



CARS 2024 Scientific Program

**CARS 2024 Computer Assisted Radiology and Surgery
38th International Congress and Exhibition
June 18 - 21, 2024**

Universitat Pompeu Fabra, Campus del Poblenou, Roc Boronat 138, 08018 Barcelona, Spain
<https://www.cars-int.org>

Tuesday, June 18, 2024 Auditorium

8:45 Welcome to CARS 2024

President: Miguel Á. González Ballester, PhD (ES)

Tuesday, June 18, 2024 Auditorium

25th IFCARS / SPIE / ISCAS Joint Workshop on the Digital Operating Room (DOR) Chairs: Heinz U. Lemke, PhD (DE), Osman M. Ratib, MD (CH), Kensaku Mori, PhD (JP)

9:00 – 10:45 Digital Operating Room

Session Chairs: Kevin Cleary, PhD (US), Hugo Herrero Antón de Vez, MD (ES)

9:00 The Robotic Circulating Nurse: results and lessons learned of the AURORA project

L. Bernhard, C. Scheppach, C. Müller, M. Berlet, A. Jell, A. Knoll, D. Wilhelm, Klinikum rechts der Isar der Technischen Universität München (DE) [CARS/DOR-LE-90]

9:15 Introducing AI to the Context: AR-Driven Operation Manuals for Surgical Instruments – Project KARVIMIO

E. Cramer, A. B. Kucharski, J. Kreimeier, S. Andreß, S. Li, C. Walk, F. Merkl, J. Högl, P. Wucherer, P. Stefan, S. Weidert, R. von Eisenhart-Rothe, D. Roth, Institute for Work and Technology, Gelsenkirchen; Friedrich Alexander University, Erlangen; Musculoskeletal Univ. Center Munich at the LMU Clinic; Medability GmbH; Technical Univ. of Munich (DE) [CARS/DOR-LE-150]

9:30 OR-NeRF: Improved depth reconstructions and faster training for few-shot video datasets

B. Gerats, J. Wolterink, I. Broeders, Meander Medical Center, Amersfoort; University of Twente, Enschede (NL) [CARS/DOR-LE-72]

9:45 Investigation of possible sources of electrodermal activity in surgical personnel to assess workplace stress levels

M. Schlender, V. Uslar, S. Uppenkamp, N. Tabriz, D. Weyhe, T. Cetin, Carl von Ossietzky Universität Oldenburg (DE) [CARS/DOR-LE-91]

10:00 Investigating Objective Measures of Intraoperative Stress and the Impact of Smart Hearing Protection

V. Uslar, M. Schlender, A. C. Scherer, J. Rennies-Hochmuth, D. Weyhe, Carl von Ossietzky Universität Oldenburg (DE) [CARS/DOR-LE-93]

10:15 AI & surgery: Can we develop quality "replacement parts" for the human central nervous system?

R. Andrews, WFNS, Los Gatos, CA (US) [CARS/DOR-LE-50]

10:30 Central Command Suite: Futureproofing next generation surgical environments to embrace the Digital Operating Room

C. Amato, C. Yang, N. Badihi, L. Bernhard, O. Ratib, B. Seeliger, D. Wilhelm, Cannon Design, Los Angeles, CA (US); IHU Strasbourg (FR); Klinikum rechts der Isar der TUM, München (DE); University Hospital of Geneva (CH) [CARS/DOR-LE-24-00177]

10:45 Break

Tuesday, June 18, 2024 Auditorium

38th CARS - Computer Assisted Radiology and Surgery

Chairs: Miguel Á. González Ballester, PhD (ES), Heinz U. Lemke, PhD (DE)

11:00 – 12:45 Diagnostic/Therapeutic Workflow

Session Chairs: Pierre Jannin, PhD (FR), Miguel A. González Ballester, PhD (ES)

Audio-based Event Detection in the Operating Room

J. Fuchtmann, T. Riedel, M. Berlet, A. Jell, L. Wegener, L. Wagner, S. Graf, D. Wilhelm, D. Ostler, Klinikum rechts der Isar der Technischen Univ. München; Technische Universität München (DE); Medical University Innsbruck (AT) [CARS-LE-24-00041]

Transferable Situation Recognition System for Scenario-Independent Context-Aware Surgical Assistance Systems: A Proof of Concept

D. Junger, C. Kücherer, B. Hirt, O. Burgert, Reutlingen University; Eberhard Karls University Tübingen (DE) [CARS-LE-24-00067]

Towards multimodal graph neural networks for surgical instrument anticipation

L. Wagner, D. Schneider, L. Mayer, A. Jell, C. Müller, A. Lenz, A. Knoll, D. Wilhelm, Klinikum rechts der Isar der Technischen Univ. München; Technische Universität München (DE) [CARS-LE-24-00039]

The Sound of Surgery - Development of an Acoustic Trocar System Enabling Laparoscopic Sound Analysis

D. Ostler-Mildner, L. Wegener, J. Fuchtmann, H. Feußner, D. Wilhelm, N. Navab, Klinikum rechts der Isar der Technischen Universität; Technische Universität, München (DE) [CARS-LE-24-00081]

A Real-Time Approach for Surgical Activity Recognition and Prediction based on Transformer Models in Robot-Assisted Surgery

D.S.V. Bandara, C. Ketai, J. Arata, Kyushu University, Fukuoka (JP) [CARS-LE-24-00116]

Automated assessment of non-technical skills by heart-rate data

A. Huauilmé, A. Tronchot, H. Thomazeau, P. Jannin, Université de Rennes 1; University Hospital of Rennes (FR) [CARS-LE-24-00093]

TraumaFlow - Development of a workflow-based clinical decision support system for the management of severe trauma cases

J. Neumann, C. Vogel, L. Kießling, G. Hempel, C. Kleber, G. Osterhoff, T. Neumuth, Leipzig University; University Hospital Leipzig (DE) [CARS-LE-24-00035]

12:45 Break

Tuesday, June 18, 2024 Auditorium

14:00 – 14:51 CAR Poster Session 1

Session Chairs: John S.H. Baxter, PhD (FR), Maryam E. Rettmann, PhD (US)

Simulated Augmented Reality-Based Calibration of Optical See-Through Head Mound Display for Surgical Navigation

H. Ha, K. Gu, D. Jeung, J. Hong, H. Lee, Daegu Gyeongbuk Institute of Science & Technology (KR) [CAR-PO-24-00026]

Analysis of Convolutional Neural Networks for Fronto-Temporal Dementia Biomarker Discovery

J.S.H. Baxter, A. Estudillo-Romero, R. Migliaccio, B. Batrancourt, P. Jannin, Université de Rennes 1; Paris Brain Institute (FR) [CAR-PO-24-00063]

Virtual airways heatmaps to optimize point of entry location in lung biopsy planning systems

P. Lloret, D. Gil, M. Diez-Ferrer, C. Sanchez Ramos, Universitat Autònoma de Barcelona; Computer Vision Center; Bellvitge University Hospital, Llobregat (ES) [CAR -PO-24-00079]

Evaluating the Efficacy of Left Atrial Appendage Occlusion in Atrial Fibrillation Patients Using 4D Flow MRI: A Preliminary Study

P. Casademunt, X. Morales, J. Mill, P. Cepas, A. Doltra, X. Freixa, O. Camara, Pompeu Fabra University; Hospital Clínic Barcelona (ES) [CAR-PO-110]

SmartLAA: automatic identification of most similar left atrial appendage for fast surrogates of fluid simulations

M. Saiz Vivó, C. Albors, A. Herrero Díaz, J. Mill, A. L. Olivares, B. Legghe, X. Iriart, H. Cochet, G. Piella, M. Sermesant, O. Camara, O. Camara, Universitat Pompeu Fabra, Barcelona (ES); IHU Liryc, CHU Bordeaux; Inria Centre, Université Côte d'Azur, Epione team, Sophia Antipolis, Valbonne (FR) [CAR-PO-132]

The fetus as a patient: understanding the fetal response to ICU medication in an artificial placenta model

R. Spoelman, I. Villanueva, G. Bernardino, S. Sánchez, E. Gratacós, F. Crispi, B. Bijmens, KU Leuven (BE); Universitat Pompeu Fabra, Barcelona; Institut de Recerca Sant Joan de Déu, Esplugues de Llobregat (ES) [CAR-PO-130]

Automated assessment system of the inspiration status in chest X-ray images

N. Matsubara, A. Teramoto, M. Takei, Y. Kitoh, S. Kawakami, Shinshu University Hospital; Shinshu University School of Medicine, Nagano; Meijo University, Nagoya (JP) [CAR-PO-44]

Needle Tracking in Low-Resolution Ultrasound Volumes Using Deep Learning

S. Grube, S. Latus, F. Behrendt, O. Riabova, M. Neidhardt, A. Schlaefer, Hamburg University of Technology (DE) [CAR-PO-24-00092]

Development and validation of a workflow to assess the effects of proton beam radiation dose in the coronary arteries

M. Rettmann, T. Hirao, T. Koya, K. Newman, J. Kruse, D. Shumway, K. Merrell, A. Deisher, K. Siontis, Mayo Clinic, Rochester, MN (US) [CAR-PO-151]

Can deep learning-based reconstruction improve in-plane peripheral spatial resolution in ultra-high-resolution computed tomography?

A. Urikura, T. Ishihara, Y. Miyamae, S. Sato, H. Nagasawa, T. Yoshida, National Cancer Center Hospital, Tokyo; Shizuoka Cancer Center (JP) [CAR-PO-100]

Benchmarking Uncertainty Estimates for Segmentation Quality Prediction in Medical Imaging

S. O K, A. Galdran, M. Riera-Marin, . García, J. Rodríguez-Comas, G. Piella, M. A. González Ballester, University of Pompeu Fabra; Sycal Medical, Barcelona (ES) [CAR-PO-61]

From coronary to iliac arteries: transfer learning for enhanced stenoses detection in digital subtraction angiography

J. Osburg, N. Erben, D. Wulff, P. M. H. Ha, R. Kloeckner, K. Moutchou, F. Wegner, F. Ernst, University of Lübeck; University Hospital Schleswig-Holstein (DE) [CAR-PO-115]

Development of a low-cost device for concussion detection with AI-assisted pupillometry

M. Schepelmann, H.G. Krojanski, Leibniz University Hannover (DE) [CAR-PO-152]

A Novel Contact Optimization Algorithm for Endomicroscopic Surface Scanning

X. Xu, S. Zhao, L. Gong, S. Zuo, Tianjin University (CN) [CAR-PO-24-00072]

Utilizing LightGBM for Target Displacement Prediction

E. Lugez, A. Nakhuda, Toronto Metropolitan University (CA) [CAR-PO-127]

Respiratory-induced liver motion estimation using abdominal surface displacement as a surrogate: Robotic phantom and clinical validation with varied correspondence models

A. Cordon, M. Abayazid, University of Twente, Enschede (NL) [CAR-PO-23-00997]

MRI-compatible abdomen phantom to mimic respiratory-triggered organ movement while performing needle-based interventions

I. Vogt, K. Engel, A. Schlünz, R. Kowal, B. Hensen, M. Gutberlet, F. Wacker, G. Rose, Otto-von-Guericke-University Magdeburg; Hannover Medical School (DE) [CAR-PO-24-00005]

14:51 – 15:11 Model Guided Medicine Video Presentations

Session Chairs: John S.H. Baxter, PhD (FR), Maryam E. Rettmann, PhD (US)

Deep learning based scapular morphology completion – comparison to a statistical shape model approach

H. Hess, A. Oswald, A. Lädermann, M. Schär, M. A. Zumstein, K. Gerber, University of Bern; Insel University Hospital; Orthopaedics Sonnenhof, Bern; Hôpital de La Tour, Meyrin (CH) [CARS-LE-82-V]

High-resolution 3D scapula model reconstruction from orthogonal clinical MRI

H. Hess, A. Oswald, A. Lädermann, M. A. Zumstein, K. Gerber, University of Bern; Orthopaedics Sonnenhof, Bern; Hôpital de La Tour, Meyrin (CH) [CARS-LE-124-V]

15:15 – 16:15 Surgical Robotics and Instrumentation

Session Chairs: Kensaku Mori, PhD (JP), Albert Hernansanz, PhD (ES)

Development of a Human Machine Interface for Robotically Assisted Surgery Optimized for Laparoscopic Workflows

L. Wegener, D. Wilhelm, M. Berlet, J. Fuchtmann, Klinikum rechts der Isar der Technischen Univ., München (DE) [CARS-LE-24-00055]

A dual-instrument Kalman-based tracker to enhance robustness of microsurgical tools tracking

M. Magro, N. Covallero, E. Gambaro, E. Ruffaldi, E. De Momi, Politecnico di Milano; Medical Microinstruments Inc., Pisa (IT) [CARS-LE-24-00056]

Applying artificial intelligence on EDA sensor data to predict stress on minimally invasive robotic-assisted surgery.

D. Caballero, M.J. Pérez-Salazar, J.A. Sánchez-Margallo, F.M. Sánchez-Margallo, Jesús Usón Minimally Invasive Surgery Centre, Cáceres (ES) [CARS-LE-24-00073]

6G in Medical Robotics: Development of Network Allocation Strategies for a Telerobotic Examination System

S. Kolb, A. Madden, N. Kröger, F. Mehmeti, F. Jurosch, L. Bernhard, W. Kellerer, D. Wilhelm, Klinikum rechts der Isar der Technischen Univ. München; Technische Universität München (DE) [CARS-LE-24-00044]

16:15 Break

16:30 – 18:00 Model Guided Medicine

Session Chairs: Dirk Wilhelm, MD (DE), Aura Hernández, PhD (ES)

Model guided medicine as a proper solution for the containment of artificial intelligence healthcare?

D. Wilhelm, M. Cypko, Klinikum rechts der Isar der TUM, München; Hahn-Schickard-Gesellschaft, Freiburg (DE) [CARS-LE-121]

MuHEA: Multimodal Health Analytics Engine, a Meta Model to predict outcome of kidney transplant recipients using multidomain and multimodal data

A. Kumar, M. Cypko, G. Köber, L. Pape, K. Budde, M. Schiffer, O. Amft, University of Freiburg; Hahn-Schickard-Gesellschaft für angewandte Forschung e. V., Freiburg; University Hospital of Essen; Charité – Universitätsmedizin Berlin; University Hospital Erlangen (DE) [CARS-LE-83]

Spectral Normalized Neural Gaussian Process as viable candidate for trustworthy AI in clinical decision support systems

A. Lindenmeyer, D. Schneider, T. Neumuth, The Innovation Center Computer Assisted Surgery – ICCAS, Leipzig (DE) [CARS-LE-78]

Experience with treatment decision model development for head and neck cancer based on Bayesian networks

M. Stoehr, A. Dietz, J. Gaebel, University Hospital Leipzig, University of Leipzig (DE) [CARS-LE-117]

Enhancing Clinical Decision Support with Large Language Models: A Semi-Automatic Approach for Modeling Bayesian Networks

M. Cypko, M. Stoehr, O. Amft, Hahn-Schickard Gesellschaft, Freiburg; University of Leipzig (DE) [CARS-LE-123]

Panel Discussion

18:00 – 19:00 CARS 2024 Opening Session

President: Miguel Á. González Ballester, PhD (ES)

Deep Learning Medical Image Analysis in Radiology: myths, realities and validation

Keynote Speaker: Leo Joskowicz, PhD, The Hebrew University of Jerusalem (IL)

About Time, Models and Surgery

Keynote Speaker: Dirk Wilhelm, MD, Klinikum rechts der Isar der TUM, München (DE)

Impact of the Digital Transformation on Radiology

Keynote Speaker: Salvador Pedraza, MD, PhD, Hospital Clinic, Barcelona (ES)

19:00-20:30 Welcome Reception

Wednesday, June 19, 2024

Aranyó Hall

17:00 – 17:30 CARS Poster Session

Session Chairs: Lukas Bernhard, MSc (DE), Randy E. Ellis, PhD (CA)

Deep learning-based analysis to analyze the effect of magnification on rectal neuroendocrine tumor type classification.

J. Y. Park, Y. J. Kim, J. Kim, K. G. Kim, Gachon University, Incheon (KR) [CARS-PO-39]

Mass Spectrometry Imaging of Archival Histological Sections of Renal Cell Carcinoma

R. E. Ellis, R. L. Theriault, M. Hassan, R. Wood, R. D. Oleschuk, K. Y. M. Ren, Queen's University, Kingston, ON (CA) [CARS-PO-48]

In AI outcomes, we can (statistically) trust

A. Hernández, D. Gil, G. Torres, Computer Vision Center, Bellaterra, Barcelona (ES) [CARS-PO-128]

Situational awareness and task generation with a human-robot shared execution for a surgical ward

S. Stabenow, D. Wilhelm, Technical University of Munich (DE) [CARS-PO-134]

ChatGPT for medical students: do they use it and what do they think about it?

M. Ruta, R. Fisher, J. Simpson, E. vanSonnenberg, The University of Arizona College of Medicine, Phoenix (US) [CARS-PO-143]

Preliminary study on neutrophil detection, segmentation and measurement from confocal laser scanning microscope images

C. Wang, M. Oda, Y. Wu, S. Kawamura, T. Takebe, K. Mori, Nagoya University (JP) [CARS-PO-145]

Extra-abdominal trocar and instrument detection for enhanced surgical workflow understanding

F. Jurosch, L. Wagner, K. Louis, A. Jell, D. Wilhelm, M. Berlet, Klinikum rechts der Isar der Technischen Univ. München (DE) [CARS-PO-24-00040]

Diagnosis of helicobacter pylori using autoencoders for the detection of anomalous staining patterns in immunohistochemically stained whole slide images

P. Cano, E. Musulen, D. Gil, Computer Vision Center; Hospital General de Cataluña, Barcelona (ES) [CARS-PO-24-00043]

A Microdissectomy Surgical Video Annotation Framework for Supervised Machine Learning Applications

K. Cleary, K.J. Jawed, I. Buchanan, E. Fischer, A. Mun, N. Gowda, A. Naeem, R. Yilmaz, D.A. Donoho, Children's National Hospital, Washington, DC; George Washington University Medical Center (US) [CARS-PO-24-00071]

Establishing a medical school interest group to support the growth of AI among medical students: a direct effect of CARS!

R. Fisher, E. Neitzel, E. vanSonnenberg, The University of Arizona College of Medicine, Phoenix (US) [CARS-PO-142-V]

Thursday, June 20, 2024

Aranyó Hall

38th International Congress and Exhibition on Computer Assisted Radiology (CAR)

Chair: Ulrich Bick, MD (DE)

8:30-10:45 Medical Imaging

Session Chairs: Marian Himstedt, PhD (DE), Gemma Piella, PhD (ES)

3D CT to 2D X-Ray image registration for improved visualization of tibial vessels in endovascular procedures

M. Saderi, J.H. Patel, C.D. Sheagren, J. Csóre, T.L. Roy, G.A. Wright, University of Toronto; Houston Methodist Hospital (CA) [CAR-LE-24-00046]

Automatic monitoring of left ventricular function by artificial intelligence in transesophageal echocardiography

A. A. Taskén, J. Yu, E. A. R. Berg, B. L. Grenne, E. Holte, H. Dalen, S. B. Stølen, F. Lindseth, S. Aakhus, G. Kiss, Norwegian University of Science and Technology, Trondheim (NO) [CAR-LE-19]

Generation of pseudo CT images from phalanges CR images using generative adversarial networks

T. Yamazaki, T. Ushikoshi, R. Ueno, K. Tanaka, K. Fukumoto, Saitama Institute of Technology; Neomedical Corporation; Saitama Jikei Hospital (JP) [CAR-LE-95]

Deep Learning-based Harmonization of Multisite Pediatric Brain MRI

Z. Jiang, A. Parida, S. Anwar, N. Stence, N. Foreman, M. J. Fisher, R. A. Avery, M. George Linguraru, Children's National Hospital, Washington DC; Children's Hospital Colorado, Aurora; Children's Hospital of Philadelphia (US) [CAR-LE-133]

Feasibility of non-enhanced cervical carotid artery ultrasonography for predicting development of microemboli during carotid endarterectomy

T. Chiba, S. Fujiwara, K. Oura, K. Oikawa, K. Chida, M. Kobayashi, K. Yoshida, Y. Kubo, T. Maeda, R. Itabashi, K. Ogasawara, Iwate Medical University School of Medicine (JP) [CAR-LE-57]

Classification of peritoneal lesions and detection of peritoneal metastasis using in vivo laparoscopic hyperspectral imaging

H. Köhler, J. Hartmann, A. Pfahl, M. Mehdorn, T. Lingscheidt, Y. Moulla, S. Niebisch, I. Gockel, A. Melzer, S. Stelzner, University of Leipzig (DE) [CAR-LE-49]

Analysis of Skin-Cancer Margins Using Mass Spectrometry Imaging

R. E. Ellis, K. Williams, R. L. Theriault, M. Kaufmann, K. Y. M. Ren, Queen's University, Kingston, ON (CA) [CAR-LE-34]

A Bronchoscopic Navigation Method Based on Neural Radiation Fields

J. Zheng, L. Zhu, C. Wang, J. Jiang, A. Song, Southeast University, Nanjing; Hanglok Tech Co. Ltd., Hengqin; The First Affiliated Hospital of Soochow University (CN) [CAR-LE-23-00996]

Airway label prediction in video bronchoscopy: capturing temporal dependencies utilizing anatomical knowledge

M. Himstedt, R. Keuth, M. Heinrich, M. Eichenlaub, University of Lübeck; Albert-Ludwigs-Universität Freiburg Universitätsklinikum (DE) [CAR-LE-23-00596]

10:45 Break

11:00-13:00 Imaging Informatics - Organ-specific Segmentation (1)

Session Chairs: Akinobu Shimizu, PhD (JP), Bart Bijmens, PhD (ES)

Biomechanically Regularized Deep Learning Registration of Fetal Brain MRI

V. Comte, J. Recober, G. Piella, M. Ceresa, M. A. Gonzalez Ballester, Universitat Pompeu Fabra, Barcelona (ES); European Commission, Joint Research Center, Geel (BE) [CAR-LE-97]

Longitudinal assessment of abnormal cortical folding in fetuses and neonates with ventriculomegaly

G. Marti-Juan, A. Urru, O. Benkarim, N. Hahner, G. Piella, E. Eixarch, M. Á. González Ballester, Universitat Pompeu Fabra; Hospital Clínic, Barcelona (ES); Montreal Neurological Institute and Hospital, Montreal (CA) [CAR-LE-17]

Unified HT-CNNs Architecture: Transfer Learning for Segmenting Diverse Brain Tumors in MRI from Gliomas to Pediatric Tumors

R. Ashraf Zeineldin, F. Mathis-Ullrich, Friedrich-Alexander-Universität, Erlangen-Nürnberg (DE) [CAR-LE-24-00111]

Fully automated segmentation of substantia nigra towards longitudinal analysis of Parkinson's Disease

T. Hu, H. Itoh, M. Oda, S. Saiki, K. Kamagata, K. Ishikawa, W. Sako, N. Hattori, S. Aoki, K. Mori, Nagoya University; Juntendo University; Juntendo University Hospital, Tokyo; University of Tsukuba, Ibaraki (JP) [CAR-LE-23-00988]

AI-assisted automatic MRI-based tongue volume evaluation in motor neuron disease (MND)

I. Vernikouskaya, H.-P. Mueller, A.C. Ludolph, J. Kassubek, V. Rasche, Ulm University Medical Center; University of Ulm (DE) [CAR-LE-23-00976]

Heart and great vessels segmentation in congenital heart disease via a combination of CNN and conditioned energy function

X. Chen, J. Liu, B. Zeng, Shanghai Jiao Tong University (CN) [CAR-LE-24-00027]

Automatic Inferior Vena Cava Diameter Measurement System Using Ultrasound and Deep Learning

N. Umetsu, N. Koizumi, Y. Nishiyama, T. Ishikawa, H. Noro, R. Kasagi, I. Fujii, H. Tsukihara, N. Matsumoto, M. Ogawa, The University of Electro-Communications; The University of Tokyo; Nihon University School of Medicine, Tokyo (JP) [CAR-LE-24]

Single-Image Transfer Learning for Vessel Segmentation in Dissecting Microscopic Images using Self-Supervised Consistency Loss and Retinal Images

Y. Wu, Y. Hayashi, M. Oda, S. Kawamura, T. Takebe, K. Mori, Nagoya University; Tokyo Medical and Dental University (JP) [CAR-LE-108]

13:00 Break

14:00-15:00 CAR Poster Session 2

Session Chairs: Mario A. Cypko, PhD (DE), Sylvia Saalfeld, PhD (DE)

3D MRI modeling of the extracranial facial nerve in parotid tumors: possibilities and difficulties – preliminary results

M. Moll, L. Karssemakers, L. Braun, M. van Alphen, L. ter Beek, R. van Veen, L. Smeele, M. Valstar, Antoni van Leeuwenhoek - Netherlands Cancer Institute, Utrecht (NL) [CAR-PO-76]

Deep Learning-Based Segmentation of Left Ventricular Myocardium on Dynamic Contrast Enhanced MRI: A Comprehensive Evaluation Across Temporal Frames

R. Jafari, R. Verma, V. Aggarwal, R.K. Gupta, A. Singh, Indian Institute of Technology New Delhi; Fortis Memorial Research Institute (IN) [CAR -PO-24-00053]

3D Mobile Regression Vision Transformer for Collateral Imaging in Acute Ischemic Stroke

S. Jung, H. Yang, H.J. Kim, H.G. Roh, J.T. Kwak, Korea University; Konkuk University Hospital Seoul; Catholic University, Deajeon (KR) [CAR-PO-24-00054]

Comparison of the abdominal computed diffusion-weighted imaging between different software: a phantom study

T. Yoshida, A. Urikura, M. Endo, Shizuoka Cancer Centre (JP) [CAR-PO-102]

Multi-dimensional Consistency Learning between 2D Swin U-Net and 3D U-Net for Intestine Segmentation from CT volume

Q. An, H. Oda, Y. Hayashi, T. Kitasaka, H. Uchida, A. Hinoki, K. Suzuki, A. Takimoto, M. Oda, K. Mori, Nagoya University; Aichi Cancer Center Hospital, Nagoya (JP) [CAR-PO-24-00120]

A Semi-supervised Method for Tubular Structure Segmentation with Structure-Aware Consistency

R. Zhu, M. Oda, Y. Hayashi, T. Kitasaka, K. Mori, Nagoya University; Aichi Institute of Technology, Toyota (JP) [CAR-PO-24-00117]

Contraction Assessment of Abdominal Muscles using Automated Segmentation Designed for Wearable Ultrasound Applications

H. Strohm, S. Rothlübbers, L. Perotti, O. Stamm, M. Fournelle, J. Jenne, M. Günther, Fraunhofer-Institute for Digital Medicine MEVIS, Bremen; Charité-University Medical Center, Berlin (DE) [CAR-PO-24-00075]

Transformers for Colorectal Cancer Segmentation in CT Imaging

L.I. Spitz, G. Hille, P. Tummala, S. Saalfeld, Otto-von-Guericke-Universität Magdeburg (DE) [CAR-PO-24-00086]

Modality redundancy for MRI-based glioblastoma segmentation

S. De Sutter, J. Wuts, W. Geens, A.M. Vanbinst, J. Duerinck, J. Vandemeulebroucke, Vrije Universiteit Brussel; UZ Brussel; Universitair Ziekenhuis Brussel, Elsene (BE) [CAR-PO-24-00077]

PolypNextLSTM: A lightweight and fast polyp video segmentation network using ConvNext and ConvLSTM

K. Reuter, D. Bhattacharya, F. Behrendt, L. Maack, S. Grube, A. Schlaefer, Technische Universität Hamburg (DE) [CAR-PO-24-00065]

Enhancing medical image segmentation using three-dimensional positional contrastive learning

T. Kikuchi, S. Hanaoka, Y. Nomura, H. Mori, T. Yoshikawa, Jichi Medical University Hospital, Tochigi; The University of Tokyo Hospital; Chiba University (JP) [CAR-PO-58]

Automatic optimization of Aorta ROI for Arterial Input Function using O15-water PET image series

M. Miki, N. Ono, H. Iida, S. Kanaya, P. Nuutila, Nara Institute of Science and Technology (JP), University of Turku (FI) [CAR-PO-87]

TransCOR: a web/cloud based platform for quality control and ground truth generation in ultrasound imaging

J. Prats i Valero, S. Sánchez-Martínez, A. M. Aguado, G. Bernardino, S. Mohsin, Z. Hoodbhoy, D. Chowdhury, B. Hasan, B. Bijnens, Universitat Pompeu Fabra, Barcelona (ES), Sindh Institute of Urology and Transplantation; Aga Khan University Karachi (PK), Cardiology Care for Children, Lancaster (US) [CAR-PO-75]

Automatic Robotic Duplex Sonography of Leg Arteries

J. Osburg, A. Scheibert, M. Horn, R. Pater, F. Ernst, University of Lübeck; University Hospital Lübeck (DE) [CAR -PO-24-00078]

Examining the Efficacy of Fine-Tuning Multilingual Large Language Models for Report Structuring in English and Japanese Radiology Reports.

H. Matsuo, M. Nishio, T. Matsunaga, T. Murakami, Kobe University Graduate School of Medicine (JP) [CAR-PO-47]

Automatic extraction of TNM staging from lung cancer radiology reports using GPT3.5: Effect of English and German on accuracy

T. Matsunaga, H. Matsuo, M. Nishio, T. Murakami, Kobe University Graduate School of Medicine (JP) [CAR-PO-60]

Stewart Platform based Tele-operated Robotic System for Endoscopic Diagnosis in Otolaryngology

S. Shim, J. M. Shin, T. H. Kim, J. Seo, Korea Institute of Machinery and Materials, Daegu; Korea University, Seoul (KR) [CAR-PO-84]

Design and Evaluation of an Anthropomorphic Neck Phantom for Improved Ultrasound Diagnostics of Thyroid Gland Tumors

D. Leonov, A. Nasibullina, V. Grebennikova, O. Vlasova, Y. Bulgakova, E. Belyakova, D. Shestakova, J.F. Silva Costa-Júnior, O. Omelianskaya, Y. Vasilev, Moscow Center for Diagnostics and Telemedicine; Moscow Research and Practical Clinical Center of Diagnostics and Telemedicine Technologies (RU); Brazilian Air Force Academy (BR) [CAR-PO-24-00034]

Domain adaptation for anatomical 3D shape reconstruction

S.N. Thrissur Ranganathan, L. Humbert, M.A. González Ballester, Galgo Medical S.L.; Universitat Pompeu Fabra, Barcelona (ES) [CAR-PO-24-00076]

15:00 Break

15:15-17:00 Imaging Informatics - Organ-specific Segmentation (2)

Session Chairs: Elizabeth Beckmann, BSc (GB), Sikha O K, PhD (ES)

Tumor Segmentation from Hepatic iUS in Surgical Navigation: from 2D segmentations to 3D reconstructions.

T. Natali, K. Olthof, T. Ruers, M. Fusaglia, Netherlands Cancer Institute, Amsterdam (NL) [CAR-LE-73]

Classification of the surface and back surface unevenness of the liver using ultrasound images of the sagittal section of the liver.

I. Fujii, N. Koizumi, Y. Nishiyama, M. Ogawa, M. Naoki, R. Kasagi, N. Umetsu, T. Ishikawa, The University of Electro-Communications; Nihon University, Tokyo (JP) [CAR-LE-21]

Global Registration of Kidneys in 3D Ultrasound and CT images

T. Collins, W.B. Ndzimbong, N. Thome, C. Fourniol, Y. Keeza, B. Sauer, J. Marescaux, D. George, A. Hostettler, IRCAD France & Africa; Clinique Sainte Anne, Strasbourg; Sorbonne University CNRS; Hopital Europeen Georges Pompidou, Paris (FR) [CAR-LE-24-00082]

Simultaneous lung lesion detection and segmentation in longitudinal chest CT by deep learning voxel classification with SimU-Net

L. Joskowicz, N. Kenneth Portal, S. Rochman, A. Szeskin, R. Lederman, J. Sosna, The Hebrew University of Jerusalem (IL) [CAR-LE-12]

Deep Learning Enhanced Stroke Lesion Segmentation: Optimizing CT and Perfusion Maps Integration

A. Kandpal, A. Singh, Indian Institute of Technology Delhi, New Delhi (IN) [CAR-LE-85]

Automatic detection of high-resolution impedance manometer in video-fluoroscopic images from head and neck cancer patients

M. M. Rocha, L. van der Molen, M. Neijman, M. van Alphen, M. van den Brekel, F. Siepel, The Netherlands Cancer Institute, Amsterdam; University of Twente, Enschede (NL) [CAR-LE-99]

Automatic Detection of Enlarged Pathological Mediastinal Lymph Nodes in CT Using Deep Learning

L. Joskowicz, A. Olesinski, R. Lederman, J. Sosna, The Hebrew University of Jerusalem (IL) [CAR-LE-11]

17:00 Break

17:15-18:30 Imaging Informatics – Methods and Tools

Session Chairs: Masahiro Oda, PhD (JP), Debora Gil, PhD (ES)

Robust unsupervised texture segmentation for motion analysis in ultrasound images

A. Brignol, J.-F. Aubin-Fournier, F. Chretien, C. Fortin, C. Laporte, Concordia University; CHU Sainte-Justine CRME; Ecole Polytechnique de Montreal (CA) [CAR-LE-24-00038]

Semantic Segmentation Dataset Authoring with Simplified Labels

L. Uramoto, Y. Hayashi, M. Oda, T. Kitasaka, K. Mori, Nagoya University; Aichi Institute of Technology, Toyota (JP) [CAR -LE-24-00132]

Subcutaneous Edema Segmentation on Abdominal CT using Weak Multi-Class Labels and Iterative Annotation

S. Bhadra, J. Liu, R.M. Summers, National Institutes of Health Clinical Center, Bethesda, MD (US) [CAR-LE-24-00106]

VESCL: An Open Source 2D Vessel Contouring Library

S. Frisken, N. Haouchine, D.-D. Chlorogiannis, V. Gopalakrishnan, A. Cafaro, W. Wells, A. Golby, R. Du, Brigham and Women's Hospital, Boston, MA; Massachusetts Institute of Technology, Cambridge, MA (US) [CAR-LE-24-00098]

Generalisation Capabilities of Machine-Learning Algorithms the Detection of the Subthalamic Nucleus in Micro-Electrode Recordings

T. Martin, P. Jannin, J.S.H. Baxter, Université de Rennes 1 (FR) [CAR-LE-24-00064]

Friday, June 21, 2024

Auditorium

8:30-10:15 Virtual and Augmented Reality

Session Chairs: Roy Eagleson, PhD (CA), Alissa Jell, MD (DE)

Augmented Reality in anatomical teaching of the pancreas – A randomized-controlled trial

T. Schneider, N. Tabriz, C. Strotmann, V. Oedemis, V. Uslar, M. Schlender, V. Kraft, A. Schenk, M. A. Bisotti, S. Pelzl,

D. Weyhe, D. Salzmann, Carl von Ossietzky University of Oldenburg; Fraunhofer Institute for Digital Medicine MEVIS, Bremen; Hannover Medical School; apoQlar GmbH, Hamburg (DE) [CAR-LE-101]

Towards multimodal visualization of esophageal motility - Fusion of manometry, impedance, and videofluoroscopic image sequences

A. Geiger, L. Bernhard, F. Gassert, H. Feußner, D. Wilhelm, H. Friess, A. Jell, Technical University Munich; Klinikum rechts der Isar der TUM, Munich (DE) [CAR-LE-24-00051]

Augmented reality system for MRI-guided interventions: a cadaver study

V. Lam, P. Yarmolenko, P. Rajan, M. Hossbach, A. Demir, P. Foroughi, K. Cleary, R. Vellody, K. Sharma, Children's National Hospital, Washington, DC; Clear Guide Medical Inc., Baltimore (US) [CAR-LE-136]

Comparative visualization of in-silico hemodynamic indices with different left atrial appendage occluder configurations

J. Nuhic, C. Albors, J. Mill, A. L. Olivares, O. Camara, M. Meuschke, Universitat Pompeu Fabra, Barcelona (ES); Otto-von-Guericke-University Magdeburg (DE) [CAR-LE-125]

Stereo Reconstruction from Microscopic Images for Computer-Assisted Ophthalmic Surgery

R.C. Peter, S. Moreira, E. Tagliabue, M. Hillenbrand, R. Nunes, F. Mathis-Ullrich, Carl Zeiss AG, Oberkochen; FAU Erlangen-Nürnberg (DE); Universidade de Lisboa Instituto Superior Tecnico, Lisbon (PT); Università di Verona (IT) [CAR-LE-24-00074]

From Microscope to Head-Mounted Display: Integrating Hand Tracking into Microsurgical Augmented Reality

T. El Chemaly, C. Athayde Neves, F. Fu, B. Hargreaves, N.H. Blevins, Stanford University, Palo Alto, CA (US) [CAR-LE-24-00136]

Design and evaluation of an AR-based thermal imaging system for planning reconstructive surgeries

M. Unger, A. Hänel, C. Chalopin, D. Halama, Universität Leipzig; University Hospital, Leipzig (DE) [CAR-LE-24-00083]

10:15 Break

Friday, June 21, 2024

Auditorium

16th CARS Clinical Day - Clinical Applications of AI

Chairs: Leonard Berliner, MD (US), Eric vanSonnenberg, MD (US), Javier Herrero Jover, MD (ES)

10:30-12:15 Clinical Decision and Support Systems

Session Chairs: Leonard Berliner, MD (US), Jaume Reventós, MD, PhD (ES)

The future of AI in robotic surgery: towards autonomous surgery

Invited Speaker: Juan A. Sánchez Margallo, PhD, Jesús Usón Minimally Invasive Surgery Centre Cáceres (ES) [CD-IS-160]

A multi-data and sensor fusion infrastructure for the evaluation of patient-specific treatment of osteoporotic vertebral fractures

E. Schreiber, J. Neumann, T. Stelzner, A. Völker, D. Wiersbicki, S. Förstl, M. Schreiber, J. B. Tylcz, C. E. Heyde, T. Neumuth, University Leipzig; University Hospital Leipzig (DE) [CD-LE-111]

Extended upper GI functional assessment in swallowing disorders by synchronized intra- and extraesophageal ultrasound

A. Jell, A. Geiger, K. Stock, H. Friess, D. Wilhelm, H. Feußner, Technical University of Munich, School of Medicine and Health (DE) [CD-LE-70]

Lung tumor tracking based on biomechanical modeling and deep learning of the respiratory movement for radiation therapy

H. Ladjal, A. Lenoir, B. Shariat, LIRIS, Villeurbanne (FR) [CD-LE-113]

Assessment of intracranial aneurysm neck deformation after Contour deployment

L.I. Spitz, J. Korte, F. Gaidzik, N. Larsen, B. Preim, S. Saalfeld, Otto-von-Guericke-Universität Magdeburg; University Hospital Schleswig-Holstein Campus Kiel (DE) [CD-LE-24-00088]

A neuroimaging study on the relation between intrauterine growth restriction and cortical development of the fetal brain.

G. Marti-Juan, I. Valenzuela Silva, Y. Gomez, E. Eixarch, M. Á. González Ballester, G. Piella, Universitat Pompeu Fabra; Hospital Clínic and Hospital Sant Joan de Déu, Barcelona (ES); Lausanne University Hospital (CH) [CD-LE-112]

Hyperspectral light-field imaging for continuous intraoperative perfusion assessment

M. Gerlich, E. L. Wisotzky, W. Kneist, A. Hilsmann, S. Kray, Pforzheim University; Fraunhofer Heinrich-Hertz-Institute, Berlin; Klinikum Darmstadt (DE) [CD-LE-109]

Towards a Better Healthcare: 6G as Enabling Technology

M. Rockstroh, R. Irmer, C. Lipps, J. Dommel, A. Schatz, T. Pabst, C. Moellenhoff, T. Neumuth, Leipzig University; Vodafone Germany, Duesseldorf; Deutsches Forschungszentrum für Künstliche Intelligenz GmbH, Kaiserslautern; Fraunhofer Heinrich Hertz Institute, Berlin (DE) [CD-LE-94]

12:15 Break

14:00-16:25 Advances in Imaging and Intervention

Session Chairs: Eric vanSonnenberg, MD (US), Gabriel Bernardino, PhD (ES)

Micro-robotic percutaneous targeting of type II endoleaks in the angio-suite

G. Widmann, J. Deeg, A. Frech, J. Klocker, G. Feuchtner, M. Freund, Medical University of Innsbruck (AT) [CD-LE-23-00985]

Autonomous Navigation of Catheters and Guidewires in Mechanical Thrombectomy using Inverse Reinforcement Learning

H. Robertshaw, L. Karstensen, B. Jackson, A. Granados, T.C. Booth, King's College London (GB); Friedrich-Alexander-Universität Erlangen-Nürnberg (DE) [CD-LE-24-00089]

Automated detection and analysis of distal radius fractures using 2D (radiographs) and 3D (computed tomography) image data

M. Keller, C. Huwyler, M. Rohner, M. Melchior, F. Thieringer, P. Honigmann, Kantonsspital Baselland, Liestal (CH) [CD-LE-153]

The Benefits of Incorporating Clinical Data into Radiomic Models

G. Torres, C. Sanchez Ramos, S. Baeza Mena, A. Rosell Gratacós, D. Gil, Universidad Autónoma de Barcelona; Hospital Universitari Germans Trias i Pujol, Barcelona (ES) [CD-LE-63]

Hybrid Radiomics and Deep Learning – Fusion Models for Multimodal Data

L. Berliner, H. Patel, Staten Island University Hospital, Staten Island, NY (US) [CD-LE-16]

Introduction and Evaluation of a New Method for Model-based Individual Life-spanning Surgical Documentation

M. Berlet, A. Jell, L. Wagner, L. Bernhard, J. Fuchtmann, L. Wegener, H. Feussner, H. Friess, D. Wilhelm, Klinikum rechts der Isar der Technischen Univ. München (DE) [CD-LE-24-00024]

Development of a 3D model-based liver tumor treatment efficacy evaluation system without the external tracking device

R. Kasagi, N. Koizumi, Y. Nishiyama, T. Ishikawa, I. Fujii, N. Umetsu, K. Numata, R. Tsumura, The University of Electro-Communications, Tokyo; Yokohama City University Medical Center; National Institute of Advanced Industrial Science and Technology, Tsukuba (JP) [CD-LE-20]

Virtual Reality in Surgery: Minimizing stress and pain in patients undergoing minor-surgical procedures under local anesthesia – results of a feasibility study

M. Sargut, A. Novotny, H. Friess, M. Kranzfelder, Klinikum rechts der Isar der Technischen Univ. München; Klinik Hallerwiese, Nürnberg; Klinikum Freising (DE) [CD-LE-24-00045]

Birmingham Hip Resurfacing: Clinical and Radiographic Outcomes with Minimum 2 Years Follow Up and Sub-Analysis of Navigation vs Non-navigation

R. Quesada, A. Kahana-Rojkind, E. Walsh, T. McCarroll, M. Schinsky, B. Domb, American Hip Institute Research Foundation, Des Plaines (US) [CD-LE-126]

Design implications of repurposing a radiomics research platform for education: The case of QuantImage v2

D. Ablar, J. Mlynář, R. Schaer, A. Depeursinge, M. Jreige, J.O. Prior, F. Evéquo, HES-SO Valais-Wallis School of Management, Sierre; Lausanne University Hospital (CH) [CD-LE-24-00084-V]

Friday, June 21, 2024

Auditorium

16:30-18:00 1st Workshop on Model Guided Medicine, AI and the Search for Truth

Chairs: Miguel Á. González Ballester, PhD (ES), Heinz U. Lemke, PhD (DE)

Introduction to Workshop on Model Guided Medicine (MGM) and the Search for Truth

Heinz U. Lemke, PhD (DE)

Model Guided Medicine and Artificial Intelligence

Mario A. Cypko, PhD (DE)

Medical Information and Model Management Systems (MIMMS)

Heinz U. Lemke, PhD (DE)

Model-Guided Medicine for a Human-Oriented Healthcare System

Hugo Herrero Antón de Vez, MD (ES)

Model Based Medical Evidence (MBME)

Leonard Berliner, MD (US)

Regulation of AI Algorithms for Clinical Decision Support

Krishna Kandarpa, MD, PhD (US)

Model-Guided Medicine for the Operating Room

Maximilian W. Berlet, MD (DE)

Central Command Suite: Futureproofing next generation surgical environments to embrace the Digital Operating Room

Carlos L. Amato, AIA, ACHA (US)

Discussion on Need, Focus, Timing and Membership of Working Groups on MGM

Speakers and Audience

Discussion on Need, Focus, and Timing of Think Tanks and Workshops on MGM

Speakers and Audience

Closing Remarks

Heinz U. Lemke and Miguel Á. González Ballester

Wednesday, June 19, 2024

Auditorium

26th International Conference on Computer-Aided Diagnosis and Artificial Intelligence (CAD-AI)

Chairman: Hiroyuki Yoshida, PhD (US)

8:30-8:48 CAD-AI Poster Session

Session Chairs: Hiroyuki Yoshida, PhD (US)

Automated Report Generation in Chest X-ray Images Using Vision Transformer and GPT

K. Isaji, A. Teramoto, H. Fujita, Meijo University, Nagoya; Gifu University (JP) [CAD-AI-PO-56]

Automated Report Generation in Lung Cytology Using CNN and Multiple Transformers

A. Teramoto, A. Michiba, Y. Kiriya, T. Tsukamoto, H. Fujita, Meijo University, Nagoya; Fujita Health University, Toyoake; Gifu University (JP) [CAD-AI-PO-38]

A study on an automated detection model for spinal diseases in CT images using AI

S. H. Lee, Y. J. Kim, K. G. Kim, Gachon University, Incheon (KR) [CAD-AI-PO-40]

Improving lung nodule segmentation in thoracic CT Scans through the ensemble of 3D U-Net models

H. Rikhari, E. Baidya Kayal, S. Ganguly, A. Sasi, S. Sharma, A. Antony, K. Rangarajan, S. Bakhshi, D. Kandasamy, A. Mehndiratta, Indian Institute of Technology; All India Institute of Medical Sciences; Ambedkar Institute-Rotary Cancer Hospital, New Delhi (IN) [CAD-AI-PO-24-00061]

Investigation of Improved Accuracy in Breast Cancer Microcalcification Malignancy Assessment using Super-Resolution Processing with ESRGAN

R. Ohsaka, A. Sugawara, R. Ooyama, Y. Katchi, K. Abe, Y. Takatori, Kanagawa Institute of Technology (JP) [CAD-AI-PO-86]

Artificial Intelligence Assisted Preoperative Diagnosis Support System for Ovarian Tumors

D. Inaba, N. Koizumi, Y. Nishiyama, K. Atsushi, Y. Ikeda, The University of Electro-Communications, Tokyo; Nagoya University Hospital (JP) [CAD-AI-PO-147]

8:50 Break

9:00-10:30 CAD-AI in Colon & Lung

Session Chairs: Akinobu Shimizu, PhD (JP), Debora Gil, PhD (ES)

Denosing Diffusion for Colorectal Polyp Segmentation in Photon-counting CT Colonography

J. Näppi, T. Hironaka, D. Wu, R. Gupta, R. Tachibana, K. Taguchi, M. Okamoto, H. Yoshida, Massachusetts General Hospital, Boston, MA; Johns Hopkins University, Baltimore, MD (US), Boston Medical Sciences, Inc., Tokyo (JP) [CAD-AI-LE-5]

Denosing Diffusion for Electronic Cleansing in CT Colonography

R. Tachibana, J. Näppi, T. Hironaka, M. Okamoto, H. Yoshida, National Institute of Technology, Oshima College (JP); Boston Medical Sciences Inc.; Harvard Medical School, Massachusetts General Hospital, Boston, MA (US) [CAD-AI-LE-138]

Computer-aided ulcerative colitis colonoscopy grading system using deep learning

Y. Y. Chang, Y. Y. Chen, Y. S. Huang, H. H. Yen, National Taichung University of Science and Technology; National Taiwan University, Taipei; National Changhua University of Education; Changhua Christian Hospital (TW) [CAD-AI-LE-31]

A position-enhanced sequential feature encoding model for lung infections and lymphoma classification on CT images

R. Zhao, W. Li, X. Chen, Y. Li, B. He, Y. Zhang, Y. Deng, C. Wang, F. Jia, Chinese Academy of Sciences; Shenzhen Institute of Advanced Technology; Shenzhen People's Hospital; Guangzhou Medical University (CN) [CAD-AI-LE-24-00102]

Detection of pulmonary nodules in chest radiographs: novel cost function for effective network training with purely synthesized datasets

S. Hanaoka, Y. Nomura, T. Yoshikawa, T. Nakao, T. Takenaga, H. Matsuzaki, N. Yamamichi, O. Abe, The University of Tokyo Hospital; Chiba University (JP) [CAD-AI-LE-23-00956]

A 3-D ResRga Computer-aided Diagnosis System in Computed Tomography for Lung EGFR Mutation Status Classification

Y. S. Huang, Y. C. Chang, R. F. Chang, National Changhua University of Education, Changhua (TW) [CAD-AI-LE-29]

10:30 Break

10:45-11:50 Radiomics

Session Chairs: Shouhei Hanaoka, MD, PhD (JP), Viacheslav Danilov, PhD (ES)

Detection of mutation of driver gene from the CT images based on ensemble learning

T. Kamiya, Y. Yoshifuku, T. Terasawa, T. Aoki, Kyushu Institute of Technology, Kitakyushu (JP) [CAD-AI-LE-98]

Radioproteomics for estimating the activity of immune checkpoint molecules from image findings of breast cancer

Y. Uchiyama, F. Harada, T. Fukuda, University of Miyazaki; Nagasaki University (JP) [CAD-AI-LE-35]

Development and validation of a radiomics-based classification model of pancreatic lesions on CT scan images

D. Cañadas-Gómez, M. Riera-Marín, J. Moreno-Vedia, J. García López, J. Rodríguez-Comas, Sycai Technologies, Barcelona (ES) [CAD-AI-LE-122]

Diagnostic accuracy of malignant prostate cancer using semi-quantitative parameters and texture features evaluated on 68Ga-PSMA PET/CT

A. Mehndiratta, N. Kumar, S. Jaswal, S. A. Shamim, E. Baidya Kayal, G. Arora, H. K. Gupta, Indian Institute of Technology; All India Institute of Medical Sciences, New Delhi (IN) [CAD-AI-LE-51-V?]

18F-FDG PET/CT based semi-quantitative parameters and textural features for diagnostic accuracy in Renal Cell Carcinoma

A. Mehndiratta, N. Kumar, H. K. Gupta, S. A. Shamim, E. Baidya Kayal, G. Arora, S. Jaswal, Indian Institute of Technology; All India Institute of Medical Sciences, New Delhi (IN) [CAD-AI-LE-52-V?]

11:50 Break

12:00-13:00 Decision Support Systems

Session Chairs: Janne J. Näppi, PhD (US), Gerard Martí, PhD (ES)

A study on the OTE major cause prediction model based on deep learning for the diagnosis of disability in the occurrence of sleep apnea

Y. S. Baik, Y. S. Lee, Y. J. Kim, K. K. Kim, Gachon University; College of IT Convergence, Incheon (KR) [CAD-AI-LE-55]

Diagnosing peripheral retinal lesions in ultrawide field fundus imaging through deep learning techniques

Y. W. Lee, S. C. Chang, Y. J. Hsieh, R. F. Chang, Feng Chia University, Taichung; National Taiwan University, Taipei (TW) [CAD-AI-LE-42]

Prediction of prognosis after reverse total shoulder arthroplasty using deep learning algorithm

Y. Lee, Y. Kim, G. Jeong, K. Kim, Gachon University; Gachon University Gil Medical Center, Incheon (KR) [CAD-AI-LE-89]

Unfeasibility of common stochastic deep learning methods for clinical decision support in the human-machine collaborative setting

D. Schneider, M. Blattmann, A. Lindenmeyer, T. Neumuth, University of Leipzig (DE) [CAD-AI-LE-14]

13:00 Break

14:00 CAD Invited Lecture

Session Chair: Hiroyuki Yoshida, PhD (US)

Cognitive AI: How Human-Like Thinking Can Improve Deep Neural Networks

Invited Speaker: Matthew Brown, PhD, David Geffen School of Medicine at UCLA, Los Angeles, CA (US) [CAD-AI-IS-158]

14:15-15:30 Segmentation and Classification

Session Chairs: Hiroyuki Yoshida, PhD (US), Karen López-Linares, PhD (ES)

Enhanced Muscle and Fat Segmentation for CT-Based Body Composition Analysis: A Comparative Study

R.M. Summers, B. Hou, T. Sudharshan Mathai, J. Liu, C. Parnell, National Institutes of Health; Walter Reed National Military Medical Center, Bethesda, MD (US) [CAD-AI-LE-24-00066]

Sacrum and ilium segmentation in magnetic resonance images using feature fusion and slice position coordinates

T. Zhong, T. Tomita, S. Tsuji, Y. Kadono, K. Tada, T. Nozaki, M. Tamaki, A. Shimizu, Tokyo Univ. of Agriculture and Technology; Juntendo Univ.; Morinomiya Univ. of Medical Sciences; Nippon Life Hosp.; Osaka Inst. of Tech.; Osaka Univ.; Kobe Univ.; Chuo Univ., Tokyo; Saitama Medical Univ. Hosp. (JP) [CAD-AI-LE-28]

Segmentation of Mediastinal Lymph Nodes in CT with Anatomical Priors

R.M. Summers, T. Sudharshan Mathai, B. Liu, National Institutes of Health Clinical Center, Bethesda, MD; The George Washington University (US) [CAD-AI-LE-24-00123]

A 3-D transformer for tumor computer-aided diagnosis in automated breast ultrasound images

R. F. Chang, Y. S. Huang, Y. H. Chien, National Taiwan University, Taipei; National Changhua University of Education (TW) [CAD-AI-LE-30]

Preliminary study of maximizing performance for each site in training of computer-aided diagnosis using federated learning

A. Yamada, S. Hanaoka, T. Takenaga, T. Yoshikawa, Y. Nomura, Chiba University; The University of Tokyo Hospital (JP) [CAD-AI-LE-54]

15:30 Break

15:45-16:45 Detection

Session Chairs: Ruy-Feng Chang, PhD (CN), Oscar Cámara, PhD (ES)

BT Retina U-Net: A Self-Supervised pre-trained framework for Cancer Lesion Detection in PET-CT

S. Bendazzoli, K. Louis, KTH Royal Institute of Technology, Huddinge (SE); Technical University of Munich (DE) [CAD-AI-LE-65]

Performance changes due to differences among annotating radiologists for training data in computerized lesion detection

Y. Nomura, S. Hanaoka, N. Hayashi, T. Yoshikawa, S. Koshino, C. Sato, M. Tatsuta, Y. Tanaka, S. Kano, M. Nakaya, S. Inui, Chiba University; Kitasato University Hospital; The University of Tokyo; The University of Tokyo Hospital; Tokyo University of Agriculture and Technology; NTT Medical Center (JP) [CAD-AI-LE-24-00010]

Deep Learning-Based Automatic Stroke Detection: Evaluating Potential of CT Images & CT Perfusion

A. Kandpal, A. Singh, Indian Institute of Technology Delhi, New Delhi (IN) [CAD-AI-LE-92]

Computer-aided diagnosis of lower extremity lymphedema for each leg in pelvic computed tomography images using deep learning

M. Tsuji, S. Akita, H. Naganishi, A. Matsuoka, K. Koga, N. Mitsukawa, Y. Nomura, Chiba University; Chiba University Hospital; NACS Clinic Lymphedema Center Kita Yokohama (JP) [CAD-AI-LE-22]

16:45 Break

30th Computed Maxillofacial Imaging Congress (CMI)

Chair: Christos Angelopoulos, DDS (US)

17:00-18:33 Computed Maxillofacial Imaging

Session Chairs: Christos Angelopoulos, DDS (US), Samir C. Aboul-Hosn Centenero, MD, PhD (ES)

Automatic evaluation of alveolar bone using panoramic radiography in patients with periodontal disease.

A. Katsumata, Y. Miyata, T. Hayashi, Asahi University School of Dentistry, Gifu; EyeTech Ltd., Tokyo (JP) [CMI-LE-53]

Research and preliminary application of mixed reality-based surgical navigation system in craniomaxillofacial trauma bone reconstruction

J. Wu, C. Lin, C. Yang, Y. Zhang, S. Zhang, Shanghai Jiao Tong University School of Medicine, Shanghai (CN) [CMI-LE-80]

Development of an Artificial Intelligence System for Segmentation and Classification of Early Dental Caries

K. Raghuvanshi, A. Sachdeva, A. Kandpal, R. Jafari, A. Chawla, A. Singh, Indian Institute of Technology; All India Institute of Medical Sciences, New Delhi (IN) [CMI-LE-107]

A craniomaxillofacial defects dataset and a data driven repair method

S. Zhang, X. Chen, Fudan University, Shanghai (CN) [CMI-LE-141]

Analysis of the implementation of an assistance circuit for intra-operative superposition and comparison of the surgical outcomes using ICBCCT in maxillofacial surgery.

N. Adell Gómez, A. Valls-Ontañón, A. Malet-Contreras, A. García-Piñeiro, M. Gómez-Chiari, A. Valls-Esteve, L. Krauel, J. Rubio-Palau, Hospital Sant Joan de Déu; International University of Catalunya, Barcelona (ES) [CMI-LE-24-00052]

Large Language Models Diagnose Facial Deformity

J. Lee, X. Xu, D. Kim, H.H. Deng, T. Kuang, N. Lampen, X. Fang, J. Gateno, P. Yan, Rensselaer Polytechnic Institute, Troy, NY; Houston Methodist Research Institute, Houston, TX (US) [CMI-LE-24-00097]

An Automatic Generation Algorithm for Craniomaxillofacial Soft Tissue Based on Point Cloud Generation Network

L. Ma, B. Han, B. Jie, R. Li, C. Wang, L. Zhang, F. Chen, Y. Zhang, Y. He, H. Liao, Tsinghua University; Peking University, Beijing; Nanjing University of Aeronautics and Astronautics (CN) [CMI-PO-24-00131]

Thursday, June 20, 2024

Auditorium

28th Annual Conference of the International Society for Computer Aided Surgery (ISCAS)

Chairs: Kensaku Mori, PhD (JP), Cristian A. Linte, PhD (US)

8:30-10:30 Visualizations and Image-guided Interventions

Session Chairs: Kensaku Mori, PhD (JP), Elisenda Eixarch, MD, PhD (ES)

A Comparative Analysis of Augmented Reality and Haptic Interfaces in Preoperative Surgical Planning

N. Kazemipour, A. Hooshir, M. Kersten-Oertel, Concordia University; McGill University, Montreal, QC (CA) [ISCAS-LE-24-00085]

Enhancing Surgical Navigation: A Robust Hand-Eye Calibration Method for the Microsoft HoloLens 2

D. Allen, T.M. Peters, E.C.S. Chen, Western University; Robarts Research Institute, London, ON (CA) [ISCAS-LE-24-00133]

Feasibility of Augmented Reality Guidance Utilizing Point Cloud-based Registration for Pulmonary Segmentectomy in VATS and RATS Procedures

J. Peek, X. Zhang, K. Hildebrandt, A. Sadeghi, Q. Mank, A. Bogers, E. Mahtab, Erasmus Medical Center, Rotterdam; Technical University Delft (NL) [ISCAS-LE-71]

Feasibility of MR angiography based 3D models for preoperative assessment of perforator vessels in fibula free flap reconstruction

A. F. de Geer, M. J. A. van Alphen, J. van der Ouderaa, A. S. te Boekhorst, B. I. Plakké, M. B. Karakullukcu, R. L. P. van Veen, F. J. Siepel, L. C. ter Beek, P. K. de Koekoek-Doll, W. H. Schreuder, Netherlands Cancer Institute, Amsterdam; University of Twente, Enschede (NL) [ISCAS-LE-120]

Design and development of a compact PET imaging system that enables FDG-PET imaging of metastatic lymph nodes during esophageal cancer surgery

K. Ogane, Y. Kondo, K. Shimazoe, H. Takahashi, I. Sakuma, T. Momose, Y. Seto, National Cancer Center Hospital Tokyo; The University of Tokyo (JP) [ISCAS-LE-46]

Context aware analysis of ICG fluorescence angiography for colorectal anastomosis

F. Lippiotta, K. Tehlan, D. Wilhelm, Klinikum rechts der Isar der TUM; Technical University of Munich (DE) [ISCAS-LE-32]

Enhanced Self-Supervised Monocular Depth Estimation with Self-Attention and Joint Depth-Pose Loss for Laparoscopic Images

W. Li, Y. Hayashi, M. Oda, T. Kitasaka, K. Misawa, K. Mori, Nagoya University; Aichi Cancer Center Hospital, Nagoya; Aichi Institute of Technology, Toyota (JP) [ISCAS-LE-24-00105]

Navigating hepatic tumor resection through intraoperative imaging

K. Olthof, J. Smit, M. Fusaglia, N. Kok, T. Ruers, K. Kuhlmann, The Netherlands Cancer Institute - Antoni van Leeuwenhoek Hospital, Amsterdam (NL) [ISCAS-LE-69]

10:30 Break

10:45-12:15 Computer-Assisted Orthopedic Applications

Session Chairs: Caroline Essert, PhD (FR), Jérôme Noailly, PhD (ES)

Determination of rotation center and diameter of femoral heads using augmented reality-based navigation.

A. Van Ravestyn, T. Frantz, J. Vandemeulebroucke, B. Jansen, J. Duerinck, T. Scheerlinck, UZ Brussel, Jette; Free University of Brussels, Elsene (BE) [ISCAS-LE-129]

Real-time prediction of postoperative spinal shape with machine learning models trained on finite element biomechanical simulations

R. Phellan Aro, B. Hachem, J. Clin, J.-M. Mac-Thiong, L. Duong, École de Technologie Supérieure; Spinologics, Inc., Montreal, QC (CA) [ISCAS-LE-24-00049]

An automated framework for pediatric hip surveillance and severity assessment using radiographs

S. Anwar, V.K. Lam, E. Fischer, K. Jawad, S. Tabaie, K. Cleary, The Sheikh Zayed Institute for Pediatric Surgical Innovation Washington, DC (US) [ISCAS-LE-24-00103]

Acquisition of coronal alignment according to the degree of varus deformity in total knee arthroplasty using computer-assisted navigation

S. C. Choi, W. Choi, Daegu Catholic University Hospital (KR) [ISCAS-LE-37]

Long-term Outcomes of Robotic Assisted Primary Total Hip Arthroplasty with Nested Comparison to Manual Primary Total Hip Arthroplasty

R. Quesada, B. Domb, D. Sikligar, J. Keane, B. Kuhns, A. Kahana-Rojkind, American Hip Institute Research Foundation, Des Plaines (US) [ISCAS-LE-131]

Perfectly Spherical Femoroplasty With Intraoperative Navigation Software:A Prospective Single-Blinded Randomized Controlled Multi-Surgeon Study

R. Quesada, B. Kuhns, E. Walsh, A. Lall, B. Domb, American Hip Institute Research Foundation Des Plaines; LALL Orthopedics, Paramus (US) [ISCAS-LE-118]

12:15 ISCAS General Assembly

13:00 Break

14:00-14:51 ISCAS Poster Session

Session Chairs: Cristian A. Linte, PhD (US), Elvis C.S. Chen, PhD (CA)

Advantages of the experience of navigation when starting manual total knee arthroplasty

W. Choi, S.C. Choi, Daegu Catholic University Hospital, South Korea (KR) [ISCAS-PO-4]

Development of intraoperative blood transfusion prediction model

Y. Kim, G. Y. Ryu, H. H. Jeong, J. H. Oh, M. Kim, S. A. Park, H. L. Yang, Hanyang University College of Medicine; Asan Medical Center; leum Interactive; Seoul National University Bundang Hospital, Seoul (KR) [ISCAS-PO-25]

Ear endoscope manipulator with two orthogonal gimbals and a linear guide rail constructed on three sides of octagon shape for robot-assisted TEES

Y. Miwa, S. Akaki, T. Kawai, T. Fujita, N. Uehara, T. Yamashita, A. Nishikawa, H. Suzuki, Osaka Institute of Technology; Osaka University; Kobe University Graduate School of Medicine; Chuo University, Tokyo (JP) [ISCAS-PO-27]

Needle End-effector for Tele-operative Robotic System for Interventional Pain Management Procedures

Y. Moon, J. Hyun, B. Yang, M. Umer Khan Niazi, U. Mehmood, J. Choi, Asan Medical Center, University of Ulsan College of Medicine, Seoul (KR) [ISCAS-PO-41]

Calculating method for viscoelastic parameters from the measured force and displacement during grasping operation by a sensorized forceps

R. Uwano, K. Kuwana, Tokyo Denki University (JP) [ISCAS-PO-146]

Cadaver study on pedicle screw fixation using a collaborative robot: A motion planning perspective

S. Ayyasamy, A. Govindaraju, M. Lakshmanan, M. Sivaprakasam, Indian Institute of Technology Madras, Chennai (IN) [ISCAS-PO-96]

Development of a compact intraoperative plantar pressure measurement system using an RGB-D camera

E. Kobayashi, K. Shiuchi, K. Hara, I. Sakuma, S. H. Chang, T. Matsumoto, The University of Tokyo (JP) [ISCAS-PO-106]

A new robot-shank interface for intra-operative robotic knee ligament balance assessment

L. Maggi, M. Pasquini, N. Secciani, R. Giagnoni, A. Ridolfi, C. Paggetti, B. Allotta, University of Florence; Orthokey Italia Srl, Firenze (IT) [ISCAS-PO-116]

Non-rigid Scene Reconstruction of Deformable Soft-tissue with Monocular Endoscopy in Minimally Invasive Surgery

X. Chen, E. Wang, Y. Liu, J. Xu, Shanghai Jiao Tong University (CN) [ISCAS-PO-24-00050]

Enhancing YOLO for Laparoscopic Tool Detection: Novel Data Augmentation and Structural Modifications Addressing Mis-Detection of Bifurcated Targets

Y. Liu, Y. Hayashi, M. Oda, K. Mori, Nagoya University; Graduate School of Informatics, Nagoya (JP) [ISCAS-PO-24-00115]

Semi-automatic robotic puncture system based on deformable soft tissue point cloud registration

K. Chen, B. Zhang, Y. Yao, B. Wu, Q. Li, Z. Zhang, P. Fan, W. Wang, M. Lin, M.G. Fujie, Wuxi AMIT Intelligent Medical Technology Co. Ltd; The First Affiliated Hospital of Sun Yat-Sen University, Guangzhou (CN); Waseda Univ. Tokyo (JP) [ISCAS-PO-24-00058]

Optimization algorithm to minimize rod curvature in vertebral fusion surgery

R. Benito, K. López-Linares, D. Scorza, A. Iribar-Zabala, Á. Bertelsen, M. Á. González Ballester, Vicomtech; Cyber Surgery, San Sebastian; Universitat Pompeu Fabra, Barcelona (ES) [ISCAS-PO-81]

Usefulness of measuring surgeon's mental stress during gastric cancer surgery

A. Shimada, S. Kanaji, R. Sawada, Y. Koterazawa, H. Harada, N. Urakawa, H. Goto, H. Hasegawa, K. Yamashita, T. Matsuda, Y. Kakeji, Kobe University Graduate School of Medicine (JP) [ISCAS-PO-26]

Design for an EM-tracked laparoscope adapter for augmented reality in robotic surgery

L. Venix, M. Fusaglia, T. Ruers, W. Heerink, The Netherlands Cancer Institute, Amsterdam (NL) [ISCAS-PO-68]

Simulated liver deformations with intraoperative ultrasound: steps towards a multi-modal dataset

A. Zhyhka, J. Smit, K. Olthof, L. ter Beek, T. Ruers, M. Fusaglia, The Netherlands Cancer Institute, Amsterdam (NL) [ISCAS-PO-67]

Analysis of carotid artery deformation due to catheter placement

T. Ohya, I. Sakuma, W. Cai, Y. Minoura, E. Kobayashi, T. Koizumi, K. Mitsudo, Yokohama City University; The University of Tokyo (JP) [ISCAS-PO-33]

GPU-accelerated deformation mapping in hybrid organ models for real-time simulation

R. Miyazaki, Y. Hayashi, M. Oda, K. Mori, Nagoya University (JP) [ISCAS-PO-24-00128]

14:51 Break

15:00-16:55 Surgical Robotics and Instrumentation

Session Chairs: Kevin Cleary, PhD (US), Albert Hernansanz, PhD (ES)

Surgical Robot Logs and Their Potential Towards Autonomous and Skill Transfer

M. Uemura, K. Chinzei, U. Takeshi, N. Yamasaki, J. Hirata, O. Yasuyoshi, T. Yamaguchi, K. Nanchi, T. Hattori, Y. Mitani, Y. Chihara, S. Ozawa, T. Fukumoto, Kobe University, Graduate School of Medicine; Kobe University Graduate School of Engineering (JP) [ISCAS-LE-140]

IRE Made Easy: Introducing the Robotic Grid System for Multiple Parallel Needle Insertion in Irreversible Electroporation Treatment

M. Abayazid, G. Wardhana, J. Fütterer, University of Twente, Enschede; Radboud University Medical Center Nijmegen (NL) [ISCAS-LE-24-00057]

Design and Evaluation of Soft Gears for Self-Propelled Colonoscopy Robot

K. Osawa, K. Duan, A. Ueda, R. Nakadate, J. Arata, Y. Nagao, T. Akahoshi, M. Eto, E. Tanaka, Waseda University, Kitakyushu; Amtec Inc., Osaka; Kobe University; Kyushu University; Kyushu University Hospital Fukuoka (JP) [ISCAS-LE-137]

A Soft Actuator Based Robot-assisted Tracheal Intubation System

J. Liu, L. Ma, C. Hu, J. Kang, B. Zhang, R. Li, H. Liao, Tsinghua University, Beijing (CN) [ISCAS-LE-24-00109]

Design and initial feasibility testing of a novel catheter navigation robot

L. G. Gruionu, T. Lango, H. Olav Leira, C. Constantinescu, A. L. Udristoiu, A. V. Iacob, G. Gruionu, University of Craiova (RO); SINTEF; St Olavs Hospital Trondheim (NL) [ISCAS-LE-103]

Preliminary study of measuring individual compression force applied to each tip of the forceps during grasping operation

R. Hiruma, K. Kuwana, Tokyo Denki University (JP) [ISCAS-LE-149]

HybGrip: A synergistic hybrid gripper for enhanced robotic surgical instrument grasping

J. Badilla-Solórzano, S. Ihler, T. Seel, Leibniz Universität Hannover (DE) [ISCAS-LE-24-00104]

A rapid calibration pipeline for robotic percutaneous interventions – how a prototype learned to be accurate

C. D. Wörnle, R. Lutz, L. Kuntz, J. Stallkamp, M. Siegfarth, Heidelberg University, Mannheim (DE) [ISCAS-LE-59-V]

16:55 Break

17:15-18:45 Surgical Workflow and Minimally Invasive Surgery

Session Chairs: Pierre Jannin, PhD (FR), Javier Herrero, MD, PhD (ES)

A pressure sensing catheter for assisting sleeve gastrectomy and its experimental evaluation

M. G. Lee, S. Cho, S. H. Kim, S. Yun, Soonchunhyang University (KR) [ISCAS-LE-139]

The development and testing of a smart sensorized guide wire for catheterization in a “blood” vessel phantom to support aortic valve implementation

M. Berger, N. Kuhn, M. Pillei, N. Bonaros, T. Senfter, Management Center Innsbruck Internationale Hochschule GmbH; Medical University of Innsbruck (AT) [ISCAS-LE-23-00699]

A novel approach for locating misplaced gauze sponge in laparoscopic surgery

S. L. Lai, Y. C. Chou, C. S. Chen, T. C. Tung, B. R. Lin, Y. Chang, R. F. Chang, National Taiwan University Hospital; National Taiwan University; National Cheng Kung University Taipei; National Taichung University of Science and Technology Tainan (TW) [ISCAS-LE-36]

Automated phase recognition in the cardiac catheterization laboratory procedures using Deep Learning

E. Frassini, T. Vijfinkel, R. Butler, Y. Weijenberg, J. van den Dobbelsteen, M. van der Elst, B. Hendriks, Technical University Delft (NL) [ISCAS-LE-77]

2D Human Pose Tracking in the Cardiac Catheterization Laboratory with BYTE

R. Butler, T. Vijfinkel, E. Frassini, S. van Riel, C. Bachvarov, J. Constandse, M. van der Elst, J. van den Dobbelsteen, B. Hendriks, Delft University of Technology; Reinier de Graaf Gasthuis, Delft; Philips, Best (NL) [ISCAS-LE-88]

Evaluation of mesh-based sensor networks for acquisition of process relevant data in clinical environments

M. Voß, S. Gudenkauf, M. Mandal, A. Schneider, Jade University of Applied Sciences, Wilhelmshaven (DE) [ISCAS-LE-119]

IPCAI 2024 - 15th International Conference on Information Processing in Computer-Assisted Interventions

General Chairs: Raphael Sznitman, PhD (CH), Nicolas Padoy, PhD (FR), Stamatia (Matina) Giannarou, PhD (UK)

Program Chairs: Toby Collins, PhD (FR), Sarah Moccia, PhD (IT), Mathias Unberath, PhD (US)

tba

Friday, June 21, 2024

Auditorium

CARS 2024 Closing Remarks

Heinz U. Lemke and Miguel Á. González Ballester
