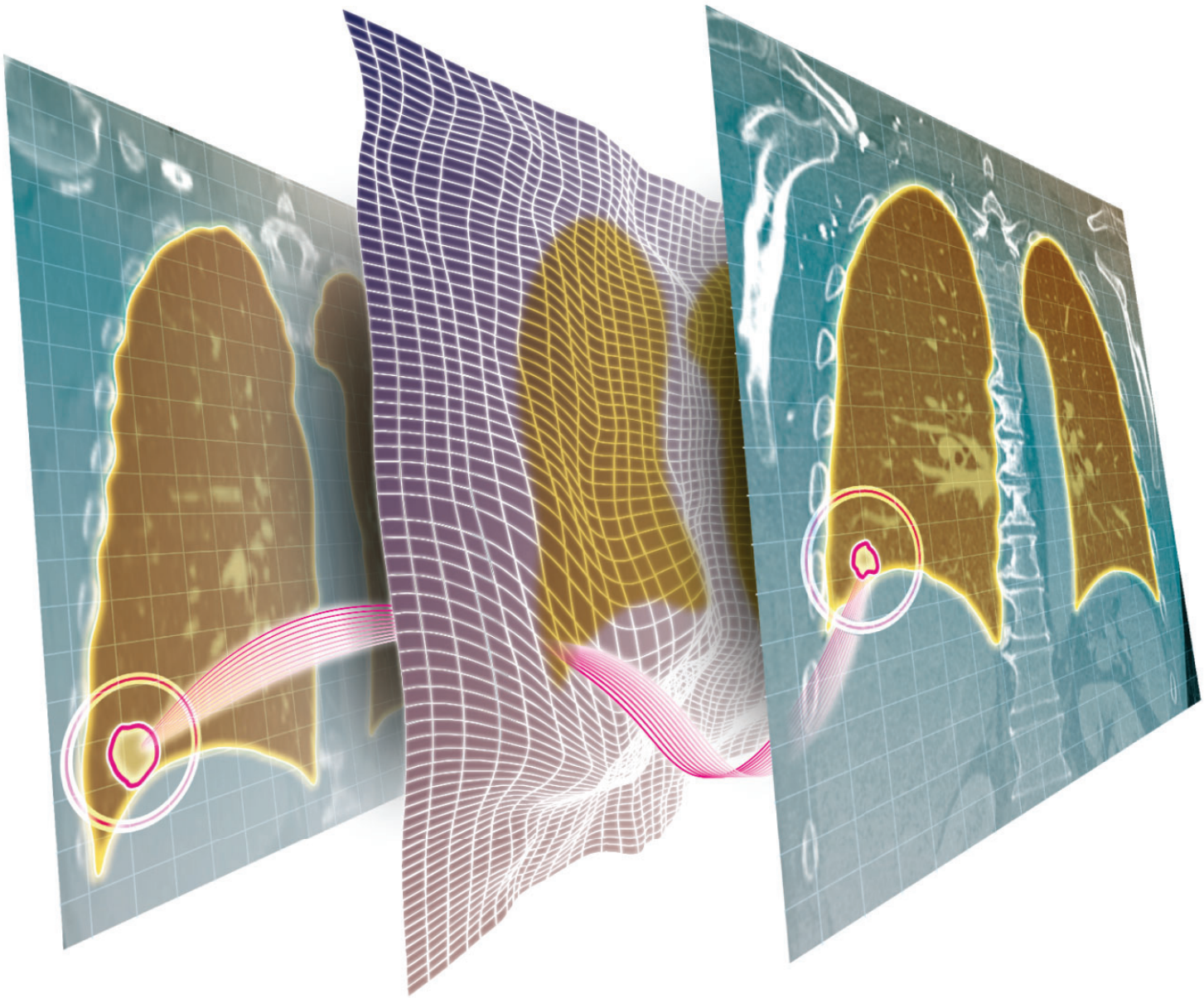
Fraunhofer
MEVIS

FRAUNHOFER INSTITUTE FOR DIGITAL MEDICINE



# ANNUAL REPORT
# 2023/24

# FRAUNHOFER MEVIS

# INSTITUTE FOR DIGITAL MEDICINE

# ANNUAL REPORT 2023/24

*A deep learning approach allows CT images to be compared automatically in the context of cancer treatment — so that even small changes to lung tumors can be detected and located with greater speed and precision.*

# TABLE OF CONTENTS

# FRAUNHOFER MEVIS AT A GLANCE

## BRIEF PROFILE

The Fraunhofer Institute for Digital Medicine MEVIS, in short Fraunhofer MEVIS, is dedicated to the development of software and IT solutions to overcome the rapidly growing complexity in healthcare. Fraunhofer MEVIS combines technological excellence with close clinical integration and acts as a bridge from research to product. Through longstanding collaborations and intensive networking with hospitals and clinical partners, Fraunhofer MEVIS has deep clinical expertise and direct access to realworld data, testing environments and enduser feedback — clear advantages over purely academic or purely industrial players. Building on more than 30 years of experience, Fraunhofer MEVIS delivers solutions with demonstrable clinical impact. A key differentiator is the proven ability to translate prototype approaches into regulatory compliant, quality assured, maintainable software — making them product-ready for industry partners. Combined with structured validation and transfer knowhow, this enables the delivery of tailored, clinically deployable products that sustainably accelerate the path from idea to clinical use.

**Strategic Considerations**

The roots of Fraunhofer MEVIS lie in the creation, quantitative analysis, and interactive exploration of medical image data in their specific clinical context. We believe that medical imaging shall no longer be regarded as a field on its own. Instead, image features must be quantitatively correlated to available clinical information in order to discover new relevant knowledge. Fraunhofer MEVIS is uniquely positioned to achieve this by combining its deep understanding of clinical procedures and issues with mastery of the entire technology value chain — from imaging physics and data generation to algorithm and platform development to validation, product certification, and clinical implementation. We have built substantial expertise and a good reputation in the deep learning and artificial intelligence (AI) arena. This enables us to successfully cope with the rapidly growing complexity in all diagnostic and therapeutic domains. While many competitors worldwide are active in the field of medical AI, Fraunhofer MEVIS is one in a few that covers the complete process of knowledge generation to eventually make AI a powerful clinical tool in hospitals and medical practices. Solutions based on our collaborative and modular software platforms are used likewise in multi-centric clinical trials and pharmaceutical research.

**Clinical Commitment**

Research and development at Fraunhofer MEVIS is primarily guided by clinical needs instead of being technologically or methodologically driven. Our work focuses on developing innovative solutions for computer-assisted medical processes and their industrial implementation for clinical use. Identifying and analyzing clinical issues demands a deep understanding of medical research and calls for close cooperation with clinical partners. Fraunhofer MEVIS maintains an international network of more than 100 clinical partners — an essential source for understanding user needs and evaluating clinical value and feasibility of developed solutions.

**Industrial Collaboration**

True innovation, i.e., the successful launch of solutions onto the market with tangible impact, is only possible through close collaboration with industrial partners that provide the necessary resources and market know-how to fuel the development of new technologies. Fraunhofer MEVIS functions as the link between clinicians and industry, aiming at technological advancement for clinical use. Transferring applied research to the industry is a pillar of the institute and a basis for its future research. Partners for cooperation and clients for industrial research and development include large firms and small- or medium-sized ventures in medical technology, pharmaceutics, and related fields.

**Certification**

Successful introduction of innovative approaches onto the market requires adherence to specific regulations, such as the Euro-

pean Conformity (CE), the European Medical Device Regulation (MDR), or the approval guidelines of the United States Food and Drug Administration (FDA). Since 2005, Fraunhofer MEVIS has been part of a small group of medical technology research institutions worldwide that operate a quality management system according to the EN ISO 13485 (Medical Devices) standard with a special focus on implementing a software development process in compliance with IEC 62304. The establishment of the quality management system certified for the scope "design, development and production of software for medical products according to customer requirements" lays out well-defined steps for industrial cooperation and enables Fraunhofer MEVIS to provide market-ready solutions for commercial partners in the strongly regulated medical device market.

**Software Platforms and Solutions**

Fraunhofer MEVIS has initiated and developed a family of versatile, modular web-based software platforms that enable our partners and ourselves to quickly build innovative solutions and to adapt to new challenges flexibly.

The ***MeVisLab*** development platform (www.mevislab.de) by Fraunhofer MEVIS and MeVis Medical Solutions AG is a tool for rapid prototyping, flexible development of clinical software solutions, as well as developing products and methods for fields such as image analysis, visualization, and biophysical modeling. The joint use of *MeVisLab* at Fraunhofer MEVIS and partners in research, medicine, and industry promotes synergy, accelerates development and supports their tight technological integration.

Many of the software prototypes and solutions developed by Fraunhofer MEVIS are based on MeVisLab. Examples of ready-to-use software solutions for application in clinical workflows or in research and development include:

***OncoChange*** is an AI-driven software that enables radiologists to perform CT-based tumor follow-up assessments in clinical practice more efficiently and reliably. *OncoChange* streamlines radiologists' workflows by automating lesion measurement and detecting relevant changes. By eliminating the time-consuming steps of re-localizing and measuring target lesions in follow-up scans, *OncoChange* enables compliance with standards such as RECIST (Response Evaluation Criteria In Solid Tumors), all without increasing workload. It integrates seamlessly with existing image viewing and reporting software. OncoChange addresses the critical challenges posed by the radiologist shortage by significantly enhancing workflow efficiency.

***HistokatFusion*** brings cutting-edge image registration technology into computational pathology, and integrates different sources of information. By seamlessly aligning multiple stained sections, *HistokatFusion* facilitates in-depth analysis, accelerates biomarker discovery, advances AI development, and supports the personalization of therapies.

***CuraMate*** (formerly known as *SATORI*) is a cutting-edge toolkit designed for efficient annotation, segmentation, and image feature quantification. It provides highly customizable annotation forms, intuitive interactive contouring tools, and fully automated segmentation algorithms, allowing for a versatile approach to various annotation tasks. Once a reader study is properly set up and configured, *CuraMate* aims to guide collaborating users with different roles through their work effectively, while also ensuring that preventable errors are avoided. Finally, CuraMate integrates seamlessly with components for training and inference of Deep Learning models. A standout feature is the integrated training loop, enabling users to enhance neural networks continuously by iteratively adding new training data and correcting errors in previous algorithmic outputs.

***gammaSTAR*** represents the next evolution in MRI pulse sequence development. It provides a universal format that is compatible with different MRI models, software versions and vendors. The software solution eliminates reliance on scanner-specific sequences, enables seamless integration and accelerates the transfer of MRI technology into clinical setting. The integration of *gammaSTAR* saves time and costs in clinical workflows by enhancing MRI compatibility and minimizing manual sequence adjustments and interaction. In large imaging studies, *gammaSTAR* helps maintain consistency across multiple devices.

**Links to Academic Institutions**

In addition to the network of clinical partners, Fraunhofer MEVIS maintains a strong network of technological and academic partners. In addition to the associated professorships at local universities in the State of Bremen, joint professorships and strategic cooperations connect Fraunhofer MEVIS with universities at other sites. In 2023 and 2024, Fraunhofer MEVIS was linked to eight universities in Germany and the Netherlands via a total of twelve professorships:

- University of Bremen:
  Prof. Horst Hahn, Prof. Matthias Günther
- Constructor University Bremen:
  Prof. Tobias Preußer, Prof. Markus Wenzel
- Bremerhaven University of Applied Sciences:
  Prof. Richard Rascher-Friesenhausen, Prof. Klaus Eickel
- University of Lübeck: Prof. Jan Modersitzki
- Charité / TU Berlin: Prof. Anja Hennemuth
- Hannover Medical School: Prof. Andrea Schenk
- RWTH Aachen: Prof. Fabian Kießling, Prof. Volkmar Schulz
- Radboud University Nijmegen: Prof. Bram van Ginneken

**Brief History**

Fraunhofer MEVIS was founded in August 1995 as *MeVis — Center for Medical Diagnostic Systems and Visualization*, a non-profit limited liability company (gGmbH) at the University of Bremen, partially funded by the State of Bremen. Its founder Prof. Heinz-Otto Peitgen was appointed Executive Director. In 2006, the institute was renamed *MeVis Research GmbH, Center for Medical Image Computing*.

Since 1997, MeVis Research has spawned several legally and financially independent spin-offs, most of which merged in 2007 to form the publicly traded MeVis Medical Solutions AG. Between 1995 and 2008, the number of employees at MeVis Research rose steadily from 10 to 51 full-time positions.

On January 1, 2009, MeVis Research was incorporated into the Fraunhofer-Gesellschaft as the *Fraunhofer Institute for Medical Image Computing MEVIS*. During a transition phase of five years, the parent institute in Bremen (2009–2013) and the site in Lübeck (2010–2014) received funding from the States of Bremen and Schleswig-Holstein and were co-financed by the European Regional Development Fund (ERDF).

In October 2012, MEVIS founder Prof. Peitgen retired and handed over the management of the institute to his former deputy, Prof. Horst Hahn. From May 2014, the institute was jointly headed by Prof. Hahn and Prof. Ron Kikinis. Since March 2020, Prof. Hahn has been the sole managing director of the institute with two deputies.

**Recent Developments**

In January 2019, the institute changed its name to *Fraunhofer Institute for Digital Medicine MEVIS* to underscore its mission of driving the transition to tomorrow's digital precision medicine through systematic computer support.

Due to its success, Fraunhofer MEVIS received funding for a new building from the Federal Republic of Germany, the State of Bremen, and the European Commission. It moved in its "Workshop of Digital Medicine" in May 2021.

In August 2022, Fraunhofer MEVIS launched a high-performance cluster for computationally intensive AI applications. The "KI-Cluster Health", purchased with ERDF funding, is equipped with 42 Nvidia A100 graphics processor units.

In December 2022, the TechsoMed GmbH was founded in Bremen, based on a collaboration with the Israeli medical technology company TechsoMed Ltd. in the field of ultrasound-guided thermal ablation.

*View of the Fraunhofer MEVIS institute building located on the campus of the University of Bremen. The "Workshop of Digital Medicine" accommodates up to 210 workplaces on a usable floor space of 2600 m². The building was funded in equal parts by the Federal Republic of Germany, the Federal State of Bremen, and the European Commission (ERDF).*


Fraunhofer
MEVIS

# OPERATING AND ORGANIZATIONAL STRUCTURES

Fraunhofer MEVIS' collaborative orientation is reflected in the institute's operating principles and organizational structure. Researchers are not bound to strict, hierarchically organized working groups, but act in a flexible network.

Project teams are put together with team members from different technological and clinical disciplines. This form of dynamic collaboration promotes cooperation and fosters cross-training, beneficial to both, the individuals and the institute as a whole.

Internal communication is governed by transparency and cooperation. Access to information is only restricted insofar as required by confidentiality agreements with customers or by legal constraints — otherwise sharing of information is encouraged and expected at all levels and is actively aided by exchange forums such as the social Wiki-based intranet (Confluence), morning meetings for all institute members, and an active information policy by the leadership. Initiative beyond obvious work assignment is highly encouraged.

One guiding principle of Fraunhofer MEVIS is to value the diversity of all employees. Our diversity management aims to create a working environment in which all employees have fair opportunities for participation and development — irrespective of their ethnic origin, gender, religion and ideology, disability, age or sexual identity.

Three male and three female persons of trust are elected by the staff to function as liaisons and mediators when needed. In addition, two female equal opportunity officers are elected to promote and ensure balanced participation and diversity.

To improve management, organization, and staff development, Fraunhofer MEVIS established a mentoring system. A group of experienced staff members act as mentors or co-mentors to less experienced colleagues (mentees). Responsibilities of the mentors include the professional development of the mentee, the coordination between the goals of the institute and those of the mentee, as well as the identification and addressing of potential conflicts and problems.

Fraunhofer MEVIS introduced a structure of organizational entities (OEs) each with a responsible OE manager (OEV). The main objectives of the OE structure are:

- clear allocation of responsibilities,
- delegation of project budgets, and
- strengthening the strategic focus.

Allocated budgets must be explicitly used for appropriate strategic objectives. Objectives and budgets are coordinated by the OEVs in consultation with the institute directors and the financial management. OEVs are by default mentors for their respective OE members. Mentees can freely choose their OE as well as their co-mentor.

Overall responsibility for the institute is organized in a central leadership and administration structure. The heads of the institute are:

- Prof. Horst K. Hahn (Managing Institute Director)
- Prof. Matthias Günther (Deputy)
- Prof. Andrea Schenk (Deputy)
- Thomas Forstmann (Head of Administration)

They are assisted in operational and strategic decisions and tasks by

- the OEVs,
- four leadership committees for human resources (LH), finance (LF), quality management (LQ), and IT security (LS), and
- the Institute Management Committee (Institutsleitungsausschuss, ILA).

The ILA has an advisory function, prepares decision papers for the institute's management, and can also pass resolutions in consultation with the institute's management in their absence. The ILA consists of eight employees with equal voting rights plus a person of trust and an equal opportunity officer. It meets once a month and as needed.

Next to its internal structures, Fraunhofer MEVIS has an external independent Advisory Board which advises the institute's management on matters relating to scientific focus, strategic orientation, and clinical as well as industrial translation.

# ADVISORY BOARD

Fraunhofer MEVIS is supported by its Advisory Board (Kuratorium) which is composed of persons with diverse backgrounds relevant to the institute. It advises the management of Fraunhofer MEVIS in issues of scientific focus, strategic orientation, and clinical as well as industrial translation.

The 2023 and 2024 Advisory Board meetings, chaired by Prof. Hans Maier, were the first held in person after the coronavirus pandemic and took place in the new Fraunhofer MEVIS institute building. The representatives of the Fraunhofer-Gesellschaft and the Fraunhofer MEVIS management provided an overview of current developments, followed by an in-depth discussion of structural and financial prospects. Beyond their usual role as advisors, the members of the Advisory Board have been actively involved in the strategy process of Fraunhofer MEVIS in several workshops and interviews.

In 2023, Dr. Muylkens retired and Prof Magheli was newly appointed to the Advisory Board. In 2024, Prof. Schill stepped down from the Advisory Board after ten years of membership. The representatives of the Fraunhofer-Gesellschaft and the Fraunhofer MEVIS management thanked the retiring members for their great commitment and warmly welcomed the new appointee.

In 2023 and 2024, the Advisory Board consisted of the following persons:

**Chairs**

*Prof. Hans Maier (since 2009)*
Chief Executive Officer (CEO) German Heart Center Berlin
Vice Chairman Supervisory Board German Heart Center Charité Berlin

*Prof. Mathias Prokop (since 2014)*
Radboud University Medical Center, Nijmegen
University Medical Center, Groningen
The Netherlands

**Medicine**

*Prof. Ahmed Magheli (since 2023)*
Vivantes Klinikum Am Urban
Berlin

**Science**

*Prof. Iris Pigeot (since 2022)*
Leibniz Institute for Prevention Research and Epidemiology — BIPS
Bremen

**Industry**

*André Hartung (since 2022)*
Siemens Healthineers, Forchheim

*Stefan Widensohler (since 2019)*
Krauth Invest GmbH & Co. KG, Hamburg

**Universities**

*Prof. Kerstin Schill (2014-2024)*
Hanse-Wissenschaftskolleg, Delmenhorst
University of Bremen

**Research Funding**

*Dr. Michaela Muylkens (2022-2023)*
Bremen Senator of Science and Ports, Bremen

*Dr. Bernd Roß (since 2019)*
Ministry of Education, Science and Culture, Kiel

**Guests**

*Prof. Gerhard Hindricks*
Clinic for Cardiology, Angiology and Intensive Care Medicine
Charité – Universitätsmedizin Berlin

*Prof. Ron Kikinis*
Former Institute Co-Director (2014-2020)
Boston/USA

*Prof. Heinz-Otto Peitgen*
Founder and former Institute Director (1995-2012)
Bremen

*Participants of the 16th meeting of the Fraunhofer MEVIS Advisory Board on June 21, 2024 in Bremen.*

# THE INSTITUTE IN FIGURES

**Budget and Earning Trends**

In 2024, Fraunhofer MEVIS increased its total earnings and industry earnings to record levels of nearly 17 million euros. The main contributors were publicly funded earnings, including internal Fraunhofer projects, with 8.4 million euros (50%), followed by industry earnings and other third-party funding with 4.2 million euros (31%). Our regular basic funding rose to 3.1 million euros (19%). Thanks to the successful results in the years 2018 to 2023, the institute's reserves remained stable.

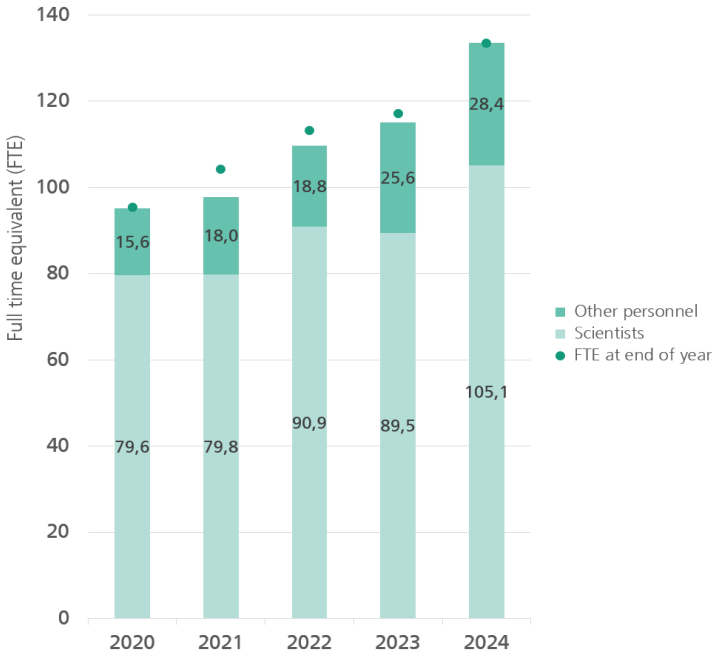

*Earnings in million euros in the period from 2020 to 2024.*

Operating Budget (OB), Investment Budget (IB) and Total Budget in thousand euros:

| | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| **OB:** | 11,306 | 11,448 | 12,946 | 13,737 | 16,070 |
| **IB:** | 122 | 947 | 220 | 1,865 | 679 |
| **Total:** | **11,428** | **12,395** | **13,166** | **15,602** | **16,749** |

**Human Resources**

The overall average number of persons employed by Fraunhofer MEVIS has increased significantly by 10 full-time equivalents (FTE) in 2024 (+8.6%). This is due to a high project workload and for strategic considerations integrating our Hamburg group into Fraunhofer MEVIS. The vast majority of these positions are for scientific personnel (+8 FTE). The high level of FTE at the end of 2024 (133.5 FTE or +14 FTE compared to 2023) reflects the dynamic growth over the last 3 years.




*Development of employment figures for scientists and other personnel shown as annual average FTE between 2020 and 2024. The dots indicate the staff FTE at the end of the year.*

Full-time equivalents as annual average (avg FTE) and at the end of the year (eoy FTE):

| | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|
| **avg FTE:** | 95.2 | 97.8 | 109.7 | 115.1 | 125.1 |
| **eoy FTE:** | 95.4 | 104.2 | 113.3 | 117.1 | 133.5 |

# THE FRAUNHOFER-GESELLSCHAFT

The Fraunhofer-Gesellschaft, headquartered in Germany, is one of the world's leading organizations for applied research. Since its founding as a nonprofit organization in 1949, Fraunhofer has held a unique position in the German research and innovation ecosystem. With nearly 32,000 employees, the research organization operates 75 institutes and independent research units across Germany. The Fraunhofer-Gesellschaft plays a major role in innovation by prioritizing research on cutting-edge technologies and the transfer of results to industry to strengthen Germany's industrial base and for the benefit of society as a whole.

Fraunhofer's primary customer base consists of large and medium-sized companies that utilize its expertise to boost their competitiveness with new technologies. For years, Fraunhofer has been one of the most active patent applicants in both Germany and Europe. Its extensive international patent portfolio is the basis for technology transfer through research projects, spin-offs and licensing. Moreover, Fraunhofer addresses societal goals in key technology sectors through interdisciplinary and international partnerships in specific markets. Examples include developments in microelectronics, artificial intelligence (AI), quantum computing, healthcare, the circular economy, new materials, energy systems, critical infrastructure security and defense.

Fraunhofer is an attractive and established partner in publicly funded joint projects with industry partners. The Fraunhofer-Gesellschaft is also instrumental in strengthening Germany's innovation and industrial base and ensuring its viability. Its activities create jobs in Germany, increase public-sector investments, give companies competitive edges and foster public acceptance of advanced technology. International partnerships with leading research partners and companies around the world ensure direct contact with the most influential research communities and economic areas.

Fraunhofer's annual business volume is €3.6 billion, €3.1 billion of which is generated by contract research — Fraunhofer's core business model. Unlike other public research organizations, base funding from the German federal and state governments is merely the foundation for the annual research budget. This serves as the basis for groundbreaking precompetitive research that will become important for the private sector and society in the years ahead. Fraunhofer's distinctive feature is its large share of industry revenue, guaranteeing close collaboration with the private sector and industry and the consistent focus of Fraunhofer's research on the market. In 2024 alone, industry revenue accounted for €867 million of its total budget. Fraunhofer's research portfolio is augmented by competitively acquired public-sector funding, pursuing the right balance between public-sector and industry revenue.

Highly motivated employees are the most important factor behind Fraunhofer's success. The research organization therefore fosters an environment that encourages independent thinking, creativity and goal-driven work. It supports career development in both research and industry by providing targeted programs for professional and personal development.

The Fraunhofer-Gesellschaft is a recognized nonprofit organization named after Joseph von Fraunhofer (1787–1826), a Munich-based scholar who enjoyed equal success as a scientist, inventor and entrepreneur. His legacy continues to inspire the organization's spirit of innovation to this day.


*Locations of Fraunhofer institutes in Germany in 2024. Fraunhofer MEVIS has major sites in Bremen, Berlin, Hamburg, and Lübeck.*

# THE YEARS 2023/24

## CHRONICLE

**January 12-13, 2023**
Recertification audit of the Fraunhofer MEVIS quality management system by DEKRA.

**February 19-23, 2023**
Fraunhofer MEVIS presents AI and CAD support for diagnosis and therapy in digital medicine at the SPIE Medical Imaging conference in San Diego, California.

**February 27, 2023**
Diversity Workshop for employees of Fraunhofer MEVIS in Bremen.

**March 27, 2023**
Prof. Henrik Grönberg from Karolinska Institutet in Stockholm is visiting Fraunhofer MEVIS.

**April 3, 2023**
Prof. Andrea Schenk appointed deputy institute director of Fraunhofer MEVIS.

**April 25-27, 2023**
Fraunhofer MEVIS presents innovative research for the lead market of digital healthcare at the DMEA 2023 trade fair in Berlin.

**May 19, 2023**
Prof. Horst Hahn appointed honorary member of the German Radiological Society (DRG) at the German Radiology Congress (RÖKO) in Wiesbaden.

**June 12, 2023**
15th annual meeting of the Fraunhofer MEVIS Advisory Board in Bremen.

**June 17 - September 17, 2023**
Exhibition of EVOLVER by artists Marshmallow Laser Feast, key scientific partner Fraunhofer MEVIS, at MUSEUM WAVE in Seoul, Korea.

**August 25, 2023**
Workshop on disability awareness for employees of Fraunhofer MEVIS in cooperation with Inklupreneur.

**August 28, 2023**
Speculative Fiction workshop on future professions in digital medicine with Prof. Joachim Friedmann from the ifs International Film School Cologne and school students.

**August 29, 2023**
Executive vice presidents Elisabeth Ewen and Dr. Sandra Krey at Fraunhofer MEVIS for the dialogue format *'Vorstand vor Ort'*.

**August 30, 2023**
Prof. Gerhard Hindricks from the German Heart Center and the Clinic for Cardiology (DHZC) at the Charité Berlin is visiting Fraunhofer MEVIS.

**September 20, 2023**
Fraunhofer MEVIS hosts a reception for international scientists organized by the University of Bremen Research Alliance (UBRA).

**October 19, 2023**
Premiere of Whose Scalpel 2.0, a development of the outcome of the STEAM Imaging I residency with artist Yen Tzu Chang, at INTER-ARTISTIC EXPRESSIONS in Taipei, Taiwan.

**November 14, 2023**
Start of International Fraunhofer Talent School Bremen: STEAM Imaging V – *Holding the 'Digital' in Medicine to Account* with medic and artist Fiona Smith.

**November 25, 2023**
Fraunhofer MEVIS is hosts gastrology clinicians at their congress *23. Bremer Gastro-Tag* organized by Gesundheit Nord Bremen.

**November 26-30, 2023**
Fraunhofer MEVIS presents its latest developments in AI-based digital medicine at RSNA 2023 in Chicago, USA.

**February 6-8, 2024**
Monitoring audit of the Fraunhofer MEVIS quality management system by DEKRA.

**March 6, 2024**
Fraunhofer MEVIS commissions a photovoltaic system installed on the roof of the institute building, which covers approximately 10 percent of its electricity needs.

**March 26, 2024**
The Fraunhofer-Gesellschaft celebrates its 75th anniversary.

**April 4, 2024**
Workshop *MRI Sequence Composition Beyond Academia* at the Institute for Design Informatics at the University of Edinburgh.

**April 5, 2024**
Exhibition of *The BOX Will See You Now*, outcome of *STEAM Imaging V*, at Edinburgh Science Festival, UK and in September at Ars Electronica's JKU MEDCampus in Linz, Austria.

**April 9-11, 2024**
Fraunhofer MEVIS presents innovative research for the lead market of digital healthcare at the fair DMEA 2024 in Berlin.

**April 11-12, 2024**
Institute-wide workshops to commonly develop a set of guiding principles (Leitziele) for Fraunhofer MEVIS.

**April 25, 2024**
Girls' Day activities at Fraunhofer MEVIS (annually since 2014).

**May 21, 2024**
Visit by Bremen's Senator for Health Claudia Bernhard and State Councilor Silke Stroth.

**June 21, 2024**
16th annual meeting of the Fraunhofer MEVIS Advisory Board in Bremen.

**June 28, 2024**
Fraunhofer MEVIS is participating in a new special exhibition entitled *AI, what's up?* at the Universum Bremen science museum.

**August 8, 2024**
Kick-off event at Fraunhofer MEVIS for the trial run of the *Digital Medicine* specialization at the Oberschule am Waller Ring.

**August 21, 2024**
STEAM workshop: *Expansion & imagination of the human body* with alumni artist Yen Tzu Chang and school students.

**August 26-29, 2024**
Multi-day workshop on medical imaging for the *Informatica Feminale* at the University of Bremen (annually since 2013).

**September 11, 2024**
Fraunhofer MEVIS Bremen Big Date Challenge Pupils Track: *Clinical Decision Support for Physicians*, initiated by the Stiftung Bremer Wertpapierbörse (BWB).

**September 25, 2024**
Inaugural visit by Bremen's Senator for Science Kathrin Moosdorf, State Councilor Irene Strebl, and Head of the Department for Science Planning and Research Funding Dr. Lars Henning.

**October 21, 2024**
Roundtable discussion on early detection of prostate cancer with experts from various medical disciplines, policy makers, and health insurance professionals.

**October 28, 2024**
STEAM Workshop *Breast Health Awareness* to promote understanding of breast health among school students as well as their female friends and relatives (annually since 2022).

**December 1-5, 2024**
Fraunhofer MEVIS presents its latest developments in AI-based digital medicine at RSNA 2024 in Chicago.

# AWARDS 2023/24

**DGDM Master's Thesis Award 2023**
Fraunhofer MEVIS scientist Vanja Cangalovic awarded by the Deutsche Gesellschaft für Digitale Medizin e.V. (DGDM) for her masters's thesis.

**Second Place at SPIE CAD Live Demo Award 2023**
The Fraunhofer MEVIS team takes second place with two demos at the Computer-Aided Diagnosis Live Demonstrations Award at the SPIE Medical Imaging Conference in San Diego.

**Wiley Top Downloaded Articles 2023**
Articles by Fraunhofer MEVIS scientists Lars Walczak and Sonja Wichelmann (formerly Jäckle) are among the most downloaded articles in the Wiley journals *Computer Graphics Forum and International Journal of Medical Robotics* and *Computer Assisted Surgery*.

**Second place at SemiCOL Challenge 2023**
The MEVIS team wins the second place out of nine participants in the SemiCOL 2023 challenge on semi-supervised learning for colorectal cancer organized under supervision of the European Society of Integrative and Digital Pathology (ESDIP).

**Best Technical Implementation at HACK|BAY 2023**
The team around Dennis Philipp recognized for the best technical implementation for the Siemens Healthineers challenge *Improve Children's Radiology Experience* at the HACK|BAY hackathon in Nuremberg.

**University Lübeck's Open Science Prize 2023**
Alessa Hering, scientist at Fraunhofer MEVIS and Radboud University Medical Center Nijmegen, receives the University of Lübeck's Open Science Prize 2023 for her commitment to co-organizing the challenge *Learn2Reg: Open Science in Medical Image Registration*.

**Highly Cited Researcher 2023**
Professor Fabian Kiessling recognized by Clarivate as a Highly Cited Researcher 2023 in the Pharmacology and Toxicology category. This is the fifth consecutive year he has been on the Highly Cited Researcher list.

**NordWest Award 2024**
The project Model Region for Industrial Mathematics (MOIN) received the NordWest Award of the Metropolitan Region Northwest. Fraunhofer MEVIS is a partner in the sub-project *#MOIN Campus Neighborhood*.

**Research Prize in Orthopedics and Trauma Surgery 2024**
Researchers from Fraunhofer MEVIS, the University Medical Center Freiburg, and Stryker Leibinger GmbH & Co. KG received the Research Prize for Digitalization in Orthopedics and Trauma Surgery 2024 for their publication entitled *Validation of a Finite Element Simulation for Predicting Individual Knee Joint Kinematics*.

**Best Animation at Raw Science Film Festival 2024**
The documentary *We Flow into the World, and the World Flows into Us — The Beauty of Blood Flow* a joint work of Marshmallow Laser Feast and Fraunhofer MEVIS, received the Industry Award for Best Animation at the Raw Science Film Festival 2024 in New York.

**Highly Cited Researcher 2024**
Professor Fabian Kiessling recognized by Clarivate as a Highly Cited Researcher 2024 in the Pharmacology and Toxicology category. This is the sixth consecutive year he has been on the Highly Cited Researcher list.

# SELECTED HIGHLIGHTS 2023/24

**Personalia**

On April 3, 2023, the executive board of the Fraunhofer-Gesellschaft has appointed Prof. Andrea Schenk as deputy director of Fraunhofer MEVIS as. Together with the managing director Prof. Horst Hahn and the deputy institute director Prof. Matthias Günther, Prof. Andrea Schenk forms the new executive leadership of Fraunhofer MEVIS. The previous deputy director Prof. Tobias Preußer is now devoting himself entirely to the development of the TechsoMed GmbH, which was founded in December 2022. In 2023, Fraunhofer MEVIS employees Markus Wenzel and Klaus Eickel were appointed professors at Constructor University Bremen and Bremerhaven University of Applied Sciences, respectively.

**Horst Hahn appointed Honorary Member of the DRG**

Fraunhofer MEVIS director Prof. Horst Hahn was awarded the honorary membership of the German Radiological Society (DRG) at the German Radiology Congress (Deutscher Röntgenkongress, RÖKO) in Wiesbaden on May 19, 2023. The honorary membership was conferred by Prof. Jörg Barkhausen, president of the DRG 2021-2023 and Director of the Department of Radiology and Nuclear Medicine at the Lübeck Campus of the University Hospital Schleswig-Holstein. At the award ceremony, Horst Hahn gave a talk entitled "AI as a lifesaver in the sea of uncertainty?" in which he highlighted the limitations and opportunities of implementing AI in medicine, which affect both humans and technology.

**Data-efficient foundation model for biomarker detection**

Researchers from Fraunhofer MEVIS have developed a foundation model in collaboration with RWTH Aachen University, the University of Regensburg, and Hannover Medical School. The resource-efficient AI model analyzes histopathological tissue samples quickly and reliably, based on only a fraction of the usual training data. The Fraunhofer MEVIS team won the classification section of the international challenge SemiCOL 2023 (Semi-supervised learning for colorectal cancer detection) without having to make expensive adjustments to its model. It outperformed all other models in the classification of histopathological images of colorectal cancer in tumors and healthy tissue, ranking second overall among nine participating teams.

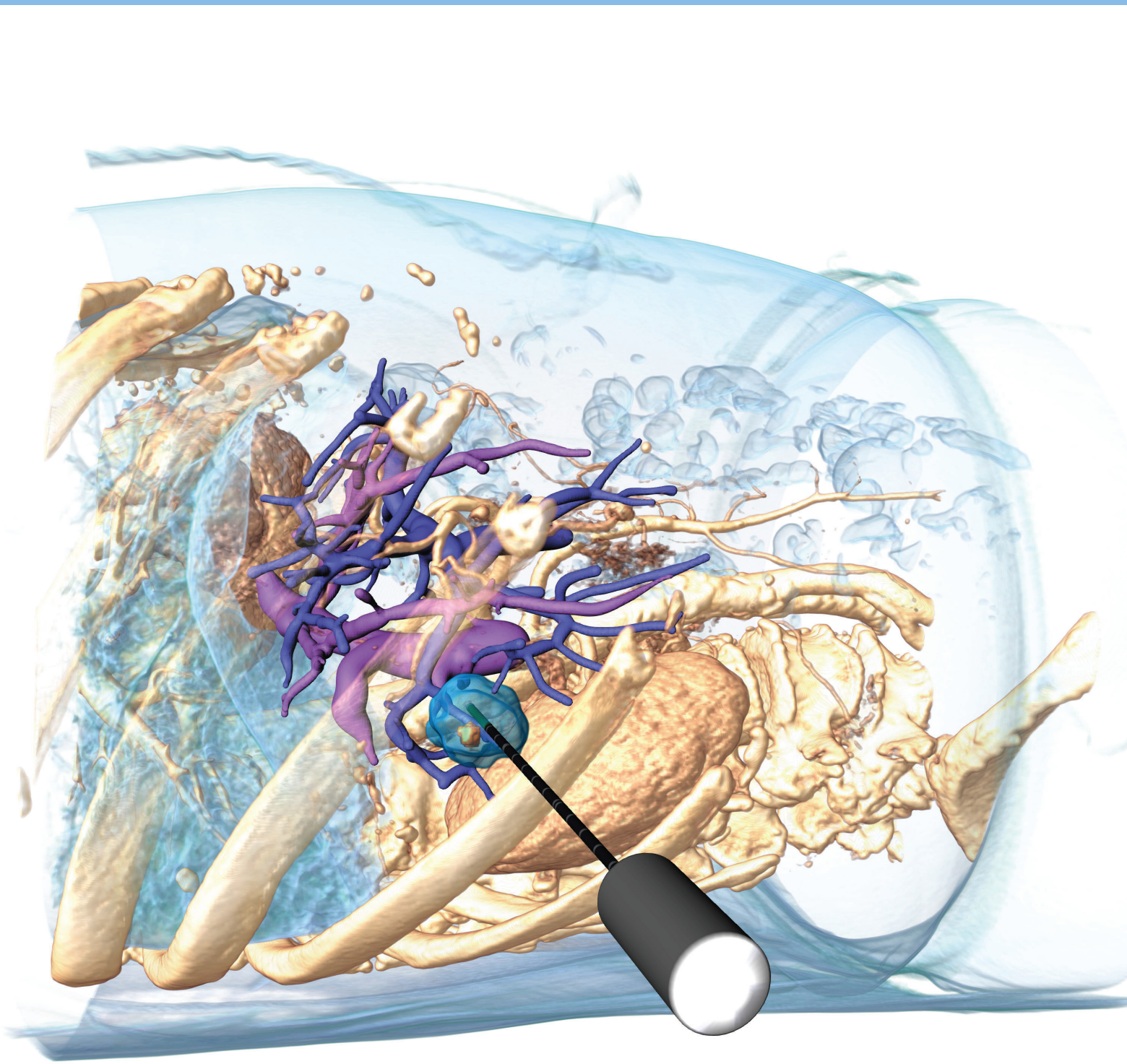
**Fraunhofer MEVIS reduces ecological footprint**

In March 2024, Fraunhofer MEVIS commissioned a photovoltaic system on the roof of its institute building in Bremen. With a maximum output of around 50 kilowatts, it is expected to cover around 10 percent of the building's energy requirements with solar energy. This corresponds to a potential saving of around 20 tons of carbon dioxide ($CO_2$) per year. Like the entire building, the photovoltaic system was financed in equal parts by the federal government, the state of Bremen, and the EU.

**Approval of school specialization "Digital Medicine"**

Starting in the 2025/26 school year, a new specialization at the secondary school Oberschule am Waller Ring offers Bremen school students the opportunity to explore future professional fields in medicine. In 2024, the school authorities approved the Digital Medicine specialization, which focuses on how digital methods can enhance healthcare. Prominent examples include medical imaging techniques and the potential of AI. A first pilot phase began in August 2024. The specialization is being developed and offered in cooperation with Fraunhofer MEVIS.

*The image shows the planning of a tumor ablation in the liver. The FDA-certified image-guided thermal ablation system for a more targeted and effective therapy is the result of a research partnership between Israeli medical technology company TechsoMed Ltd. and Fraunhofer MEVIS, from which the subsidiary TechsoMed GmbH in Bremen emerged in 2022.*



# SCIENTIFIC PUBLICATIONS 2023/24

## Journal Articles 2023


Alpers R, Kühne L, Hung-Phoc T, Zeeb H, Westphal M, Jäckle S (2023) Evaluation of the EsteR Toolkit for COVID-19 Decision Support: Sensitivity Analysis and Usability Study. JMIR Form Res 7:e44549

Awan R, Raza SEA, Lotz J, Weiss N, Rajpoot N (2023) Deep feature based cross-slide registration. Comput Med Imaging Graph 104:102162

Berijanian M, Schaadt NS, Huang B, Lotz J, Feuerhake F, Merhof D (2023) Unsupervised many-to-many stain translation for histological image augmentation to improve classification accuracy. J Pathol Inform 14:100195

Biancacci I, De Santis D, Rama E, Benderski K, Momoh J, Pohlberger R, Moeckel D, Kaps L, Rijcken CJF, Prakash J, Thewissen M, Kiessling F, Shi Y, Peña Q, Sofias AM, Consolino L, Lammers T (2023) Repurposing Tamoxifen for Tumor Microenvironment Priming and Enhanced Tumor-Targeted Drug Delivery. Advanced Therapeutics 6(11)

Bilic P, Christ P, Li HB, Vorontsov E, Ben-Cohen A, Kaissis G, Szeskin A, Jacobs C, Mamani GEH, Chartrand G, Lohöfer F, Holch JW, Sommer W, Hofmann F, Hostettler A, Lev-Cohain N, Drozdzal M, Amitai MM, Vivanti R, Sosna J, Ezhov I, Sekuboyina A, Navarro F, Kofler F, Paetzold JC, Shit S, Hu X, Lipková J, Rempfler M, Piraud M, Kirschke J, Wiestler B, Zhang Z, Hülsemeyer C, Beetz M, Ettlinger F, Antonelli M, Bae W, Bellver M, Bi L, Chen H, Chlebus G, Dam EB, Dou Q, Fu C-W, Georgescu B, Giró-i-Nieto X, Gruen F, Han X, Heng P-A, Hesser J, Moltz JH, Igel C, Isensee F, Jäger P, Jia F, Kaluva KC, Khened M, Kim I, Kim J-H, Kim S, Kohl S, Konopczynski T, Kori A, Krishnamurthi G, Li F, Li H, Li J, Li X, Lowengrub J, Ma J, Maier-Hein K, Maninis K-K, Meine H, Merhof D, Pai A, Perslev M, Petersen J, Pont-Tuset J, Qi J, Qi X, Rippel O, Roth K, Sarasua I, Schenk A, Shen Z, Torres J, Wachinger C, Wang C, Weninger L, Wu J, Xu D, Yang X, Yu SC-H, Yuan Y, Yue M, Zhang L, Cardoso J, Bakas S, Braren R, Heinemann V, Pal C, Tang A, Kadoury S, Soler L, van Ginneken B, Greenspan H, Joskowicz L, Menze B (2023) The Liver Tumor Segmentation Benchmark (LiTS). Med Image Anal 84:102680

Bisson T, Franz M, Dogan O I, Romberg D, Jansen C, Hufnagl P, Zerbe N (2023) Anonymization of whole slide images in histopathology for research and education. Digital Health 9:205520762311714

Bouteldja N, Hölscher DL, Klinkhammer BM, Buelow RD, Lotz J, Weiss N, Daniel C, Amann K, Boor P (2023) Stain-Independent Deep Learning–Based Analysis of Digital Kidney Histopathology. The American Journal of Pathology 193(1):73–83

Breutigam N-J, Hoinkiss DC, Konstandin S, Buck MA, Mahroo A, Eickel K, von Samson-Himmelstjerna F, Günther M (2023) Subject-specific timing adaption in time-encoded arterial spin labeling imaging. Magn Reson Mater Phy 37

de Jager NS, van Oostenbrugge TJ, Pätz T, Jenniskens SFM, Fütterer JJ, Langenhuijsen JF, Overduin CG (2023) Intraoperative MRI-derived volumetric ablation margins and initial correlation with local outcome after MRI-guided cryoablation of renal tumors. Cancer Imaging 23(31)

Ezhov I, Scibilia K, Franitza K, Steinbauer F, Shit S, Zimmer L, Lipkova J, Kofler F, Paetzold JC, Canalini L, Waldmannstetter D, Menten MJ, Metz M, Wiestler B, Menze B (2023) Learn-Morph-Infer: A new way of solving the inverse problem for brain tumor modeling. Med Image Anal 83:102672

Fedorov A, Longabaugh WJR, Pot D, Clunie DA, Pieper SD, Gibbs DL, Bridge C, Herrmann MD, Homeyer A, Lewis R, Aerts HJWL, Krishnaswamy D, Thiriveedhi VK, Ciausu C, Schacherer DP, Bontempi D, Pihl T, Wagner U, Farahani K, Kim E, Kikinis R (2023) National Cancer Institute Imaging Data Commons: Toward Transparency, Reproducibility, and Scalability in Imaging Artificial Intelligence. RadioGraphics 43(12):e230180

Franke B, Schlief A, Walczak L, Sündermann S, Unbehaun A, Kempfert J, Solowjowa N, Kühne T, Goubergrits L (2023) Comparison of hemodynamics in biological surgical aortic valve replacement and transcatheter aortic valve implantation: An in-silico study. Artificial Organs 47(2):352–360

Gerken A, Walluscheck S, Kohlmann P, Galinovic I, Villringer K, Fiebach JB, Klein J, Heldmann S (2023) Deep learning-based segmentation of brain parenchyma and ventricular system in CT scans in the presence of anomalies. Front. Neuroimaging 2:1228255

Guillemin PC, Sinden D, M'Rad Y, Schwenke M, Le Guevelou J, Uiterwijk JWE, Lorton O, Scheffler M, Poletti P-A, Jenne J, Zilli T, Salomir R (2023) A Novel Concept of Transperineal Focused Ultrasound Transducer for Prostate Cancer Local Deep Hyperthermia Treatments. Cancers 15(1):163

Hadler T, Ammann C, Wetzl J, Viezzer D, Gröschel J, Fenski M, Abazi E, Lange S, Hennemuth A, Schulz-Menger J (2023) Lazy Luna: Extendible software for multilevel reader comparison in cardiovascular magnetic resonance imaging. Comput Methods Programs Biomed 238:107615

Hering A, Hansen L, Mok TCW, Chung ACS, Siebert H, Hager S, Lange A, Kuckertz S, Heldmann S, Shao W, Vesal S, Rusu M, Sonn G, Estienne T, Vakalopoulou M, Han L, Huang Y, Yap P-T, Brudfors M, Balbastre Y, Joutard S, Modat M, Lifshitz G, Raviv D, Lv J, Li Q, Jaouen V, Visvikis D, Fourcade C, Rubeaux M, Pan W, Xu Z, Jian B, De Benetti F, Wodzinski M, Gunnarsson N, Sjolund J, Grzech D, Qiu H, Li Z, Thorley A, Duan J, Grosbrohmer C, Hoopes A, Reinertsen I, Xiao Y, Landman B, Huo Y, Murphy K, Lessmann N, van Ginneken B, Dalca AV, Heinrich MP (2023) Learn2Reg: Comprehensive Multi-Task Medical Image Registration Challenge, Dataset and Evaluation in the Era of Deep Learning. IEEE Trans Med Imaging 42(3):697–712

Ho H, Rezania V, Schwen LO (2023) Editorial: Multiscale modeling for the liver. Front Bioeng Biotechnol 11:1179980

Hoinkiss DC, Huber J, Plump C, Lüth C, Drechsler R, Günther M (2023) AI-driven and automated MRI sequence optimization in scanner-independent MRI sequences formulated by a domain-specific language. Frontiers in Neuroimaging – Neuroimaging Analysis and Protocols 2

Jansen C, Lindequist B, Strohmenger K, Romberg D, Küster T, Weiss N, Franz M, Schwen LO, Evans T, Homeyer A, Zerbe N (2023) The vendor-agnostic EMPAIA platform for integrating AI applications into digital pathology infrastructures. Future Generation Computer Systems 140:209–224

Kazerouni A, Aghdam EK, Heidari M, Azad R, Fayyaz M, Hacihaliloglu I,

Merhof D (2023) Diffusion models in medical imaging: A comprehensive survey. Med Image Anal 88:102846

Klein J, Gerken A, Agethen N, Rothlübbers S, Upadhyay N, Purrer V, Schmeel C, Borger V, Kovalevsky M, Rachmilevitch I, Shapira Y, Wüllner U, Jenne J (2023) Automatic planning of MR-guided transcranial focused ultrasound treatment for essential tremor. Front Neuroimaging, Sec.. Brain Imaging Methods 2

Koplin C, Schwarz-Fischer E, Zschippang E, Löw YM, Czekalla M, Seibel A, Rörich A, Georgii J, Güttler F, Yarar-Schlickewei S, Kailer A (2023) Design of Reliable Remobilisation Finger Implants with Geometry Elements of a Triple Periodic Minimal Surface Structure via Additive Manufacturing of Silicon Nitride. J 6(1):180–197

Kossen T, Madai VI, Mutke MA, Hennemuth A, Hildebrand K, Behland J, Aslan C, Hilbert A, Sobesky J, Bendszus M, Frey D (2023) Image-to-image generative adversarial networks for synthesizing perfusion parameter maps from DSC-MR images in cerebrovascular disease. Front Neurol 13:1051397

Laue HOA (2023) Editorial for "Detection of Treatment Response in Triple-Negative Breast Tumors to Paclitaxel Using MRI Cell Size Imaging". J Magn Reson Imaging

Laue HOA, Persigehl T (2023) Editorial for "Computed DWI Results in Superior Capability for N-Stage Assessment of Non-Small Cell Lung Cancer than that of Actual DWI, STIR Imaging and FDG-PET/CT". J Magn Reson Imaging 57(1):273–274

Lee J, Westphal M, Vali Y, Boursier J, Petta S, Ostroff R, Alexander L, Chen Y, Fournier C, Geier A, Francque S, Wonders K, Tiniakos D, Bedossa P, Allison M, Papatheodoridis G, Cortez-Pinto H, Pais R, Dufour J-F, Leeming DJ, Harrison S, Cobbold J, Holleboom AG, Yki-Järvinen H, Crespo J, Ekstedt M, Aithal GP, Bugianesi E, Romero-Gomez M, Torstenson R, Karsdal M, Yunis C, Schattenberg JM, Schuppan D, Ratziu V, Brass C, Duffin K, Zwinderman K, Pavlides M, Anstee QM, Bossuyt PM (2023) Machine learning algorithm improves the detection of NASH (NAS-based) and at-risk NASH: A development and validation study. Hepatology 78(1):258–271

Lindner T, Bolar DS, Achten E, Barkhof F, Bastos-Leite AJ, Detre JA, Golay X, Günther M, Wang DJJ, Haller S, Ingala S, Jäger HR, Jahng G-H, Juttukonda MR, Keil VC, Kimura H, Ho M-L, Lequin M, Lou X, Petr J, Pinter N, Pizzini FB, Smits M, Sokolska M, Zaharchuk G, Mutsaerts HJMM (2023) Current state and guidance on arterial spin labeling perfusion MRIin clinical neuroimaging. Magn Reson Med 89(5):2024–2047

Loose S, Solou D, Strecker C, Hennemuth A, Hüllebrand M, Grundmann S, Asmussen A, Treppner M, Urbach H, Harloff A (2023) Characterization of aortic aging using 3D multi-parametric MRI-long-term follow-up in a population study. Sci Rep 13(1)

Madore B, Hess AT, van Niekerk AMJ, Hoinkiss DC, Hucker P, Zaitsev M, Afacan O, Günther M (2023) External Hardware and Sensors, for Improved MRI. JMRI 57(3):690–705

Martín-Isla C, Campello VM, Izquierdo C, Kushibar K, Sendra-Balcells C, Gkontra P, Sojoudi A, Fulton MJ, Arega TW, Punithakumar K, Li L, Sun X, Al Khalil Y, Liu D, Jabbar S, Queirós S, Galati F, Mazher M, Gao Z, Beetz M, Tautz L, Galazis C, Varela M, Hüllebrand M, Grau V, Zhuang X, Puig D, Zuluaga MA, Mohy-ud-Din H, Metaxas D, Breeuwer M, van der Geest RJ, Noga M, Bricq S, Rentschler ME, Guala A, Petersen SE, Escalera S, Palomares JFR, Lekadir K (2023) Deep Learning Segmentation of the Right Ventricle in Cardiac MRI: The M&Ms Challenge. IEEE J Biomed Health Inform 27(7):3302–3313

Medved M, Vicari M, Karczmar GS (2023) Characterization of Effects of Compressed Sensing on High Spectral and Spatial Resolution (HiSS) MRI with Comparison to SENSE. Tomography 9(2):693–705

Merkes JM, Raabe G, Kiessling F, Rueping M, Banala S (2023) An Unexpected Boron Rearrangement Leads to a Fluorogenic and Colorimetric BODIPY Probe. Advanced Optical Materials 11(6):2202601

Nadig V, Herweg K, Chou MMC, Lin JWC, Chin E, Li C-A, Schulz V, Gundacker S (2023) Timing advances of commercial divalent-ion co-doped LYSO:Ce and SiPMs in sub-100 ps time-of-flight positron emission tomography. Phys Med Biol 68(7):075002

Naunheim S, Kuhl Y, Solf T, Schug D, Schulz V, Mueller F (2023) Analysis of a convex time skew calibration for light sharing-based PET detectors. Phys. Med. Biol. 68(2):025013

Oechtering TH, Nowak A, Sieren MM, Stroth AM, Kirschke N, Wegner F, Balks M, König IR, Jin N, Graessner J, Kooijman-Kurfuerst H, Hennemuth A, Barkhausen J, Frydrychowicz A (2023) Repeatability and reproducibility of various 4D Flow MRI postprocessing software programs in a multi-software and multi-vendor cross-over comparison study. J Cardiovasc Magn Reson 25(1):22

Peisen F, Gerken A, Hering A, Dahm I, Nikolaou K, Gatidis S, Eigentler TK, Amaral T, Moltz JH, Othman AE (2023) Can Whole-Body Baseline CT Radiomics Add Information to the Prediction of Best Response, Progression-Free Survival, and Overall Survival of Stage IV Melanoma Patients Receiving First-Line Targeted Therapy: A Retrospective Register Study. Diagnostics 13(20):3210

Schacherer DP, Herrmann MD, Clunie DA, Höfener H, Clifford W, Longabaugh WJR, Pieper S, Kikinis R, Fedorov A, Homeyer A (2023) The NCI Imaging Data Commons as a platform for reproducible research in computational pathology. Comput Methods Programs Biomed 242:107839

Schafstedde M, Jarmatz L, Brüning J, Hüllebrand M, Nordmeyer S, Harloff A, Hennemuth A (2023) Population-based reference values for 4D flow MRI derived aortic blood flow parameters. Physiol Meas 44(3):035003

Schraven S, Rosenhain S, Brueck R, Wiechmann TM, Pola R, Etrych T, Lederle W, Lammers T, Gremse F, Kiessling F (2023) Dye labeling for optical imaging biases drug carriers' biodistribution and tumor uptake. Nanomedicine 48:102650

Schultz B, DeLong LN, Masny A, Lentzen M, Raschka T, van Dijk D, Zaliani A, COPERIMOplus, Fröhlich H (2023) A machine learning method for the identification and characterization of novel COVID-19 drug targets. Sci Rep 13(1)

Schuppert C, Rospleszcz S, Hirsch JG, Hoinkiss DC, Köhn A, von Krüchten R, Russe MF, Keil T, Krist L, Schmidt B, Michels KB, Schipf S,

Brenner H, Kröncke TJ, Pischon T, Niendorf T, Schulz-Menger J, Forsting M, Völzke H, Hosten N, Bülow R, Zaitsev M, Kauczor HU, Bamberg F, Günther M, Schlett CL (2023) Automated image quality assessment for selecting among multiple magnetic resonance image acquisitions in the German National Cohort study. Sci Rep 13:22745

Schwen LO, Kiehl TR, Carvalho R, Zerbe N, Homeyer A (2023) Digitization of Pathology Labs: A Review of Lessons Learned. Lab Invest 103(11):100244

Siegel M, Maier P, Taghizadeh E, Fuchs A, Yilmaz T, Meine H, Schmal H, Lange T, Izadpanah K (2023) Change in Descriptive Kinematic Parameters of Patients with Patellofemoral Instability When Compared to Individuals with Healthy Knees—A 3D MRI In Vivo Analysis. Jcm 12(5):1917

Siegel M, Taghizadeh E, Lange T, Fuchs A, Yilmaz T, Maier P, Meine H, Schmal H, Izadpanah K (2023) Influence of Medial Patellofemoral Ligament Reconstruction on Patellofemoral Contact in Patients With Low-Flexion Patellar Instability: An MRI Study. Orthop J Sports Med 11(5):232596712311602

Siegel M, Taghizadeh E, Fuchs A, Maier P, Schmal H, Lange T, Yilmaz T, Meine H, Izadpanah K (2023) Einfluss der Quadrizepsmuskulatur auf den patellofemoralen Kontaktmechanismus bei Patienten mit strecknaher patellofemoraler Instabilität nach MPFL-Rekonstruktion. Die Orthopädie 52(10):834–842

Tatagiba M, Lepski G, Kullmann M, Krischek B, Danz S, Bornemann A, Klein J, Fahrig A, Velnar T, Feigl GC (2023) The Brainstem Cavernoma Case Series: A Formula for Surgery and Surgical Technique. Medicina 59(9):1601

Theilen E, Rörich A, Lange T, Bendak S, Huber C, Schmal H, Izadpanah K, Georgii J (2023) Validation of a finite element simulation for predicting individual knee joint kinematics. OJEMB

Vignon-Clementel IE, Jagiella N, Dichamp J, Kowalski J, Lederle W, Laue H, Kiessling F, Sedlaczek O, Drasdo D (2023) A proof-of-concept pipeline to guide evaluation of tumor tissue perfusion by dynamic contrast-agent imaging: Direct simulation and inverse tracer-kinetic procedures. Front Bioinform 3

Wagner M, Müller-Stich B-P, Kisilenko A, Tran D, Heger P, Mündermann L, Lubotsky DM, Müller B, Davitashvili T, Capek M, Reinke A, Reid C, Yu T, Vardazaryan A, Nwoye CI, Padoy N, Liu X, Lee E-J, Disch C, Meine H, Xia T, Jia F, Kondo S, Reiter W, Jin Y, Long Y, Jiang M, Dou Q, Heng PA, Twick I, Kirtac K, Hosgor E, Bolmgren JL, Stenzel M, von Siemens B, Zhao L, Ge Z, Sun H, Xie D, Guo M, Liu D, Kenngott HG, Nickel F, Frankenberg M von, Mathis-Ullrich F, Kopp-Schneider A, Maier-Hein L, Speidel S, Bodenstedt S (2023) Comparative validation of machine learning algorithms for surgical workflow and skill analysis with the HeiChole benchmark. Med Image Anal 86:102770

Wallus check S, Canalini L, Strohm H, Diekmann S, Klein J, Heldmann S (2023) MR-CT multi-atlas registration guided by fully automated brain structure segmentation with CNNs. Int J CARS 18:483–491

Weninger L, Ecke J, Jütten K, Clusmann H, Wiesmann M, Merhof D, Na C-H (2023) Diffusion MRI anomaly detection in glioma patients. Sci Rep 13(1)

**Journal Articles 2024**

Azad R, Aghdam EK, Rauland A, Jia Y, Avval AH, Bozorgpour A, Karimijafarbigloo S, Cohen JP, Adeli E, Merhof D (2024) Medical Image Segmentation Review: The Success of U-Net. IEEE Trans Pattern Anal Mach Intell 46(12):10076–10095

Azad R, Kazerouni A, Heidari M, Aghdam EK, Molaei A, Jia Y, Jose A, Roy R, Merhof D (2024) Advances in medical image analysis with vision Transformers: A comprehensive review. Med Image Anal 91:103000

Baeßler B, Engelhardt S, Hekalo A, Hennemuth A, Hüllebrand M, Laube A, Scherer C, Tölle M, Wech T (2024) Perfect Match: Radiomics and Artificial Intelligence in Cardiac Imaging. Circ: Cardiovascular Imaging 17(6):e015490

Brandenburg LS, Georgii J, Schmelzeisen R, Spies BC, Burkhardt F, Fuessinger MA, Rothweiler RM, Gross C, Schlager S, Metzger MC (2024) Reconstruction of dental roots for implant planning purposes: a retrospective computational and radiographic assessment of single-implant cases. Int J CARS 19(3):591–599

Cangalovic VS, Thielke F, Meine H (2024) Comparative evaluation of uncertainty estimation and decomposition methods on liver segmentation. Int J CARS 19(2):253–260

Cetin AI, Turhan G, Padrela BE, Mahroo A, Konstandin S, Honkiss DC, Breutigam N-J, Keil V, Barkhof F, Danyeli AE, Özduman K, Necmettin Pamir MN, Eickel K, Mutsaerts H-J, Petr J, Günther M, Dincer A, Ozturk-Isik E (2024) Tissue-specific T2 BBB-ASL in Meningiomas. Magn Reson Mater Phy 37(S1):1–781(P416)

Dahm IC, Kolb M, Altmann S, Nikolaou K, Gatidis S, Othman AE, Hering A, Moltz JH, Peisen F (2024) Reliability of Automated RECIST 1.1 and Volumetric RECIST Target Lesion Response Evaluation in Follow-Up CT—A Multi-Center, Multi-Observer Reading Study. Cancers 16(23):4009

Floca R, Bohn J, Haux C, Wiestler B, Zöllner FG, Reinke A, Weiß J, Nolden M, Albert S, Persigehl T, Norajitra T, Baeßler B, Dewey M, Braren R, Büchert M, Fallenberg EM, Galldiks N, Gerken A, Götz M, Hahn HK, Haubold J, Haueise T, Große Hokamp N, Ingrisch M, Iuga A-I, Janoschke M, Jung M, Kiefer LS, Lohmann P, Machann J, Moltz JH, Nattenmüller J, Nonnenmacher T, Oerther B, Othman AE, Peisen F, Schick F, Umutlu L, Wichtmann BD, Zhao W, Caspers S, Schlemmer H-P, Schlett CL, Maier-Hein K, Bamberg F (2024) Radiomics workflow definition & challenges – German priority program 2177 consensus statement on clinically applied radiomics. Insights Imaging 15:124

Gerhardt P, Shehu N, Ferrari I, Hüllebrandt M, Hennemuth A, Martinoff S, Ewert P, Stern H, Meierhofer C (2024) Quantifying aortic valve regurgitation in patients with congenital aortic valve disease by 2D and 4D flow magnetic resonance analysis. Int J Cardiol 408:132084

Ghete T, Kock F, Pontones M, Pfrang D, Westphal M, Höfener H, Metzler M (2024) Models for the marrow: A comprehensive review of AI-based cell classification methods and malignancy detection in bone marrow aspirate smears. HemaSphere 8(12):e70048

Hering A, Westphal M, Gerken A, Almansour H, Maurer M, Geisler B,

Kohlbrandt T, Eigentler T, Amaral T, Lessmann N, Gatidis S, Hahn H, Nikolaou K, Othman A, Moltz J, Peisen F (2024) Improving assessment of lesions in longitudinal CT scans: a bi-institutional reader study on an AI-assisted registration and volumetric segmentation workflow. Int J CARS 19:1689–1697

Hoffmann T, Teichgräber U, Lassen-Schmidt B, Renz D, Brüheim LB, Krämer M, Oelzner P, Böttcher J, Güttler F, Wolf G, Pfeil A (2024) Artificial intelligence-based quantification of pulmonary HRCT (AIqpHRCT) for the evaluation of interstitial lung disease in patients with inflammatory rheumatic diseases. Rheumatol Int 44(11):2483–2496

Hoffmann T, Teichgräber U, Lassen-Schmidt B, Kroegel C, Krämer M, Förster M, Renz D, Oelzner P, Böttcher J, Franz M, Wolf G, Güttler F, Pfeil A (2024) Ist JAK-Hemmung eine Option in der Behandlung der interstitiellen Lungenerkrankung bei einer rheumatoiden Arthritis? Z Rheumatol 83:495–499

Hottenrott S, Bendz P, Meybohm P, Bauer E, Schmee S, Haas T, Kranke P, Rumpf F, Helmer P, Hennemuth A, Westphal M, Alpers R, Hüllebrand M, Börm P, Blanck N, Zacharowski K, Vo L, Booms P, Ghanem A, Wolfram C, Yürek F, Salgado E, Spies C, Balzer F, Flothow A, Sundmacher L, König A, Schüttig W, von Dincklage F, Nagel SK, Heilinger J-C (2024) KI-augmentierte perioperative klinische Entscheidungsunterstüt- zung (KIPeriOP) – Studiendesign und erste Zwischenergebnisse. Anästh Intensivmed 65:156–172

Ivantsits M, Tautz L, Huellebrand M, Walczak L, Akansel S, Khasyanova I, Kempfert J, Sündermann S, Falk V, Hennemuth A (2024) MV-GNN: Generation of continuous geometric representations of mitral valve motion from 3D+t echocardiography. Computers in Biology and Medicine 182:109154

Khatami SG, Sargsyan A, Russo MF, Domingo-Fernández D, Zaliani A, Kaladharan A, Sethumadhavan P, Mubeen S, Gadiya Y, Karki R, Gebel S, Ruppa Surulinathan RK, Lage-Rupprecht V, Archipovas S, Mingrone G, Jacobs M, Claussen C, Hofmann-Apitius M, Kodamullil AT (2024) Curating, Collecting, and Cataloguing Global COVID-19 Datasets for the Aim of Predicting Personalized Risk. Data 9(2):25

Kock F, Thielke F, Abolmaali N, Meine H, Schenk A (2024) Suitability of DNN-based vessel segmentation for SIRT planning. Int J CARS 19(2):233–240

Konstandin S, Nagtegaal M, Nielsen JF, Deelchand DK, Peltier S, Najac C, van Osch T, Günther M, Öz G, Hoinkiss DC, Oeltzschner G (2024) Vendor-neutral magnetic resonance spectroscopy. ISMRM Workshop on MR Spectroscopy: Frontiers in Molecular & Metabolic Imaging 47

Kraft V, Schumann C, Salzmann D, Weyhe D, Zachmann G, Schenk A (2024) A Clinical User Study Investigating the Benefits of Adaptive Volumetric Illumination Sampling. IEEE TVCG 30(12):7571–7578

Lassen-Schmidt B, Baessler B, Gutberlet M, Berger J, Brendel JM, Bucher AM, Emrich T, Fervers P, Kottlors J, Kuhl P, May MS, Penzkofer T, Persigehl T, Renz D, Sähn M-J, Siegler L, Kohlmann P, Köhn A, Link F, Meine H, Thiemann MT, Hahn HK, Sieren MM (2024) Cooperative AI training for cardiothoracic segmentation in computed tomography: An iterative multi-center annotation approach. European Journal of Radiology 176:111534

Laue HOA (2024) Editorial for "Detection of Treatment Response in Triple-Negative Breast Tumors to Paclitaxel Using MRI Cell Size Imaging". J Magn Reson Imaging 59(2):585–586

Magnuska ZA, Roy R, Palmowski M, Kohlen M, Winkler BS, Pfeil T, Boor P, Schulz V, Krauss K, Stickeler E, Kiessling F, Moy L, Weintraub E (2024) Combining Radiomics and Autoencoders to Distinguish Benign and Malignant Breast Tumors on US Images. Radiology 312(3):online first

Mahroo A, Konstandin S, Günther M (2024) Blood–Brain Barrier Permeability to Water Measured Using Multiple Echo Time Arterial Spin Labeling<scp>MRI</scp>in the Aging Human Brain. J Magn Reson Imaging 59(4):1269–1282

Manini C, Hüllebrand M, Walczak L, Nordmeyer S, Jarmatz L, Kuehne T, Stern H, Meierhofer C, Harloff A, Erley J, Kelle S, Bannas P, Trauzeddel RF, Schulz-Menger J, Hennemuth A (2024) Impact of training data composition on the generalizability of convolutional neural network aortic cross-section segmentation in four-dimensional magnetic resonance flow imaging. J Cardiovasc Magn Reson 26(2):101081

Manini C, Nemchyna O, Akansel S, Walczak L, Tautz L, Kolbitsch C, Falk V, Sündermann S, Kühne T, Schulz-Menger J, Hennemuth A (2024) A simulation-based phantom model for generating synthetic mitral valve image data–application to MRI acquisition planning. Int J CARS 19(3):553–569

Mayr MF, Siegel M, Taghizadeh E, Obid P, Schmal H, Izadpanah K (2024) Prediction of the Hamstring Graft Size for ACL Reconstruction Using Different Axial Layers in Preoperative MRI. J Pers Med 14(6):582

Mihandoost S, Rezvantalab S, M Pallares R, Schulz V, Kiessling F (2024) A Generative Adversarial Network Approach to Predict Nanoparticle Size in Microfluidics. ACS Biomater Sci Eng 11(1):268–279

Morgan CA, Thomas DL, Shao X, Mahroo A, Manson TJ, Suresh V, Jansson D, Ohene Y, Günther M, Wang DJJ, Tippett LJ, Dragunow M (2024) Measurement of blood–brain barrier water exchange rate using diffusion-prepared and multi-echo arterial spin labelling: Comparison of quantitative values and age dependence. NMR In Biomed 37(12):e5256

Padrela B, Mahroo A, Tee M, Sneve MH, Moyaert P, Geier O, Kuijer JPA, Beun S, Nordhøy W, Zhu YD, Buck MA, Hoinkiss DC, Konstandin S, Huber J, Wiersinga J, Rikken R, de Leeuw D, Grydeland H, Tippett L, Cawston EE, Ozturk-Isik E, Linn J, Brandt M, Tijms BM, van de Giessen EM, Muller M, Fjell A, Walhovd K, Bjørnerud A, Pålhaugen L, Selnes P, Clement P, Achten E, Anazodo U, Barkhof F, Hilal S, Fladby T, Eickel K, Morgan C, Thomas DL, Petr J, Günther M, Mutsaerts HJMM (2024) Developing blood-brain barrier arterial spin labelling as a non-invasive early biomarker of Alzheimer's disease (DEBBIE-AD): a prospective observational multicohort study protocol. BMJ Open 14(3):e081635

Peisen F, Gerken A, Dahm I, Nikolaou K, Eigentler T, Amaral T, Moltz JH, Othman AE, Gatidis S (2024) Pre-treatment 18F-FDG-PET/CT parameters as biomarkers for progression free survival, best overall response and overall survival in metastatic melanoma patients undergoing first-line immunotherapy. PLoS ONE 19(1):e0296253

Peisen F, Gerken A, Hering A, Dahm I, Nikolaou K, Gatidis S, Eigentler TK, Amaral T, Moltz JH, Othman AE (2024) Can Delta Radiomics Improve

the Prediction of Best Overall Response, Progression-Free Survival, and Overall Survival of Melanoma Patients Treated with Immune Checkpoint Inhibitors? Cancers 16(15):2669

Pigeot I, Ahrens W, Darms J, Fluck J, Golebiewski M, Hahn HK, Hu X, Intemann T, Kasbohm E, Kirsten T, Klammt S, Klopfenstein SAI, Lassen-Schmidt B, Peters M, Sax U, Waltemath D, Schmidt CO (2024) Making Epidemiological and Clinical Studies FAIR Using the Example of COVID-19. Datenbank Spektrum 24(2):117–128

Pizzini FB, Boscolo Galazzo I, Natale V, Ribaldi F, Scheffler M, Caranci F, Lovblad K-O, Menegaz G, Frisoni GB, Gunther M (2024) Insights into single-timepoint ASL hemodynamics: what visual assessment and spatial coefficient of variation can tell. Radiol med 129(3):467–477

Prasser F, Riedel N, Wolter S, Corr D, Ludwig M (2024) Künstliche Intelligenz und sichere Gesundheitsdatennutzung im Projekt KI-FDZ: Anonymisierung, Synthetisierung und sichere Verarbeitung für Real-World-Daten. Bundesgesundheitsbl 67:171–179

Rörich A, Lange A, Heldmann S, Moltz JH, Walczak L, Yarar-Schlickewei S, Güttler F, Georgii J (2024) Inferring 3D finger bone shapes from 2D images – a detailed analysis of shape accuracy. Comput Methods Biomech Biomed Eng Imaging Vis 12(1):2359397

Redlich J-P, Feuerhake F, Weis J, Schaadt NS, Teuber-Hanselmann S, Buck C, Luttmann S, Eberle A, Nikolin S, Appenzeller A, Portmann A, Homeyer A (2024) Applications of artificial intelligence in the analysis of histopathology images of gliomas: a review. npj Imaging 2:16

Rix A, Heinrichs H, Porte C, Leenaars C, Bleich A, Kiessling F (2024) Ultrasound-induced immune responses in tumors: A systematic review and meta-analysis. J Control Release 371:146–157

Rovedo P, Meine H, Hucker P, Taghizadeh E, Izadpanah K, Zaitsev M, Lange T (2024) Time-Resolved Quantification of Patellofemoral Cartilage Deformation in Response to Loading and Unloading via Dynamic MRI With Prospective Motion Correction. J Magn Reson Imaging 60(1):175–183

Schäfer R, Lotz J, Kiessling F (2024) A multi-task learning strategy to pretrain models for medical image analysis. Nat Comput Sci 4:479–480

Schäfer R, Nicke T, Höfener H, Lange A, Merhof D, Feuerhake F, Schulz V, Lotz J, Kiessling F (2024) Overcoming data scarcity in biomedical imaging with a foundational multi-task model. Nat Comput Sci 4:495–509

Schraven S, Brück R, Rosenhain S, Lemainque T, Heines D, Noormohammadian H, Pabst O, Lederle W, Gremse F, Kiessling F (2024) CT- and MRI-Aided Fluorescence Tomography Reconstructions for Biodistribution Analysis. Invest Radiol 59(7):504–512

Schumacher J, Brüssermann S, Geisler B, Jäckle S (2024) COVID-19 isolation and quarantine orders in Berlin-Reinickendorf (Germany): How many, how long and to whom? PLOS ONE 19(3):e0271848

Shalom ES, Kim H, van der Heijden RA, Ahmed Z, Patel R, Hormuth II DA, DiCarlo JC, Yankeelov TE, Sisco NJ, Dortch RD, Stokes AM, Inglese M, Grech-Sollars M, Toschi N, Sahoo P, Singh A, Verma SK, Rathore DK, Kazerouni AS, Partridge SC, LoCastro E, Paudyal R, Wolansky IA, Shukla-Dave A, Schouten P, Gurney-Champion OJ, Jiřík R, Macíček O, Bartoš M, Vitouš J, Das AB, Kim SG, Bokacheva L, Mikheev A, Rusinek H, Berks M, Hubbard Cristinacce PL, Little RA, Cheung S, O'Connor JPB, Parker GJM, Moloney B, LaViolette PS, Bobholz S, Duenweg S, Virostko J, Laue HO, Sung K, Nabavizadeh A, Saligheh Rad H, Hu LS, Sourbron S, Bell LC, Fathi Kazerooni A (2024) The ISMRM Open Science Initiative for Perfusion Imaging (OSIPI): Results from the OSIPI–Dynamic Contrast-Enhanced challenge. Magn Reson Med 91(5):1803–1821

Stader JM, Recker F, Tonguc T, Ramig O, Thudium M, Matlac D, Mutschler N, Egger EK, Mustea A, Küppers J, Essler M, Jenne J, Strunk HM, Conrad R, Marinova M (2024) Clinical experience with shear wave elastography (SWE) for assessing healthy uterus in a transabdominal approach. Sci Rep 14:14473

Strohm H, Rothluebbers S, Perotti L, Stamm O, Fournelle M, Jenne J, Guenther M (2024) Contraction assessment of abdominal muscles using automated segmentation designed for wearable ultrasound applications. IJCARS 19:1607–1614

Walluscheck S, Gerken A, Galinovic I, Villringer K, Fiebach JB, Klein J, Heldmann S (2024) Generative adversarial network–based reconstruction of healthy anatomy for anomaly detection in brain CT scans. JMI 11(4):044508

Weitz P, Valkonen M, Solorzano L, Carr C, Kartasalo K, Boissin C, Koivukoski S, Kuusela A, Rasic D, Feng Y, Pouplier SS, Sharma A, Eriksson KL, Robertson S, Marzahl C, Gatenbee CD, Anderson ARA, Wodzinski M, Jurgas A, Marini N, Atzori M, Müller H, Budelmann D, Weiss N, Heldmann S, Lotz J, Wolterink JM, De Santi B, Patil A, Sethi A, Kondo S, Kasai S, Hirasawa K, Farrokh M, Kumar N, Greiner R, Latonen L, Laenkholm A-V, Hartman J, Ruusuvuori P, Rantalainen M (2024) The ACROBAT 2022 challenge: Automatic registration of breast cancer tissue. Med Image Anal 97:103257

Westphal M, Zapf A (2024) Statistical inference for diagnostic test accuracy studies with multiple comparisons. Stat Methods Med Res 33(4):669–680

Woods JG, Achten E, Asllani I, Bolar DS, Dai W, Detre JA, Fan AP, Fernández-Seara MA, Golay X, Günther M, Guo J, Hernandez-Garcia L, Ho M-L, Juttukonda MR, Lu H, MacIntosh BJ, Madhuranthakam AJ, Mutsaerts H-J, Okell TW, Parkes LM, Pinter N, Pinto J, Qin Q, Smits M, Suzuki Y, Thomas DL, Van Osch MJP, Wang DJJ, Warnert EAH, Zaharchuk G, Zelaya F, Zhao M, Chappell MA (2024) Recommendations for quantitative cerebral perfusion<scp>MRI</scp>using multi-timepoint arterial spin labeling: Acquisition, quantification, and clinical applications. Magnetic Resonance in Med 92(2):469–495

Zerbe N, Schwen LO, Geißler C, Wiesemann K, Bisson T, Boor P, Carvalho R, Franz M, Jansen C, Kiehl TR, Lindequist B, Pohlan NC, Schmell S, Strohmenger K, Zakrzewski F, Plass M, Takla M, Küster T, Homeyer A, Hufnagl P (2024) Joining forces for pathology diagnostics with AI assistance: The EMPAIA initiative. J Pathol Inform 15:100387

## Conference Papers 2023


Ambroladze A, Hahn HK, Amer H, Ingrisch M, Gerken A, Wenzel M, Püsken M, Mittermeier A, Engel C, Schmutzler R, Fallenberg EM (2023) CNN-based Whole Breast Segmentation in Longitudinal High-risk MRI Study. Bildverarbeitung fuer die Medizin. pp 159–164

Azad R, Arimond R, Aghdam EK, Kazerouni A, Merhof D (2023) DAE-Former: Dual Attention-Guided Efficient Transformer for Medical Image Segmentation. In: Rekik I, Adeli E, Park SH, Cintas C, Zamzmi G (eds) Proceedings of the 6th MICCAI Workshop on Predictive Intelligence in Medicine (PRIME 2023). LNCS 14277, pp 83–95

Bozorgpour A, Sadegheih Y, Kazerouni A, Azad R, Merhof D (2023) DermoSegDiff: A Boundary-Aware Segmentation Diffusion Model for Skin Lesion Delineation. In: Rekik I, Adeli E, Park SH, Cintas C, Zamzmi G (eds) Proceedings of the 6th MICCAI Workshop on Predictive Intelligence in Medicine (PRIME 2023). LNCS 14277, pp 146–158

Buck MA, Eickel K, Günther, M (2023) Analytical model for determination of exchange times in multi-TE velocity-selective Arterial Spin Labeling. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 0376

Buck MA, Huber J, Günther M (2023) Robust Implementation of a 3D velocity-selective ASL sequence for breast imaging. Proceedings of the 39th Annual Scientific Meeting of the ESMRMB. P180

Budelmann D, Qing C, Laue HOA, Albadry M, Dahmen U, Schwen LO (2023) Segmentation of Lipid Droplets in Histological Images. Medical Imaging with Deep Learning (MIDL 2023), short paper track

Heidari M, Kazerouni A, Soltany M, Azad R, Aghdam EK, Cohen-Adad J, Merhof D (2023) HiFormer: Hierarchical Multi-scale Representations Using Transformers for Medical Image Segmentation. Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision. IEEE, pp 6191–6201

Huber J, Eickel K, Günther M (2023) U-JET: Preliminary results of a convolutional neural network approach for distortion-free image reconstruction of PROPELLER data. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 3709

Huber J, Günther M, Hoinkiss DC (2023) A novel calibration scan for subject-specific tissue suppression in arterial spin labeling. Proceedings of the 39th Annual Scientific Meeting of the ESMRMB. P186

Huber J, Hoinkiss DC, Plump C, Lüth C, Drechsler R, Günther M (2023) High-level and modular description of MRI sequences using domain-specific language. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 2225

Karimijafarbigloo S, Azad R, Kazerouni A, Ebadollahi S, Merhof D (2023) MMCFormer: Missing Modality Compensation Transformer for Brain Tumor Segmentation. Proceedings of Machine Learning Research (MIDL 2023). pp 1144–1162

Karimijafarbigloo S, Azad R, Kazerouni A, Merhof D (2023) MS-Former: Multi-Scale Self-Guided Transformer for Medical Image Segmentation. Proceedings of Machine Learning Research (MIDL 2023). pp 680–694

Karimijafarbigloo S, Azad R, Kazerouni A, Velichko Y, Bagci U, Merhof D (2023) Self-supervised Semantic Segmentation: Consistency over Transformation. Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops. pp 2646–2655

Karimijafarbigloo S, Azad R, Merhof D (2023) Self-supervised Few-Shot Learning for Semantic Segmentation: An Annotation-Free Approach. In: Rekik I, Adeli E, Park SH, Cintas C, Zamzmi G (eds) Proceedings of the 6th MICCAI Workshop on Predictive Intelligence in Medicine (PRIME 2023). LNCS 14277, pp 159–171

Khodapanah Aghdam E, Azad R, Zarvani M, Merhof D (2023) Attention Swin U-Net: Cross-Contextual Attention Mechanism for Skin Lesion Segmentation. IEEE International Symposium on Biomedical Imaging. IEEE, pp 1–5

Kuckertz S, Heldmann S, Moltz JH (2023) Efficient Registration of Longitudinal Studies for Follow-Up Lesion Assessment by Exploiting Redundancy and Composition of Deformations. In: Woo J, Hering A, Silva W, Li X, Fu H, et al. (eds) Proceedings of the First MICCAI Workshop on Lesion Evaluation and Assessment with Follow-up (LEAF 2023). LNCS 14394, pp 91–99

Lassen-Schmidt B, Baessler B, Gutberlet M, Link F, The RACOON Study Group, Bucher A, Penzkofer T, May MS, Sieren MM (2023) Establishing a time-efficient iterative artificial intelligence training workflow of segmentation models for the mediastinum and heart in the nationwide RACOON consortium. European Congress of Radiology

Lassen-Schmidt B, Bucher A, Penzkofer T, Döllinger F, Fink M, May M, Sähn M, The RACOON study group, Kohlmann P, Köhn A, Link F, Thiemann MT, Hahn H. (2023) Consistent and efficient image segmentation in the German nationwide RACOON consortium. Annual Meeting of the Radiological Society of North America

Mahroo A, Konstandin S, Hoinkiss DC, Hirsch J, Günther M (2023) Increased Blood-brain Barrier Permeability in Response to Caffeine Challenge. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 2582

Molaei A, Aminimehr A, Tavakoli A, Kazerouni A, Azad B, Azad R, Merhof D (2023) Implicit Neural Representation in Medical Imaging: A Comparative Survey. Proceedings of the IEEE/CVF International Conference on Computer Vision Workshops. pp 2373–2383

Mou Y, Li F, Weber S, Haneef S, Meine H, Caldeira L, Jaberansary M, Welten S, Yediel Ucer Y, Prause G, Decker S, Beyan O, Kirsten T (2023) Distributed Privacy-Preserving Data Analysis in NFDI4Health with the Personal Health Train. In: Sure-Vetter Y, Goble C (eds) Proceedings of the 1st Conference on Research Data Infrastructure (CoRDI) – Connecting Communities. pp 1–5

Nagtegaal M, Hoinkiss DC, Konstandin S, de Bresser J, Günther M, van Osch MJP (2023) Vendor-agnostic pulse programming on gammaSTAR: A traveling head experiment to test the Philips driver. Proceedings of the 39th Annual Scientific Meeting of the ESMRMB. LT54

Nagtegaal M, Konstandin S, Hoinkiss DC, Gross-Weege N, Schulz V, Günther M, van Osch T (2023) Vendor neutral pulse programming: Running gammaSTAR sequences on Philips Hardware. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 2217

Padrela B, Sneve M, Zelhorst S, Tee M, Grydeland H, Mahroo A, Kuijer J, Walhovd K, Fjell A, Konstandin S, Eickel K, Barkhof F, Hilal S, Günther M, Mutsaerts H, Petr J (2023) Blood-brain barrier permeability changes over the lifespan. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 1919

Padrela B, Tee M, Sneve M, Mahroo A, Geier O, Thomas D, Morgan C, Moyaert P, Ozturk E, Nordhøy W, Pålhaugen L, Linn J, Selnes P, Eickel K, Konstandin S, Kuijer J, Hoinkiss DC, Breutigam NJ, Buck MA, Achten R, Barkhof F, Hilal S, Fladby T, Anazodo U, Petr J, Mutsaerts H, Günther M (2023) DEveloping Blood-Brain barrier arterial spin labeling as a non-Invasive Early biomarker (DEBBIE). Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 367

Rauland A, Merhof D (2023) Using Synthetic Training Data in Neural Networks for the Estimation of Fiber Orientation Distribution Functions from Single Shell Data. IEEE International Symposium on Biomedical Imaging. IEEE, pp 1–5

Rörich A, Izadpanah K, Theilen E, Walczak L, Lange T, Huber C, Georgii J (2023) Comparison of patient-specific knee joint motion modelling using position-based dynamics and finite element methods. International Conference on Computational Bioengineering. 31

Reinschluessel AV, Muender T, Fischer R, Kraft V, Uslar VN, Weyhe D, Schenk A, Zachmann G, Döring T, Malaka R (2023) Versatile Immersive Virtual and Augmented Tangible OR – Using VR, AR and Tangibles to Support Surgical Practice. Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems. Association for Computing Machinery, Hamburg, Germany, pp 1–5

Schuppert C, von Krüchten R, Hirsch J, Hoinkiss DC, Kaaks R, Bamberg F, Kauczor HU, Günther M, Schlett C (2023) Ganzkörper-Magnetresonanztomographien in der NAKO Gesundheitsstudie: Anwendung einer automatisierten Bildqualitätsanalyse zur Vorhersage der empfunden Bildqualität. 104. Deutscher Röntgenkongress. 195(S 01): S40

Schuppert C, von Krüchten R, Hirsch J, Hoinkiss DC, Kaaks R, Bamberg F, Kauczor HU, Günther M, Schlett C (2023) Whole-Body Magnetic Resonance Imaging in the Large Population-Based German National Cohort Study (NAKO): Use of an Automated Image Quality Assessment for the Prediction of Perceived Image Quality. European Congress of Radiology

Sommer L, Hoinkiss DC, Huber J, Konstandin S, Günther M (2023) Feasibility Study to Spatially Map the Filtration Function of the Kidneys with Multi-TE Arterial Spin Labeling. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 2760

Thielke F, Kock F, Hänsch A, Abolmaali N, Schenk A, Meine H (2023) Combining arterial and venous CT scans in a multi-encoder network for improved hepatic vessel segmentation. Proc. SPIE Medical Imaging 2023: Image Processing. Proc.SPIE 12464, 124640B

Turhan G, Cetin A, Mahroo A, Padrela B, Konstandin S, Hoinkiss DC, Breutigam NJ, Eickel K, Petr J, Mutsaerts H, Danyeli A, Ozduman K, Günther M, Dincer A, Ozturk-Isik E (2023) Perfusion and Time of Exchange Measurements Using BBB-ASL in Gliomas: The Initial Experience. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 1757

Wallus check S, Canalini L, Klein J, Heldmann S (2023) Unsupervised learning of healthy anatomy for anomaly detection in brain CT scans. Proc. SPIE Medical Imaging 2023: Computer-Aided Diagnosis. 124650

Winata S, Hoinkiss DC, Keith G, al-Wasity S, Porter D (2023) Multislice-to-volume Prospective Motion Correction for Functional MRI Protocols at 7T. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 1830

Winata S, Hoinkiss DC, Keith GA, al-Wasity S, Porter D (2023) Real-time multislice-to-volume motion correction for task-based functional MRI at 7 T. Proceedings of the 39th Annual Scientific Meeting of the ESMRMB. LT51

Winata S, Hoinkiss DC, Keith GA, al-Wasity S, Porter DA (2023) Prospective motion correction for functional MRI at 7T using multislice-to-volume image registration. 29th Organisation of Human Brain Mapping Annual Meeting (OHBM 2023)

Winata S, Hoinkiss DC, Keith GA, Williams SN, Ding BY, al-Wasity S, Shajan G, Porter D (2023) Parallel transmit imaging with real-time multislice-to-volume motion correction for task-based functional MRI at 7 T. Proceedings of the 39th Annual Scientific Meeting of the ESMRMB. P176

## Conference Papers 2024

Azad R, Kazerouni A, Sulaiman A, Bozorgpour A, Aghdam EK, Jose A, Merhof D (2024) Unlocking Fine-Grained Details with Wavelet-Based High-Frequency Enhancement in Transformers. In: Cao X, Xu X, Rekik I, Cui Z, Ouyang X (eds) Proceedings of the 14th MICCAI Workshop on Machine Learning in Medical Imaging (MLMI 2023). LNCS 14348, pp 207–216

Bauer M, Manini C, Klemmer S, Meyer T, Ivantsits M, Walczak L, Hennemuth A, Tzschätzsch H (2024) Development and Analysis of a Pipeline for Cardiac Ultrasound Simulation for Deep Learning Segmentation Methods. In: Fellner D, Hansmann W, Purgathofer W, Sillion F (eds) Proceedings of the Eurographics Workshop on Visual Computing for Biology and Medicine 2024. Eurographics Association, Code 208602

Bozorgpour A, Azad B, Azad R, Velichko Y, Bagci U, Merhof D (2024) HCA-NET: Hierarchical Context Attention Network for Intervertebral Disc Semantic Labeling. IEEE International Symposium on Biomedical Imaging. 10635688

Brosig J, Krüger N, Wamala I, Ivantsits M, Sündermann S, Kempfert J, Heldmann S, Hennemuth A (2024) Learning 3D aortic root assessment based on sparse annotations. Proceedings of SPIE Medical Imaging: Computer-Aided Diagnosis. 129271S

Buck MA, Eickel K, Günther M (2024) Development of a robust velocity selective arterial spin labeling sequence to address B0- and B1-field inhomogeneities for breast imaging. Proceedings of the 40th Annual Scientific Meeting of the European Society of Magnetic Resonance in Medicine and Biology. pp 1–781(P412)

Buck MA, Sommer L, Huber J, Günther M, Hoinkiss DC (2024) Finding the optimal acquisition strategy to visualize liver perfusion using velocity selective arterial spin labeling. Proceedings of the 40th Annual Scientific

Meeting of the European Society of Magnetic Resonance in Medicine and Biology. Barcelona, Spain, 411

Cetin A, Turhan G, Padrela B, Mahroo A, Konstandin S, Hoinkiss DC, Breutigam NJ, Keil V, Ayca ED, Özduman K, Eickel K, Mutsaerts H, Petr J, Günther M, Dincer A, Ozturk-Isik E (2024) Quantification of BBB Permeability in glioma using ASL with tissue specific T2 values. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 3862

Gehrmann P, Koller T, Klein J (2024) Towards optimal camera positioning for navigated surgery applications based on RGBD data. Proceedings of SPIE Medical Imaging 2024: Image-Guided Procedures, Robotic Interventions, and Modeling. SPIE, 129280G

Geißler K, Ambroladze A, Papenberg N, Koller T, Amer H, Fallenberg EM, Kurt SA, Ingrisch M, Hahn H (2024) Deformable current-prior registration of DCE breast MR images on multi-site data. Proceedings of SPIE Medical Imaging 2024: Image Processing. 129262S

Geißler K, Hirsch JG, Heldmann S, Meine H (2024) Structure Size as Confounder in Uncertainty Based Segmentation Quality Prediction. Proceedings of The 7nd International Conference on Medical Imaging with Deep Learning. pp 504–519

Geißler K, Mensing D, Wenzel M, Hirsch JG, Heldmann S (2024) Towards TotalSegmentator for MRI data leveraging GIN data augmentation. Proceedings of SPIE Medical Imaging: Image Processing. 1292604

Geißler K, Wenzel M, Diekmann S, von Busch H, Grimm R, Meine H (2024) Application of Active Learning-based on Uncertainty Quantification to Breast Segmentation in MRI. In: Maier A, Deserno TM, Handels H, Maier-Hein K, Palm C, Tolxdorff T (eds) Bildverarbeitung für die Medizin 2024. Informatik aktuell, pp 178–183

Hering A, de Boer S, Saha A, Twilt JJ, Heinrich MP, Yakar D, de Rooij M, Huisman H, Bosma JS (2024) Deformable MRI Sequence Registration for AI-Based Prostate Cancer Diagnosis. In: Modat M Simpson I. Špiclin Ž. Bastiaansen W. Hering A. Mok T.C.W. (ed) Biomedical Image Registration. WBIR 2024. LNCS, pp 148–162

Hoffmann T, Teichgräber U, Lassen-Schmidt B, Renz D, Brüheim LB, Krämer M, Oelzner P, Böttcher J, Güttler F, Wolf G, Pfeil A (2024) AB1491 Quantification of lung involvement in inflammatory rheumatic disease – interstitial lung disease (IRD ILD): A comparative study between symptomatic and asymptomatic patients using AI based HRCT analysis. Annals of the Rheumatic Diseases. pp 2113–2114

Huang B, Ying J, Lyu R, Schaadt NS, Klinkhammer BM, Boor P, Lotz J, Feuerhake F, Merhof D (2024) Utnetpara: A Hybrid CNN-Transformer Architecture with Multi-Scale Fusion for Whole-Slide Image Segmentation. Proceedings of the 21st IEEE International Symposium on Biomedical Imaging

Huber J, Buck MA, Hoinkiss DC (2024) Towards non-invasive perfusion imaging of abominal organs under free breathing using 3D GRASE PROPELLER-JET. Proceedings of the 40th Annual Scientific Meeting of the European Society of Magnetic Resonance in Medicine and Biology. Barcelona, Spain, 49

Immoor E, Koller TL (2024) Potential of Tetrahedral Markers for Infrared Pose Tracking in Surgical Navigation. In: Fellner D, Hansmann W, Purgathofer W, Sillion F (eds) Proceedings of the Eurographics Workshop on Visual Computing for Biology and Medicine 2024. Eurographics Association, Code 208602

Ivantsits M, Huellebrand M, Walczak L, Welz J, Greve D, Wamala I, Suendermann S, Kempfert J, Falk V, Hennemuth A (2024) Algorithmic Integration and Quantification of Endoscopic and 3D TEE Images in Mitral Valve Surgery. In: Fellner D, Hansmann W, Purgathofer W, Sillion F (eds) Proceedings of the Eurographics Workshop on Visual Computing for Biology and Medicine 2024. Eurographics Association, Code 208602

Karimijafarbigloo S, Azad R, Merhof D (2024) Self-Supervised Contrastive Learning for Consistent Few-Shot Image Representations. In: Rekik I, Adeli E, Park SH, Cintas C (eds) Proceedings of the 7th International Workshop on Predictive Intelligence in Medicine. LNCS, pp 173–184

Karimijafarbigloo S, Azad R, Kazerouni A, Merhof D (2024) Reducing Uncertainty in 3D Medical Image Segmentation under Limited Annotations through Contrastive Learning. Proceedings of the International Conference on Medical Imaging with Deep Learning (MIDL 2024). pp 694–707

Karimijafarbigloo S, Azad R, Velichko Y, Bagci U, Merhof D (2024) Leveraging Unlabeled Data for 3D Medical Image Segmentation Through Self-Supervised Contrastive Learning. Proceedings of the 21st IEEE International Symposium on Biomedical Imaging

Kazerouni A, Karimijafarbigloo S, Azad R, Velichko Y, Bagci U, Merhof D (2024) Fusenet: Self-Supervised Dual-Path Network For Medical Image Segmentation. IEEE International Symposium on Biomedical Imaging

Kohlbrandt T, Moltz J, Heldmann S, Hering A, Lellmann J (2024) Joint Learning of Image Registration and Change Detection for Lung CT Images. In: Maier A, Deserno TM, Handels H, Maier-Hein K, Palm C, Tolxdorff T (eds) Proceedings of German Conference on Medical Image Computing, BVM 2024. Informatik aktuell, pp 46–51

Kumari P, Reisenbüchler D, Luttner L, Schaadt NS, Feuerhake F, Merhof D (2024) Continual Domain Incremental Learning for Privacy-Aware Digital Pathology. In: Linguraru MG, et al. (eds) Medical Image Computing and Computer Assisted Intervention – MICCAI 2024. LNCS 15012, pp 34–44

Lankenau KM, Brauße E, Schill J, Hirsch JG, Schroder J, Günther M, Schultz T (2024) Multimodal Dementia Screening from Brain Magnetic Resonance Imaging and Conversational Speech. Proceedings of the 46th Annual International Conference of the IEEE Engineering in Medicine and Biology Society. Institute of Electrical and Electronics Engineers Inc., 205300

Lütjen T, Huber J, Günther M, Hoinkiss DC (2024) Field-map-based off-resonance correction in 3D GRASE PROPELLER XD-GRASP. Proceedings of the 40th Annual Scientific Meeting of the European Society of Magnetic Resonance in Medicine and Biology. Barcelona, Spain, 221

Nagtegaal M, Hoinkiss DC, Konstandin S, Smink J, Oeltzschner G, Günther M, van Osch M (2024) Advanced vendor-neutral MR sequences on Philips via gammaSTAR: pCASL and MRS-STEAM. Proceedings of the 40th Annual Scientific Meeting of the European Society of Magnetic Resonance in Medicine and Biology. Barcelona, Spain, 116

Padrela BE, Tecelão S, Geier O, Sneve MH, Garcia DV, Mahroo A, Pålhaugen L, Kirsebom B-E, Eickel K, Thomas DL, Bjørnerud A, Fjell AM, Walhovd KB, Barkhof F, Selnes P, Günther M, Petr J, Fladby T, Mutsaerts HJMM (2024) ASL blood-brain barrier permeability is associated with amyloid and cognitive impairment. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 0732

Plump C, Hoinkiss DC, Huber J, Berger BJ, Lüth C, Günther M, Drechsler R (2024) Finding the perfect sequence for your patient – towards an optimization workflow for MRI-sequences. 2024 IEEE Congress on Evolutionary Computation. Yokohama, Japan

Rahlfs H, Hüllebrand M, Schmitter S, Strecker C, Harloff A, Hennemuth A (2024) Learning carotid vessel wall segmentation in black blood MRI using sparsely sampled cross-sections from 3D data. Proceedings of SPIE Medical Imaging: Computer-Aided Diagnosis. 129271P

Sadegheih Y, Merhof D (2024) Segmentation of Brain Metastases in MRI: A Two-Stage Deep Learning Approach with Modality Impact Study. In: Rekik I, Adeli E, Park SH, Cintas C (eds) Proceedings of the 7th International Workshop on Predictive Intelligence in Medicine. LNCS, pp 196–206

Theilen E, Rörich A, Georgii J, Izadpanah K (2024) Prediction of patient-specific knee joint dynamics in tibial fractures. 16th World Congress on Computational Mechanics and 4th Pan American Congress on Computational Mechanics

Turhan G, Cetin AI, Padrela BE, Mahroo A, Konstandin S, Hoinkiss DC, Breutigam N-J, Keil V, Danyeli AE, Ozduman K, Eickel K, Mutsaerts HJ, Petr J, Günther M, Dincer A, Ozturk-Isik E (2024) The effect of BBB-ASL intravoxel transit time on perfusion and water exchange time modeling in gliomas. Proceedings of the 40th Annual Scientific Meeting of the European Society of Magnetic Resonance in Medicine and Biology. Barcelona, Spain, 53

Winata S, Hoinkiss DC, Keith GA, Williams SN, Ding BY, al-Wasity S, Shajan G, Porter D (2024) Real-time Multislice-to-volume Motion Correction with B1+ Shimming for Task-based Functional MRI at 7T. Proceedings of the ISMRM & ISMRT Annual Meeting & Exhibition. 2659

Winata S, Hoinkiss DC, Keith GA, Williams SN, Ding BY, al-Wasity S, Shajan G, Porter D (2024) Real-Time Multislice-to-Volume Motion Correction with Single & Parallel Transmission for Task-Based Functional MRI at 7T. Proceedings of the ISMRM Workshop on Motion Correction in MR. Québec City, QC, Canada

Xu T, Wolters T, Lotz J, Bisson T, Kiehl T-R, Flinner N, Zerbe N, Eichelberg M (2024) PROSurvival: A Technical Case Report on Creating and Publishing a Dataset for Federated Learning on Survival Prediction of Prostate Cancer Patients. In: Stoicu-Tivadar L, Benis A, Deserno TM, Bolboacă SD, Saranto K, Crişan-Vida M, Gallos P, Chirila OS, Weber P, Mihalaş G, Tamburis O (eds) Collaboration across Disciplines for the Health of People, Animals and Ecosystems. Proceedings of the EFMI Special Topic Conference 2024. Stud Health Technol Inform, pp 220–224

## Conference Proceedings 2023/24

Woo J, Hering A, Silva W, Li X, Fu H, Liu X, Xing F, Purushotham S, Mathai TS, Mukherjee P, De Grauw M, Tan RB, Corbetta V, Kotter E, Reyes M, Baumgartner CF, Li Q, Leahy R, Dong B, Chen H, Huo Y, Lv J, Xu X, Li X, Mahapatra D, Cheng L, Petitjean C, Presles B (2023) Medical Image Computing and Computer Assisted Intervention – MICCAI 2023 Workshops. Springer, Cham, LNCS 14394

## Book Chapters 2023/24

Pigeot I, Fröhlich H, Intemann T, Prause G, Wright MN (2023) KI und die Nationale Forschungsdateninfrastruktur für personenbezogene Gesundheitsdaten (NFDI4HEALTH). In: Dössel O, Schäffter T, Rutert B (eds) Künstliche Intelligenz in der Medizin. Berlin: Berlin-Brandenburgische Akademie der Wissenschaften, 2023. (Denkanstöße aus der Akademie : eine Schriftenreihe der Berlin-Brandenburgischen Akademie der Wissenschaften ; 11), pp 62–74

Ritter P, Rothlübbers S, Becker R, Freyer F, Villringer A (2023) EEG Quality: The Image Acquisition Artefact. In: Mulert C, Lemieux L (eds) EEG – fMRI. Springer, Cham, pp 189–212

Wenzel M (2023) Generative Adversarial Networks and Other Generative Models. In: Colliot O (ed) Machine Learning for Brain Disorders. NM 197, pp 139–192

## Dissertations 2023/24

Canalini, Luca (2024) Segmentation-enhanced registration methods to support image-guided treatments of brain tumors, Universität Bremen

Mahroo, Amnah (2024) Developing an image biomarker for assessing blood-brain barrier permeability, Universität Bremen

## Master's Theses 2023

Afsharian, Ali (2023) Adaption and Training of Self-Supervised Vision Transformers for Volumetric Medical Imaging Data, Constructor University Bremen

Agethen, Niklas (2023) Self-Supervised Contrastive Learning for Anatomical Landmark Detection in Brain MRI, Universität Bremen

Al-Asadi, Yasir (2023) CNN-Based Pulmonary Artery (including the Valve) Segmentation in CT Image Data, TU Berlin

Bofferding, Marie Clara (2023) A Comparative Analysis of Automated and AI-based Approaches to Airway Tree Segmentation Considering Pathological Lung CT Data, Otto-von-Guericke University Magdeburg

Gajaria, Anand (2023) Efficient Breast Parenchyma Segmentation in MRI through Active Learning and Sparse Annotation, Constructor University Bremen

Kohlbrandt, Temke (2023) Gemeinsames Lernen von Bildregistrierung und Veränderungskarten für Lungen-CT-Bilder, Universität zu Lübeck

Mönter, Nadine (2023) Multi-task Learning for Breast Cancer Classification, Universität zu Lübeck

Oltmanns, Tristan Evaluierung von transverse Oscillation Vektorflussbestimmung in fk-Stolt-Migration basierter Ultraschall-Bildgebung, Universität Bremen

Philipp, Lena (2023) Body Composition Assessment in 3D CT Images, Universität Bremen

Sundar, Anurag (2023) Clinically useful early detection of Parkinson's Disease using uncertainty-aware classification with CNNs, Constructor University Bremen

Weber, Nathalie (2023), Cepstralanalyse und energiebasierte Modellierungsansätze zur Reduzierung von Gitterstrukturen auf Röntgenbildern, Universität zu Lübeck

Welz, Juri (2023) Segmentation and Classification of Stereoendoscopic Image Data in Mitral Valve Surgery, TU Berlin

## Master's Theses 2024

Afzoon Khiyavi, Ali (2024) Vertebrae 3D segmentation in MRI images by fine-tuning transformer based models, Constructor University Bremen

Alam, Aiman (2024) On Causal Signals in Medical Image Data, Constructor University Bremen

Bauer, Marcel (2024) Entwicklung und Analyse einer Pipeline zur kardialen Ultraschallsimulation für Deep Learning Segmentierungsmethoden, Freie Universität Berlin

Degheh, Mostafa (2024) Causal Relationship Extraction from Biomedical Text Using LLM, Constructor University Bremen

Hahn, Ruven (2024) Vergleich von Relevanzmaßen zur automatischen Zusammenfassung von Radiologieberichten mit Large Language Models, Ernst-Abbe-Hochschule Jena

Heber, Karoline (2024) Interactive Enhancement of Annotations for Subsequent Image-Based Pulmonary Vessel Segmentation and Graph-Based Separation via Deep Learning, Universität zu Lübeck

Immoor, Erik (2024) Potential nicht-sphärischer retroreflektierender Marker für Tracking-Anwendungen, Universität Bremen

Katlun, Friederike (2024) Exploring Improvements for the Monitoring of Metastatic Melanoma Lesions Across Longitudinal CT Images with Self-Supervised Anatomical Embeddings, Universität zu Lübeck

Mammadli, Novruz (2024) Anomaly Detection in Contrast-Enhanced Breast MRI Data, Hochschule Bremen

Pinsker, Julius (2024) Pattern Recognition on Contrast-Enhanced Ultrasound Videos for the Classification of Renal Cysts, Universität Bremen

Rosenthal, Fabian (2024) Comparison of uncertainty quantification techniques for empirical prediction performance based on cross-validation, Technische Hochschule Köln

Soloveva, Polina (2024) Software development for qualitative and quantitative evaluation of metamaterial-based technology in magnetic resonance imaging, Universität des Saarlandes

Tappermann, Chiara (2024) Deep Learning-Based Outcome Prediction from Endoscopic Videos for Robot-Assisted Radical Prostatectomy, Universität Bremen

Verch, Jonas Patrick (2024) mlschedule: Predicting runtime of machine learning pipelines including preprocessing steps, Humboldt University Berlin

Wefer, Elin Marie (2024) Design von Verankerungselementen nach Vorbild des Knochenwachstums zur Anwendung an Endoprothesen, Hochschule Bremen

Zimmer, Rebecca (2024) Elastische Bildregistrierung mithilfe der spektralen Zerlegung des elastischen Operators, Universität zu Lübeck

# IMPRESSUM


| | |
|---|---|
| **Authors** | Thomas Forstmann<br>Horst Hahn<br>Bianka Hofmann<br>Guido Prause |
| **Translation** | David Black |
| **Editor** | Nadja Oellrich |
| **Layout** | Olaf Klinghammer<br>Guido Prause |
| **Images** | © Fraunhofer MEVIS<br>© Jan Meier (p.10) |

| | |
|---|---|
| **Publisher** | Fraunhofer MEVIS<br>Max-von-Laue-Str. 2<br>28359 Bremen<br>Germany<br>+49 421 17879 2001<br>office@mevis.fraunhofer.de<br>www.mevis.fraunhofer.de |