CARS 2023 Preliminary Program

CARS 2023 Computer Assisted Radiology and Surgery
37th International Congress and Exhibition
June 20 - 23, 2023

June 20-22 - Hanns-Seidel Stiftung, Conference Center, Munich, Germany
June 23 - TranslaTUM (Klinikum rechts der Isar)
https://www.cars-int.org

Tuesday, June 20, 2023

8:45 Welcome to CARS 2023

Leonard Berliner, MD (US)
Dirk Wilhelm, MD (DE)
Heinz U. Lemke, PhD (DE)

Tuesday, June 20, 2023

9:00 Digital Operating Room (1)

Session Chairs: Pierre Jannin, PhD (FR), Ken Masamune, PhD (JP)

Surgical Workflow Analysis: a bridge between model and data driven AI
Invited Lecture: Pierre Jannin, PhD, University of Rennes (FR) [DOR-IS-300]

Automated Surgical Procedure Capture and Analysis System for Surgical Performance Evaluation
K. Yoshimitsu, T. Ishikawa, Y. Muragaki, K. Masamune, Tokyo Women's Medical Univ. (JP) [DOR-LE-84]

A Robotic System for Solo Surgery in Flexible Ureteroscopy: Development and Evaluation with Clinical Users
K. Hagmann, C. Schlenk, F. Steidle, L. Oliva Maza, A. Kolb, A. Hellings-Kuß, D.S. Schöb, J. Klodmann, A. Miernik, A. Albu-Schäffer, Deutsches Zentrum für Luft- und Raumfahrt, Wessling; German Aerospace Center, Oberpfaffenhofen; Universitätsklinikum Freiburg (DE) [DOR-LE-23-00052]

Stereoscopic Calibration for Augmented Reality Visualization in Microscopic Surgery
T. El Chemaly, C. Athayde Neves, C. Leuze, B. Hargreaves, N H. Blevins, Stanford Univ., CA (US) [DOR-LE-23-00083]

Accuracy of On-Site Teleoperated Milling with Haptic Assistance
S. Drobinsky, M. Fuente, B. Puladi, K. Radermacher, Helmholtz Institute for Biomedical Engineering of RWTH Aachen; Univ. Hospital of RWTH Aachen (DE) [DOR-LE-23-00126]

Endoscope manipulator with gimbals rotation and linear rail mechanism for transcanal endoscopic ear surgery
M. Izawa, K. Yokoyama, T. Kawai, T. Fujita, N. Uehara, T. Yamashita, A. Nishikawa, H. Suzuki, Osaka Inst. of Technology; Kobe Univ. Graduate School of Medicine; Osaka Univ., Graduate School of Engineering Science; Chuo Univ. Faculty of Science and Engineering (JP) [DOR-LE-31]

Multipurpose Prediction Model for Type-A Patients in Heart Surgery using Bayesian Networks
M. Cypko, A. Abd el Al, M. Montagner, V. Falk, A. Meyer, German Heart Center, Charite, Berlin (DE) [DOR-LE-123]

Tuesday, June 20, 2023

11:00 Digital Operating Room (2)

Session Chairs: Klaus Radermacher, PhD (DE), Dirk Wilhelm, MD (DE)

Postoperative CT scan comparison after corrective Osteotomies in Wrist and Forearm Surgery using a laser osteotome - a cadaver study
M. Hofer, E. Coppo, M. Morawska, M. Müller-Gerbl, P. Honigmann, Univ. Basel, Liestal; Kantonsspital Baselland; Advanced Osteotomy Tools AG, Basel (CH) [DOR-LE-44]

Versatile end effector for laparoscopic robotic scrub nurse
L. Wagner, S. Kolb, C. Looschen, L. Bernhard, J. Fuchtmann, M. Berlet, J. Fottner, A. Knoll, D. Wilhelm, Klinikum rechts der Isar der TUM; Technical Univ. Munich (DE) [DOR-LE-23-00027]

Improving instrument detection for a robotic scrub nurse using multi-view voting
J. Badilla-Solórzano, S. Ihler, N.-C. Gellrich, S. Spalthoff, Leibniz Univ. Hannover, Garbsen; Hannover Medical School (DE) [DOR-LE-23-00077]

Integration of a surgical robotic arm to the connected operating room via ISO IEEE 11073 SDC
N. Wickel, M. Vossel, O. Yilmaz, K. Radermacher, A. Janß, Rheinisch-Westfalische Technische Hochschule Aachen (DE) [DOR-LE-23-00097]

DICOM Structured Reporting Templates to support the documentation of surgical operations
O. Burgert, E. Just, D. Junger, D. Weckmann, C. González Cabrera, F. Bridault, K. Schaumann, T. Klenzner, J. Brandenburg, M. Wagner, C. Kücherer, Reutlingen Univ.; Univ. Hospital Düsseldorf; Univ. Hospital Heidelberg (DE); IRCAD, Strasbourg; IHU Strasbourg (FR) [DOR-LE-23-00056]

Panel Discussion

Panelists: M. Berlet, P. Jannin, C. Linte, K. Masamune, K. Mori, K. Radermacher, D. Wilhelm

Tuesday, June 20, 2023

14:00 OR2040 - Surgical Robotics and Telesurgery

Session Chairs: Stefanie Speidel, PhD (DE), Yoshihiro Muragaki, MD (JP)

Lessons learned moving from OR 2020 to OR 2040
Invited Lecture: Kevin Cleary, PhD, The Sheikh Zayed Institute for Pediatric Surgical Innovation, Washington, DC (US) [CARS-OR2040-IS-302]

Towards a Novel Soft Robotic System for Minimally Invasive Interventions
N. Barnes, O. Young, A. Colton, X. Liu, D. Gandhi, R. Sochol, J. Brown, A. Krieger, Johns Hopkins Univ. Whiting School of Engineering; Univ. of Maryland at College Park, Baltimore, MD (US) [CARS-OR2040-LE-23-00076]

Multi-task mission planning for autonomous service robots within the OR wing
L. Bernhard, A. Knoll, D. Wilhelm, Klinikum rechts der Isar der Technischen Univ. München; Technical Univ. of Munich (DE) [CARS-OR2040-LE-51]

A Long Distance Telesurgical Demonstration on Robotic Surgery Phantoms over 5G
G.P. Moustris, C.S. Tzafestas, K.M. Konstantinidis, National Technical Univ. of Athens; Athens Medical Centre (GR) [CARS-OR2040-LE-23-00071]

Beyond telerobotics: promising applications of autonomous robots within the OR wing
L. Bernhard, C. Yang, O. Ratib, D. Wilhelm, C. Amato, Klinikum rechts der Isar der Technischen Universität München (DE); CannonDesign, Los Angeles (US); Univ. Hospital of Geneva (CH) [CARS-OR2040-LE-95]

Recent advances on remote surgical guidance in smart cyber operating theater and experimental telesurgery via surgical robot
Invited Lecture: Y. Muragaki, MD, R. Yamaguchi, K. Yoshimitsu, K. Masamune, Kobe University; Tokyo Women's Medical University (JP)

Tuesday, June 20, 2023

16:00 OR2040 - Surgical Informatics and Interventional Suites

Session Chairs: Kevin Cleary, PhD (US), Akinobu Shimizu, PhD (JP)

6G Networks for the Operating Room
F. Jurosch, N. Kröger, F. Mehmeti, E. Martens, S. Speidel, W. Kellerer, D. Wilhelm, J. Fuchtmann, Klinikum rechts der Isar der Technischen Universität München; TU Dresden, National Center for Tumor Diseases, (DE) [CARS-OR2040-LE-23-00033]

The surgical report of the future – development of a crucial document
M. Berlet, T. Vogel, J. Fuchtmann, L. Wagner, L. Bernhard, M. Kähler, H. Feussner, M. Kranzfelder, H. Friess, D. Wilhelm, Klinikum rechts der Isar, der Technischen Univ. Munich; Technical Univ. of Munich (DE) [CARS-OR2040-LE-69]

Digital IR Suite of the Future - Stages 1 and 2 – vision and design using Quality Function Deployment (QFD) and Success Resource Deployment (SRD)
L. Berliner, V. Gallo, J. Scheiner, S. Hanna, C. Amato, B. DeForest, P. Ciaravino, M. Raden, Staten Island Univ. Hospital, New York, Cannon Design, Architecture, Los Angeles (US) [CARS-OR2040-LE-45]

Digital IR Suite of the Future – Stage 3 - ensuring success during implementation using Hoshin Kanri
L. Berliner, V. Gallo, J. Scheiner, S. Hanna, C. Amato, B. DeForest, P. Ciaravino, M. Raden, Staten Island Univ. Hospital, New York; Cannon Design, Architecture, Los Angeles (US) [CARS-OR2040-LE-47]

Healthcare Architecture, Evidence Based Design
C. Amato, B. Seeliger [CARS-OR2040-IJCARS Editorial-303]

Panel Discussion
Panelists: K. Cleary, Y. Muragaki, A. Shimizu, S. Speidel, D. Wilhelm

Tuesday, June 20, 2023

18:00 CARS 2023 Opening Session

Moderators: Julia Schnabel, PhD (DE), Leo Joskowicz, PhD (IL)

CARS in 2023: Redefining Radiology and Surgery
R. Andrews, NASA Ames Research Center, Los Gatos, CA (US) [CARS-LE-37]

Can Engineers in Medical School Promote Awareness for AI?
E. vanSonnenberg, University of Arizona College of Medicine Phoenix (US) [CARS-IS-305]

Why will Model-based Medicine Become a Main Pillar for the Future Health Care System
D. Wilhelm, M. Cypko [CARS-IS-306]

Panel on Impact of Model Guided Medicine on R&D in Computer Assisted Radiology and Surgery
Panelists: C. Amato, R. Andrews, L. Berliner, K. Cleary, M. Cypko, H. Herrero, Y. Muragaki, E. vanSonnenberg, D. Wilhelm

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Wednesday, June 21, 2023

37th International Congress and Exhibition on Computer Assisted Radiology (CAR)
Chair: Ulrich Bick, MD (DE)

8:00 Imaging Informatics – Methods and Tools
Session Chairs: Marcus R. Makowski, MD (DE), Hans Meine, PhD (DE)

Registration of digital subtraction angiography images using non-linear displacement vector fields with Swin-Unet-transformer
B. Kraus, L. Huischen, M. Vetter, Mannheim Univ. of Applied Sciences (DE) [CAR-LE-52]

SGSR: style-subnets-assisted generative latent bank for large-factor super-resolution with registered medical image dataset
T. Zheng, H. Oda, Y. Hayashi, S. Nakamura, M. Mori, H. Takabatake, H. Natori, M. Oda, K. Mori, Nagoya Univ.; Univ. of Shizuoka; Sapporo Kosei General Hospital; Sapporo Minami-Sanjo Hospital; Keiwa-Kai Nishioka Hospital, Sapporo (JP) [CAR-LE-23-00085]

Combining Seeded Region Growing and k-Nearest Neighbours for the Segmentation of Routinely Acquired Spatio-Temporal Image Data
L. Zerweck, S. Wesarg, J. Kohlhammer, M. Köhm, Fraunhofer Institute for Translational Medicine and Pharmacology ITMP, Frankfurt am Main (DE) [CAR-LE-23-00028]

Suitability of DNN-based Vessel Segmentation for SIRT Planning
F. Kock, F. Thielke, N. Abolmaali, H. Meine, A. Schenk, Fraunhofer-Institut fur Digitale Medizin MEVIS; Univ. of Bremen; Univ. of Bochum (DE) [CAR-LE-23-00044]

Comparative Evaluation of Segmentation Uncertainty Estimation and Decomposition Methods
V.S. Cangalovic, F. Thielke, H. Meine, Univ. of Bremen; Fraunhofer-Institut für Digitale Medizin, Bremen (DE) [CAR-LE-23-00057]

Scribble-Supervised Semantic Segmentation for Haustral Fold Detection
S. Ehrenstein, S. McGill, J. Rosenman, S. Pizer, The Univ. of North Carolina at Chapel Hill, NC (US) [CAR-LE-23-00072]

Semantic segmentation dataset authoring with simpler labels
L. Uramoto, Y. Hayashi, M. Oda, T. Kitasaka, K. Mori, Nagoya Univ.; Aichi Institute of Technology, Toyota (JP) [CAR-LE-116]

Federated 3D Multi-Organ Segmentation with Partially Labeled and Unlabeled Data
Z. Zheng, Y. Hayashi, M. Oda, T. Kitasaka, K. Misawa, K. Mori, Nagoya Univ.; Aichi Institute of Technology, Toyota; Aichi Cancer Center Hospital (JP) [CAR-LE-23-00092]

Top-Down vs. Bottom-Up Approaches to Deep-Learning Based Localisation of Neuro-Interventional Point Targets.
E.M.-N. Giffard, P. Jannin, J.S.H. Baxter, Université de Rennes 1, (FR) [CAR-LE-23-00031]

Wednesday, June 21, 2023

10:00 Imaging Informatics – Organ-specific Segmentation

Session Chairs: Volker Rasche, PhD (DE), Yoshikazu Nakajima, PhD (JP)

Improved segmentation of basal ganglia from MR images using convolutional neural network with crossover-typed skip connection
T. Sugino, T. Kin, N. Saito, Y. Nakajima, Tokyo Medical and Dental Univ.; The Univ. of Tokyo (JP) [CAR-LE-23-00073]

Automatic segmentation of the hypothalamus on high-resolution T1-weighted MR images.
I. Vernikouskaya, H. P. Müller, J. Kassubek, V. Rasche, Ulm Univ. Medical Center; Univ. of Ulm (DE) [CAR-LE-6]

Discriminant Analysis of Parkinson-diseases-related patterns in the substantia nigra by nonnegative feature expression of neuromelanin images
H. Itoh, M. Oda, S. Saiki, K. Kamagata, N. Hattori, S. Aoki, K. Mori, Nagoya Univ.; Juntendo Univ. Tokyo (JP) [CAR-LE-117]

Automated Full Body Tumor Segmentation in DOTATATE PET/CT for Neuroencodrine Cancer Patients
A.M.L. Santilli, P. Panyam, A. Autz, R. Wray, J. Phillip, P. Elnajjar, N. Swinburne, M. Mayerhoefer, Memorial Sloan Kettering Cancer Center, New York, NY (US) [CAR-LE-23-00070]

Intensity-based 2D-3D registration for determining fragment position during pelvic fracture procedures
S. Häger, A. Lange, S. Heldmann, J. Modersitzki, A. Petersik, M. Schröder, H. Gottschling, T. Lieth, E. Zähringer, J.H. Moltz, Fraunhofer-Institut fur Digitale Medizin MEVIS, Lübeck; Universität zu Lübeck, Stryker Trauma GmbH, Schönkirchen (DE) [CAR-LE-23-00055]

Contactless Surface Registration of Featureless Anatomy using Structured Light Camera: Application to Fibula Navigation in Mandible Reconstruction
L. Cuau, M. De Boutray, J. Cavalcanti Santos, N. Zemiti, P. Poignet, Centre Hospitalier Universitaire de Montpellier; Laboratoire d'Informatique de Robotique et de Microelectronique de Montpellier; Université de Montpellier (FR) [CAR-LE-23-00053]

Improvement of a skeleton segmentation model of bone scintigrams with transformer and component tree loss function
Q. A. Nguyen, J. Cousty, Y. Kenmochi, S. Higashiyama, J. Kawabe, A. Shimizu, Tokyo Univ. of Agriculture and Technology, Koganei, Tokyo; Osaka Metropolitan Univ. (JP); 2LIGM, Univ. Gustave Eiffel, CNRS, ESIEE Paris (FR) [CAR-LE-30]

Improved distinct bone segmentation in upper-body CT through multi-resolution networks
E. Schnider, J. Wolleb, A. Huck, M. Toranelli, G. Rauter, M. Müller-Gerbl, P.C. Cattin, Univ. of Basel; Univ. Hospital Basel (CH) [CAR-LE-23-00061]

Multi-network approach for image segmentation in non-contrast enhanced cardiac 3D MRI of arrhythmic patients
I. Vernikouskaya, D. Bertsche, P. Metze, L. M. Schneider, V. Rasche, Ulm Univ. Medical Center (DE) [CAR-LE-8]

Improved Subcutaneous Edema Segmentation on Abdominal CT Using a Generated Adipose Tissue Intensity Prior
J. Liu, O. Shafaat, R. Summers, National Institutes of Health Clinical Center, Bethesda, MD (US) [CAR-LE-23-00100]

Wednesday, June 21, 2023

14:00 Radiological Informatics - Methods and Tools

Session Chairs: Elizabeth Beckmann, BSc (GB), Masahiro Oda, PhD (JP)

Deep Learning Reconstruction vs. Hybrid-Type Iterative Reconstruction: Capabilities for Radiation Dose Reduction on High-Definition CT
Y. Ohno, N. Hamabuchi, D. Takenaka, H. Kimata, Y. Ito, K. Fujii, N. Akino, Y. Oshima, H. Nagata, T. Ueda, Y. Ozawa, T. Yoshikawa, H. Toyama, Fujita Health Univ. School of Medicine, Toyoake; Canon Medical Systems Corporation, Otawara (JP) [CAR-LE-12]

Deep Learning Reconstruction for MR Imaging: Comparison of Capability for T-factor Evaluation with Thin-Section CT in NSCLC Patients
Y. Ohno, D. Takenaka, Y. Ozawa, K. Yamamoto, M. Shinohara, M. Ikedo, M. Yui, Y. Oshima, N. Hamabuchi, H. Nagata, T. Ueda, H. Ikeda, T. Yoshikawa, H. Toyama, Fujita Health Univ. School of Medicine, Toyoake; Canon Medical Systems Corporation, Otawara (JP) [CAR-LE-13]

Language Image Assisted labeling of video data from medical intervention rooms using Grounded Language-Image Pre-training (GLIP)
P. Schülein, A. Hadzic, M. Vetter, Mannheim Univ. of Applied Sciences (DE) [CAR-LE-16]

Rib born detection of scan path planning for fully-automated ultrasound robotic system
K. Okuzaki, N. Koizumi, K. Yoshinaka, J. Zhou, T. Fujibayashi, R. Tsumura, The Univ. of Electro-Communications, Chofu; National Inst. of Advanced Industrial and Science, Health and Medical Research Inst., Tsukuba (JP) [CAR-LE-28]

A virtual data shelf to effectively explore a large database of 3D medical surface models in VR
L. Spitz, M. Allgaier, D. Behme, A. Mpotsaris, P. Berg, B. Preim, S. Saalfeld, Otto-von-Guericke-Univ. Magdeburg; München Klinik Harlaching (DE) [CAR-LE-22-00658]

Automated Screening of Computed Tomography Using Weakly Supervised Anomaly Detection
A. Hibi, M.D. Cusimano, A. Bilbily, R.G. Krishnan, P.N. Tyrrell, Univ. of Toronto, (CA) [CAR-LE-23-00023]

A Novel Endoscopy Image Fusion System: Combine White Light Imaging and Compound Band Imaging
S. Zhang, Y. Fu, X. Zhang, T. Xie, Z. Zhao, H. Liao, Tsinghua Univ.; Peking Univ.; Tsinghua Changgung Hospital, Beijing (CN) [CAR-LE-23-00051]

A Novel Approach to Wireless Electromagnetic Tracking using Frequency Modulation Radio Communication
D. Crowley, M. Cavaliere, P. Cantillon-Murphy, Tyndall National Institute; Univ. College Cork (IE) [CAR-LE-23-00060]

Real-Time open-source integration between Microsoft HoloLens 2 and 3D Slicer
A. Pose-Díez-de-la-Lastra, T. Ungi, D. Morton, G. Fichtinger, J. Pascau, Universidad Carlos III de Madrid, Leganés (ES); Queen's Univ., Kingston, ON (CA) [CAR-LE-23-00099]

Modeling of the major temporal arcade in retinal fundus images using genetic programming
I. Cruz-Aceves, C. Chalopin, M. A. Hernandez-Gonzalez, L. M. Lopez-Montero, CONACYT, Guanajuato (MX) [CAR-LE-65]

Wednesday, June 21, 2023

16:00 Radiological Informatics – Organ-specific Application

Session Chairs: Franziska Mathis-Ulrich, PhD (DE), Ichiro Sakuma, PhD (JP)

Four-dimensional ultrasound reconstruction of carotid artery based on vascular pulsation force and image segmentation
C. Cui, Y. Lin, Z. Li, Shanghai Jiao Tong Univ.; Shanghai General Hospital (CN) [CAR-LE-39]

The CathPilot: Evaluating the Performance, Safety, and Feasibility for Peripheral Vascular Interventions
A. Tavallaei, Y. Alawneh, J. Zhou, A. Sewani, M. Keshavarz, M. Tahmasebi, T. Roy, A. Kayssi, A. Dueck, G. Wright, Ryerson Univ., Toronto; Houston Methodist Hospital; Sunnybrook Health Sciences Toronto (CA) [CAR-LE-108]

Design consideration of an integration of mechanical intravascular ultrasound and electromagnetic tracking sensor for endovascular catheter navigation
W. Cai, K. Hara, N. Tomii, E. Kobayashi, T. Ohya, I. Sakuma, The Univ. of Tokyo; Tokyo Women´s Medical Univ; Yokohama City Univ. (JP) [CAR-LE-23-00038]

Recurrent Neural Networks for Generalization of Autonomous Endovascular Guidewire Navigation in the Aortic Arch
L. Karstensen, J. Ritter, J. Hatzl, F. Ernst, J. Langejürgen, C. Uhl, F. Mathis-Ullrich, Fraunhofer-Institut für Produktionstechnik und Automatisierung, Mannheim; Univ. Hospital Heidelberg; Univ. of Lübeck; Karlsruhe Institute of Technology (DE) [CAR-LE-23-00068]

A simulation-based phantom model for generating synthetic mitral valve image data – application to MRI acquisition planning.
C. Manini, O. Nemchyna, S. Akansel, L. Walczak, L. Tautz, C. Kolbitsch, V. Falk, S. Sündermann, T. Kühne, J. Schulz-Menger, A. Hennemuth, Charite Univ. Hospital ; German Heart Centre; Fraunhofer MEVIS; Physikalisch-Technische Bundesanstalt; Max-Delbrück-Centrum für Molekulare Medizin in der Helmholtz-Gemeinschaft (MDC) Berlin (DE) [CAR-LE-23-00102]

3D cerebral fluidography for assessing cerebrospinal fluid dynamics using diffusion-weighted imaging at human 7 Tesla MRI
S. Fujiwara, K. Ogasawara, K. Chida, Y. Ogasawara, J. I. Nomura, S. Oshida, K. Fujimoto, S. Tsutsui, K. Setta, Y. Yoshioka, Iwate Medical Univ., Morioka; National Inst. of Information and Communications Technology, Suita (JP) [CAR-LE-112]

Optimising Control Methodology for Robotic Interventional Neuroradiology Procedures
B.M. Jackson, W. Crinnion, M. De Iturrate Reyzabal, H. Robertshaw, C. Bergeles, K. Rhode, T. Booth, King's College London (GB) [CAR-LE-23-00075]

Predicting structural brain trajectories with discrete optimal transport normalizing flows
M. Masias, M.Á. González Ballester, G. Piella , Univ. Pompeu Fabra, Barcelona (ES) [CAR-LE-58]

Impact of Cardiac and Respiratory Motion on the 3D Accuracy of Image-Guided Interventions on Monoplane Systems
V. Rasche, D. Bertsche, P. Metze, L.M. Schneider, I. Vernikouskaya, Ulm Univ. Medical Center (DE) [CAR-LE-23-00091]

Effect of patient-specific scapula and humerus morphology on shoulder biomechanics: A comparison of rotator cuff tear and osteoarthritis patients
A. Oswald, J. Menze, M. Jacxsens, T. Rojas, M. Zumstein, K. Gerber, Univ. of Bern; Kantonsspital St.Gallen; Inselspital, Bern (CH); Clinica Santa Maria, Chile (CL) [CAR-LE-62]

Thursday, June 22, 2023

8:00 CAR Poster Session 1

Session Chairs: Miguel Á. González Ballester, PhD (ES), NN

Temporal subtraction technique for phalanges CR images using U-Net and Geometric-matching CNN
T. Kamiya, H. Ono, T. Aoki, Kyushu Inst. of Technology; Univ. of Occupational and Environmental Health School of Medicine, Kitakyushu (JP) [CAR-LP-PO-26]

Patch-based respiratory phase matching method for digital subtraction angiography under natural respiration
Y. Sekiguchi, T. Okamoto, K. Fujiwara, T. Kondo, J. Koizumi, H. Haneishi, Chiba Univ. (JP) [CAR-PO-82]

Tracked Ultrasound Bone Surface Registration for Intraoperative Navigation during Pediatric Bone Tumor Resections with Soft Tissue Components
M. Fitski, J.M. van der Zee, M.A.J. van de Sande, M.A.D. Buser, M.A.J. Hiep, S.E.J. Terwisscha van Scheltinga, C.C.C. Hulsker, C.H. van den Bosch, C.P. van de Ven, L. van der Heijden, G.M.J. Bökerink, M.H.W.A. Wijnen, F.J. Siepel, A.F.W. van der Steeg, Princess Maxima Center for Pediatric Oncology, Utrecht; Netherlands Cancer Institute; Academic Medical Centre, Amsterdam (NL) [CAR-PO-23-00063]

Automated detection of knee joint from X-ray fluoroscopic images based on deep learning and accuracy validation of 2D/3D registration
T. Yamazaki, H. Hayashida, F. Itami, T. Tomita, K. Sugamoto, Saitama Inst. of Technology; Osaka Univ. Graduate School of Medicine (JP) [CAR-PO-87]

Edge Reinforced Co-training Network based Bimodal Segmentation of Abnormal Nerve and Vascular for Microvascular Decompression
W. Si, R. Tu, L. Yu, Shenzhen Inst. of Advanced Technology, Chinese Academy of Sciences; The Univ. of Hong Kong (CN) [CAR-PO-40]

Automatic measurement of the muscle cross-sectional area on the 1st and 3rd lumbar vertebra levels by two U-nets
S. Hanaoka, W. Gonoi, S. Inui, N. Akamatsu, Y. Nomura, T. Takenaga, S. Miki, T. Yoshikawa, N. Hayashi, K. Sugawara, S. Taguchi, K. Kishitani, H. Kume, T. Kawai, T. Nakagawa, O. Abe, The Univ. of Tokyo Hospital; Nerima Hikarigaoka Hospital,Tokyo; Chiba Univ.;Saitama Cancer Center Hospital; Teikyo Univ. School of Medicine (JP) [CAR-PO-49]

Automatic measurement system for the diameter of the inferior vena cava using deep neural network
H. Noro, N. Koizumi, Y. Nishiyama, J. ZHOU, T. Ishikawa, R. Tsumura, K. Yoshinaka, H. Tsukihara, N. Matsumoto, R. Masuzaki, M. Ogawa, K. Numata, The Univ. of Electro Comunications, Chofu; National Inst. of Advanced Industrial Science and Technology, Tsukuba; The Univ. of Tokyo; Nihon Univ. Surugadai Hosp., Chiyodaku; Yokohama City Univ. Medical Center (JP) [CAR-PO-50]

Blood Vessel Segmentation via Cascaded Enhance-segment Framework in Dissecting Microscopic Images of Cranial Windows
Y. Wu, Y. Hayashi, M. Oda, T. Zheng, S. Kawamura, T. Takebe, K. Mori, Nagoya Univ.; Tokyo Medical and Dental Univ.; (JP) [CAR-PO-70]

Unsupervised Segmentation of Fetal Brain MR Images Using Multi-Atlas Segmentation and Cascaded Registration
V. Comte, M. Alenya, A. Urru, A. Nakaki, F. Crovetto, O. Camara, E. Eixarch, F. Crispi, G. Piella, M. Ceresa, M. A. González Ballester, Universitat Pompeu Fabra; Maternal Fetal Medicine, BCNatal, Barcelona (ES) [CAR-PO-93]

post-hoc aleatoric uncertainty estimation through generalized Gaussian distribution for semantic segmentation in laparoscopic images
J. Qiu, Y. Hayashi, M. Oda, T. Kitasaka, K. Mori, Nagoya Univ.; Aichi Inst. of Technology, Toyota (JP) [CAR-PO-113]

Automatic Detection and Classification of Lesion Changes in Longitudinal Studies by Bipartite Graph Matching
L. Joskowicz, S. Rochman, A. Szeskin, R. Lederman, J. Sosna, Hebrew Univ.; Hadassah Medical Center, Jerusalem (IL) [CAR-PO-23-00021]

Towards Learning Medical Image Segmentation from Scarce and Sparse Annotations: A Simple and General Solution
Z. Zheng, Y. Hayashi, M. Oda, T. Kitasaka, K. Mori, Nagoya Univ.; Aichi Institute of Technology, Toyota (JP) [CAR-PO-23-00093]

Automatic Segmentation of Orbital Wall from CT Images Via a Thin Wall Region Supervision-Based Multi-scale Feature Search Network
J. Xu, D. Zhang, C. Wang, H. Zhou, Y. Li, X. Chen, Shanghai Jiao Tong Univ.; Shanghai 9th Peoples Hospital (CN); Royal Institute of Technology, Huddinge, Stockholm (SE) [CAR-PO-23-00096]

A robust respiratory gating method for rodent micro-CT imaging
M. Fukushima, T. Okamoto, H. Haneishi, Chiba Univ. (JP) [CAR-PO-80]

Correction software of ADC bias induced by gradient non-linearity in DWI: breast phantom study
T. Yoshida, A. Urikura, M. Endo, T. Aramaki, Shizuoka Cancer Centre; National Cancer Center Hospital Tokyo; Chiba Univ. Hospital (JP) [CAR-PO-81]

Including planning information into image fusion during left atrial appendage closure.
I. Vernikouskaya, D. Bertsche, P. Metze, L. M. Schneider, V. Rasche, Ulm Univ. Medical Center (DE) [CAR-LP-PO-9]

Thursday, June 22, 2023

9:00 CAR Poster Session 2

Session Chairs: Michael Friebe, PhD (DE), Mario A. Cypko, PhD (DE)

Deep learning-based mediastinum suppression technique for evaluating pleural invasion of lung cancer in dynamic chest radiography
R. Nagatani, R. Tanaka, F. Goshima, W. Segars, E. Abadi, E. Samei, Kanazawa Univ. Graduate School of Medical Sciences; Kanazawa Univ. (JP); Duke Univ., School of Medicine, Durham (US) [CAR-PO-29]

Implementation of an artificial intelligence pipeline for instrument location in colonoscopy
P. Sánchez-González, C. Guzman-Garcia, Á. Martínez-Alcalá García, I. Oropesa, E.J. Gómez, Univ. of Madrid; Hospital Infanta Leonor (ES) [CAR-PO-23-00010]

3d-Printed Patient-specific Perfused Aortic Dissection Model for Training of Endovascular Interventions
L. Mohl, R. F. Karl, A. Runz, M. Hagedorn, M. Tölle, J. Hatzl, K. Meisenbacher, C. Uhl, D. Böckler, S. Engelhardt, Heidelberg Univ. Hospital; German Cancer Research Center (DE) [CAR-PO-89]

Quantitative validation of two model-based methods for the correction of probe pressure deformation in ultrasound
J. Dahmani, C. Laporte, Y. Petit, École de technologie supérieure, Montreal, QC (CA) [CAR-PO-23-00079]

Evaluation of hand tracking accuracy of HoloLens 2 for palpation during closure of ventricular septal defects
L. Duong, A. Bordin, G. Tibamoso-Pedraza, J. Miró, École de technologie supérieure, Montréal: CHU Sainte-Justine, Québec (CA) [CAR-PO-110]

GPU-accelerated Octree cube deformation mapping to polygon models
R. Miyazaki, M. Oda, K. Mori, Nagoya Univ. (JP) [CAR-PO-23-00081]

Novel and Inexpensive Gamma Radiation Sensor – Initial Concept and Design
J. Sorysz, K. Heryan, G. Krombach, M. Friebe, P. Pott, Univ. of Science and Technology, Kraków (PL); Univ. Hospitals Giessen and Marburg Campus; Otto-von-Guericke-Univ., Magdeburg; Univ. Stuttgart (DE) [CAR-PO-23-00080]

Two-stage Generative Adversarial Networks for Metal Artifact Reduction and Visualization in Ablation Therapy of Liver Tumors
D. Liang, S. Zhang, Z. Zhao, G. Wang, J. Sun, J. Zhao, W. Li, L.X. Xu, Shanghai Jiao Tong Univ.; Fudan Univ. Shanghai Cancer Center (CN) [CAR-PO-23-00024]

A semi-automated robotic system for percutaneous interventions
M. Siegfarth, R. Lutz, N.-C. Iseke, J. Moviglia, F. Sadi, J. Stallkamp, Heidelberg Univ., Mannheim (DE) [CAR-PO-22-00864]

Cold Ablation Robot-Guided Laser Osteotomy in Hand, Wrist and Forearm Surgery – a feasibility study
E. Coppo, M. Hofer, M. Morawska, M. Müller-Gerbl, P. Honigmann, Kantonsspital Baselland, Liestal; Universität Basel; Advanced Osteotomy Tools AG (CH) [CARS/DOR-PO-43]

Construction of organ rotation estimation system using deep learning
M. Sano, N. Koizumi, Y. Nishiyama, J. Zhou, T. Fujibayashi, M. Matsuyama, M. Yamada, T. Ishikawa, A. Katsuragi, S. Monma, The Univ. of Electro Communications, Chofushi (JP) [CAR-PO-97]

Patient positioning assistance applicable to existing computed tomography systems
A. Urikura, Y. Miyauchi, T. Yoshida, Y. Ishita, K. Takiguchi, T. Aramaki, National Cancer Center Hospital,Tokyo; Shizuoka Cancer Center (JP) [CAR-PO-109]

Enhancing Electromagnetic Tracking Accuracy in Medical Applications using Pre-trained Witness Sensor Distortion Models
M. Cavaliere, P. Cantillon-Murphy, Univ. College Cork (IE) [CAR-PO-23-00065]

Development and assessment of novel assist device for cardiac cannulation
K. Cleary, E.M. Fischer, M. Gebremeskel, K.J. Jawed, C. Yerebakan, Children's National Hospital; The Sheikh Zayed Institute for Pediatric Surgical Innovation, Washington DC (US) [CAR-PO-23-00069]

Poster Discussion

25th International Conference on Computer-Aided Diagnosis and Artificial Intelligence (CAD-AI)
Chairman: Hiroyuki Yoshida, PhD (US)

Thursday, June 22, 2023

10:00 CAD-AI Poster Session
Session Chairs: Ruey-Feng Chang, PhD (TW)

Development of an Interpretation System for Diagnostic Imaging Methods in CAD Combined Reading of Breast Cancer
A. Sugawara, R. Ohsaka, K. Abe, H. Takeo, S. Nawano, Y. Nagai, Kanagawa Inst. of Technology; Shinmatsudo Central General Hospital; National Cancer Center Hospital East, Chiba (JP) [CAD-PO-5]

Breast mass detection using paired mammogram views based on artificial intelligence algorithm
J. W. Seo, Y. J. Kim, S. H. Lee, M. Sae Byeol, K. G. Kim, Gachon Univ., Incheon (KR) [CAD-PO-76]

Improved identification of tumors in 18F-FDG-PET examination by normalizing the standard uptake in liver based on blood-test data
A. Alam, S. Hanaoka, Y. Nomura, T. Kikuchi, T. Nakao, T. Takenaga, N. Hayashi, T. Yoshikawa, O. Abe, The Univ. of Tokyo, Bunkyo; Chiba Univ.; Jichi Medical Univ. Hospital, Tochigi (JP) [CAD-PO-23-00045]

Classification of Pancreatic Cystic Lesions with multiple annotators merging techniques
M. Riera-Marín, B. Sastre-García, J. Rodríguez-Comas, J. García-López, M. Á. González-Ballester, Sycai Technologies SL; Univ. Pompeu Fabra, BCN - MedTech, Barcelona (ES) [CAD-PO-23]

Diagnostic support system for coronary artery disease using dynamic heart shapes and patients' metadata
S. Takashima, S. Miyauchi, K. Morooka, R. Kurazume, Kyushu Univ., Fukuoka; Okayama Univ. (JP) [CAD-PO-86]

Automatic and Accurate Epileptogenic Zone Localization with SEEG Informed Structural Connectivity for Focal Epilepsy
C. Li, L. Xiao, Q. Zheng, L. Yu, W. Si, Shenzhen Inst. of Advanced Technology, Chinese Academy of Sciences; Shenzhen Inst. of Advanced Technology; The Univ. of Hong Kong (CN) [CAD-PO-41]

Identification of Diabetic Retinopathy from Fundus Images Using Deep Auto Encoder
K. Abe, H. Takeo, Y. Takahashi, Y. Nagai, Kanagawa Inst. of Technology; Takahashi Eye Clinic; National Cancer Center Hospital East, Chiba (JP) [CAD-PO-2]

Classification Trial of Anaphylaxis Caused by Nonionic Iodine Contrast Agents Using Machine Learning
H. Hattori, Y. Oshita, A. Teramoto, R. Takagi , T. Hanamatsu, H. Azuma, S. Ota, A. Watanabe, E. Sakaguchi , Y. Ohno, H. Naruse, S. Kobayashi, H. Toyama, Fujita Health Univ. School of Medicine, Toyoake (JP) [CAD-PO-60]

Thursday, June 22, 2023

10:30 CAD-AI in Lung
Session Chairs: Yoshiharu Ohno, MD (JP)

Machine Learning Based Computer-Aided Simple Triage (CAST): Capability for COVID-19 Pneumonia Triage in Multicenter and Multi-Reader Study
Y. Ohno, T. Aoki, M. Endo, H. Koyama, H. Moriya, F. Okada, T. Higashino, H. Sato, N. Manabe, J. Matsumoto, K. Arakita, K. Aoyagi, Y. Ikeda, S. Kaminaga, A. Taniguchi, N. Sugihara, Fujita Health Univ. School of Medicine, Toyoake; Univ. of Occupational and Environmental Health School of Medicine; Chiba Univ. Hospital; Osaka Police Hospital (JP) [CAD-LE-11]

Data-Driven COVID-19 Analysis bases on Three-Dimensional Attention Mechanisms
R. Toda, H. Itoh, M. Oda, Y. Hayashi, Y. Otake, M. Hashimoto, T. Akashi, S. Aoki, K. Mori, Nagoya Univ.; Nara Institute of Science and Technology (NAIST); Keio Univ. School of Medicine, Tokyo; Juntendo Univ. Hospital, Tokyo (JP) [CAD-LE-23-00082]

3-D SEH-YOLO: A YOLO-based Computer-aided Detection model for Lung Nodule Detection on Low-dose Computed Tomography
Y. S. Huang, T. A. Chen, R. F. Chang, National Changhua Univ. of Education; National Taiwan Univ., Taipei (TW) [CAD-LE-19]

Virtual Radiomics Biopsy for the Histological Diagnosis of Pulmonary Nodules - Intermediate Results of the RadioLung Project
G. Torres, D. Gil, S. Baeza Mena, A. Rosell Gratacós, C. Sanchez, Computer Vision Center, Univ. Autónoma de Barcelona (UAB); Hospital Universitari Germans Trias i Pujol, Barcelona (ES) [CAD-LE-20]

Application of Convolutional Neural Network with Transfer learning to pattern recognition of tuberculosis in chest X-ray images.
P. Azevedo-Marques, L. Lins de Lima, R. Rodrigues, J. Saito, O. Yussuf, L. Peron, K. Lopes, M. Koenigkam-Santos, Univ. of São Paulo, Ribeirão Preto Medical School (BR) [CAD-LE-96]

Prognostic performance evaluation of a weakly unsupervised GAN model progressive fibrosing interstitial lung disease
H. Yoshida, M. Okamoto, J. Näppi, C. Watari, Harvard Medical School, Boston (US) [CAD-LE-67]

Thursday, June 22, 2023

11:30 CAD-AI in Brain
Session Chairs: Akinobu Shimizu, PhD (JP)

Recommendations on best practices for AI and machine learning for computer-aided diagnosis in medical imaging
Invited Lecture: Lubomir Hadjiyski, PhD, University of Michigan, Michigan Medicine, Ann Arbor, MI (US) [CAD-AI-IS-308]

Creating Pseudo Datasets from Disparate Datasets for Domain Adaptation for Brain Metastases Detection
M. Tan, A. Liew, C. C. Lee, B. L. Lan, Monash Univ. Malaysia, Subang Jaya; Sunway Medical Centre, Selangor (MY) [CAD-LE-10]

Efficient Brain Tumor Segmentation using Swin Transformer and Enhanced Local Self-Attention
F. Ghazouani, S. Ruan, Henri Becquerel Cancer Institute; Univ. of Rouen Normandy, Rouen (FR) [CAD-LE-23-00047]

Investigation of federated learning for automated cerebral aneurysm detection in head MR angiography images
A. Yamada, S. Hanaoka, H. Shibata, T. Takenaga, T. Yoshikawa, Y. Nomura, Chiba Univ.; The Univ. of Tokyo Hospital (JP) [CAD-LE-21]

Searching for infiltrative brain tumor using qMRI and deep learning model explainability
I. E. Tampu, I. Blystad, N. Haj-Hosseini, A. Eklund, Linköping Univ. (SE) [CAD-LE-118]

Thursday, June 22, 2023

14:00 CAD-AI in Abdomen
Session Chairs: Paulo Mazzonicini Azevedo-Marques, PhD (BR)

Universal Detection and Segmentation of Lymph Nodes in Multi-parametric MRI
T.S. Mathai, S. Lee, T.C. Shen, D.C. Elton, Z. Lu, R.M. Summers, National Institutes of Health Clinical Center, Bethesda, MD (US) [CAD-LE-23-00104]

Pancreatic IPMN Cysts Detection and Segmentation in Multi-Sequence MRI by Deep Learning
L. Joskowicz, N. Mazor, G. Dar, R. Lederman, N. Lev-Cohain, J. Sosna, The Hebrew Univ. of Jerusalem; Hadassah Univ. Medical Center, Jerusalem (IL) [CAD-LE-24]

Performance evaluation of self-supervised 3D GAN for electronic cleansing in photon-counting CT colonography
R. Tachibana, J. Näppi, T. Hironaka, S. Yoshida, D. Wu, R. Gupta, K. Taguchi, H. Yoshida, National Inst. of Technology, Oshima; Harvard Medical School; Massachusetts General Hospital, Boston; John Hopkins Univ., Baltimore (JP) [CAD-LE-120]

Computer-aided Diagnosis of Simulated Colorectal Polyps in Photon-counting CT Colonography
J. Näppi, T. Hironaka, D. Wu, R. Gupta, R. Tachibana, K. Taguchi, H. Yoshida, Massachusetts General Hospital, Boston; The John Hopkins Univ., Baltimore (US) [CAD-LE-61]

Thursday, June 22, 2023

15:00 CAD-AI in Breast and Other Organs
Session Chairs: Hiroyuki Yoshida, PhD (US)

3-D ResNeSt tumor diagnosis for automated breast ultrasound image
R.- F. Chang, Y. S. Huang, C. Dai, National Taiwan Univ., Taipei; National Changhua Univ. (TW) [CAD-LE-33]

Multiple Instance Ensembling For Paranasal Anomaly Classification In The Maxillary Sinus
D. Bhattacharya, F. Behrendt, B.T. Becker, D. Beyersdorff, E. Petersen, M. Petersen, B. Cheng, D. Eggert, C. Betz, A.S. Hoffmann, A. Schlaefer, Hamburg Univ. of Technology (DE) [CAD-LE-23-00026]

Comparison of tumor detection models in laryngeal endoscopic still images using deep learning
S. H. Lee, Y. J. Kim, J. W. Seo, S. B. Mun, K. G. Kim, Gachon Univ., Incheon (KR) [CAD-LE-75]

Distal radius fracture classification on dual-view radiography using ensemble deep learning framework
B. Schmutz, H. Min, A. Wadhawan, Y. Rabi, P. Bourgeat, J. Dowling, J. White, A. Tchernegovski, B. Formanek, M. Schuetz, G. Mitchell, F. Williamson, C. Hacking, K. Tetsworth, Queensland Univ. of Technology, Brisbane; Royal Brisbane and Women's Hospital, Herston (AU) [CAD-LE-115]

29th Computed Maxillofacial Imaging Congress (CMI)
Chairs: Christos Angelopoulos, DDS (US), Yoshihiko Hayakawa, PhD (JP)

Thursday, June 22, 2023

16:30 Computed Maxillofacial Imaging
Session Chairs: Christos Angelopoulos, DDS (US), Yoshihiko Hayakawa, PhD (JP)

AI-based characterization of partially edentulous jaws in panoramic x-rays
H. Meine, L. Brandenburg, M. Detering, P. Weingart, M. C. Metzger, J. Georgii, Fraunhofer Inst. for Digital Medicine MEVIS Bremen; Univ. of Freiburg (DE) [CMI-LE-94]

Orbital reconstruction with Gaussian processes
Y. Sun, P. Vanslambrouck, R. Willaert, M. Bila, C. Politis, P. Claes, J. Van Dessel, Univ. Hospitals Leuven; KU Leuven (BE) [CMI-LE-90]

Incremental Biomechanical Deep Learning Modeling of Facial Tissue Deformation
N. Lampen, D. Kim, X. Xu, X. Fang, T. Kuang, H. H. Deng, M. A. K. Liebschner, J. J. Xia, J. Gateno, P. Yan, Rensselaer Polytechnic Inst., Troy; Houston Methodist Research Inst.; Baylor College of Medicine, Houston (US) [CMI-LE-103]

Mandible landmark detection for craniomaxillofacial surgical planning using graph convolutional network
P. Yan, X. Xu, T. Kuang, A. Chen, N. Lampen, X. Fang, D. Kim, M. A. K. Liebschner, J. J. Xia, J. Gateno, H. H. Deng, Rensselaer Polytechnic Inst., Troy; Houston Methodist Research Inst.; Baylor College of Medicine, Houston (US) [CMI-LE-104]

Mouth and rip motion capture during speech and the development of rip-reading AI
T. Hirabayashi, R. Hosoya, Y. Hayakawa, KItami Inst. of Technology (JP) [CMI-LE-111]

A feasibility study on estimating desired postoperative face using deep learning for patients with craniomaxillofacial deformities
N. Lampen, J. Lee, D. Kim, X. Xu, X. Fang, T. Kuang, H. H. Deng, M. A. K. Liebschner, J. J. Xia, J. Gateno, P. Yan, Rensselaer Polytechnic Inst., Troy, NY; Houston Methodist Research Inst.; Baylor College of Medicine Texas (US) [CMI-LE-121]

Diameters of lingual, facial, and maxillary arteries measured on 3D computed tomography angiography images
T. Ohya, I. Sakuma, W. Cai, E. Kobayashi, T. Koizumi, K. Mitsudo, Yokohama City Univ.; The Univ. of Tokyo; Tokyo Women´s Medical Univ. (JP) [CMI-PO-23-00018]

Development of practical education system for intraoral radiography using Extended Reality
K. I. Ejima, T. Sasaki, K. Honda, Y. Arai, Nihon Univ. School of Dentistry, Tokyo (JP) [CMI-PO-63]

27th Annual Conference of the International Society for Computer Aided Surgery (ISCAS)
Chairs: Kensaku Mori, PhD (JP), Cristian A. Linte, PhD (US)

Thursday, June 22, 2023

8:00 ISCAS Poster Session
Session Chairs: Cristian A. Linte, PhD (US), Kensaku Mori, PhD (JP)

Low Cost On-chip Magnetic Sensors for Electromagnetic Navigation Bronchoscopy
K. O'Donoghue, M. Srivastava, A. Sidun, H. A. Jaeger, D. O'Hare, P. Cantillon-Murphy, Tyndall Quantum Computer Engineering Centre, Dublin; Mannheim Univ. of Applied Sciences (DE) Univ. College Cork (IE) [ISCAS-PO-53]

Phantom and preclinical study for Bone tumor surgical robotic system
S. Kim, D. Shin, C. Lee, D. Yu, J. Cho, H. Bang, H. J. Lee, D. H. Kim, I. Park, J. Hong, S. Joung, AIRS, Deagu ; Kyungpook National Univ. Hospital; DIGST, Deagu (KR) [ISCAS-PO-92]

Rotational performance evaluation of a rotation mechanism including crown gear for controlling the posture of a flexible surgical tool
T. Okada, T. Dohi, R. Doine, K. Kuwana, Tokyo Denki Univ. (JP) [ISCAS-LP-PO-114]

Towards Development of a Mixed-Reality Surgical Simulator
N. Navkar, A. W. Palliyali, S. Paul, J. Abinahed, A. Mohamed, E. Yaacoub, Hamad Medical Corporation; Qatar Univ., Doha (QA) [ISCAS-PO-17]

Validation of an augmented reality based functional method to determine and render the hip rotation center during total hip arthroplasty
Q. Neuville, T. Frantz, F. Van Gestel, B. Janssen, J. Vandemeulebroucke, T. Scheerlinck, J. Duerinck, UZ Brussel: Universitair Ziekenhuis Brussel (BE) [ISCAS-PO-101]

On the way to surgineering a laparoscopic pre-training system in virtual reality with validated haptic feedback

H.- G. Enkler, W. Kunert, S. Pfeffer, K.-J. Bock, S. Axt, J. Johannink, C. Reich, Furtwangen Univ. of Applied Sciences; Universitätsklinikum Tübingen, Tübingen (DE) [ISCAS-PO-23-00030]

Surgical workflow recognition for effective use of plastic surgery videos
T. Kobayashi, H. Kajita, Y. Takatsume, Y. Aoki, Keio Univ., Yokohama; Keio Univ. School of Medicine Tokyo (JP) [ISCAS-PO-34]

Effects of patient demographics on anatomical fitting of a distal femur plate: A 3D modelling study
B. Schmutz, M. T. Phan, J. Pople, B. C. W. Lam, E. Schoofs, J. Warren, H. Minehara, K. Tetsworth, M. Schuetz, Queensland Univ. of Technology; Jamieson Trauma Inst., Brisbane, QLD (AU); Fukushima Medical Univ., Kawasaki (JP) [ISCAS-PO-4]

Navigation makes more accurate femur resection compared to conventional TKA in lateral femoral bowing greater than 5 degrees
W. K. Choi, Daegu Catholic Univ. Hospital (KR) [ISCAS-PO-14]

A method for analyzing position of polar body in oocyte from microscopic images for assisting intracytoplasmic sperm injection
Y. Hayashi, T. Aoyama, G. Koutaki, K. Mori, Nagoya Univ.; Kumamoto Univ. (JP) [ISCAS-PO-122]

MRI-based training model for left atrial appendage closure
V. Rasche, D. Bertsche, M. Pfisterer, T. Dahme, L.-M. Schneider, P. Metze, I. Vernikouskaya, Ulm Univ. Medical Center (DE) [ISCAS-PO-23-00004]

Thursday, June 22, 2023

8:45 Intelligent Surgical Workflows Meet AI

Session Chairs: Pierre Jannin, PhD (FR), Kensaku Mori, PhD (JP)

TRandAugment: Temporal Random Augmentation Strategy for Surgical Activity Recognition from Videos
S. Ramesh, D. Dall'Alba, C. Gonzalez, T. Yu, P. Mascagni, D. Mutter, J. Marescaux, P. Fiorini, N. Padoy, Univ. of Verona (IT); IHU Strasbourg; Univ. Hospitals, Strasbourg (FR) [ISCAS-LE-23-00011]

A methodology for the annotation of surgical video for supervised machine learning applications
E.M. Fischer, K.J. Jawed, K. Cleary, A. Balu, A. Donoho, W. Gestrich-Thompson, D. Donoho, Children's National Hospital; The Sheikh Zayed Institute for Pediatric Surgical Innovation, Washington, DC; SurgicalVideo.io , Austin, TX (US) [ISCAS -LE-23-00067]

Towards an Interoperable, Intraoperative Situation Recognition System via Process Modeling, Execution, and Control using the standards BPMN and CMMN
D. Junger, E. Just, J.M. Brandenburg, M. Wagner, K. Schaumann, T. Klenzner, O. Burgert, Reutlingen Univ.; Universitätsklinikum Düsseldorf; Universitätsklinikum Heidelberg (DE) [ISCAS-LE-23-00042]

Augmenting instrument segmentation in video sequences of minimally invasive surgery by synthetic smoky frames
T. Rückert, M. Rieder, D. Rauber, M. Xiao, E. Humolli, H. Feussner, D. Wilhelm, C. Palm, Ostbayerische Technische Hochschule Regensburg; Klinikum rechts der Isar, Technical Univ. of Munich (DE) [ISCAS-LE-105]

Reducing False Positives in Automatic Hepatic Tumor Segmentation: a Deep Learning Approach
T. Natali, A. Zhylka, K. Olthof, J. Smit, T. Baetens, T. Ruers, M. Fusaglia, Netherlands Cancer Inst. - Antoni van Leeuwenhoek Hospital, Amsterdam (NL) [ISCAS-LE-56]

Instrument segmentation with TernausNet during temporal bone surgery
C. Yuan, D. Shin, T. N. Le, V. Y. Lin, J. M. Chen, L. A. Kahrs, J. T. Lui, Univ. of Toronto; Sunnybrook Health Sciences Centre; Univ. of Calgary, Cumming School of Medicine (CA) [ISCAS-LE-64]

Thursday, June 22, 2023

10:15 Interventional Navigation and Visualization

Session Chairs: Ichiro Sakuma, PhD (JP), Caroline Essert, PhD (FR)

Robust and Efficient AR-based Navigation for Laparoscopic Liver Surgery
W. Si, Y. Li, L. Yu, P. A. Heng, The Chinese Univ. of Hong Kong (HK); Shenzhen Inst. of Advanced Technology, Chinese Academy of Sciences (CN) [ISCAS-LE-46]

The influence of surgical navigation on the complexity of open liver surgery
K. Olthof, J. Smit, M. Fusaglia, N. Kok, K. Kuhlmann, T. Ruers, Netherlands Cancer Inst. - Antoni van Leeuwenhoek Hospital, Amsterdam (NL) [ISCAS-LE-55]

Fibular osteotomies with an electromagnetic navigated surgical cutting guide: a proof of concept study
A. F. de Geer, L. M. N. Aukema, M. J. A. van Alphen, W. H. Schreuder, R. L. P. van Veen, T. J. M. Ruers, F. J. Siepel, M. B. Karakullukcu, Netherlands Cancer Inst. - Antoni van Leeuwenhoek Hospital, Amsterdam; Univ. of Twente, Enschede (NL) [ISCAS-LE-98]

Role of preoperative navigated transcranial magnetic stimulation for surgical management of gliomas located near motor function area
M. Tamura, A. Kuwano, T. Takakura, J. F. Mangin, I. Sato, M. Nitta, T. Saito, T. Kawamata, K. Masamune, Y. Muragaki, Tokyo Women's Medical Univ.; Future Univ. Hakodate, Faculty of System Information Science Engineering (JP); Neurospin, Biomedical Imaging Inst., CEA, Gif/Yvette (FR) [ISCAS-LE-99]

Feasibility of tracked ultrasound registration for pelvic-abdominal tumor navigation: a patient study
M.A.J. Hiep, W.J. Heerink, H.C. Groen, T.J.M. Ruers, Netherlands Cancer Institute; Antoni van Leeuwenhoek, Amsterdam (NL) [ISCAS-LE-23-00029]

A multi-view interactive virtual-physical registration method for mixed reality based surgical navigation in pelvic and acetabular fracture fixation
X. Chen, P. Tu, H. Wang, L. Joskowicz, Shanghai Jiao Tong Univ.; Shanghai Sixth People's Hospital (CN); The Hebrew Univ., Jerusalem (IL) [ISCAS-LE-23-00014]

Navigation Error Estimation with Considering Human's Discriminative Sensitivity in AR Surgical Navigation
Y. Nakajima, Y. Yashima, S. Onogi, Tokyo Medical and Dental Univ. (JP) [ISCAS-LE-23-00074]

3D Holographic Volume Rendering with Mid-Air Gestural Interaction for Intuitive Diagnosis
Y. Qiu, W. Si, Shenzhen Inst. of Advanced Technology, Chinese Academy of Sciences (CN) [ISCAS-LE-42]

Augmented Reality guidance for the surgical localization of pediatric chest wall tumors
R. van der Woude, J. van der Zee, M. Fitski, C. van de Ven, M. Wijnen, F. Siepel, A. van der Steeg, Princess Máxima Center, Utrecht; Univ. of Twente, Enschede (NL) [ISCAS-LE-100]

Thursday, June 22, 2023

14:00 Instrumentation and Robotics

Session Chairs: Kevin Cleary, PhD (US), Alois Knoll, PhD (DE)

Comparison of Robotic and Open Pancreaticoduodenectomy with Portal-Superior Mesenteric Vein Resection for Advanced Peri-ampullary Tumors
Y. J. Chen, H. C. Lin, Taichung Veterans General Hospital (TW) [ISCAS-LE-57]

Comparison of image quality of 3D ultrasound: motorized acquisition versus freehand navigated acquisition, a phantom study
N. Bekedam, L. Karssemakers, M. van Alphen, R. van Veen, L. Smeele, B. Karakullukcu, Netherlands Cancer Institute, Amsterdam (NL) [ISCAS-LE-22-00839]

Development and Validation of a Flexible Fetoscope for Fetoscopic Laser Coagulation
M. A. Ahmad, M. Ourak, D. Wenmaekers, I. Valenzuela, D. Basurto, S. Ourselin, T. Vercauteren, J. Deprest, E. Vander Poorten, KU Leuven; Univ. Hospital Leuven (BE); King`s College London (GB) [ISCAS-LE-22-00858]

Robot-assisted Ultrasound Reconstruction for Spine Surgery: from Bench-top to Pre-clinical Study
R. Li, A. Davoodi, Y. Cai, K. Niu, G. Borghesan, N. Cavalcanti, A. Massalimova, F. Carrillo, P. Fürnstahl, E. Vander Poorten, Katholieke Univ. Leuven; Univ. Twente, Enschede (BE) Univ. of Zürich, (CH) [ISCAS-LE-23-00034]

A Stiffness-tunable Soft Actuator Inspired by Helix for Medical Applications
S. Dai, C. Hu, L. Ma, X. Zhang, H. Zhang, H. Liao, Tsinghua Univ. School of Medicine, Beijing; Shanghai Jiao Tong Univ. (CN) [ISCAS-LE-23-00058]

Automatic Patient Positioning Based on Robot Rotational Workspace for Extended Reality
M. Żelechowski, B. Faludi, M. Karnam, N. Gerig, G. Rauter, P.C. Cattin, Univ. of Basel, Allschwil; Univ. Hospital, Basel (CH) [ISCAS-LE-23-00066]

Thursday, June 22, 2023

15:45 Surgical Planning, Training and Simulation

Session Chairs: Leo Joskowicz, PhD (IL), John S.H. Baxter, PhD (FR)

Towards Immersive Collaboration of Remote Surgical Training
W. Si, Z. Shao, Y. Tong, Shenzhen Inst. of Advanced Technology; Chinese Academy of Sciences; The Chinese Univ. of Hong Kong (CN) [ISCAS-LE-38]

Development of a total hip arthoplasty support system that includes dummy and virtual lower-limb models
A. Hanafusa, H. Kato, S. Hara, A. Kato, S. Mohamaddan, M. Takagi, T. Baba, Y. Homma, Y. Oishi, Shibaura Inst. of Technology, Saitama; Juntendo Univ. School of Medicine; Surgical Alliance Inc., Tokyo (JP) [ISCAS-LE-83]

A Sensorized Modular Training Platform to Reduce Vascular Damage in Endovascular Surgery
N. Fischer, C. Marzi, K. Meisenbacher, A. Kisilenko, T. Davitashvili, M. Wagner, F. Mathis-Ullrich, Karlsruhe Institute of Technology; Univ. Hospital Heidelberg (DE) [ISCAS-LE-23-00032]

Comparison of 2D and autostereoscopic 3D visualization during mixed reality simulation
V. Vörös, J. De Smet, M. Ourak, V. Poliakov, J. Deprest, T. Kimpe, E. Vander Poorten, Katholieke Universiteit Leuven; Katholieke Universiteit Leuven Groep Wetenschap and Technologie, Heverlee; Univ. Hospital Leuven; Barco NV Medical Imaging Systems, Kortrijk (BE) [ISCAS-LE-23-00062]

Gaze behavior is related to objective technical skills assessment during virtual reality simulator based surgical training: a proof of concept
S. Galuret, N. Vallée, A. Tronchot, H. Thomazeau, P. Jannin, A. Huaulmé, Universite de Rennes 1; Univ. Hospital of Rennes (FR) [ISCAS-LE-23-00118]

Deep learning-based soft-tissue-driven craniomaxillofacial surgical planning
P. Yan, X. Fang, D. Kim, X. Xu, T. Kuang, N. Lampen, J. Lee, H. H. Deng, J. Gateno, M. A. K. Liebschner, J. J. Xia, Rensselaer Polytechnic Inst., Troy, NY (US) [ISCAS-LE-106]

A method for accurate and reproducible specimen alignment for insertion tests of cochlear implant electrode arrays
J. Cramer, G. Böttcher-Rebmann, T. Lenarz, T.S. Rau, Hannover Medical School (DE) [ISCAS-LE-22-00813]

Correlation Between Tearing Energy and Elasticity in Porcine Duodenum
K. Yamamoto, K. Hara, E. Kobayashi, Y. Akagi, I. Sakuma, The Univ. of Tokyo; Women´s Medical Univ., Tokyo (JP) [ISCAS-LE-23-00037]

Preclinical evaluation of a tool for insertion force measurements in cochlear implant surgery
G. Böttcher-Rebmann, V. Schell, M.G. Zuniga, R. Salcher, T. Lenarz, T.S. Rau, Hannover Medical School (DE) [ISCAS-LE-23-00050]

15th CARS Clinical Day - Clinical Applications of AI

Chairs: Leonard Berliner, MD (US), Dirk Wilhelm, MD (DE), Eric vanSonnenberg, MD (US)

Friday, June 23, 2023

8:30 Stanley-Baum-Lecture

Radiomics: From Molecular Biology to Clinical Application
Leonard Berliner, MD, Staten Island University Hospital - Northwell Health, Staten Island, NY (US)

9:00-10:30 Education and AI

Session Chairs: Leonard Berliner, MD (US), Thomas Neumuth, PhD (DE), Eric vanSonnenberg, MD (US)

9:00 Engineers in Medicine Part 1: A Pilot Comparative Profile of Engineering Students vs Non-engineering Students in Admission to Medical School
N. Groth, C. Y. Lin, E. vanSonnenberg, G. Fogerty, J. Winkelman, University of Arizona College of Medicine Phoenix (US) [CARS-LE-71]

9:15 Engineers in Medicine Part 2: What Is Medical School Like for Engineering Majors?
N. Groth, J. Winkelman, E. vanSonnenberg, G. Fogerty, J. Foote, University of Arizona College of Medicine Phoenix (US) [CARS-LE-72]

9:30 Engineers in Medicine Part 3: What Are Their Engineering Majors and What Specialties Do They Pursue?
M. Rosztoczy, E. vanSonnenberg, D. Crawford, P. Kang, P. Yue-Cheng, M. Mamlouk, G. Fogerty, J. Winkelman, N. Groth, University of Arizona College of Medicine Phoenix (US) [CARS-LE-73]

9:45 Advances in Radiomics
Invited Speaker: Amber Simpson, PhD, Queen's University Kingston, ON (CA)

10:00 AI in Nuclear Medicine
Invited Speaker: Giuseppe Esposito, MD, Georgetown Univ. Medical Center, Washington, DC (US)

10:15 Activities of the NIH Regarding AI
Invited Speaker: Kris Kandarpa, MD, PhD, National Institutes of Health (NIH), Bethesda, MD (US)

10:30 Break

11:00 – 11:45 Innovations in Surgery with AI Methods and Tools

Session Chair: Andreas Melzer, MD (DE) (tbc)

6G mobile communication for the smart hospital and robotics
Stefanie Speidel, Wolfgang Kellerer, Franziska Jurosch, Sven Kolb, National Center for Tumor Diseases, Dresden; Klinikum rechts der Isar der TUM, Munich (DE)

Collaborative robotics revisited
Lukas Bernhard, Lars Wagner, Klinikum rechts der Isar der TUM, Munich (DE)

The clinical robotic center at the TUM Klinikum
Dirk Wilhelm, Klinikum rechts der Isar der TUM, Munich (DE)

11:45 Panel Discussion on the Impact of AI and MGM

Moderator: Alois Knoll, PhD (DE) (tbc)

Panellists: tbd

12:45 -13:00 Closing Remarks

Dirk Wilhelm, MD (DE), Heinz U. Lemke, PhD (DE)

IPCAI 2023 - 14th International Conference on Information Processing in Computer-Assisted Interventions

General Chairs: Tim Salcudean, PhD (CA), Nicolas Padoy, PhD (FR), Raphael Sznitman, PhD (CH)

Program Chairs: Toby Collins, PhD (FR), Qi Dou, PhD (HK), Mathias Unberath, PhD (US)

Tuesday, June 20 - 21, 2023

Program tba