad Juarez, Chihuahua (MEX); Universitat Politècnica de Catalunya, Barcelona (E) [339]

**15:45 Computer assisted identification of acute ischemic infarct using CT number and wavelet features from CT images**

M. Nag, S. Koley, D. Das, C. Chakraborty, A. Sadhu, N. Ghosh, Indian Institute of Technology, Kharagpur (IND) [106]

**16:00 Towards a novel fused colour model to improve diabetic retinopathy diagnosis.**

J. Escorcia-Gutierrez, J. Torrents-Barrena, P. Romero-Aroca, A. Valls, D. Puig, Universitat Rovira i Virgili, Tarragona; University Hospital Sant Joan de Reus (E) [240]

**16:15 Heterogeneity Analysis of Standardised Diffusion Weighted Magnetic Resonance Images of the Prostate**

G. Samarasinghe, A. Sowmya, D. A. Moses, University of New South Wales, Kensington; Prince of Wales Hospital, Sydney (AUS) [226]

16:30 Break

**16:30 CAD Poster Presentations**

**Chairs:**

Kunio Doi, PhD (USA), Hiroyuki Yoshida, PhD (USA)

## 23<sup>rd</sup> Computed Maxillofacial Imaging Congress

Chairman: **Christos Angelopoulos, DDS (USA)**, Co-chair: **Yoshihiko Hayakawa, PhD (J)**

Friday, June 23, 2017  
Room Estocolmo

### 8:30 Image-Guided Oral Surgery and Implantology, Statistical Reconstruction

#### Session Chairs:

Yoshinori Arai, PhD (J), Christos Angelopoulos, DDS (USA)

#### 8:30 Comparison of different iterative reconstruction techniques for noise reduction in dentomaxillofacial imaging

G. Widmann, F. Menapace, G. Degenhart, M. Steurer, R. Hörmann, W. Puelacher, Medizinische Universität Innsbruck (A) [248]

#### 8:45 Identification of the inferior alveolar canal using ultralow dose CT and iterative reconstruction imaging.

G. Widmann, F. Menapace, G. Degenhart, M. Steurer, R. Hörmann, W. Puelacher, Medizinische Universität Innsbruck (A) [251]

#### 9:00 Analysis of Spatial Resolution of Cone Beam Computed Tomography Depending on Change in Pixel Size of Flat Panel Detector

K. Honda, T. Suzuki, Y. Hayashi, S. Hirai, Y. Arai, Nihon University, Tokyo (J) [119]

#### 9:15 CBCT evaluation of maxillary artery branches in a group of Anatolian patients

Z. S. BERKTAS, M. H. KURT, K. ORHAN, Ankara University (TR) [123]

#### 9:30 Detection of various width and depth of peri-implant crestal bone defects with different imaging modalities

N. Morgan, W. Aboelmaaty, L. Gadalla, E. Abdel Fadil, Mansoura University (ET) [290]

9:45 Break

Friday, June 23, 2017  
Room Estocolmo

### 10:00 Computed Maxillofacial Image Guided Surgery, Modelling

#### Session Chairs:

Wael Aboelmaaty, PhD (ET), Gerlig Widmann, MD, PD (A)

#### 10:00 TBD

**Invited Speaker:** Akitoshi Katsumata, DDS, PhD, Asahi University, Gifu (J) [465]

#### 10:15 Computer-assisted navigation in surgical management of the lesions in the temporomandibular joint and skull base

S. Zhang, J. Wu, C. Yang, B. Xu, S. G. Shen, Jiao Tong University School of Medicine, Shanghai (CHN) [48]

#### 10:30 Application of sparse shape modeling to automated planning of mandibular reconstruction

M. Nakao, R. Kawasaki, Y. Imai, N. Ueda, T. Hatanaka, M. Shiba, T. Kirita, T. Matsuda, Kyoto University; Rakuwakai Otowa Hospital, Kyoto; Nara Medical University (J) [58]

#### 10:45 Quantitative assessment of facial asymmetry using a neuro-MCDM model

S. Y. Wan, L. J. Lo, Chang Gung University, Kwei-Shan, Taoyuan; Chang Gung Memorial Hospital, Guishan Dist., Taoyuan (RC) [280]

#### 11:00 Pathological mandibular biomechanics: finite element analysis based on partial dentition, cystic lesion, and partial resection

C. Kober, C. Hellmich, A. Gurin, V. Komlev, G. Kjeller, R. Sader, H. F. Zeilhofer, B. I. Berg, Hamburg Univ. of Applied Sciences; Univ. Frankfurt am Main (D); TU Vienna (A); Central Scientific Research Inst. of OMF Surgery; A.A. Baikov Inst. of Metallurgy and Material Science (RUS); The Sahlgrenska Academy (S); Univ. Hospital Basel (CH) [253]

11:15 Break

Friday, June 23, 2017  
Room Estocolmo

### 11:30 Tutorial on CMI

#### Session Chairs:

Cornelia Kober, PhD (D), Silvio Diego Bianchi, MD (I)

#### 11:30 Innovative techniques in image processing and recognition in CMI

Roberto Molteni, Skanray Europe s.r.l., Bologna (I), Yoshinori Arai, Nihon University, Tokyo (J)

12:30 Break

Friday, June 23, 2017  
Room Estocolmo

### 14:00 Computed Maxillofacial Image Guided Surgery II

#### Session Chairs:

Akitoshi Katsumata, DDS, PhD (J), Asma'a Al-Ekrish, MDS (SA)

**14:00 Customized CAD/CAM miniplates and cutting guides as tools to improve accuracy during orthognathic surgery.**  
J. Gutiérrez Santamaría, J. Pamiás Romero, J. Masiá Gridilla, J. A. Hueto Madrid, C. Bescós Atín, Hospital Universitario Vall d'Hebron, Barcelona (E) [156]

**14:15 Development a novel surgical navigation system for the intraoperative reposition of separated bones in orthognathic surgery**

X. Chen, L. Xu, P. Jia, Y. Sun, C. Politis, Shanghai Jiao Tong University (CHN); KU Leuven (B) [179]

**14:30 Comparison between clinical accuracy of titanium plates pre-bending on 3D models of original and mirror images for mandibular defects**

W. Aboelmaaty, M. Isaac, I. Sharabasy, Mansoura University; Delta University for Science and Technology, Ministry of Health and Population, Mansoura (ET) [241]

**14:45 New generation of maxillomandibular reconstruction with free fibula flap using computer-aided design/ computer-aided manufacturing solutions.**

J. Masia, J. Pamiás, J. Gutiérrez, M. Saez, C. Bescós, Hospital Vall d'Hebron, Barcelona (E) [244]

**15:00 Round Table Discussion on Computed Maxillofacial Image-Guided Endodontics, Oral Surgery, Orthodontics and Implantology**

**Session Chairs:** Akitoshi Katsumata, DDS, PhD (J), Asma'a Al-Ekrish, MDS (SA)

15:15 Break

Friday, June 23, 2017  
Room Estocolmo

**15:15 CMI Poster Session (short presentations)**

**Chairs:**

Christos Angelopoulos, DDS (USA), Yoshihiko Hayakawa, PhD (J)

15:30 Break

Friday, June 23, 2017  
Room Estocolmo

**15:45 CAR / CARS Poster Session**

15:45 PO # 001 - 020

16:45 PO # 021 - 040

17:45 PO # 041 - 047

18:15 Break

**IPCAI 2017 - 8<sup>th</sup> International Conference on Information Processing in  
Computer-Assisted Interventions**

General Chairs: **Kensaku Mori, PhD (J), Parvin Mousavi, PhD (CDN), Danail Stoyanov, PhD (UK)**

Tuesday, June 20, 2017  
Room Barcelona

**10:30 Introduction**

**Chairs:** Cristian A. Linte, PhD (USA), Nicolas Padoy, PhD (F)

**10:45 Short Presentations Session I: Endoscopy, Visualization and Augmented Reality for CAI**

**Chair:** Raphael Sznitman, PhD (CH)

**Comparison of Optical See-Through Head-Mounted Displays for Surgical Interventions with Object-Anchored 2D Display**

L. Qian, A. Barthel, A. Johnson, G. Osgood, P. Kazanzides, N. Navab, B. Fuerst, Johns Hopkins University (USA); Technical University of Munich (D) [155-I]

**Deep Monocular 3D Reconstruction for Assisted Navigation in Bronchoscopy**

M. Visentini-Scarzanella, T. Sugiura, T. Kaneko, S. Koto, Toshiba (J) [110]

**SLIM (Slit Lamp Image Mosaicing): Handling Reflection Artifacts**

K. Prokopetc, A. Bartoli, Université d'Auvergne (F) [121]

**Intelligent viewpoint selection for efficient CT to video registration in laparoscopic liver surgery**

M. Robu, P. Edwards, J. Ramalinho, S. Thompson, B. Davidson, D. Hawkes, D. Stoyanov, M. Clarkson, University College London (UK) [173]

**Projective biomechanical depth matching for soft-tissue registration in laparoscopic surgery**

D. Reichard, D. Häntschi, S. Bodenstedt, S. Suwelack, M. Wagner, H. Kenngott, B. Müller-Stich, R. Dillmann, S. Speidel, Karlsruhe Institute of Technology; Medical University of Heidelberg (D) [181]

**Real-Time Surgical Tool Tracking and Pose Estimation for Intraoperative Ultrasound Visualisation using a Hybrid Cylindrical Marker**

L. Zhang, M. Ye, P.-L. Chan, G.-Z. Yang, Imperial College London (UK); Chinese Hong Kong University (CHN) [120]

**11:25 Short Presentations Session II: Ultrasound-guided Interventional Applications**

**Chair:** Elvis Chen, PhD (CDN)

**Adaptive Learning from RF to B-mode Ultrasound Data for Prostate Cancer Detection**

S. Azizi, P. Mousavi, P. Yan, A. Tahmasebi, J. Tae Kawk, Sheng Xu, B. Turkbey, P. Choyke, P. Pinto, B. Wood, P. Abolmaesumi, University of British Columbia; Queen's University (CDN); Philip Research; National Institute of Health (USA), Sejong University (ROK) [154]

**First clinical use of the EchoTrack guidance approach for radiofrequency ablation of thyroid gland nodules**

A. Franz, A. Seitel, N. Bopp, C. Erbeling, S. Delorme, D. Cheray, F. Grünwald, H. Korkusuz, L. Maier-Hein, German Cancer Research Center; University Hospital Frankfurt (D) [186]

**Robust Motion Tracking in Liver from 2D Ultrasound Images Using Supporters**

E. Ozkan, C. Tanner, M. Kastelic, O. Mattausch, M. Makhinya, O. Goksel, ETH Zurich (CH) [128]

**Enhancement of Bone Shadow Region Using Ultrasound Transmission Maps**

I. Hacıhaliloglu, Rutgers University (USA) [160]

**Geometric Modeling of Hepatic Arteries in 3D Ultrasound with Unsupervised MRA Fusion during Liver Interventions**

M. Gerard, F. Michaud, A. Bigot, A. Tang, G. Soulez, S. Kadoury, Ecole Polytechnique de Montréal, Université de Montréal (CDN) [126]

**Model-based Registration of Preprocedure MR and Intraprocedure US**

D. Behnami, A. Sedghi, E. M. Abu Anas, A. Rasouljan, A. Seitel, V. Lessoway, T. Ungi, D. Yen, J. Osborn, P. Mousavi, R. Rohling, P. Abolmaesumi, University of British Columbia; Queen's University; Kingston General Hospital (CDN) [146]

**12:05 Short Presentations Session III: Intra-operative Robotic Systems and Applications**

**Chair:** Su-Lin Lee, PhD (UK)

**Force Assisted Ultrasound Imaging System through Dual Force Sensing and Admittance Robot Control**

T.-Y. Fang, H. Zhang, R. Finocchi, R. Taylor, E. Boctor, Johns Hopkins University (USA) [152]

**Hand-eye calibration for surgical cameras -- A Procrustean Perspective-n-Point solution**

I. Morgan, U. Jayarathne, A. Rankin, T. M. Peters, E. C.S. Chen, University of Waterloo; Western University; Robarts Research Institute (CDN) [198]

**Acoustic Window Planning for Ultrasound Acquisition**

R. Göbl, S. Virga, J. Rackerseder, B. Frisch, N. Navab, C. Hennesperger, Technical University of Munich (D)[129]

**Evaluation of a novel multi-articulated endoscope: proof of concept through a virtual simulation**

T. Karvonen, Y. Muranishi, G. Yamamoto, T. Kuroda, T. Sato, Kyoto University; Kyoto University Hospital (J) [205]

### **On the Reproducibility of Expert-Operated and Robotic Ultrasound Acquisitions**

R. Kojcev, A. Khakzar, B. Fuerst, O. Zettinig, C. Fakhry, B. De Jong, J. Richmon, R. Taylor, E. Sinibaldi, Nassir Navab, Johns Hopkins University; Harvard University (USA); Technical University of Munich (D); Italian Institute of Technology (I) [177]

### **A Gaze-Contingent Framework for Human-Robot Collaboration in the Operating Theatre**

A. Kogkas, A. Darzi, G. Mylonas, Imperial College London (UK) [209]

12:45 Lunch Break

14:15 **Keynote Presentation:** Makoto Hashizume, MD, Kyushu University, Fukuoka (J)

**Chair:** Dan Stoyanov, PhD (UK)

### **15:00 Short Presentations Session IV: Surgical Workflow and Skill Analysis**

**Chair:** Stefanie Speidel, PhD (D)

#### **Video and Accelerometer-Based Motion Analysis for Automated Surgical Skills Assessment**

A. Zia, Y. Sharma, V. Bettadapura, E. Sarin, I. Essa, Georgia Institute of Technology; Emory University (USA) [185]

#### **The Minimally Acceptable Classification Criterion for Surgical Skill**

R. Dockter, T. Lendvay, Robert Sweet, T. Kowalewski, University of Minnesota; Seattle Children's Hospital; University of Washington (USA) [191]

#### **Predicting Surgical Skill from the First N Seconds of a Task**

A. French, T. M. Lendvay, R. M. Sweet, T. M. Kowalewski, University of Minnesota; University of Washington (USA) [204]

#### **Addressing multilabel imbalance problem of Surgical Tool Detection using CNN**

M. Sahu, A. Mukhopadhyay, A. Szengel, S. Zachow, Zuse Institute Berlin (D) [140]

#### **Temporal clustering of surgical activities in robot-assisted surgery**

A. Zia, C. Zhang, X. Xiong, A. Jarc, Georgia Institute of Technology; University of Tennessee; Intuitive Surgical, Inc. (USA) [199]

15:30 Coffee Break

### **16:00 Short Presentations Session V: Computer-aided Decision, Planning and Modeling for IGI**

**Chair:** Amber L. Simpson, PhD (USA)

#### **Automatic Spine Level Identification System using a Deep Convolutional Neural Network**

J. H. Hetherington, V. A. Lessoway, V. Gunka, P. Abolmaesumi, R. N. Rohling, University of British Columbia (CDN) [151]

#### **Extraction of Skin Lesions from Non-Dermoscopic Images for Surgical Excision of Melanoma**

H. Jafari, E. Nasr-Esfahani, N. Karimi, R. Soroushmehr, S. Samavi, K. Najarian, Isfahan University of Technology (IR); University of Michigan, McMaster University (CDN) [194]

#### **Towards PCI procedure modelling: Empty catheter segmentation**

K. Bacchuwar, J. Cousty, R. Vaillant, L. Najman, GE-Healthcare; Université de Paris Est (F) [147]

#### **An Efficient Cardiac Mapping Strategy for Radiofrequency Catheter Ablation with Active Learning**

Y. Feng, Z. Guo, Z. Dong, X.-Y. Zhou, K.-W. Kwok, S. Ernst,; Su-Lin Lee, Imperial College London; National Health Service [UK]; Hong Kong University (CHN) [153]

#### **Interactive Segmentation in MRI for Orthopedic Surgery Planning: Bone Tissue**

F. Ozdemir, N. Karani, P. Fuerstahl, O. Goksel, ETH Zurich; University Hospital Balgrist (CH) [188]

#### **Automatic Anatomical Labeling of Arteries and Veins Using Conditional Random Fields**

T. Kitasaka, M. Kagajo, Y. Nimura, Y. Hayashi, M. Oda, K. Misawa, K. Mori, Aichi Institute of Technology; Nagoya University; Aichi Cancer Center Hospital (J) [193]

### **16:40 Short Presentations Session VI: Intra-operative Navigation, Registration and Tracking**

**Chair:** Miguel Angel Gonzalez Ballester, PhD (E)

#### **Can Real-Time RGBD Enhance Intraoperative Cone-Beam CT?**

J. Fotouhi, B. Fuerst, W. Wein, Nassir Navab, ImFusion; Johns Hopkins University (USA) [127]

#### **Electromagnetically Tracked Personalized Templates for Surgical Navigation**

R. Ellis, A. Dickinson, M. Zec, D. Pichora, B. Rasquinha, Queen's University; Kingston General Hospital (CDN) [136]

#### **Anser EMT: The first open-source electromagnetic tracking platform for image-guided interventions**

H. A. Jaeger, A. Franz, K. O'Donoghue, A. Seitel, F. Trauzettel, L. Maier-Hein, P. Cantillon-Murphy, University College Cork (IRL); German Cancer Research Center (D) [182]

#### **Coffee: The Key to Safer Image-Guided Surgery**

P. Wellborn, N. Dillon, P. Russell, R. Webster III, Vanderbilt University (USA) [210]

#### **Contact-less stylus for surgical navigation -- registration without digitization**

E. C.S. Chen, B. Ma, T. M. Peters, Robarts Research Institute; York University (CDN) [116]

#### **Pose-Aware C-Arm for Automatic Re-Initialization of Interventional 2D/3D Image Registration**

J. Fotouhi, B. Fuerst, A. Johnson, R. Taylor, G. Osgood, N. Navab, M. Armand, Johns Hopkins University (USA) [175]

### **17:20 Presentation of Awards I**

### **17:30 Poster Presentation Session I & Social Event**

Dedicated to the 23 short oral presentations NOT featured as long presentations on June 21st

**19:00 End of the Day**

Wednesday June 21, 2017

**8:30 Selected Oral Presentations (1/3): Endoscopy, Visualization and Augmented Reality for CAI & Intra-operative Navigation, Registration and Tracking**

**Chairs:** Raphael Sznitman, PhD (CH), Miguel Angel Gonzalez Ballester, PhD (E)

10:10 Coffee Break

**10:40 Selected long oral Presentations (2/3): Ultrasound-guided Interventional Applications & Computer-aided Decision, Planning and Modeling for IGI**

**Chairs:** Elvis Chen, PhD (CDN), Amber L. Simpson, PhD (USA)

12:20 Lunch

**13:50 Selected long oral Presentations (3/3): Surgical Workflow and Skill Analysis & Intra-operative Robotic Systems and Applications**

**Chairs:** Stefanie Speidel, PhD (D), Su-Lin Lee, PhD (UK)

**15:30 Coffee Break & Poster Presentation Session II**

Dedicated to the 12 papers selected for long oral presentations on June 21st

**16:45 Presentation of Awards II & Closing**

**Chairs:** Cristian A. Linte, PhD (USA), Nicolas Padoy, PhD (F)

17:15 End of the Day

## Poster Session

### Poster Presentation Schedule

Poster No.	Presentation Time	Room
<b>CAR / CARS</b>		Estocolmo
# 001 – 020	June 23 (Frid) 15:45 – 16:45	
# 021 – 040	16:45 – 17:45	
# 041 – 047	17:45 – 18:45	
<b>ISCAS</b>		Barcelona
# 048 – 061	June 22 (Thu) 12:00 – 13:00	
# 062 – 075	June 23 (Fri) 09:15 – 10:15	
# 076 – 090	June 24 (Sat) 14:00 – 15:00	
<b>CAD</b>		Estocolmo
# 091 - 097	June 22 (Thu) 16:30 – 17:00	
<b>CMI</b>		Estocolmo
# 098 - 102	June 23 (Frid) 15:15 – 15:30	

### CAR / CARS

#### CAR / CARS Poster Session and Presentation Times

Session Chairs: Michael Friebe, PhD (D), Miguel A. Gonzalez Ballester, PhD (E)

Friday, June 23, 2017, Room Estocolmo

#### CAR / CARS Poster Session 1

15:45 PO # 001 - 020

#### CAR / CARS Poster Session 2

16:45 PO # 021 - 040

#### CAR / CARS Poster Session 3

17:45 PO # 041 - 047

#### **001 The bare bones of 3D printing: rapid prototyping as educational and decision making tools for orthopedic patients**

K. Luecke, N. Lambert, R. Foley, J. Ford, S. Decker, University of South Florida, Tampa (USA) [125]

#### **002 Robustness of trabecular bone parameters for small CT volumes**

S.G.F. Ryan, G. Venne, J.F. Rudan, R.E. Ellis, Queen's University, Kingston, Ontario (CDN) [318]

#### **003 A simple framework for dPET phantom generation with an example dataset for hypometabolic temporal lobe lesions**

N. Martínez, M. Bertrán, Á. Gómez, G.F. Carbajal, A. Fernández, R. Ferrando, Universidad de la República, Montevideo (U) [307]

#### **004 SIRT Activity and Dose Calculation Using an Optimized Territorial Model for the Liver**

N. Traulsen, P. Schilling, S. Thoduka, N. Abolmaali, G. Chlebus, J. Strehlow, A. Schenk, Fraunhofer Institute for Medical Image Computing MEVIS, Lübeck; Städtisches Klinikum Dresden-Friedrichstadt (D) [317]

#### **005 Abdominal aortic aneurysm rupture risk evaluation by wall stress analysis**

P. Zelter, A. Kolsanov, B. Yaremin, D. Volov, A. Nikonorov, SamSMU, Samara (RUS) [234]

#### **006 Patient-specific wall shear stress simulation - prediction of the susceptible regions to develop atherosclerotic lesions in the left coronary artery**

D. Szczerba, J. Wasilewski, K. Mirota, E. Stachowiak, Z. Małota, M. Gąsior, Univ. of Silesia; Medical Univ. of Silesia, Katowice; Univ. of Bielsko-Biała; Silesian Univ. of Technology, Gliwice; Foundation of Cardiac Surgery Development, Zabrze (PL) [243]

#### **007 2D hip translation from plain AP radiographs**

R. Ellis, C. DesRoche, J. Rudan, Queen's University, Kingston, Ontario (CDN) [94]

#### **008 Modelling of breast temperatures in dynamic thermograms using texture analysis methods for cancer detection**

D. Puig, M. Abdel-Nasser, University Rovira i Virgili, Tarragona (E); Aswan University (ET) [49]



- 009 Development of an interface for features extraction of a ground-glass opacity nodule**  
J. Wang, W. Du, D. Yuan, Y. Miao, Y. Ma, H. Zhang, Tianjin Polytechnic University; Tianjin Chest Hospital, Tianjin (CHN); Kyoto Institute of Technology (J) [174]
- 010 Relationship between lung cancer and homology-based CT quantification in CT database of lung nodules**  
M. Nishio, K. Nakane, T. Kubo, M. Yakami, Y. Emoto, T. Aakasaka, K. Onoue, K. Togashi, Kyoto University Graduate School of Medicine; Osaka University Graduate School of Medicine and Health Science; Kyoto College of Medical Science (J) [110]
- 011 Survey and Classification of Radiologic Image Reference Databases**  
O. Burgert A. Gebregiorgis, C. Thies, Reutlingen University (D) [60]
- 012 Development of electromagnetic catheter navigation system for superselective intra-arterial chemoradiotherapy**  
R. Matsubara, K. Yanagida, J. Wang, K. Nakagawa, E. Kobayashi, T. Ohya, I. Tohnai, S. Ichiro, S. Ichiro, The University of Tokyo Graduate School of Engineering; Yokohama City University Graduate School of Medicine (J); Beihang University Graduate School of Engineering, Beijing (CHN) [122]
- 013 Fusion based computer-aided biopsy for early diagnosis of liver cancer**  
S. Mahmoudi, F. Lecron, V. Wilmet, S.A. Mahmoudi, University of Mons - Faculty of Engineering (B) [93]
- 014 Possibility of dose reduction for CDMAM Phantom image using Sparse Coding Super-resolution Processing**  
Y. Miyasaka, S. Sanada, R. Tanaka, M. Higashi, M. Ogaki, M. Kita, Y. Matsuda, K. Imamura, J. Shiraishi, F. Akita, Kanazawa University; EIZO corporation, Hakusan; Kumamoto University; Shizuoka Cancer Center, Sunto-gun (J) [146]
- 015 A Computerized Method for the Detection of Intracranial Aneurysm on Digital Substraction Angiogram using Fuzzy Approaches and a Prior Knowledge Fusion**  
I. Rahmany, N. Khelifa, Université Tunis El Manar (TN) [257]
- 016 Multi-modality statistical model between a thoracic CT volume and photographs of lung cryosections of a cadaver**  
J. Ishida, A. Saito, A. Shimizu, Tokyo University of Agriculture and Technology, Koganei (J) [141]
- 017 Single shot laser speckle based 3D acquisition system for medical applications**  
D. Khan, M.A. Shirazi, M.Y. Kim, Kyungpook National University, Daegu (ROK) [315]
- 018 Coherent Point Drift Algorithms for Breast Image Registration**  
G. Ahmadian, S. Bohun, M. Ebrahimi, University of Ontario Institute of Technology, Oshawa ON (CDN) [342]
- 019 Registration of multimodal medical images based on structure information and optical flow**  
K. Zhu, J. Zhang, J. Wang, Soochow University, Suzhou; Changshu Institute of Technology (CHN) [357]
- 020 Generic thrombus segmentation from pre- and post-operative CTA**  
F. Lalys, V. Yan, A. Kaladji, A. Lucas, S. Esneault, Therenva SAS, Rennes; Univ. of Rennes (F) [359]
- 021 Vertebral Body Segmentation in Clinical Routine Spine MRI. Evaluation focusing on a large variety of clinical routine MRI sequences**  
G. Hille, S. Saalfeld, S. Serowy, K. Tönnies, Otto-von-Guericke University Magdeburg (D) [331]
- 022 Virtual bronchoscopy and path planning without tracheobronchial tree segmentation**  
C. Ciobirca, A. Udristoiu, T. Lango, S. D. Pastrama, G. Gruionu, L. G. Gruionu, Politehnica University of Bucharest; University of Craiova (RO); SINTEF Technology and Society, Trondheim (N); Harvard University, Edwin L. Steele Laboratory for Tumor Biology, Boston (USA) [162]
- 023 Development of voxel-based morphometry system for WAIR images obtained by the DIR sequence using an optimized MRI method**  
N. Hayashi, Y. Satoh, Y. Shimoyama, S. Motegi, H. Watanabe, K. Ujita, T. Ogura, A. Ogura, Y. Tsushima, Gunma Prefectural College of Health Sciences, Maebashi; Shinozuka Hospital, Fujioka; Josai Clinic; Gunma University Hospital; Gunma University Graduate School of Medicine (J) [121]
- 024 Simulated monochromatic images for artefact correction in cone-beam CT**  
S. Melnik, K. L. Soika, E. Uhlmann, Fraunhofer Institute for Production Systems and Design Technology IPK, Berlin (D) [183]
- 025 Estimation of trabecular bone thickness in gray scale: a validation study**  
R. Moreno, N. Batool, M. Chowdhury, O. Smedby, KTH Royal Institute of Technology, Huddinge, Stockholm (S) [266]
- 026 Feature-based registration of micro CT volumes**  
K. Nagara, S. Nakamura, H. Roth, M. Oda, H. Homma, H. Takabatake, M. Mori, H. Natori, K. Mori, Nagoya University; Sapporo-Kosei General Hospital; Sapporo Minami-sanjo Hospital; Keiwakai Nishioka Hospital (J) [111]
- 027 Patient-specific modeling of unruptured human abdominal aortic aneurysms using deformable hexahedral meshes**  
T. Tomanidou, J. Noailly, M. Ceresa, C. Zhang, K. López-Linares Román, I. Macía Oliver, M. A. González Ballester, Universitat Pompeu Fabra, Barcelona; Vicomtech, San Sebastián (E) [161]
- 028 Comparison with SWI and QSM techniques for evaluation of nigrosome-1 between normal and parkinson disease subjects**

- K. M. Lee, H. G. Kim, E. J. Kim, W. S. Choi, I. Y. Lee, B. S. Choi, Kyung Hee University College of Medicine, Seoul; Seoul National University College of Medicine, Gyeonggi-do (ROK) [20]
- 029 A Tracking Method of Invisible Tumors Using Surrounding Features on Time Series X-ray Images**  
T. Iwai, M. Nakao, M. Nakamura, T. Matsuda, Kyoto University (J) [194]
- 030 The application of 3D printed materials in particle radiotherapy**  
A. Solovov, A. Chernukha, U. Stepanova, M. Troshina, A. Lychagin, V. Kharlov, S. Ulyanenko, V. Galkin, A. Tsyb Medical Radiological Research Centre; Fablab Model Spectr, Obninsk (RUS) [61]
- 031 Fully automatic definition and detector learning of anatomical landmarks in medical images**  
S. Hanaoka, Y. Nomura, M. Nemoto, T. Takenaga, S. Miki, T. Yoshikawa, N. Hayashi, O. Abe, A. Shimizu, The University of Tokyo Hospital; Tokyo University of Agriculture and Technology, Koganei (J) [27]
- 032 SVM based finger joint detection method for the progress estimation of rheumatoid arthritis**  
K. Morita, M. Nii, S. Kobashi, University of Hyogo, Himeji (J) [269]
- 033 An intensity-based rigid registration of 2D C-Arm and 3D CT images for image-assisted navigation system**  
X. Chen, P. Jia, L. Xu, J. Egger, Shanghai Jiao Tong University (CHN); BioTechMed, Graz (A) [55]
- 034 Comparison of Model Initialization Methods for Liver Segmentation using Statistical Shape Models**  
G. Chlebus, A. Schenk, S. Thoduka, N. Abolmaali, I. Endo, H. Meine, Fraunhofer MEVIS, Bremen; Städtisches Klinikum Dresden-Friedrichstadt (D); Yokohama City University Graduate School of Medicine (J) [154]
- 035 Robust lung lobe segmentation with false positive reduction of fissure detection using classifier in volumetric chest CT**  
J. Park, N. Kim, M. Lee, J. B. Seo, University of Ulsan College of Medicine, Songpa-gu, Seoul (ROK) [134]
- 036 Deep convolutional neural network and graph cut based liver tumor segmentation from CT images**  
F. Jia, W. Li, Chinese Academy of Sciences, Shenzhen (CHN) [59]
- 037 Region of Interest Detection with Iterative Colour Clustering and a Global Weighting Scheme**  
M. Katanacho, J. Hoffmann, E. Uhlmann, Fraunhofer Institute for Production Systems and Design Technology IPK, Berlin (D) [82]
- 038 Registration and landmarking of polygonal mesh facial scans using a point feature based iterative point correspondence algorithm**  
J. Bannister, J. Larson, B. Hallgrímsson, P. H. Lim, R. A. Spritz, O. D. Klein, F. P. J. Bernier, N. D. Forkert, University of Calgary (CDN); University of Colorado, Aurora; University of California, San Francisco (USA) [273]
- 039 Multidimensional Haralick's feature space analysis for assessment of the Achilles tendon in MR imaging**  
J. M. Nowosielski, J. Zieliński, B. A. Borucki, K. S. Nowiński, University of Warsaw (PL) [239]
- 040 A method of registering real-time X-ray image on angiogram for percutaneous coronary intervention**  
D. Kim, S. Park, M. H. Jeong, J. Ryu, Gwangju Institute of Science and Technology; Chonnam National University Hospital, Gwangju (ROK) [168]
- 041 Computerized Detection Scheme for Quantitative Diagnostics of Rheumatoid Arthritis in Ultrasonography**  
H. Watanabe, N. Hayashi, M. Shimosegawa, T. Ogura, N. Tanki, N. Nakamura, M. Ogawa, N. Takagi, Gunma Prefectural College of Health Sciences, Maebashi; Butsuryo College of Osaka, Sakai; Kaihin Orthopedic & Rheumatism Clinic, Chiba; Teikyo University Chiba Medical Center, Ichihara (J) [176]
- 042 Development of surgical guide for breast-conserving surgery**  
S. W. Lee, G. B. Kim, J. W. Lee, S. H. Ahn, B. S. Ko, N. Kim, Asan Medical Center, Seoul (ROK) [277]
- 043 Hand Gesture Recognition for Contactless Device Control in Operating Rooms**  
E. Nasr-Esfahani, N. Karimi, S.M. Reza Soroushmehr, M. Hossein Jafari, M. Amin Khorsandi, S. Samavi, K. Najarian, Isfahan University of Technology (IR); University of Michigan, Ann Arbor (USA) [432]
- 044 Reconstructing a real size 3D structure of colon lesions from endoscopic video**  
A. Kumar, C. C. Huang, Y. Y. Wang, K. C. Liu, S. W. Huang, W. C. Hung, Y. C. Lee, IRCAD-Taiwan, Changhua; National Chung Cheng University, Chiayi (RC) [265]
- 045 A 1.7 Fr. Steerable Microcatheter based on a Loop-Shaped Guidewire**  
A. Yamada, N. Nitta, S. Naka, S. Morikawa, S. Tani, T. Tani, Shiga University of Medical Science, Otsu (J) [279]
- 046 A Controllable Viscoelastic Liver Model using Hydraulic Power System**  
K. Saito, D. Kim, E. Kobayashi, N. Takano, B. N. Li, I. Sakuma, Teikyo Heisei University, Tokyo; Univ. of Tokyo; Hefei Univ. of Technology; Nakanoegota Hospital, Tokyo (J) [263]
- 047 Development of 3D virtual spine shape superimpose display system for subjects seated on wheelchairs**  
A. Hanafusa, D. Suzuki, N. Suzuki, A. Hattori, Shibaura Institute of Technology, Saitama; Jikei University, School of Medicine, Institute for High Dimensional Medical Imaging, Komae (J) [200]

ISCAS

ISCAS Poster Session and Presentation Times

Thursday, June 22, 2017, Room Barcelona

**12:00 Poster Session 1**

**Session Chairs:**

Makoto Hashizume, MD (J), Kevin Cleary, PhD (USA)

Posters # 048 - # 061

Friday, June 23, 2017, Room Barcelona

**9:15 Poster Session 2**

**Session Chairs:**

Leo Joskowicz, PhD (IL), Purang Abolmaesumi, PhD (CDN)

Posters # 062 - # 075

Saturday, June 24, 2017, Room Barcelona

**14:00 Poster Session 3**

**Session Chair:**

Kensaku Mori, PhD (J)

Posters # 076 - # 090

**048 optical tracking system with small sized markers for image-guided surgery**

Y.S. Chae, M.Y. Kim, Kyungpook National University, Daegu (ROK) [358]

**049 Computed tomography-based navigation system using a patient-specific instrument for femoral component positioning: an experimental in vitro study with a sawbone model**

S. Lee, J.-Y. Kim, J. Hong, S.-Y. Kim, Kyungpook National Univ. Hospital; Daegu Gyeongbuk Institute of Science & Technology (ROK) [311]

**050 Automatic aortic root segmentation and anatomical landmarks detection for TAVI procedure planning**

F. Lallys, S. Esneault, V. Auffret, M. Castro, P. Haignon, C. Goksu, Therenva SAS, Rennes; Univ. of Rennes (F) [310]

**051 Brain Atlas Construction by Non-Rigid Registration of Brain Block Models**

S. Miyauchi, K. Morooka, S. Sasaki, T. Tsuji, Y. Miyagi, T. Fukuda, K. Samura, R. Kurazume, Kyushu University, Fukuoka; Toshiba Medical Systems Corporation, Otawara; Kanazawa University; Fukuoka Mirai Hospital; Kumamoto University; Fukuoka University Hospital (J) [138]

**052 Registration of preoperative MRI and ultra-low field interventional MRI (iMRI) for improved neuro-navigation**

O. Weber, G. Tsarfaty, N. Kiryati, M. Hadani, E. Konen, A. Mayer, Tel-Aviv University; Sheba Medical Center, Ramat-Gan (IL) [428]

**053 An optimized least-moving-point algorithm to detect the hip center in computer assisted orthopedic surgery**

G. Dardenne, Z. Dib, C. Hamitouche, C. Lefèvre, E. Stindel, University Hospital of Brest (F) [363]

**054 INITIAL EXPERIENCE USING A ROBOTIC-DRIVEN LAPAROSCOPIC NEEDLE HOLDER WITH ERGONOMIC HANDLE: ASSESSMENT OF SURGEONS' TASK PERFORMANCE AND ERGONOMICS**

J.A. Sánchez-Margallo, F.M. Sánchez-Margallo, Univ. of Extremadura, Cáceres; Minimally Invasive Surgery Centre Jesús Usón (E) [340]

**055 CiGuide: a hybrid-tracked robotic laser guidance platform for intraoperative guidance**

Z. Bardosi, C. Plattner, Y. Özbek, T. Hofmann, S. Milosavljevic, W. Freysinger, Medical University Innsbruck; MCI, Innsbruck (A) [430]

**056 Touchless interface for intraoperative access to patient data**

A. Zheng, F. King, N. Hata, Brigham and Women's Hospital and Harvard Medical School, Boston; Lawrenceville School (USA) [112]

**057 Haptic guidance based only on cardiac X-ray images for robot assisted coronary intervention**

A. Tahir, S. Park, D. Kim, M. H. Jeong, J. Ryu, Gwangju Institute of Science and Technology; Chonnam National Univ. Hospital, Gwangju; National Univ., Daegu (ROK) [175]

**058 A Modified Surgical Instrument Monitoring method using Fluoroscopy for Stereotactic Neurosurgery**

S. H. Shin, Y. S. Kim, Hanyang University Medical Center, Seoul (ROK) [267]

**059 In-silico modeling and activation of the bilateral subthalamic nucleus for DBS surgery planning**

A. Alises, M. Ceresa, M. A. Gonzalez Ballester, Universitat Pompeu Fabra; ICREA, Barcelona (E) [212]

**060 The possibility and feasibility of an ultrasonic microdissector**

T. Goto, T. OGIWARA, K. Hongo, J. Okamoto, Y. Fujii, Y. Muragaki, Shinshu Univ., Matsumoto (J); Institute of Tokyo Women's Medical Univ., Tokyo (J) [23]

- 061 Endo-Trainer – A low-cost training system for da Vinci robotic surgery**  
H. Lee, D. Kim, B. Cheon, D. Lee, D. Jeong, D. Kang, H. Baek, M. Hwang, D. S. Kwon, KAIST, Daejeon (ROK) [72]
- 062 Development and evaluation of a multi-sensor low-cost tracking device for prostate biopsy simulation**  
A. Leinert, R. Oueslati, P. A. Barraud, J. Troccaz, Université de Grenoble, La Tronche (F) [142]
- 063 Design and testing of an arm type device for sidestream dark-field imaging by dynamic simulation, FEA, and topological optimization**  
M. Sekine, M. Takahashi, R. Hashimoto, T. Kurata, T. Ohnishi, H. Haneishi, Chiba University, Chiba; Takano Co., Ltd, Nagano (J) [40]
- 064 Gain tuning method by brain activity measurement for surgical endoscopic control**  
S. Miura, T. Kaneko, K. Kawamura, Y. Kobayashi, M. Fujie, Waseda University, Tokyo; Chiba University; Osaka University (J) [278]
- 065 Clinical evaluations of surgical instruments exchange with robotic scrub nurse system in neurosurgical operating cases**  
K. Yoshimitsu, H. Yamaga, Y. Fukutomi, K. Masamune, S. Ikuta, Y. Horise, H. Iseki, Y. Muragaki, Tokyo Women's Medical Univ.; Showa Univ. Fujigaoka Hospital, Kanagawa; Waseda Univ., Tokyo (J) [155]
- 066 Semi-automatic design of customized osteosynthesis material for corrective osteotomy of the distal radius**  
G. Caiti, J. Dobbe, G. Strijkers, G. Streekstra, AMC, Amsterdam (NL) [189]
- 067 The impact of computer graphical measurement methods on determining the radius of femoral shaft bowing: Implications for intramedullary nailing**  
B. Schmutz, T. Phan, Queensland University of Technology, Kelvin Grove Brisbane, QLD (AUS) [113]
- 068 Dynamic Reconstruction of Deformable Soft-tissue with Stereo Scope in Minimal Invasive Surgery**  
J. Song, J. Wang, L. Zhao, S. Huang, G. Dissanayake, University of Technology Sydney (AUS); University of Chinese Academy of Sciences, Beijing (CHN) [426]
- 069 The new computer and fluorescence-guided system for planning and aiding oncological treatment**  
E. Świątek-Najwer, M. Majak, M. Żuk, M. Popek, Z. Kulas, J. Jaworowski, P. Pietruski, Wrocław University of Technology; Medical University of Warsaw (PL) [229]
- 070 Robot-assisted primary cementless total hip arthroplasty with a short femoral stem: a prospective randomized mid-term outcome study**  
S. J. Lim, S. M. Kim, K. Kim, Y. S. Park, Samsung Medical Center, Seoul; Seoul Medical Center (ROK)
- 071 Mammoplasty using three-dimensional CAD/CAM custom templates with upright and sitting position of the mirrored healthy side**  
Y. Takeichi, H. Iguchi, H. Motai, M. Iwamoto, H. Tada, K. Hishida, Y. Itoh, Daiyukai Daiichi Hospital, Nagoya; Nagoya City University; Motai Clinic, ORL, Tokai; Aichi Medical Univ., Nagakute, Wakaba Hospital, Tsu (J) [81]
- 072 Preoperative simulation of costal cartilage graft volume for surgery treatment with enophthalmos associated with orbital bone fracture**  
M. Iwamoto, Y. Morishima, Y. Takeichi, K. Yokoo, Aichi Medical University, Nagakute; Ogaki Municipal Hospital, Daiyukai Daiichi Hospital (J) [71]
- 073 Optimizing bone alignment in the application of an oblique single-cut rotation osteotomy**  
J. Dobbe, S. Strackee, G. Streekstra, University of Amsterdam (NL) [7]
- 074 Personalized 3D printed surgical tool for guiding the osteotome during dorsal hump reduction in rhinoplasty**  
H. Herrero, J. Herrero, R. Trueba, Centro Médico Teknon; Alma IT Systems, Barcelona (E) [300]
- 075 A simulation study on deformation estimation of elastic materials using monocular images**  
M. Nakao, S. Akira, T. Matsuda, Kyoto University (J) [33]
- 076 Endomina: The Endoluminal Universal Robotized Triangulation System for gastro-enterology**  
N. Cauche, M. Hiernaux, V. Huberty, M. Ibrahim, A. Chau, J. Devière, A. Delchambre, Université Libre de Bruxelles; Endo Tools Therapeutics S.A., Gosselies (B) [366]
- 077 Grasper having tactile sensing function using acoustic reflection for laparoscopic surgery**  
H.H. Ly, Y. Tanaka, T. Fukuda, A. Sano, Nagoya Institute of Technology (J) [328]
- 078 Robotic-assisted microsurgical anastomosis training with motion capture using the DVRK: The Caltech-Verona Dataset**  
D. Naftalovich, D. Dall'Alba, G. De Rossi, P. Fiorini, J. W. Burdick, California Institute of Technology, Pasadena (USA); University of Verona (I) [429]
- 079 Validation of an optical sensor for tracking two Degrees of Freedom of laparoscopic tools**  
J. B. Pagador, L. Bote-Curiel, J. C. Gómez-Blanco, F. M. Sánchez-Margallo, Jesús Usón Minimally Invasive Surgery Centre, Cáceres (E) [86]
- 080 Accuracy of a single camera, marker based surgical navigation system - simulation and implementation**  
M. Katanacho, O. Krumpek, E. Uhlmann, Fraunhofer Institute for Production Systems and Design Technology, Berlin (D) [326]

### **081 3D Boolean operations in virtual surgical planning**

J. Charton, M. Laurentjolye, Y. Kim, Korea Institute of Science and Technology, Seoul (ROK); CHU de Bordeaux (F) [364]

### **082 Novel methods for image guided surgical navigation using ToF scanner and optical IR tracking**

M. Boyarkin, O. Egorov, K. Bychenkov, S. Chaplygin, A. Kolsanov, sMedX LLC; SamSMU Samara (RUS) [76]

### **083 Image-guidance for laparoscopic liver ablations - technical evaluation in 54 patients**

I. Paolucci, H. Nilsson, J. Freedman, D. Candinas, S. Weber, P. Tinguely, University of Bern; University Hospital of Bern (CH); Danderyd Hospital, Stockholm (S) [74]

### **084 Advantages navigation can give starter of total knee replacement surgeon**

W. K. Choi, M. R. Cho, Daegu Catholic University Hospital (ROK) [66]

### **085 Comparison of Auditory Display Methods for Elevation Change in Three-Dimensional Tracked Surgical Tool**

D. Black, R. López-Velazco, H. Hahn, J. Pascau, R. Kikinis, Jacobs Univ.; Fraunhofer MEVIS; Univ. of Bremen (D); Instituto de Investigación Sanitaria Gregorio Marañón; Universidad Carlos III de Madrid (E) [230]

### **086 Surgical navigation using intuitive image-to-patient registration for robot-assisted partial nephrectomy: clinical feasibility study**

S. Kobayashi, B. Cho, K. Tatsugami, M. Eto, M. Hashizume, Kyushu University, Fukuoka (J) [102]

### **087 Integration of a surface scanner with an electromagnetic tracker for breast cancer surgery guidance**

M. García-Sevilla, R. López-Velazco, S. Lizarraga, M. Herrero-Conde, M. Desco, M. J. Ledesma-Carbayo, J. Pascau, Instituto de Investigación Sanitaria Gregorio Marañón; Universidad Carlos III de Madrid; Hospital General Universitario Gregorio Marañón; Hospital de Madrid Sanchinarro, Madrid (E) [215]

### **088 Psychoacoustically motivated sonification for surgeons**

D. Black, T. Ziemer, University of Bremen; Jacobs University; Fraunhofer MEVIS, Bremen (D) [228]

### **089 Eye Tracking Technology for monitoring surgeons' attention during box trainer tasks: a preliminary proof of concept**

P. Sánchez-González, J. Ortega-Morán, A. Toribio-Silva, B. Rodríguez-Vila, I. Oropesa, J. Pagador, F. Sánchez-Margallo, E. Gómez, Universidad Politécnica de Madrid; Jesus Uson Minimally Invasive Surgery Centre, Cáceres (E) [89]

### **090 Acquisition of basic psychomotor skills using a temporomandibular joint simulator**

J. B. Pagador, J. L. Moyano-Cuevas, F. Monje-Gil, C. Hernadez-Vila, F. M. Sánchez-Margallo, Universidad Politécnica de Madrid; Jesus Uson Minimally Invasive Surgery Centre, Cáceres (E); [98]

## **CAD**

Thursday, June 22, 2017

Room Estocolmo

### **16:30 CAD Poster Session**

#### **Chairs:**

Kunio Doi, PhD (USA), Hiroyuki Yoshida, PhD (USA)

### **091 A deep convolutional neural network based false positive reduction in mass detection algorithm on digital breast tomosynthesis images**

J. W. Jeong, S. H. Chae, Y. L. Cho, E. Y. Chae, H. H. Kim, Y. W. Choi, S. Lee, ETRI - Electronics & Telecommunications Research Institute, Daejeon; Asan Medical Center, Seoul; Korea Electrotechnology Research Institute, Ansan (ROK); [271]

### **092 The mass detection method in synthetic mammograms using deep learning**

S. H. Chae, J. W. Jeong, J. H. Choi, Y. L. Cho, E. Y. Chae, H. H. Kim, Y. W. Choi, S. Lee, ETRI - Electronics & Telecommunications Research Institute, Daejeon; Ewha Womans University, Seoul; Asan Medical Center, Seoul; KERI, Ansan (ROK) [139]

### **093 Breast Mass Classification using the Fundamental Deep Learning Approach**

K. G. Kim, Y. Kim, C. Park, Gachon University, Incheon (ROK) [178]

### **094 Segmental recognition of skeletal muscle in whole-body CT images and its texture analysis using skeletal muscle models**

N. Kamiya, K. Ieda, X. Zhou, M. Yamada, H. Kato, K. Azuma, C. Muramatsu, T. Hara, T. Miyoshi, T. Inuzuka, M. Matsuo, H. Fujita, Aichi Prefectural University; Gifu University; Gifu Univ. Hospital; University of Occupational and Environmental Health, Fukuoka (J) [150]

### **095 Machine learning with 3D spatio-temporal SSM for Alzheimer's disease patient classification**

S. Alam, M. Nii, A. Shimizu, S. Kobashi, University of Hyogo, Himeji; Tokyo Agriculture University (J) [284]

### **096 Study of a method for building a learning database for use in the development of CAD systems that use artificially created case images**

K. Abe, H. Takeo, Y. Kuroki, S. Nawano, Kanagawa Institute of Technology, Kanagawa; Niimura Hospital, Kagoshima; International Univ. of Health and Welfare, Tokyo (J) [2]

**097 Deep super-learning of polyp images for computer-aided detection in CT colonography**

H. Yoshida, K. Umehara, J. Näppi, T. Hironaka, T. Ishida, D. Regge, Harvard Medical School, Boston, MA (USA); Osaka University (J); Institute for Cancer Research and Treatment, Turin (I) [109]

**CMI**

Friday, June 22, 2017  
Room Estocolmo

**15:15 CMI Poster and Presentation Times**

**Chairs:**

Christos Angelopoulos, DDS (USA), Yoshihiko Hayakawa, PhD (J)

**098 Multidisciplinary network between navigation-assisted platform and computer-aided design and manufacturing platform**

C. Bescós Atín, J. Pamiás Romero, M. Sáez Barba, J. Gutiérrez Santamaría, J. Masiá Gridilla, S. Siurana, J. Giralt, N. Basté, M. Alberola, Hospital Universitario Vall d'Hebron, Barcelona (E) [159]

**099 A Semi-Supervised Method for Determining the Maxillary and Mandibular Boundaries on Panoramic Radiographs**

K. Orhan, A. Culhaoglu, I. S. Yetik, M. C. Aktas, M. Kilicarslan, Ankara University (TR) [44]

**100 Computational fluid dynamic analysis of the upper airway flow after orthognathic surgery**

M. K. Kim, S. H. Kang, Y. H. Kim, Y. J. Won, H. W. Roh, H. S. Jang, National Health Insurance Service Ilsan Hospital, Goyang; Midas IT, Seongnam (ROK) [97]

**101 Development of surgical planning using a depth-adjustable drill burr for dental implant placement**

B. Cho, R. Ouchida, M. Hashizume, Kyushu University, Fukuoka (J) [140]

**102 Development of surgical planning software for mandibular reconstruction using fibular flap**

L. Kim, Y. Kim, H. Kim, H. Cho, J. Charton, D. Lee, J. W. Lee, Korea Institute of Science and Technology, Seoul; Kyung Hee University, Seoul (ROK) [144]