

# Tassilo Wald

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## Research Interest:

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My research focuses on machine learning and its applications in medical image analysis, with a particular interest in understanding the representations learned by deep neural networks and guiding their development. This led me to explore self-supervised learning for 3D medical imaging, where I aim to develop general-purpose representations applicable to various downstream tasks. Notably, I recently collaborated with the German start-up FLOY to develop a large pre-trained brain MRI model. I am also currently leading the development of pre-training methods for [The Human Radiome Project](#), a pilot project of the Helmholtz Foundation Model Initiative, which seeks to create a vision foundation model for 3D radiology. Furthermore, I am currently working on curating a large-scale dataset, establishing a benchmark, and maintaining a comprehensive repository of the most relevant 3D SSL methods to accelerate the 3D medical SSL community.

## Education:

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**Apr. 2020 – present:** **German Cancer Research Center (DKFZ), Heidelberg**  
Department for Medical Image Computing (MIC)  
PhD Student in Computer Science  
Advisor: Prof. Klaus H. Maier-Hein

- Representational Similarity
- Feature Diversity
- 3D Medical Image Segmentation

**Apr 2016 – Aug. 2019:** **Karlsruhe Institute of Technology (KIT),**  
M.Sc. in Electrical Engineering and Information Theory  $\emptyset_{1,3}$

- Master thesis in computer vision (1,0): “Combination of Temporal and Spatial Information Extraction Within a CNN for Improving Object Detection”
- Specialization in control theory and machine learning

## Other Research Experience:

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**Oct. 2019 – Mar. 2020:** **FZI Research Center for Information Technology, Karlsruhe**  
Student Assistant

- 2D+t Object detection
- Multi Task Learning

**Dec. 2017 – Apr. 2018:** **Bosch Japan, Yokohama**  
Intern in the Engineering Application Product Department

- Automated evaluation of brake assistant validation and testing
- Neural network classification for ultrasound brake assistant

**Jun. 2015 – Dec. 2016:** **Institute of Systems Optimization (ITE), Karlsruhe**  
Student Assistant

- Microcontroller software development
- System integration
- Experimental setup und evaluation

## Publications (First & Equal Contribution):

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1. [NeurIPS 2024]: Wald, Tassilo, Constantin Ulrich, Gregor Köhler, David Zimmerer, Stefan Denner, Michael Baumgartner, Fabian Isensee, Priyank Jaini, and Klaus H. Maier-Hein. "Decoupling Semantic Similarity from Spatial Alignment for Neural Networks." In *The Thirty-eighth Annual Conference on Neural Information Processing Systems*, (2024) (Collaboration with Google DeepMind).
2. [Preprint 2024] Tassilo Wald\*, Constantin Ulrich\*, Jonathan Suprijadi, Michal Nohel, Robin Peretzke, Klaus Maier-Hein, "An OpenMind for 3D medical vision self-supervised learning.", arXiv preprint
3. [MICCAI 2024] Isensee, Fabian\*, Tassilo Wald\*, Constantin Ulrich\*, Michael Baumgartner\*, Saikat Roy, Klaus Maier-Hein, and Paul F. Jaeger. "nnu-net revisited: A call for rigorous validation in 3d medical image segmentation." *International Conference on Medical Image Computing and Computer-Assisted Intervention*, pp. 488-498. Cham: Springer Nature Switzerland, 2024
4. [Preprint 2024] Wald, Tassilo\*, Constantin Ulrich\*, Stanislav Lukyanenko, Andrei Goncharov, Alberto Paderno, Leander Maerkisch, Paul F. Jaeger, and Klaus Maier-Hein. "Revisiting MAE pre-training for 3D medical image segmentation." arXiv preprint arXiv:2410.23132 (2024).
5. [Preprint 2024] Constantin Ulrich\*, Wald Tassilo\*, Emily Tempus\*, Maximilian Rokuss, Paul F. Jaeger, Klaus H. Maier-Hein. "RadioActive: 3D Radiological Interactive Segmentation Benchmark." arXiv preprint arXiv:2411.07885 (2024)
6. [Preprint 2024] Klabunde, Max\*, Tassilo Wald\*, Tobias Schumacher\*, Klaus Maier-Hein, Markus Strohmaier, and Florian Lemmerich. "Resi: A comprehensive benchmark for representational similarity measures." arXiv preprint arXiv:2408.00531 (2024).
7. [SCIS 2023] Tassilo Wald, Constantin Ulrich, Fabian Isensee, David Zimmerer, Gregor Koehler, Michael Baumgartner, Klaus H. Maier-Hein. "Exploring new ways: Enforcing representational dissimilarity to learn new features and reduce error consistency," *Workshop on Spurious Correlations, Invariance and Stability (SCIS) at ICML*, 2023. [PDF]
8. [MIDL short 2023] Saikat Roy\*, Tassilo Wald\*, Gregor Köhler\*, Maximilian R. Rokuss\*, Nico Disch\*, Julius Holzschuh\*, David Zimmerer\*, Klaus H. Maier-Hein. "SAM.MD: Zero-shot medical image segmentation capabilities of the Segment Anything Model," *Medical Imaging with Deep Learning (MIDL), short paper track*, 2023. [PDF]
9. [BVM 2023] Fabian Isensee\*, Constantin Ulrich\*, Tassilo Wald\*, Klaus H. Maier-Hein. "Extending nnU-Net is all you need," *Bildverarbeitung für die Medizin (BVM)*, 2023. (Oral) [PDF]
10. [NOA 2022] Irada Pflueger\*, Tassilo Wald\*, Fabian Isensee, Marianne Schell, Hagen Meredig, Kai Schlamp, Denise Bernhardt, Gianluca Brugnara, Claus Peter Heußel, Juergen Debus, Wolfgang Wick, Martin Bendszus, Klaus H. Maier-Hein, Philip Vollmuth. "Automated detection and quantification of brain metastases on clinical MRI data using artificial neural networks," *Neuro-Oncology Advances*, 4(1), 2022. [PDF]

For co-authored papers please check my website [tawald.github.io](http://tawald.github.io) or my [google scholar](https://scholar.google.com/).

## Challenges & Hackathons:

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1. [MICCAI Challenge] 1<sup>st</sup> place of 13  
Jonathan Deissler\*, Tassilo Wald\*, "Mediastinal Lymph Node Quantification (LNQ): Segmentation of Heterogeneous CT Data," 2023 [Grand Challenge]
2. [MICCAI Challenge] 1<sup>st</sup> place of 20  
Fabian Isensee\*, Constantin Ulrich\*, Tassilo Wald\*, "Abdominal Multi-Organ Segmentation (AMOS) Challenge", 2022 [Grand Challenge]
3. [HiDA Hackathon] 1<sup>st</sup> place of 4  
Tassilo Wald\*, Michael Baumgartner\*, Gregor Köhler\*, "AI-HERO Hackathon for Energy-Efficient AI", 2022 [Link]

## Services & Activities:

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- Organizer of the [Heidelberg.ai](#) non-profit organization for researchers in the field of Artificial Intelligence since Feb. 2023.
- Reviewer for NeurIPS, ICLR, CVPR, ICML 2024
- Maintainer of nnU-Net, a self-configuring method for 3D medical image segmentation, since 2023.
- Reviewer for Unifying Representations in Neural Models (UniReps) workshop hosted at NeurIPS 2023, Bildverarbeitung für die Medizin (BVM) 2020-2022, Medical Image Computing and Computer-Assisted Intervention (MICCAI) 2021-2022 (allegedly), Nature methods 2022-2023 (allegedly).
- Tutorial Speaker on “Multi Task Learning in medicine” in the scope of the “Advanced Deep Learning” Tutorial for BVM 2022.
- Scholarship holder of “*Deutschlandstipendium*” awarded to 300 engaging and talented students out of 23.920 enrolled students in KIT 2017-2018.