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Martina Murr, Dr.

martina.murr@gmx.de
linkedin.com/in/martina-murr
orcid.org/0009-0009-4154-7292
researchgate.net/Martina-Murr

Summary

My career in medical technology began with an apprenticeship as an industrial electronics technician, which I successfully completed in 2004. I remained with the same company until 2020, where I held various positions, including commissioning, technical authorship, service engineering, and most recently, project management. My professional journey has consistently connected me to the fields of medical technology and physics, encompassing areas such as mammography, radiotherapy, and computed tomography. Driven by an insatiable thirst for knowledge, I pursued further education alongside my career. I successfully completed my first distance learning degree in electrical engineering (FH) in 2013. Subsequently, in 2020, I earned a master's degree in medical physics, which deepened my understanding of "medical imaging and processing" and "radiation physics," among other subjects.

"I have no special talent, I am just passionately curious." (Albert Einstein)

This passion for learning ultimately led me to fully focus on scientific work. In 2025, I successfully completed my PhD in the field of magnetic resonance-guided radiotherapy (MRgRT), concentrating on the determination of the total delivered treatment dose. Through this work, I acquired in-depth knowledge of clinical workflows, dose management in radiation oncology and knowledge transfer.

"The more you know, the more you realize what you do not yet know." (Socrates)

My career trajectory is defined by technical expertise, scientific curiosity, and a strong commitment to advancing the fields of medical technology and physics. I am keen to apply and further enhance my research skills in a postdoctoral role, particularly by addressing complex scientific questions and contributing to innovative, patient-relevant solutions. I greatly value interdisciplinary collaboration and the exchange of ideas across professional boundaries. To me, research is more than merely generating results—it represents an opportunity to challenge assumptions, drive innovation, and promote meaningful progress in both scientific and clinical contexts. With a diverse background encompassing industry, research, and teaching, I believe I am well positioned to contribute to scientific advancement, clinical improvement, and the transfer of academic knowledge.

Personal Profile

I possess extensive expertise in medical technology and physics, especially in mammography, radiotherapy, computed tomography, and MR-guided radiotherapy (MRgRT), with a strong focus on radiation dose determination and MR physics. My professional experience includes hands-on work in electrical engineering, system commissioning, technical documentation, and project management. Throughout my career, I have independently led scientific projects and contributed to interdisciplinary research environments. Scientific challenges motivate me, and I approach my work with precision, responsibility, and a goal-oriented mindset. I place great importance on clarity in scientific communication and the practical relevance of research outcomes. Flexibility and creativity enable me to adapt quickly to new topics and work effectively—both autonomously and within teams. My ambition is to contribute meaningfully to the development of adaptive, image-based therapies and to support the integration of research, clinical application, and education in a forward-thinking environment.

EDUCATION

Dr. sc. hum| ***Biomedical Physic*** Graduated 2025
Biomedical Physic, Radiation Oncology, University Tübingen
Thesis: Development and validation of a robust deformable dose accumulation approach in magnetic resonance-guided radiation therapy Tübingen, DE

Master of Science| ***Major: Medical Imaging and -processing, Minor: Radiation Physics*** Graduated 2020
Correspondence Course, Technical University Kaiserslautern
Thesis: Diffusion kurtosis imaging with fluid suppression in the prostate Kaiserslautern, DE

Dipl.-Ing.(FH) - Electrical Engineering | ***Major: Telecommunications*** Graduated 2013
Correspondence Course, Wilhelm Büchner Hochschule
Thesis: Comparison of magnetic resonance imaging, mammography and ultrasound images of the breast Darmstadt, DE

Industrial Electronics Technician | ***Instrument Engineering*** Graduated 2004
Siemens AG Medical Solution Erlangen, DE

PROFESIONAL CAREER

Lecturer 2025–
Wilhelm Büchner Hochschule Darmstadt, DE

- Lecturer in Master's degree program in Medical Technology
- Module: Digitalization in medicine, Healthcare Technology
- Supervision of Bachelor's and Master's theses

Research Assistant 2020–2024
University Hospital Tübingen, Biomedical Physic, Radiation Oncology Tübinge, DE

- Planning, implementation and evaluation of scientific studies in the field of MR-guided radiotherapy, in particular on dose accumulation and deformable image registration.
- Application of image processing methods such as registration, segmentation and MR signal processing with MATLAB, Python, 3D Slicer, MONACO, ADMIRE Research.
- Project management and study coordination in interdisciplinary and international teams.
- Cooperation with clinical specialists for data acquisition and coordination of clinical research protocols.
- Participation in research publications and presentations in the context of the PhD.

Project Manager for Computerized Tomography (CT) 2017–2020
Siemens Healthineers Forchheim, DE

- Projects
  - CT NAEOTOM Alpha Klasse
- Detailed achievements
  - Responsible for ensuring that products were designed and developed with ease of maintenance, servicing and support in mind. Acted as a link between product development and service operations to enable a smooth transition from project completion to ongoing customer support. Main tasks included planning and coordinating serviceability work packages, optimizing service functions and documentation, and preparing the technical support teams for a successful implementation.

Project Manager for Women's Health 2013–2017
Siemens Healthcare GmbH Erlangen, DE

- Projects
  - INSPIRE project (2017) (M1)
  - MAMMOMAT Revelation (2015-2016) (M1)
  - MAMMOMAT Fusion / MAMMOMAT Inspiration VB60 (2014-2016) (M2/M1)
  - MAMMOMAT Fusion VB50 (2013-2015) (M2)
  - MAMMOMAT Inspiration VB30O (2013) (M1)
- Detailed achievements

- Generate ideas and develop concepts.
- Requirement engineering: Creation of the marketing requirement specification (service chapter).
- Development of the service strategy and the corresponding implementation concept.
- Planning, creation, implementation and moderation of workshops. From the generation of ideas to the transfer of knowledge to the customer service sub-processes Participants: Development, Service Technicians, Application, Training Center, Support Center.
- Creation of documentation: presentations, strategies, concept booklets, service documentation.
- Review of service functionality before product release.
- Ensuring timely preparation of the service organization.
- Coordination of activities with the Customer Service sub-processes: Application Services, Business Administration, Managed Logistics, Training Center, Customer Relationship Management, Customer Care Center, Headquarter Support Center
- Support and monitoring of customer-used-test systems

Serviceability Engineer Radiotherapy 2009–2013
Siemens AG Medical Solution Erlangen, DE

- Focus area
  - kV/MV Imaging
  - syngo Workstation
- Detailed achievements
  - Checking service functionality before product release
  - Planning and providing technical information for the various service units
  - Conducting and moderating workshops. Transfer of knowledge to the Customer Service sub-processes. Participants: Development, service technicians, application, training center, support center
  - Ensuring the timely preparation of the service organization
  - Reviewing and optimizing service functionality as part of the product launch

Installer of Mammographysystems 2004–2009
Siemens AG Medical Solution Worldwide

- Commissioning of analog and digital mammography systems (Mammomat Nova, Mammomat Novation), worldwide.
- Acceptance and constancy test according to §16 of the X-ray ordinance in Germany

PUBLICATIONS

Martina Murr, Kristy K. Brock, Marco Fusella, Nicholas Hardcastle, Mohammad Hussein, Michael G Jameson, Isak Wahlstedt, Johnson Yuen, Jamie R McClelland*, and Eliana Vasquez Osorio*. (*Joint senior authors) | ***Applicability and usage of dose mapping/accumulation in radiotherapy.***
Radiotherapy and Oncology 182 (2023) 109527. | https://doi.org/10.1016/j.radonc.2023.109527.

Lena Nenoff, Florian Amstutz, **Martina Murr,** Ben Archibald-Heeren, Marco Fusella, Mohammad Hussein, Wolfgang Lechner, Ye Zhang, Greg Sharp and Eliana Vasquez Osorio. | ***Review and recommendations on deformable image registration uncertainties for radiotherapy applications.***
Physics in Medicine & Biology 2023. | https://doi.org/10.1088/13616560/ad0d8a.

Martina Murr, Uffe Bernchou, Edyta Bubula-Rehm, Mark Ruschin, Parisa Sadeghi, Peter Voet, Jeff D Winter, Jinzhong Yang, Eyesha Younus, Cornel Zachiu, Yao Zhao, Hualiang Zhong, Daniela Thorwarth. | ***A multi-institutional comparison of retrospective deformable dose accumulation for online adaptive magnetic resonance-guided radiotherapy.***
Physics and Imaging in Radiation Oncology 2024;0. | https://doi.org/10.1016/j.phro.2024.100588.

Martina Murr, Daniel Wegener, Simon Böke, Cihan Gani, David Mönnich, Maximilian Niyazi, Moritz Schneider, Daniel Zips, Arndt-Christian Müller, Daniela Thorwarth. | ***Comparison of online adaptive and non-adaptive magnetic resonance image-guided radiation therapy in prostate cancer using dose accumulation.***
Physics and Imaging in Radiation Oncology 2024;32. | https://doi.org/10.1016/j.phro.2024.100662

Dominika Skwierawska, Sebastian Bickelhaupt, Maximilian Bachl, Rolf Janka, **Martina Murr,** Felix Gloger, Tristan A Kuder, Moritz Zaiss, Dominique Hadler, Michael Uder, Frederik B Laun. | ***Relevance of Prostatic Fluid on the Apparent Diffusion Coefficient: An Inversion Recovery Diffusion-Weighted Imaging Investigation***
Invest Radiol. 60(6):p 357-368, June 2025.| https://doi.org/10.1097/rli.0000000000001139

Research Interests

Image Registration
Geometric fusion of multi- and monomodal imaging data to enhance diagnostic accuracy and therapeutic planning. Development of robust algorithms for precise image fusion and longitudinal image analysis.

Dose Accumulation in Adaptive Radiotherapy
Quantification of accumulated radiation dose over the course of treatment. Investigation of advanced computational methods for accurate dose tracking in evolving anatomical scenarios.

Diffusion-Weighted Imaging (DWI)
Quantitative analysis of diffusion processes for the assessment of microstructural tissue changes, with applications in tumor characterization and therapy monitoring.

Medical Image Processing and Reconstruction
Algorithm development for image enhancement, segmentation, and quantitative evaluation of medical imaging data, with emphasis on clinical applicability and reproducibility.

Magnetic Resonance Imaging (MRI)
Application in image-guided radiotherapy and high-resolution diagnostics. Exploration of novel MRI-based biomarkers and functional imaging techniques for therapy guidance.

X-ray Imaging and Computed Tomography (CT)
Utilization in oncologic diagnostics and treatment planning. Focus on improving image quality, dose efficiency, and integration with other modalities.

Radiotherapy (RT)
Optimization of treatment planning techniques to enhance tumor targeting while minimizing normal tissue exposure. Research on adaptive and personalized radiation therapy approaches.

Statistical Analysis
Application of advanced statistical and data-driven methods to evaluate imaging biomarkers, dose distributions, and clinical outcomes.

Radiation Protection
Development of evidence-based strategies to minimize radiation exposure for both patients and healthcare professionals.

Workshop / Working Group

American Association of Physicists in Medicine (AAPM) IHE-RO Deformable Image Registration | *member* 2023–
Integrating the Healthcare Enterprise (IHE) Radiation Oncology Technical Framework Supplement

ESTRO ACPSEM AAPM working group: Data and tool sharing for commissioning and validation of deformable image registration | *lead* 2023–
Sharing of data and tools for commissioning and validation of deformable image registration.

European SocieTy for Radiotherapy and Oncology (ESTRO) working group: Deformable Image Registration uncertainty quantification | *member* 2023–
Quantification of uncertainty in deformable image registration.

European SocieTy for Radiotherapy and Oncology (ESTRO working group: Uncertainties in deformable image registration | ***member*** 2021–2023
Review and development of recommendations on deformable image registration uncertainties for radiotherapy applications

European SocieTy for Radiotherapy and Oncology (ESTRO) working group: Dose Accumulation | ***lead*** 2021–2023
Investigation of the applicability and utilization of dose calculation/accumulation in radiotherapy

Elekta MR-Linac dose accumulation working group | ***second lead*** 2021–2025
Multi-institutional deformable dose accumulation study for online adaptive magnetic resonance-guided radiotherapy

European SocieTy for Radiotherapy and Oncology (ESTRO) 2021 Physics Workshop - Science in Development | ***participation, member*** 2021
Workshop: Commissioning and Quality Assurance of Deformable Image Registration for Current and Future Radiotherapy Applications

54. Meeting of the Working Group "Magnetic Resonance Procedure", Erlangen| ***participation*** 2019
Conference

22. Annual meeting of the German section ISMRM e.V., Kiel | ***participation*** 2019
Conference

Conferences and Presentations

Applicability and usage of dose mapping/accumulation in radiotherapy May 2024
European SocieTy for Radiotherapy and Oncology (ESTRO) Congress | *Symposium* Glasgow, GB-SCT

Dose accumulation after online adaptive MR-guided RT compared to CT-based IGRT in prostate cancer May 2024
European SocieTy for Radiotherapy and Oncology (ESTRO) Congress | *Poster Presentation* Glasgow, GB-SCT

Applicability and usage of dose mapping/accumulation in radiotherapy June 2023
The Medical Image Registration Special Interest Group (MIRSIG) Webinar Series, Australasian College of Physical Scientists & Engineers in Medicine | *Invited Talk* Australasian

A multi-institutional retrospective deformable dose accumulation analysis for MR-guided RT May 2023
European SocieTy for Radiotherapy and Oncology (ESTRO) Congress | *Proffered Papers* Copenhagen, DK

Vergleich verschiedener Strategien zur deformierbaren Dosisakkumulation in der MR-geführten adaptiven Strahlentherapie des Prostatakarzinoms May 2022
Deutsche Gesellschaft für Radioonkologie (DEGRO) | *Poster Presentation* Stuttgart, DE

Comparison of different strategies for deformable dose accumulation in prostate cancer radiotherapy May 2022
European SocieTy for Radiotherapy and Oncology (ESTRO) Congress | *Poster Digital* Copenhagen, DK

Awards and Scholarships

DFG (PAK 997/1, MU 4603/1-1)

Programs

Women@ESTRO 2021-2025
European SocieTy for Radiotherapy and Oncology (ESTRO)

Women@SV 2014–2020
Siemens Healthineers

Learning Campus @Heathcare 2014–2016
Siemens Healthineers

Teaching Experience

Lecturer in Master's degree program in Medical Technolog 2025–
Wilhelm Büchner Hochschule Darmstadt, DE

Physics internship: Medical-technical assistants laboratory (MTA-L) 2022–2023
University Hospital Tübingen Tübingen, DE

Training of instructors for service technicians prior to product launch. 2009–2020
Siemens Healthineers Erlangen, DE

Additional Qualifications

Special course on radiation protection (Spezialkurs im Strahlenschutz) 2019
TU Kaiserslautern Kaiserslautern, DE

Trainer (IHK) 2018
IHK Nürnberg Nürnberg, DE

Safety officer for medical products (Sicherheitsbeauftragte für Medizinische Produkte) 2016
TU Kaiserslautern Kaiserslautern, DE

Expertise in Austrian law on radiation protection (Fachkunde österreichisches Strahlenschutzrecht) 2016
TU Kaiserslautern Feldkirch, AU

Expertise in German law on radiation protection (Fachkunde deutsches Strahlenschutzrecht) 2016
TU Kaiserslautern Feldkirch, AU

English language assessor for technical service documents 2014
Siemens Healthineers Forchheim, DE

Skills

Languages: German (native), English (fluent to business fluent)
Programming: Python, Matlab, R and SPSS
Document Creation: Microsoft Office , LaTeX