Tom Griesler
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Research Profile

PhD candidate in Biomedical Engineering developing quantitative abdominal MRI methods based on magnetic resonance fingerprinting (MRF). Research focuses on quantitative abdominal MRI, multi-echo MRF reconstruction, perfusion MRI, machine learning, and open-source pulse sequence programming. Core developer of OpenMRF (openmrf.org) for reproducible Pulseq-based MRF acquisition and reconstruction.

Education

University of Michigan *Expected 2027*
PhD, Biomedical Engineering

Universität Würzburg *July 2023*
Master of Science, Physics

Technische Universität Darmstadt *February 2020*
Bachelor of Science, Physics

Research Experience

Technion – Israel Institute of Technology *October 2025 – January 2026*
Visiting Researcher
Visited Efrat Shimron's group at Technion to advance machine learning methods for multi-echo MRF reconstruction and open-source liver T1 mapping.

University of Michigan, Department of Biomedical Engineering *August 2023 – present*
Graduate Student Research Assistant
Advisor: Professor Nicole Seiberlich
- Develop optimized MRF sequence designs for rapid quantitative abdominal imaging
- Advance multiparametric liver imaging at mid-field (0.55T), including T1, T2, T2*, and PDFF mapping
- Extend Deep Image Prior reconstruction to support multi-echo MRF data
- Develop high temporal resolution quantitative perfusion imaging concepts using MRF
- Lead development of OpenMRF, an open-source Pulseq-based framework for MRF acquisition and reconstruction
- Coordinate a multi-site, multi-vendor phantom study within OpenMRF development

Universität Würzburg, Experimental Physics 5 *April 2022 – July 2023*
Graduate Researcher
Advisors: Professor Peter M. Jakob, Dr. Martin Blaimer
- Master's Thesis: "Target-dependent Optimization of Magnetic Resonance Fingerprinting Sequences"
- Built an end-to-end workflow for planning and performing MRF measurements
  - Created a Python module for MRF sequence optimization using multiple cost functions, including the Cramer-Rao Lower Bound
  - Implemented MRI sequences in PyPulseq and performed phantom and in vivo measurements on a clinical 3T scanner

  - Implemented a reconstruction pipeline to estimate relaxation times and tissue fractions from raw data
- Applied the framework to estimate myelin water fraction in the human brain

Magnetic Resonance and X-Ray Imaging Department, Fraunhofer EZRT *June 2021 – August 2021*
Research Intern
Advisor: Dr. Martin Blaimer
- Performed relaxometric measurements on geological samples using a gradient and radiofrequency insert in the magnetic field of a clinical 1.5T scanner
- Analyzed measurement data in Matlab

Technische Universität Darmstadt, Institute for Condensed Matter Physics *September 2019 – February 2020*
Undergraduate Researcher
Advisor: Professor Michael Vogel
- Bachelor's Thesis: "Design of a PFG NMR Probe and Diffusion Measurements on a Lithium Chloride Solution in Confinement"
- Identified improvement opportunities for an existing probe design
- Designed components of a new probe in the CAD software "OnShape"
- Assembled the probe (manual assembly, soldering of electrical components, adjustment of the electrical oscillating circuit)
- Performed diffusion measurements in an NMR spectrometer
- Evaluated and visualized the results in Python

Teaching Experience

Technische Universität Darmstadt
Undergraduate Teaching Assistant *October 2017 – September 2018*
October 2019 – March 2020
- Teaching assistant for *Experimental Physics I & II* for Professor Regine von Klitzing and Professor Norbert Pietralla
- Held weekly exercise sessions
- Held weekly office hours to help students with concepts and homework
- Corrected the weekly homework
- Corrected the final exams

Conference Abstracts (First Author)

7 first-author conference abstracts (2024–2025).
- **Tom Griesler**, Maximilian Gram, Jannik Stebani, Petra Albertova, Peter Dawood, Nicole Seiberlich, Peter Michael Jakob, Martin Blaimer. "Towards Sequence Optimization for Multi-Compartment Magnetic Resonance Fingerprinting". *ISMRM Annual Meeting and Exhibition* 2024, Singapore.
- **Tom Griesler**, Jesse Hamilton, Sydney Kaplan, Evan Cummings, Nicole Seiberlich, Gastao Cruz. "Preparation Scheme Optimization for Abdominal MRF". *ISMRM Annual Meeting and Exhibition* 2024, Singapore.
- **Tom Griesler**, Luis Hernandez-Garcia, Zhongnan Liu, Jesse Hamilton, Thomas Chenevert, Vikas Gulani, Nicole Seiberlich, Gastao Cruz. "Feasibility of High Temporal Resolution Quantitative Perfusion Using MR Fingerprinting". *ISMRM Workshop on Perfusion MRI* 2025, Pam-

plona, Spain.

- **Tom Griesler**, Evan Cummings, Gastao Cruz, Matthew S Davenport, Hero Hussain, Jesse Hamilton, Nicole Seiberlich. "Improved Liver T1, T2, T2*, and PDFF Mapping at 0.55T Using Rosette MRF with Optimized Sequence Design and Deep Image Reconstruction". *ISMRM Workshop on Body MRI* 2025, Philadelphia, PA, USA.
- **Tom Griesler**, Evan Cummings, Sydney Kaplan, Jesse Hamilton, Matthew S Davenport, Nicole Seiberlich, Gastao Cruz. "Kidney T1, T2, T2*, T1rho, and PDFF Mapping at 1.5T Using Rosette MRF with Dictionary Patch-Based Regularization". *ISMRM Workshop on Body MRI* 2025, Philadelphia, PA, USA.
- **Tom Griesler**, Evan Cummings, Gastao Cruz, Matthew S Davenport, Hero Hussain, Jesse Hamilton, Nicole Seiberlich. "Improved Liver T1, T2, T2*, and PDFF Mapping at 0.55T Using Rosette MRF with Optimized Sequence Design and Deep Image Reconstruction". *ISMRM Annual Meeting and Exhibition* 2025, Honolulu, HI, USA. Received ISMRM Summa Cum Laude Merit Award.
- **Tom Griesler**, Evan Cummings, Sydney Kaplan, Jesse Hamilton, Matthew S Davenport, Nicole Seiberlich, Gastao Cruz. "Kidney T1, T2, T2*, T1rho, and PDFF Mapping at 1.5T Using Rosette MRF with Dictionary Patch-Based Regularization". *ISMRM Annual Meeting and Exhibition* 2025, Honolulu, HI, USA.

Conference Abstracts (Coauthor)

12 coauthored conference abstracts (2023–2026).

- Peter Dawood, Jannik Stebani, **Tom Griesler**, Felix Breuer, Daniel Weber, Volker Herold, Shaihan Malik, Peter M. Jakob, Martin Blaimer. "Neural network informed flip angle optimization for SAR reduced imaging". *ESMRMB Annual Scientific Meeting* 2023, Basel, Switzerland.
- Gastao Cruz, Evan Cummings, **Tom Griesler**, Jesse Hamilton, Vikas Gulani, Matthew Davenport, Nicole Seiberlich. "2D T1, T2, T2* And PDFF Mapping In The Kidney With Rosette MRF Using Hermitian Low-Rank and Dictionary-Patch Based Regularization". *ISMRM Annual Meeting and Exhibition* 2024, Singapore.
- Petra Albertova, **Tom Griesler**, Martin Blaimer, Nicole Seiberlich, Peter M. Jakob, Peter Nordbeck, Maximilian Gram. "Magnetic Resonance Fingerprinting enables spatially resolved characterization of pulsed magnetic fields in the nano-Tesla range". *BIOMAG* 2024, Sydney, Australia.
- Kian R Weihrauch, **Tom Griesler**, Jesse Hamilton, Nicole Seiberlich, Gastao Cruz. "Deep Learning for Kidney Segmentation Using Quantitative MRI: Bridging the Gap Between Simulated and In Vivo Data". *ISMRM Workshop on Body MRI* 2025, Philadelphia, PA, USA.
- Gastao Cruz, Evan Cummings, **Tom Griesler**, Jacob Richardson, Jesse Hamilton, Vikas Gulani, Matthew S Davenport, Nicole Seiberlich. "3D free-breathing T1/T2/T2*/PDFF kidney mapping with dictionary-patch regularized low rank motion corrected rosette MRF". *ISMRM Workshop on Body MRI* 2025, Philadelphia, PA, USA.
- Gastao Cruz, Evan Cummings, **Tom Griesler**, Jesse Hamilton, Vikas Gulani, Matthew Davenport, Nicole Seiberlich. "3D Free-Breathing T1, T2, T2* And PDFF Mapping In The Kidneys With Dictionary-Patch Regularized Low Rank Motion Corrected Rosette MRF". *ISMRM Annual Meeting and Exhibition* 2025, Honolulu, HI, USA.
- Rudy Rizzo, Zhongnan Liu, Jesus Ernesto Fajardo Freites, **Tom Griesler**, Jesse Hamilton, Yun Jiang, Nicole Seiberlich. "Accelerating 3D High-Resolution Brain MR Fingerprinting At 0.55T: Balanced Free-Precession Meets Deep Learning". *ISMRM Annual Meeting and Exhibition* 2025, Honolulu, HI, USA.
- Maximilian Gram, Petra Albertova, **Tom Griesler**, Peter Dawood, Jannik Stebani, Martin Blaimer, Nicole Seiberlich, Peter Michael Jakob, Peter Nordbeck. "Spin-Lock Based Magnetic

Resonance Fingerprinting Enables Characterization Of Magnetic Waveforms Via Spectral Matching Of Rotary Excitation". *ISMRM Annual Meeting and Exhibition* 2025, Honolulu, HI, USA.

- Jannik Stebani, Ivaylo Angelov, Peter Dawood, **Tom Griesler**, Petra Albertova, Thomas Kampf, Kristen Rak, Peter Michael Jakob, Martin Blaimer, Maximilian Gram. "High-Resolution Quantitative Imaging Of The Inner Ear Using 3D Magnetic Resonance Fingerprinting". *ISMRM Annual Meeting and Exhibition* 2025, Honolulu, HI, USA.
- Christopher Keen, **Tom Griesler**, Nicole Seiberlich, Yun Jiang. "Improved Magnetic Resonance Fingerprinting with Optimized RF Phase Modulation". *ISMRM Workshop on Data Sampling and Image Reconstruction* 2026, Sedona, AZ, USA.
- Calder D Sheagren, **Tom Griesler**, Maximilian Gram, Nicole Seiberlich, Gastao Cruz, Jesse Hamilton. "Wideband Magnetic Resonance Fingerprinting for T1 and T2 Mapping Near Cardiac Implantable Electronic Devices". *ISMRM Workshop on Data Sampling and Image Reconstruction* 2026, Sedona, AZ, USA.
- Reina Ayde, **Tom Griesler**, Christopher Keen, Rudy Rizzo, Jesse Hamilton, Nicole Seiberlich. "Slice-to-slice initialization for accelerated Deep Image Prior reconstruction of 3D MRF maps". *ISMRM Workshop on Data Sampling and Image Reconstruction* 2026, Sedona, AZ, USA.

Preprints

- **Tom Griesler**, Jannik Stebani, Sydney Kaplan, Ivaylo Angelov, Petra Albert, Martin Blaimer, Tobias Wech, Xiang Wang, Qingping Chen, Maxim Zaitsev, Zhibo Zhu, Qi Liu, Peter Martin, Jon-Fredrik Nielsen, Jesse I Hamilton, Peter Nordbeck, Nicole Seiberlich, Maximilian Gram. "OpenMRF: A Modular, Vendor-Neutral Open-Source Framework for Reproducible Magnetic Resonance Fingerprinting using Pulseq". Submitted to *Magnetic Resonance in Medicine*, April 2026.

Invited Talks

7 invited talks across academic and industry seminars (2023–2026).

- 09/25/2024: "Quantitative Abdominal Imaging with MR Fingerprinting". Niendorf group MRI seminar, Max-Delbrück Center for Medicine (remote).
- 03/14/2025: "The Next Step: MR Fingerprinting beyond T1 and T2". Comprehensive Heart Failure Center MRI seminar, University Hospital Würzburg.
- 10/21/2025: "Everything, all at once: T1/T2/T2*/T1rho/PDFF in one breath-hold using Multi-Echo MRF". MRWue seminar, University Hospital Würzburg.
- 12/28/2025: "Multi-echo MR Fingerprinting for comprehensive tissue characterization in the abdomen". Perlman group MRI seminar, Tel Aviv University.
- 01/07/2026: "Multi-Echo Magnetic Resonance Fingerprinting". MRI Seminar, Weizmann Institute of Science.
- 03/05/2026: "Next steps with OpenMRF". WIMR seminar, University of Wisconsin-Madison.
- 03/19/2026: "Magnetic Resonance Fingerprinting: from 0.55T to 5T using open-source Pulseq tools". United Imaging Healthcare North America, Houston.

Relevant Skills

Programming

- Python: scientific computing and machine learning with PyTorch for image reconstruction, quantitative MRI analysis, gradient-based physical modeling, and experiment-parameter optimization
- Matlab: Pulseq-based sequence implementation, MRF data reconstruction, quantitative mapping, data analysis and visualization, and basic statistical analysis
- Git: collaborative version control workflows for research software

- Bash/Linux scripting for reproducible processing pipelines and high-performance computing clusters
- Sequence programming in IDEA/C++

MRI Systems and Experimental Skills
- Extensive hands-on operation of Siemens clinical MRI systems for sequence testing and data acquisition
- Phantom and in vivo MRI experiment planning, execution, and quality control

Languages
- German: Native
- English: Professional Working Proficiency (TOEFL score 110/120, 2022)
- French: Limited Working Proficiency (CEFR B2)

Honors and Awards

- Erasmus Exchange Program Student at Grenoble Institute of Technology — *September 2018 – June 2019*
- Röntgen-Studienpreis, Institute of Physics, Universität Würzburg — *June 2024*
- 2nd Place Power Pitch, ISMRM Workshop on Body MRI 2025, Philadelphia, PA, USA — *March 2025*
- Summa Cum Laude Award, ISMRM Annual Meeting 2025, Honolulu, HI, USA — *May 2025*
- Michigan-Israel Partnership for Research and Education Exchange Grant ($19k) — *October 2025 – January 2026*

Memberships

- ISMRM trainee member — *2024 – present*

Service

- Member of the Michigan Institute for Imaging Technology and Translation Social Committee — *October 2023 – present*
  - Served as Chair — *October 2023 – July 2025*
- Graduate Student Engineering Ambassador, College of Engineering, University of Michigan — *May 2025 – present*

Volunteering

- Active member, Volunteer Fire Brigade in Neuenbuch (Germany) — *2010–2023*
  - Served as Chair for Youth Education: Organized training programs and educational activities for youth members (age 12–18). — *2020–2022*
- Active Member, Neuenbucher Musikanten Brass Band — *2012–2023*
  - Served as President: Managed band activities and coordinated performances. — *2022–2023*
- Active Member, Zeltlagerteam Untermain — *2013–2023*
  - Participated in the planning and realization of a yearly summer camp for kids age 8–13.
  - Served as Board Member. — *2020–2022*