Nick Lemke

Ph.D. Candidate, TU Darmstadt, Germany

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https://nickl1234567.github.io/

Employment History

05/2024 – ····· **Ph.D. student,** MEC-Lab, TU Darmstadt
Research on resource-constrained AI for medical image analysis, specifically focusing on Neural Cellular Automata, Federated Learning, and Continual Learning
Supervision of uni-related internships, bachelor's, and master's theses
Participation in teaching two lectures

10/2023 – 12/2023 **Research Assistant,** MEC-Lab, TU Darmstadt
Implementation of federated NCA training on Android smartphones using TensorFlow Lite and Kotlin

04/2023 – 09/2023 **Working Student,** Fraunhofer IGD, Darmstadt
Implementation of a parallel packing algorithm for 3D printing in C++
Reduction of runtime by 80% using Intel Threading Building Blocks

11/2022 – 02/2023 **Research Assistant,** MEC-Lab, TU Darmstadt
Implementation and evaluation of a continual learning method
Preparation of a pre-print ready for publication

2017 – 2023 **Private tutoring** in high school level computer science, mathematics, physics, chemistry, and English.

Education

05/2024 – ····· **Ph.D. student,** MEC-Lab, TU Darmstadt
Research on resource-constrained AI for medical image analysis

01/2023 – 04/2024 **M.Sc. Computer Science,** TU Darmstadt.
Thesis title: *Distribution-Aware Replay for Continual MRI Segmentation*.

10/2020 – 04/2024 **B.Sc. Mathematics,** TU Darmstadt.
Incomplete

10/2019 – 01/2023 **B.Sc. Computer Science,** TU Darmstadt.
Thesis title: *Convert a high-polygon mesh to a low-polygon mesh with a displacement map*.

Research Publications

Journal Articles

1. C. Gonzalez, **N. Lemke**, G. Sakas, and A. Mukhopadhyay, "What is wrong with continual learning in medical image segmentation?," 2023. arXiv: 2010.11008.

Conference Proceedings

1. **N. Lemke**, C. González, A. Mukhopadhyay, and M. Mundt, "Distribution-aware replay for continual mri segmentation," in *International Workshop on Personalized Incremental Learning in Medicine*, Springer, 2024, pp. 73–85.

Skills

Languages	**German** (Native language), **English** (Fluent)
Coding	Python, Java, C/C++, C#, Kotlin, TypeScript
Python Packages	**Exceptional:** PyTorch, Numpy **Good:** PyTorch Lightning, TensorFlow Lite, OpenCV, ...
Misc.	LaTeX typesetting, Git, MS-Office, Linux

Miscellaneous Experience

Voluntary Work

2025
- **Officer for Public Relations of the MICCAI Student Board (MSB)**, responsible for the management of the MSB web and social media presence with more than 8500 followers: https://miccai-sb.github.io/
- **Reviewing** for IJCARS, IPCAI, DGM4MICCAI

Awards and Achievements

2024
- **Participation in the Hackathon *ProKI*** organized by the TU Darmstadt, the Karlsruhe Institute of Technology, as well as the Verein Deutscher Ingenieure.
  Topic: Machine vision for automated robot handling.

2023
- **Winner of the AI Competition *Wettbewerb KI in der Medizin*** held at TU Darmstadt.
  Topic: Classification and onset detection of seizures in EEG recordings.
- **Second place in the Hackathon *ProKI*** hosted by the departments of mechanical engineering at TU Darmstadt and Karlsruhe Insitute of Technology, as well as Fraunhofer LBF, Verein Deutscher Ingenieure and the Freudenberg Group.
  Topic: Predicting a wear and tear index for milling tools.