

# **DIGITAL ONCOLOGY CONFERENCE**



## A CCC-N and Else Kröner Symposium



HANNOVER FAIR, HALL 19, CONFERENCE ROOM NEW YORK March 15 and 16, 2023

### Welcomes

### Dear participants,

It is my great pleasure to welcome you to the Digital Oncology Conference 2023 – A CCC-N and Else Kröner Symposium.

The digitalization of medicine is poised to effect dramatic structural changes in both research and care. This shift allows for innovative advances in medicine, but also requires a renewed effort for interdisciplinary and interprofessional exchange.

The Else Kröner-Fresenius-Stiftung (EKFS) is pleased to support these innovative advances, for which the Digital Oncology Conference provides an excellent forum. The conference will offer a direct personal exchange, which is of key importance for bringing together different disciplines and fields such as medicine, life sciences, computer sciences, bioinformatics, new technologies and health administration. A meeting of scientists, researchers, and decision makers in these fields establishes contacts, creates trust, and builds networks. It strengthens bridges between basic and clinical science that are indispensable for exploiting the potential of digital oncology for the benefit of patients.

The diverse schedule of excellent speakers represents a large part of the oncological research spectrum and allows for two days of intense exchanges and discussions at the forefront of current and future digital transformation in oncology. With many of its funding activities, EKFS aims to support Clinician Scientists in the early stages of their careers. Thus, I am especially pleased to note the opportunities given to early-career scientists and physicians at this event. I am confident this will prove a great opportunity for the next generation to expand their skill sets and networks.

On behalf of EKFS, I wish you an exciting and successful event,

Dr. Alexander Lehmann

Else Kröner-Fresenius Stiftung, Scientific Funding

### Dear colleagues, dear participants,

Welcome to the Digital Oncology Conference 2023 – a CCC-N and Else Kröner Symposium in Hannover. It was here in Hannover that the well-known universal scientist Gottfried Wilhelm Leibniz made his pioneering contributions to mathematics and finished his design for an early mechanical calculator. Since his efforts paved the way for the modern computer, it seems a fitting location to talk about digital oncology.

We take inspiration from Leibniz not only through his works, but also from his penchant for being provocative. Hence, we chose a title that merits profound discussion. What is digital oncology? How can it improve the therapy of and care for tumor patients? Is digital oncology merely a collection of new methods that allow for new inventions and better therapies, or are we witnessing the birth of an entirely new, separate field of study? We would like to use the opportunity this conference offers to find a common language that facilitates the discussion of these questions.

We are especially excited to welcome you today because the Digital Oncology Conference 2023 – A CCC-N and Else Kröner Symposium is the first major in-person conference organized by the Comprehensive Cancer Center Niedersachsen. The CCC-N is a joint project between the University Medical Center Göttingen and the Hannover Medical School and, since 2021, has been funded by the Deutsche Krebshilfe as one of Germany's centers of excellence in cancer care and research.

We are very much looking forward to the talks, posters, discussions, and especially meeting with you in the coming two days!

#### Prof. Dr. Michael Heuser

Conference Chair and Head of CCC-H Translational Research

#### Prof. Dr. Günter Schneider

Conference Chair and Head of G-CCC Translational Research

# Program Day 1 | March 15, 2023

### Day 1 | March 15, 2023

11:30 Welcome Lunch

|         | Welcome<br>Conference Chairs: Michael Heuser, Hannover<br>Günter Schneider, Göttingen   |
|---------|---|
| SESSION | <b>I: Digital and Computational Histopathology</b> Chairs: Friedrich Feuerhake, Hannover Niels Grabe, Göttingen                                 |
| 12:30   | Computer Vision and Deep Learning for improved diagnostics of myeloid malignances<br>Moritz Middeke, Dresden                                    |
| 12:55   | Making sense of pathology images Peter Schüffler, Munich  |
| 13:20   | Use cases for computational pathology with high potential for clinical implementation and diagnostic decision support Jeroen van Laak, Nijmegen |
| 13:45   | Integration of computational pathology algorithms with established conventional diagnostic workflows Friedrich Feuerhake, Hannover              |
| 14:10   | Presentation from Abstracts   |
|         | Robust Metastases Detection in Whole Slide Images<br>Via Multi-Magnification Ensembles<br>Mehdi Naouar, Freiburg                                |
|         | The immune tumor microenvironment in intrahepatic cholangiocarcinoma Simon Peter, Hannover  |
| 14:25   | Coffee & Cake   |

| SESSION         | II: Al to Advance Cancer Imaging Chairs: Kristina Ringe, Hannover Christian Dullin, Göttingen                                      |
|-----------------|--|
| 15:00           | Al and Digitization in Radiation Oncology: Status quo and quo vadis Rami El Shafie, Göttingen                                      |
| 15:25           | Integrating clinical and imaging data in oncology<br>Horst Hahn, Bremen  |
| 15:50           | How can Al improve radiotherapy?<br>Florian Putz, Erlangen   |
| 16:15           | Can virtual histology replace histopathology?<br>Christian Dullin, Göttingen   |
| 16:40           | Presentation from Abstracts  |
|                 | Truncated and Limited Angle CT Reconstruction using NeRF<br>Architectures<br>Bernd Schweizer, Rüsselsheim                          |
|                 | An explainable AI-approach to automatic segmentation of renal tumors on CT: a multicenter imaging study  Johannes Uhlig, Göttingen |
| 16:55-<br>18:30 | Poster Session & Get Together  |



### Day 2, Part 1 | March 16, 2023

| SESSION | III: Machine Learning and Visualization Techniques for Clinical Decision Support in Oncology Chairs: Steffen Oeltze-Jafra, Hannover Anne-Christin Hauschild, Göttingen                           |
|---------|--|
| 09:00   | Systems medicine approach to support clinical decisions in oncology Melanie Börries, Freiburg  |
| 09:20   | Take a leap: New Algorithms and Multi-Omics Data to<br>Support Clinical Decision in Oncology<br>Anne-Christin Hauschild, Göttingen   |
| 09:40   | Visual Analytics for Digital Radiotherapy<br>Renata Raidou, Vienna   |
| 10:00   | In-Silico Modeling of Therapeutic Outcomes to Suppor<br>Decision-Making in Oncology<br>Alexander Oeser, Leipzig  |
| 10:20   | Discussion Session III   |
| 10:40   | Presentation from Abstracts Reinforcement learning agent improves evolution-based cancer therapies Serhii Aif, Erlangen Machine Learning guided treatment optimization for personalized medicine |
|         | Simon Peter, Hannover  |
| 10:55   | Coffee & Cake  |

| SESSION         | IV: Digital Surgery Chairs: Peter Hillemanns, Hannover Michael Ghadimi, Göttingen   |
|-----------------|---|
| 11:25           | Innovating for a better future Tilman Schlick, Da Vinci Robotic Surgery   |
| 11:50           | From Surgical Data Science to Al-Assisted Surgery –<br>Clinical Translation of Machine Learning in Surgical Oncology<br>Martin Wagner, Heidelberg/Dresden |
| 12:15           | The power of digital technologies for craniomaxillofacial tumor surgery and postablative reconstruction Nils-Claudius Gellrich, Hannover                  |
| 12:40           | Establishing digital surgery at a German university hospital Michael Ghadimi, Göttingen   |
| 13:05           | Digital Infrastructure for Support of Clinical Trials<br>Stefan Rieken, Göttingen   |
| 13:20-<br>14:05 | Lunch   |



### Day 2, Part 2 | March 16, 2023

| SESSION | V: Building Trust in Artificial Intelligence Models and Digital<br>Methods in Medical Education<br>Chairs: Sabine Salloch, Hannover<br>Ulrich Sax, Göttingen   |
|---------|--|
| 14:05   | Debate: AI will replace ethics committees: Yes<br>Sabine Salloch, Hannover   |
| 14:30   | Debate: AI will replace ethics committees: No Eva Winkler, Heidelberg  |
| 14:55   | New Digital Resources to Improve Medical Education Michal Matyjas/Pascal Grosse, Berlin  |
| 15:20   | Training the next generation in Digital Medicine: Experience from<br>the DigiStrucMed Graduate Program<br>Michael Heuser, Hannover                             |
| 15:40   | Presentation from Abstracts  CLARUS: An Interactive Explainable AI Platform for Manual Counterfactuals in Graph Neural Networks Jacqueline Beinecke, Göttingen |
|         | Levels of Explicability for medical Artificial Intelligence: What do we need and what can we reach? Frank Ursin, Hannover                                      |
| 15:55   | Coffee & Cake  |

| SESSION         | IVI: Al and Machine Learning Techniques Improving Cancer Research Chairs: Tim Kacprowski, Braunschweig/Hannover Tim Beißbarth, Göttingen           |
|-----------------|--|
| 16:25           | Modelling immunotherapies in silico Francesca Finotello, Innsbruck   |
| 16:50           | Understanding tumor evolution with statistical machine learning Jack Kuipers, Zurich   |
| 17:15           | A Vision of Computational Translational Pharmacogenomics<br>Michael Menden, Munich   |
| 17:40           | How can we make sense of the data overload in cancer research? Tim Beißbarth, Göttingen  |
| 18:05           | Presentation from Abstracts  |
|                 | Stability of feature selection utilizing Graph Convolutional Neural<br>Network and Layer-wise Relevance Propagation<br>Hryhorii Chereda, Göttingen |
|                 | Classifying protein variants of unknown significance with machine learning structure prediction models Klara Drofenik, Göttingen                   |
| 18:20           | Young Scientist Digital Oncology Poster Award  |
| 18:25-<br>18:30 | Concluding Remarks   |

# **Chairs and Speakers**

### **Conference Chair**

#### Michael Heuser

Hematology, Hemostasis, Oncology and Stem Cell Transplantation, Hannover Medical School

Chair for Molecular Therapies in Hematology

Dr. Heuser is a professor of medicine and holds a Chair for Molecular Therapies in Hematology at Hannover Medical

School, Germany. He is the chair of the European LeukemiaNet MRD working party ELN-DAVID, and also chairs the graduate program Digital Transformation of Medicine. His research focuses on developing improved treatments for patients with acute myeloid leukemia (AML), on the pathogenesis of AML, and on measurable residual disease in AML patients. Dr. Heuser has been a clinical investigator in 70 clinical trials and has published more than 200 peer-reviewed publications.



### Günter Schneider

University Medical Center Göttingen, Department of General, Visceral and Pediatric Surgery

Professor of Translational Cancer Research

Prof. Schneider studied Medicine in Regensburg and

Würzburg. He was trained in Gastroenterology at the University of Ulm and the Technische Universität München. His re-search is focused on defining therapeutic vulnerabilities of gastrointestinal can-cers. His main research interests include the targeting of the epigenetic machine-ry, oncogenic transcription factors and signaling pathways, and the development of drug screens with the use of human primary cellular cancer models. Since 2021, he has been Professor of Translational Cancer Research at the University Medical Center Göttingen and also heads the translational research team of the G-CCC.



### **Scientific Committee and Session Chairs**

Friedrich Feuerhake (MHH, Hannover)

Niels Grabe (UMG, Göttingen)

Kristina Ringe (MHH, Hannover)

Christian Dullin (UMG, Göttingen)

Steffen Oeltze-Jafra (PLRI, TU Braunschweig, MHH, Hannover)

Anne-Christin Hauschild (UMG, Göttingen) Tim Beißbarth (UMG, Göttingen)

**Peter Hillemanns** (MHH, Hannover)

Michael Ghadimi (UMG, Göttingen)

Sabine Salloch (MHH, Hannover)

Ulrich Sax (UMG, Göttingen)

Tim Kacprowski (PLRI, TU Braunschweig, MHH, Hannover)

### **Speakers**

Moritz Middecke (University Hospital Dresden)

Peter Schüffler (TUM. Munich)

Jeroen van der Laak (Radboud University, Nijmegen, Netherlands)

Friedrich Feuerhake (MHH. Hannover)

Rami El Shafie (UMG, Göttingen)

Horst Hahn (Fraunhofer MEVIS, Bremen)

Florian Putz (Universitätsklinikum Erlangen)

Christian Dullin (UMG, Göttingen)

Melanie Börries (Albert-Ludwigs-Universität Freiburg)

**Anne-Christin Hauschild** (UMG, Göttingen) Renata Raidou (Technical University Vienna, Austria)

Alexander Oeser (Leipzig University, Leipzig)

Tilman Schlick (Intuitive Europe)

Martin Wagner (University Heidelberg, University Dresden)

Nils-Claudius Gellrich (MHH, Hannover)

Michael Ghadimi (UMG, Göttingen)

**Stefan Rieken** (UMG, Göttingen)

Sabine Salloch (MHH, Hannover)

**Eva Winkler** (UKHD), NCT Heidelberg)

Michal Matyjas (Charité, Berlin) Pascal Grosse (Charité, Berlin)

Michael Heuser (MHH, Hannover)

Francesca Finotello (University Innsbruck, Austria)

Jack Kuipers (ETH Zurich, Switzerland)

Michael Menden (Helmholtz Institute Munich)

Tim Beißbarth (UMG, Göttingen)

### **Chair Session I**

### Friedrich Feuerhake

Department of Pathology, Hannover Medical School Senior Physician and leader oft he working group "Digital Pathology"



Head of the Digital Pathology Group and attending neuropathologist at the Department of Pathology Hannover Medical School, Germany. Medical training included Internal Medicine, Microscopic Anatomy, and Neuropathology at the University Medical Centers of Hannover, Munich and Freiburg, Germany, followed by a PostDoc fellowship in lymphoma research at the Dana-Farber Cancer Institute, Boston, MA, and a position as Head of Experimental Pathology with Roche Pharma Research and Early Development (pRED), Penzberg, Germany.

The research focus is translational biomarker discovery and development exploring the interaction between immune cells and their target structures. Teaching activities include interdisciplinary courses in digital pathology, jointly with the PLRI / Technical University Brunswick. Current projects aim at integrating computational pathology into systems medicine approaches to transplantation, immunology, and cancer research.

#### Talk title

"Integration of computational pathology algorithms with established conventional diagnostic workflows"

### **Chair Session I**

### **Niels Grabe**

Institute of Pathology at UMG, National Center for Tumor Diseases NCT Heidelberg, University Hospital Heidelberg

Professor for data analysis und fusion for novel imagebased diagnostics



Niels Grabe is a biomedical informatics expert and full professor for "Data analysis and fusion for novel image based clinical diagnostics" at the University Medical Center Göttingen, Institute of Pathology, and scientific group leader at the National Center for Tumor Diseases (NCT) in Heidelberg. He is a studied computer scientist with an early specialization on artificial intelligence in biomedical applications.

In 2008 he founded the Hamamatsu Tissue Imaging and Analysis Center (TIGA) at the University Heidelberg in cooperation with Hamamatsu Photonics, Japan. He there co-developed the first AI-based digital pathology application to predict patients' response to chemotherapy by profiling immune infiltrates using digital pathology (patented). By contributing systems biological multi-cellular modelling and digital pathology image analysis to the first German systems biology consortia, his group uncovered the cellular spatial mechanism of epithelial skin wound healing. He co-directs in close collaboration with the US National Cancer Institute, Division of Cancer Epidemiology and Genetics, the currently largest AI-based cytology project for the automation of cervical cancer screening comprising over 70,000 patients. To this end, his group developed the CYTOREADER platform to study how artificial intelligence approaches can be developed and validated at large-scale.

### Jan Moritz Middeke

Department of Internal Medicine I, University Hospital Dresden & Else Kröner Fresenius Center for Digital Health Dresden

MD, Head of working group "Artificial Intelligence in Cancer"



Dr. med. Jan Moritz Middeke is a specialist in internal medicine and hematology and oncology. He heads the outpatient clinic of the Department of Internal Medicine I at the University Hospital Dresden, one of the largest center for hematological malignancies in Germany. His scientific interest is therapy optimization of acute myeloid leukemia with a special focus on the integration of novel technologies.

He is co-leader of the working group "Artificial Intelligence in Cancer" at the University Hospital Dresden and the Else Kröner Fresenius Center for Digital Health. The group uses state-of-the-art computer vision to improve accuracy and usability of cancer diagnosis and machine learning to leverage the power of big data in cancer research.

#### Talk title

"Computer Vision and Deep Learning for improved diagnostics of myeloid malignances"

Peter Schüffler

Institute of Pathology, TUM School of Medicine Technical University of Munich

### **Professor for Computational Pathology**

Prof. Schüffler's (\*1983) field of research is the area of digital and computational pathology. This includes novel



machine learning approaches for the detection, segmentation and grading of cancer in pathology images, prediction of prognostic markers and outcome prediction (e.g. treatment response). Further, he investigates the efficient visualization of high-resolution digital pathology images, automated QA, new ergonomics for pathologists, and holistic integration of digital systems for clinics, research and education.

Prof. Schüffler received his BSc and MSc in Computational Biology at the Saarland University and the MPI, Saarbrücken, Germany. In 2015, he graduated his doctoral studies in machine learning for medical image data analysis at the ETH Zurich, Switzerland. He deepened his expertise in digital and computational pathology as a Postdoc and Sr. ML Scientist at the Memorial Sloan Kettering Cancer Center New York, USA, where he co-founded Paige. In 2021, Prof. Schüffler was appointed to the professorship for computational pathology at TUM.

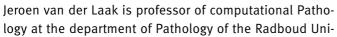
#### Talk title

"Making sense of pathology images"

### Jeroen van der Laak

Radboud University Medical Center Nijmegen, Netherlands

#### **Professor**





versity Medical Center in Nijmegen, The Netherlands and guest professor at the Center for Medical Image Science and Visualization (CMIV) in Linköping, Sweden. His research focuses on the use of artificial intelligence for analysis of digitized histopathological images. His research group was among the first to show the large potential of so-called deep learning algorithms for analysis of whole slide images. Further research focused on improvements in deep learning strategies to increase robustness and accuracy, as well as on application of deep learning for various tasks in histopathology.

In 2016 and 2017, he coordinated the CAMELYON grand challenges. Dr van der Laak co-authored over 150 peer-reviewed publications and is member of the board of directors of the Digital Pathology Association. He is organizer of sessions at the European Congress of Pathology, MICCAI and Pathology Visions. Dr van der Laak is leading the 'AI in Pathology' taskforce of the European Society of Pathology and is coordinator of the Bigpicture project. Dr van der Laak is USCAP Nathan Kaufman laureate. In 2021, he founded the Radboudumc spinoff Aiosyn, for which is is CSO.

#### Talk title

"Use cases for computational pathology with high potential for clinical implementation and diagnostic decision support"



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### **Chair Session II**

### Kristina Imeen Ringe

Department of Diagnostic and Interventional Radiology, Hannover Medical School (MHH)

Professor of Radiology, Head of Abdominal Imaging Section, in the Department of Diagnostic and Interventional Radiology, Leading attending



Kristina Ringe is Professor of Radiology and Head of the Abdominal Imaging Section in the Department of Diagnostic and Interventional Radiology at Hannover Medical School, Germany. Dr. Ringe is a clinician scientist with particular experience in hepatobiliary imaging and interventional oncology. After medical school at Georg August-University Göttingen, she has completed her radiology residency at Hannover Medical School.

Her research is funded among others by the German Research Foundation, and includes especially the advancement of MRI in the context of liver tumors and primary sclerosing cholangitis (PSC), as well as patient-based approaches for ablative and locoregional liver tumor therapy. She is board member of the Gastrointestinal and Abdominal Imaging Section of the German Roentgen Ray Society and Head of the MRI working group of the International PSC Study Group (IPSCSG). Dr. Ringe continuously participates in the development of national and international guidelines. She has authored /co-authored over 100 peer-reviewed manuscripts and book chapters in the field of diagnostic and interventional radiology.

### **Chair Session II**

### **Christian Dullin**

University Medical Center Goettingen, Institute for Diagnostic and Interventional Radiology; MPI for Multidisciplinary Sciences Goettingen, University Hospital Heidelberg, Institute for Diagnostic and Interventional Radiology, Translational Lung Research Center Heidelberg



#### Staff Scientist

Christian Dullin studied technical physics at the FSU Jena, did his PhD at the UMG Göttingen and has received his venia legendi in "experimental radiology" at the UMG in 2019. Since 2004, he has been responsible for preclinical and experimental imaging in the group for translational molecular imaging at the UMG Göttingen and the MPI for Multidisciplinary Sciences Goettingen headed by Prof. Frauke Alves.

He focuses on establishing novel imaging strategies in a variety of applications such as oncological research and lung diseases. His research concerns label free 3D soft-tissue analysis using high resolution phase contrast CT as well as experimental and functional lung imaging ranging from preclinical animal models towards potential implementations in patients. He is also a member of the Translational Lung Research Center Heidelberg and has expertise in Synchrotron based CT imaging. He also applies and teaches image processing and machine learning methods in a broad range of mainly fundamental and preclinical research projects. In this perspective, his core expertise is in 3D image analysis, unsupervised data analysis and image registration. Currently he is heading the junior group "x-ray based preclinical imaging technologies" within the institute for Diagnostic and Interventional Radiology at the UMG Göttingen.

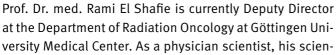
#### Talk title

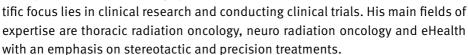
"Can virtual histology replace histopathology?"

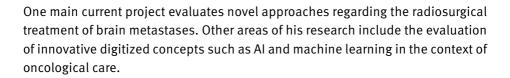
### Rami El Shafie

Clinic for Radiotherapy and Radiation Oncology, University Medical Center Göttingen (UMG)

### Deputy Director | Senior Managing Physician







#### Talk title

"AI and Digitization in Radiation Oncology: Status quo and quo vadis"



Horst Karl Hahn

Managing Director of Fraunhofer MEVIS, Bremen

Professor of Digital Medicine, University of Bremen

Since 2022 Professor (W<sub>3</sub>) of Digital Medicine, FB<sub>3</sub> Inf/ Math, University of Bremen Since 2019 Managing Director, Fraunhofer MEVIS, Institute for Digital Medicine



2012 - 2019 Director, Fraunhofer MEVIS, Institute for Medical Image Computing 2011 - 2022 Professor of Medical Imaging, Dept. CS/EE, Jacobs University Bremen

2009 - 2012 Deputy Director, Fraunhofer MEVIS

2007 -2011 Adjunct Professor of Medical Visualization, Jacobs University Bremen

2006 - 2008 Vice President (Prokurist), MeVis Research gGmbH, Bremen

2005 PhD in Computer Science, University of Bremen

1999 Diploma in Physics, University of Heidelberg

Professor Hahn was scientific coordinator of several national and European collaborative projects in the field of digital medicine and AI-based diagnostics. His scientific and technological work addresses the digital transformation of medicine based on multidisciplinary data integration and state-of-the-art machine learning methods.

### Talk title

"Integrating clinical and imaging data in oncology"

### Florian Putz

Department of Radiation Oncology, Friedrich-Alexander-Universität Erlangen-Nürnberg

### Senior Physician and Working group leader

Florian Putz is a senior physician and working group leader at the Department of Radiation Oncology of the University Hospital Erlangen. He graduated in 2012 and received his



habilitation in radiation oncology from Friedrich-Alexander University Erlangen-Nürnberg (FAU) in 2022. Florian Putz has initiated and is conducting multiple publicly and industrially-funded research projects including clinical trials, aiming to develop and evaluate deep learning applications for clinical requirements.

His current research focus is deep learning in medical imaging including auto-segmentation, imaging in radiation oncology, intracranial as well as extracranial stereotactic radiotherapy and understanding the interplay between deep learning applications and human experts. He is the working group leader of an interdisciplinary working group for artificial intelligence in radiation oncology and the medical head of the MRinRT group at Erlangen. In addition to the clinical aspects of deep learning in radiation oncology, Florian Putz is also – together with computer scientists – working on novel technical solutions for solving clinical problems, believing that traditional boundaries between clinical experts and computer scientists need to be transcended to make the most of the potential of deep learning in radiation oncology.

#### Talk title

"How can AI improve radiotherapy?"



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### **Chair Session III**

### Steffen Oeltze-Jafra

Peter L. Reichertz Institute for Medical Informatics (PLRI), Hannover Medical School (MHH)

### **Professor for Medical Information Systems**

Steffen Oeltze-Jafra has been leading the division for medical information systems and management at the Peter



L. Reichertz Institute for Medical Informatics (PLRI), Hannover Medical School (MHH) since 2021. He was head of the working group "MedDigit – Medicine and Digitalization" at the Department of Neurology, Univ. of Magdeburg (OVGU), Germany from 2018-2022 and head of the junior research group "Digital Patient and Process Models" at the Innovation Center for Computer-Assisted Surgery (ICCAS), University of Leipzig from 2016-2018. In 2016, he received a habilitation in Computer Science, in 2010 a Ph.D. in Computer Science, and in 2004, a diploma in Computational Visualistics from OVGU.

His research interests are in medical information systems, in particular, for clinical decision support, in the secondary use of clinical routine data, and in visual analytics of biomedical data.

### **Chair Session III**

### **Anne-Christin Hauschild**

Department of Medical Informatics, University Medical Center Göttingen

Professor for Clinical Decision Support Systems

Prof. Dr. Anne-Christin Hauschild is an expert in privacypreserving and systems biology aided artificial intelligen-



ce on biomedical data sets for clinical applications such as oncology. After her PhD in Bioinformatics at the Max-Plank Intitute, Saarland University, Germany and Southern Denmark University in 2016, Dr. Hauschild conducted a postdoc at the Princes Margaret Cancer Center and Center for Addiction and Mental Health in Toronto Canada. She worked as the head of the Medical Informatics division at Biomedical Data Science group at the Philips University in Marburg before she started her current position as junior professor for clinical decision support systems at the medical informatics department at the University Medical Center Göttingen.

Prof. Hauschild's group focuses on multimodal integration and analysis of electronic patient records, molecular data on aberrant gene or protein distributions, and medical imaging data to support disease prediction and therapy optimization. For this purpose, complex machine learning algorithms are developed, such as federated and transfer learning, which allow aggregating locally trained machine learning models without sharing distributed data or to leverage insights of large biomedical datasets and transfer knowledge to related small sized target dataset. Developed ExplainableAI methods aim to gain a causal understanding AI decisions in medical applications.

#### Talk title

"Take a leap: New Algorithms and Multi-Omics Data to Support Clinical Decision in Oncology"

### **Melanie Börries**

Institute of Medical Bioinformatis and Systems Medicine, Medical Center – University of Freiburg

#### Institute Director

Melanie Börries studied human medicine in Lübeck and received her PhD in medicine in 2004. She participated in the MDPhD fellowship program of the Biozentrum in Basel



from 2001-2005 and received her PhD in cell biology in 2005. In parallel, she continued her clinical training in cardiology at the Inselspital in Bern.

She was a group leader at the Freiburg Institute for Advanced Studies (FRIAS) from 2009-2013. From 2013-2019, she was a junior research group leader for systems biology and systems medicine at the Institute of Molecular Medicine and Cell Research within the German Cancer Consortium (DKTK, DKFZ partner site Freiburg). Since 2019 she is W3 professor for Medical Bioinformatics at the University of Freiburg and leads the Institute for Medical Bioinformatics and Systems Medicine at the University Medical Center Freiburg and is associate professor at the DKFZ/DKTK with a focus on analysis, integration and interpretation of high-throughput data in the context of personalized medicine.

Since 2021 she is co-director of the Tumor Center Freiburg (CCCF) and is responsible for the area of "Data driven medicine" and is spokesperson of the Molecular Tumor Board and will coordinate the medical use case "Personalized Medicine for Oncology" within the Medical Informatics Initiative.

#### Talk title

"Systems medicine approach to support clinical decisions in oncology"

### Renata Georgia Raidou

Institute of Visual Computing & Human-Centered Technology, Technical University Vienna, Austria

#### **Assistant Professor**

Renata Georgia Raidou is Assistant Professor in Medical Visualization and Visual Analytics at TU Wien, Austria. Previously, she was Assistant Professor and a Rosalind Frank-



lin Fellow at the University of Groningen, the Netherlands. Renata has a Ph.D. in Medical Visualization from Eindhoven University of Technology. She has been awarded the Dirk Bartz Prize for Visual Computing in Medicine at Eurographics 2017, the Best Ph.D. Award 2018 of the EuroVis Awards Programme, and the EuroVis Young Researcher Award 2022.

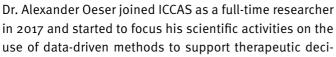
Her research focus is on the interface between Visual Analytics, Image Processing, and Machine Learning, with a strong focus on medical applications. She is particularly involved in educational activities regarding (Medical) Visualization and she has co-organized a NII Shonan Meeting on "Formalizing Biological and Medical Visualization" in 2020 and the Bio+Med+Vis Spring School in 2021&2022. She is actively involved in the EG VCBM workshop and she is a member of the Steering Committee of GI-Fachgruppe VCBM.

#### Talk title

"Visual Analytics for Digital Radiotherapy"

Alexander Oeser
Innovation Center Computer Assisted Surgery,
University of Leipzig

Post-Doc Researcher





sions in oncology and beyond. In early 2022, he successfully completed his PhD studies with a work focused on technical ways to overcome individual and institutional biases in medical decision problems using a distributed knowledge modeling and algorithmic fusion approach.

Currently, he is the technical lead of the KAIT project (in collaboration with Janssen-Cilag, Johnson & Johnson) as well as the group leader of the "AI in Hematology" research group at the Universitätsklinikum Leipzig.

#### Talk title

"In-Silico Modeling of Therapeutic Outcomes to Support Decision-Making in Oncology"



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### **Chair Session IV**

#### Peter Hillemanns

Dept. of Gynecology and Obstetrics, Medizinische Hochschule Hannover; Comprehensive Cancer Center Niedersachsen (CCC-N)

Chairman of Dept. of Ob Gyn; Speaker of the CCC-N



Dr. Hillemanns received his medical training in Obstetrics and Gynecology at Ludwig-Maximilians-University Munich-Grosshadern (Germany), where he first started with a rotation in Pathology followed by a research stipendium in Gynecologic Pathology at Columbia Presbyterian Medical Center, New York, with a special focus on HPV-driven oncogenesis of the female genital tract. He is a certified Gynecologic Oncologists and a Professor of Obstetrics and Gynecology. He serves as Chairman of the Dept. of Obstetrics, Gynecology, and Breast Cancer Center at Medical University Hannover, Germany.

His research interests are in surgical and conservative gynecological oncology. His research is focused on HPV-related diseases of the female genital tract (molecular biology) which lead to his position as Coordinator of German Guideline for Cervical Cancer Prevention. Another important focus of his research is fluorescence-diagnosis, -guided sentinel surgery in laparoscopy, and photodynamic therapy. He has published extensively on laboratory as well as clinical studies in these fields. He is a principal investigator on numerous clinical studies and has been involved in the study of many novel agents. Furthermore, he serves as speaker of the Comprehensive Cancer Center Lower Saxony, Germany.

### **Chair Session IV**

### Michael Ghadimi

University Medical Center Göttingen, Department of General, Visceral and Pediatric Surgery

### Director

Prof. Dr. med. Michael Ghadimi, born in Munich in 1968. Since 2012 Director of the Department of General, Visce-



ral and Pediatric Surgery, University Medical Center Göttingen (UMG). Permanent deputy of the Chief Medical Officer of the UMG. Executive member of the Board of the Göttingen Comprehensive Cancer Center (G-CCC). In addition, among other things, president of the German Cancer Society, Congress President of the German Cancer Congress 2022, Speaker of the Convention of Chairs of General and Visceral Surgery and Senator of the Georg-August University.

Surgical specialties: Surgery of the pancreas, rectum, esophagus and liver, minimally invasive robotic surgery, endocrine surgery, complex abdominal surgery of sarcomas. Scientific focus: Tumor biology of solid tumors (pancreas, rectum, esophagus), individualized therapy of rectal cancer, clinical trials of gastrointestinal tumors as head of clinical trial (LKP) and PI, e.g. pancreas and rectum. H-index 45 (as of 1/22).

Academic stays abroad 1997 - 1999 as Postdoctoral Fellow at the National Genome Research Institute, NCI, NIH, Bethesda/MD, USA and in 1994 during medical school in Durham/NC and Houston/TX, USA.

### Talk title

"Establishing digital surgery at a German university hospital"

Tilman Schlick Intuitive Europe,

### Senior Director Medical Affairs, Medical Officer Intuitive

Tilman Schlick, MD acts as Medical Officer in Europe for Intuitive, the maker of da Vinci Surgical Systems partnering with internal and external stakeholders on innovating for minimally invasive. Being a general surgeon and da Vinci



Surgeon by trade Tilman is focused on improved patient outcomes by shaping da Vinci Surgeons career pathways and building clinical and economic evidence for computer aided surgery and digitalization.

Prior to Intuitive, Tilman held several positions in medical device industries. He received his Ph.D. at the University of Frankfurt, Germany in molecular immunology and holds an MBA degree in General Management from University of Wales, UK.

#### Talk title

"Innovating for a better future"

### **Martin Wagner**

Department of General, Visceral and Transplantation Surgery, Heidelberg University Hospital; Department of Visceral, Thoracic and Vascular Surgery, University Hospital Carl Gustav Carus Dresden

General Surgeon and Research Group Leader Artificial Intelligence and Cognitive Robotics



Martin Wagner is a general surgeon and academic researcher at Heidelberg university hospital. After graduating from Heidelberg University Medical School in 2014, he started his surgical residency with Prof. Markus Büchler and received board certification for general surgery in 2021. As a scientist he wrote his MD-thesis about compensation of tissue shift in image-guided visceral surgery and was a postdoctoral researcher and member of the coordination team at the DFG-transregional collaborative transregional research center "Cognition-Guided Surgery". Since 2018 he is head of the newly established research group on artificial intelligence and cognitive robotics as well as scientific coordinator medicine of the "data-science driven surgical oncology" program at the National Center for Tumor diseases (NCT) Heidelberg. Starting in April 2023 he will be associate professor of surgery and artificial intelligence at the department of visceral, thoracic and vascular surgery at University Hospital Carl Gustav Carus Dresden and cluster of excellence "Tactile Internet with human in the loop" at Technical University Dresden. Based on his previous work in surgical artificial intelligence, machine vision and cognitive robotics, his research will focus on the development and clinical translation of assistance systems for the transfer of surgical experience and skills between humans and machines.

#### Talk title

"From Surgical Data Science to AI-Assisted Surgery – Clinical Translation of Machine Learning in Surgical Oncology"

### Nils-Claudius Gellrich

Hannover Medical School

# Chairman and Director of Dept. of Oral and Maxillofacial Surgery

Prof. Dr. Nils-Claudius Gellrich is holds a director and chair position at the Hannover Medical School, Department of Oral and Maxillofacial Surgery, in Hannover/ Germany,



since October 2004. Starting in 1982, he studied both dentistry and medicine at the Christian-Albrechts-University in Kiel, Germany. After acquiring his license as D.M.D. in 1987 and as M.D. in 1989, he started his specialist training in Oral and Maxillofacial Surgery at the Ruhr-University Bochum, Germany, in 1990. He obtained his board certification for Oral and Maxillofacial Surgery in January 1994 and the qualification in Regional Plastic Surgery in 1996. In 1997, he became the deputy of the chairperson at the Department of Oral and Maxillofacial Surgery at the Albert-Ludwigs-University Freiburg.

In the course of his career, Prof. Gellrich was appointed three times to chair positions at Maxillofacial Surgery Departments, i.e. Frankfurt, Hannover, Zürich. He is very active in research with 328 pubmed-listed papers; his major research interests are focusing on tissue engineering or prefabrication, computer-assisted planning using virtual models in craniofacial surgery and intraoperative navigation for complex reconstructive surgery and patient-specific and functionalized implants. Prof. Gellrich is an experienced national and international lecturer and teacher. He was invited as speaker at numerous scientific meetings and conferences worldwide and is faculty member and chairperson at multiple national and international conferences, workshops and courses, especially on osteosynthesis, reconstructive craniofacial surgery, microvascular reconstruction and dental implantology, patient-specific and functionalized implants.

#### Talk title

"The power of digital technologies for craniomaxillofacial tumor surgery and postablative reconstruction"

Stefan Rieken

Clinic for Radiotherapy and Radiation Oncology, University Medical Center Göttingen, Germany

Director; Co-Speaker of the CCC-N

Stefan Rieken, born 1979 in Cloppenburg, studied medicine in Heidelberg as a scholarship holder of the Studienstiftung des deutschen Volkes from 2000. Stays abroad



took him to the US, Vienna, and Switzerland. In his doctoral thesis at the Pharmacological Institute of the University of Heidelberg, which was awarded "summa cum laude", Prof. Rieken investigated the signaling pathways responsible for the distribution, migration, and function of immune cells of the spleen. From 2007, he completed his training and further education at the Department of Radiology at Heidelberg University Hospital. After his residency in radiotherapy in 2013, he worked in the Department of Radiation Oncology at Heidelberg University Hospital, first as a senior physician, then as a senior physician from 2016, and from 2017 also as head of the section "Thoracic Radiation Oncology".

During this time, Stefan Rieken habilitated in 2015 with a thesis on multimodal therapy for tumors with high migratory capacity by irradiation as well as targeted molecular inhibition and obtained the teaching qualification for radiotherapy. He accepted a call to the university professorship for radiation therapy at the University Medical Center Göttingen (UMG) and has been teaching and working there since April 1, 2020. Since January 1, 2023, Prof. Dr. Stefan Rieken has been the spokesperson of the University Cancer Center (G-CCC) at the University Medical Center Göttingen.

### Talk title

"Digital Infrastructure for Support of Clinical Trials"



### **Chair Session V**

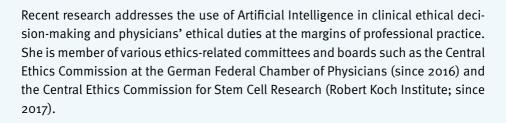
### Sabine Salloch

Institute of Ethics, History and Philosophy of Medicine, MHH

Full Professor, Head of Institute

Sabine Salloch (\*1980) is a professor of medical ethics and head of the Institute of Ethics, History and Philosophy of

Medicine at Hannover Medical School (Germany). She has academic backgrounds in medicine (M.D. University of Marburg 2006) and philosophy (Ph.D. University of Jena 2015) and specializes in ethics of digitization in health care, empirical-ethical research and medical professionalism.



### Talk title

"Debate: AI will replace ethics committees: Yes"



## **Chair Session V**

#### **Ulrich Sax**

University Medical Center Göttingen, Department of Medical Informatics

Head of Translational Research Informatics Group

Ulrich Sax studies Medical Informatics in Heidelberg (Diploma) and holds a PhD in Medical Informatics (Göttin-



gen). After his Postdoc stay at Harvard Medical in Boston, MA (CHIP) he was appointed as a Professor in Medical Informatics at UMG. He heads the Translational Research Informatics (TRI) research group within the Department of Medical Informatics, UNIVERSITY MEDICAL CENTER GÖTTINGEN GEORG-AUGUST-UNIVERSITY. His research is focused on the integration and visualization of heterogeneous high dimensional omics and clinical data in healthcare and biomedical informatics research. Current projects include NFDI4health (DFG) - A concept for a federated research data infrastructure for personal health data – he is head of the Privacy and Data Access in Concert, CRU5002 (DFG) – Deciphering Genome Dynamics for Subtype-specific Therapy in Pancreatic Cancer – head of CP2 Biomedical Informatics Support Platform DFG.

He is author of several peer reviewed articles in Biomedical Informatics, his profile can be accesses in ORCID http://orcid.org/oooo-ooo2-8188-3495

Additionally the firsthand experience of heading two IT-departments additionally to his research offers an ideal combination of IT production experience and substantial research experience in many interdisciplinary research collaborations dealing with privacy and security aspects in Biomedical informatics, Electronic Patient Records, Personal Health Records. He is frequent referee for ministries, science council and German Council of Science and Humanities.

# **Abstracts**

#### **Eva Winkler**

Section for Translational Medical Ethics, Department of Medical Oncology, National Center for Tumor Diseases, Heidelberg University Hospital, Heidelberg, Germany Head of the Heisenberg Programme & Section for Translational Medical Ethics; Board of Managing Directors of the National Center for Tumor Diseases (NCT), Heidelberg



Eva Winkler is an oncologist and Heisenberg Professor and Head of the Section for Translational Medical Ethics at the National Center for Tumor Diseases (NCT), University Hospital Heidelberg (UKHD). The Section covers the entire range of ethical questions relating to the translation of research results into healthcare. Professor Winkler is a specialist in haematology/oncology, member of the Board of Directors of NCT and works as a senior physician in the Department of Medical Oncology at the UKHD.

She holds a doctorate in cancer research from the University of Heidelberg/ German Cancer Research Center and a PhD in medical and health ethics from the University of Basel, Switzerland (with distinction). She also did two years of her medical-ethics training as part of two fellowships in the Department of Medical Ethics at Harvard Medical School and as a faculty fellow at the Center for Ethics and the Professions at Harvard University/Kennedy School of Government. The main research areas of her section are: research ethics, clinical ethics and ethical issues in health policy. Eva Winkler is also a scientific director and spokesperson for EURAT (interdisciplinary platform for Ethical and Legal Issues of Genome Sequencing).

#### Talk title

"Debate: AI will replace ethics committees: No"

Michał Matyjas
Charité – Universitätsmedizin Berlin/Germany
research assistant, M.D.

Michał Matyjas graduated from his medical studies at Charité – Universitätsmedizin Berlin/Germany in 2021. During his studies he has developed various research interests, neuroimaging being one of them. Together with his super-



visor he developed a model to train junior neuroradiologists in endovascular embolization using a three-dimensional simulator in his doctoral thesis which he just finished. Further, he has become interested in various aspects of medical education, first from the student's perspective, and now from the perspective of a researcher.

During the past year he got involved in an innovative project which uses data glasses as a tool in the bedside teaching for medical students, in particular when vulnerable patients such as oncological and geriatric patients are involved. The project seeks to develop strategies how to use the data glasses appropriately in different settings which addresses aspects of their practical use as well as new communicative strategies in bedside teaching.

#### Talk title

"New Digital Resources to Improve Medical Education"



#### **Pascal Grosse**

Charité – Universitätsmedizin Berlin/Germany

#### consultant neurologist

Pascal Grosse is neurologist with a special focus on neurological sleep medicine, epilepsy, movement disorders, and neurophysiology. He studied medicine and history at Freie Universität Berlin.

His main research areas revolve around neurophysiology, neurological sleep medicine as well as the theory and history of biopolitics with a particular focus on European and German colonialism. He is also active in the Circle U - European University project which comprises nine European universities and serves as an academic chair for Global Health. Over the past decade he has also become involved in the development of medical education including the application of digital technologies. As part of this interests in the area of medical education he recently started a new project on the use of assisted reality using smart glasses in the classroom with medical students.

#### Talk title

"New Digital Resources to Improve Medical Education"

#### Michael Heuser

Hematology, Hemostasis, Oncology and Stem Cell Transplantation, Hannover Medical School

#### Chair for Molecular Therapies in Hematology

Dr. Heuser is a professor of medicine and holds a Chair for Molecular Therapies in Hematology at Hannover Medical School, Germany. He is the chair of the European Leukemia-

Net MRD working party ELN-DAVID, and also chairs the graduate program Digital Transformation of Medicine.



His research focuses on developing improved treatments for patients with acute myeloid leukemia (AML), on the pathogenesis of AML, and on measurable residual disease in AML patients. Dr. Heuser has been a clinical investigator in 70 clinical trials and has published more than 200 peer-reviewed publications.

#### Talk title

"Training the next generation in Digital Medicine: Experience from the DigiStrucMed Graduate Program"



## **Chair Session VI**

#### **Tim Kacprowski**

Peter L. Reichertz Institute for Medical Informatics of TU Braunschweig and Hannover Medical School

Director Division Data Science in Biomedicine



I studied computational molecular biology at Saarland University and the Max Planck Institute for Informatics. After obtaining my PhD from Greifswald University in 2017 I moved to Odense, Denmark, for a PostDoc and became research group leader for computational systems medicine at the Technical University of Munich. In 2020, I joined the Technische Universität Braunschweig and Hannover Medical School as Professor for Data Science in Biomedicine at the PLRI. My main expertise and research focus comprise network biology, omics analyses and systems medicine. Since joining PLRI, I also work on integrating sensor data, immersive analytics and text mining for ethics and science of science applications.

# **Chair Session VI**

#### Tim Beißbarth

University Medical Center Göttingen, Department of Medical Bioinformatics

Director of Department, Professor for Medical Bioinformatics and Systems Medicine

in the German Medical Data Science Society (GMDS).



formatics (https://bioinformatics.umg.eu) of the University Medical Center Göttingen (UMG). Tim Beißbarth has a background in Biology and Computer Science and has been working in the area of Bioinformatics since 1998. He has been working at the German Cancer Research Center (DKFZ, Heidelberg), MPI Molecular Genetics (Berlin), WEHI (Melbourne, Australia) before and has joined the UMG in 2008. His work focuses mainly on the development of computational methods to analyze and interpret molecular high-throughput data, such as genomics, proteomics, transcriptomics, etc. and the integrative multi-omics analysis. Therefore, statistical and machine learning methods are applied, implemented and further developed. These methods are then applied in collaborative research projects with biomedical researchers and clinician scientists. Among the application areas, Cancer Research and Systems Medicine approaches have been a particular fokus. In recent year the research group has developed especially approaches and tools for the Molecular Tumorboard. Tim Beißbarth is currently representing the subject "Medizininformatik und medizinische Bioinformatik" in the review board of the

DFG and has build up the division "Medical Bioinformatics and Systems Biology"

#### Talk title

"How can we make sense of the data overload in cancer research?"

# **SESSION VI:** Al and Machine Learning Techniques Improving Cancer Research

#### Francesca Finotello

Institute of Molecular Biology and Digital Science Center (DiSC), University of Innsbruck

#### **Assistant Professor**

Francesca Finotello earned her PhD in Bioengineering in 2014 at the University of Padova, Italy. She is an Assistant Professor at the Institute of Molecular Biology and Digital



Science Center (DiSC) of the University of Innsbruck, Austria, where she leads the Computational Biomedicine group. She has longstanding expertise in the bioinformatic analysis of bulk and single-cell multiomics data and in the development of computational methods to inform precision and personalized medicine.

Her group has a particular focus on cancer immunology and integrates bioinformatics, systems biology, and machine learning techniques to elucidate the rules governing tumor-immune cell interaction. By characterizing the landscape of cancer neoantigens, the composition of the tumor immune contexture, and the intricate crosstalk governing cell-cell interactions in the tumor microenvironment, she aims at extracting mechanistic rationale to improve cancer immunotherapy.

#### Talk title

"Modelling immunotherapies in silico"

**Jack Kuipers** D-BSSE, ETH Zurich

#### **Senior Scientist**

Jack Kuipers received his PhD in Mathematics from the University of Bristol in 2008. Upon winning a Humboldt fellowship he then moved to the University of Regensburg to conduct research in Complex Quantum systems. In 2014



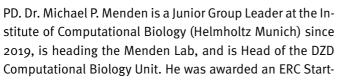
Jack joined the Department of Biosystems Science and Engineering of the ETH Zurich, where he is currently a Senior Scientist in the Computational Biology Group. Early 2019, Jack was a visiting scientist at the Harvard School of Public Health.

Jack's interdisciplinary work revolves around modelling cancer evolution and probabilistic graphical models for multi-omics cancer data, with a particular emphasis on computational methods for single-cell sequencing analysis and their phylogenetic tree inference.

#### Talk title

"Understanding tumor evolution with statistical machine learning"

Michael P. Menden Helmholtz Munich Junior Group Leader





ing Grant in 2020, and the McGuigan Rising Star Award in Drug Discovery by Cardiff University in 2022. In addition, Dr. Menden habilitated in Human Biology and Bioinformatics at LMU in 2022. Previously, he worked as Senior Scientist in Oncology Bioinformatics, AstraZeneca, UK. He was a PhD student and postdoctoral fellow at EMBL-EBI, UK. His PhD was awarded in Computational Biology by the University of Cambridge, UK in 2016.

The mission of the Menden Lab is to develop biostatistical and machine learning frameworks applied to biomedical data, to retrieve insights in the aetiology of complex diseases and identify novel intervention strategies. For this, his team explores deep molecular characterised biomedical datasets, environmental factors, and tailor their models depending on disease specific knowledge, literature and data driven analyses, thus empowering the next generation of drug target identification, drug repositioning and precision medicine.

#### Talk title

"A Vision of Computational Translational Pharmacogenomics"



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# **Poster Session**

## Session 1 – Digital and Computational Histopathology

#### 1. Lars Drüke

CD20 (B cells) and CD47 are predictive biomarkers for response to check point inhibitor therapy in renal cell carcinoma

#### 2. Kimia Mirzakhani

Molecular subtype characterization and comparison of different generated ex vivo and in vitro models derived from primary PDACs

- Mehdi Naouar (selected talk from poster abstract)
   Robust Metastases Detection in Whole Slide Images Via Multi-Magnification Ensembles
- Simon Peter (selected talk from poster abstract)
   The immune tumor microenvironment in intrahepatic cholangiocarcinoma

#### 5. Svea Schwarze

The feasibility of crowdsourcing for complex cell annotations by using Amazon Mechanical Turk

#### 6. Chiara Tappermann

An end-to-end web-application for image analysis to detect changes in melanoma images and classify skin cancer using neural networks

#### 6a. Felipe Miranda Ruiz

CNN Stability Training improves robustness to scanner and IHC-based image variability for epithelium segmentation in cervical histology

#### 6b. Andreas Keil

Automatic quality control in digital pathology for dual-stain slides with CYTOREADER and CINtec® PLUS using a deep neural network

### Session 2 – Al to advance Cancer Imaging

#### 7. Jan-Niklas Eckardt

Explainable End-to-End Deep Learning Identifies Myelodysplastic Syndromes in Bone Marrow Smears

#### 8. Rahul Kodarapu

Deep Learning-based Segmentation of Breast Biopsy Marker in Ultrasound Data

#### 9. Rimma Kondrashova

Comparison of AI software tools for automated detection, quantification and categorization of pulmonary nodules in the HANSE LCS trial

#### **10. Bernd Schweizer** (selected talk from poster abstract)

Truncated and Limited Angle CT Reconstruction using NeRF Architectures

#### 11. Simon Schröer

KalmanNet in MR-Thermometry: A step towards accurate real-time 3D monitoring of thermoablation procedures

#### 12. Annemarie Uhlig

Artificial Intelligence for asesssment of renal tumors: a multicenter study using Computed Tomography data from clinical routine.

#### **13. Johannes Uhlig** (selected talk from poster abstract)

An explainable AI-approach to automatic segmentation of renal tumors on CT: a multicenter imaging study.

# Session 3 – Machine Learning and Visualization Techniques for Clinical Decision Support in Oncology

#### **14. Serhii Aif** (selected talk from poster abstract)

Reinforcement learning agent improves evolution-based cancer therapies

#### 15. Lena Becker

Effectuality study of a 3D motion correction algorithm in C-arm CTs of severely impaired image quality during transarterial chemoembolization

#### 16. Lasse Benzinger

Should Artificial Intelligence be used to support clinical ethical decision making? A systematic review of reasons

#### 17. Jürgen Dönitz

A biomarker interpretation framework for molecular tumor boards and biomedical research

#### 18. Johanna Ernst

App-based digitalization communication and documentation in emergency medicine as illustrated in the field of stroke care

#### 19. Luca-Marie Heinze

One Serum Creatinine - Several Dosings of Cytotoxic Drugs: Different Estimation of Filtration Rate Influence Conditioning Intensity (N=959)

#### 20. Kevin Kornrumpf

CNV-Database: Creating a copy number variation database for a pan-cancer analysis

#### 21. Nadine Kurz

OnkopusClients: A generic modular toolkit for sequential processing of biomarker data

#### **22. Stefan Schrod** (selected talk from poster abstract)

Machine Learning guided treatment optimization for personalized medicine

#### 23. Julian-Philipp Waclawski

Next generation Flow Cytometry to quantify and characterize the leukemic stem cell population in acute myeloid leukemia.

# **Poster Session**

## **Session 4 – Digital Surgery**

**24. Frank Ursin** (selected talk from poster abstract)

Intraoperatively applied Mixed and Augmented Reality Technologies for Digital Surgery: Systematic Review of all Ethical Issues

#### 25. Jan Rieger

Localization of Breast Biopsy Markers in Ultrasound Data for Intraoperative Guidance – First Results on in-vivo Data

# Session 5 – Building Trust in Artificial Intelligence Models and Digital Methods in Medical Education

**26. Jacqueline Beinecke** (selected talk from poster abstract)

CLARUS: An Interactive Explainable AI Platform for Manual Counterfactuals in Graph Neural Networks

#### 27. Cornelia Dewald

A Maximum-Difference-Scaling Analysis to Identify the Relevant Attributes for Liver Cancer Therapies

#### 28. Chiara Reichert

Personalizing support for patients in the process of genetic counseling with a mobile assistant

#### 29. Ekaterina Petrova

Improving mental well-being in cardiovascular disease - development and validation of an unguided web application based on metacognitive therapy

# Session 6 – Al and Machine Learning Techniques Improving Cancer Research

#### 30. Markus Ausserhofer

NovumRNA: a comprehensive pipeline to predict non-canonical neoantigens from tumor RNA sequencing data

**31. Hryhorii Chereda** (selected talk from poster abstract)

Stability of feature selection utilizing Graph Convolutional Neural Network and Layerwise Relevance Propagation

**32. Klara Drofenik** (selected talk from poster abstract)

Classifying protein variants of unknown significance with machine learning structure prediction models

#### 33. Peng Li

Neural Network Based Multi-State Health Status Framework to Predict Outcomes of Cancer Survivors

#### 34. Lorenzo Merotto

omnideconv: enabling next-generation deconvolution of the tumor microenvironment informed by single-cell RNA sequencing

#### 35. Julia Nießen

Supramolecular assembly of GSK3a as a prospective biomarker for treatment response in acute lymphoblastic leukemias

#### 36. Michelle Tang

Al4leukemia: an Al supported clinical framework that facilitate clinical decision making and translational research

#### 37. Yannick Vogt

On the Chances and Limitations of Structure-Based Al Models for Automated Antibody Design

#### 38. Constantin Zackl

Spacedeconv streamlines spatial transcriptome deconvolution to reveal cellular niches in the tumor microenvironment

# **Information**



## **Additional Highlight**

Intuitive Surgery Workshop on a Da Vinci Surgical System

The company Intuitive Surgery brings three Da Vinci robot consoles during the Digital Oncology Conference. There will be the possibility of a handson training for assistant doctors, especially from the fields of gynecology, urology, visceral surgery.

At multiple stations, professional trainers will give an introduction to the technology and handling of the daVinci Surgical System.

#### Sessions at:

Day 1 | March 15, 2023: 12:30-13:00; 13:00-13:30; 13:30-14:00; 14:00-14:30 h

Day 2 | March 16, 2023: 9:00-9:30; 9:30-10:00; 10:00-10:30; 10:30-11:00 h; 14:00-14:30;14:30-15:00;15:00-15:30 h

### **Evaluation**

Thank you for attending the Digital Oncology Conference – an Else Kröner Symposium on March 15 and 16 2023. We would like to learn from these events for the future. Please scan the QR-code below and complete the evaluation form to help us improve the conference. Participation in the evaluation is anonymous and will take not more than 3 minutes. Your feedback is very important to us.

Thank you very much!
Your CCC-N Team

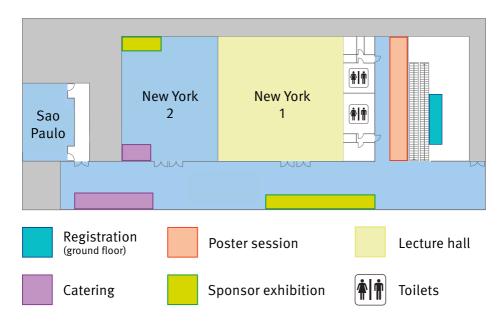


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# **Information**



#### **HALL 19, FIRST FLOOR**



## **Internet access**



Internet is available free of charge via WLAN. Please dial into the "MESSE freewifi" network. You will be automatically redirected to the Deutsche Messe AG portal page and can dial in using the "oneklick" dial-in procedure.

#### SUPPORTED BY



## **Comprehensive Cancer Center Niedersachsen (CCC-N)**

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