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# Moritz Laass

PhD Candidate & Software Engineer

## Research Interests

Spatial Computing, Probabilistic Data Structures, High-Performance Big Data Management, GPU Acceleration, and Computational Geometry.

## Education

- 2020–Present **Doctoral Candidate (Big Geospatial Data Management)**, *Technical University of Munich (TUM)*, Munich  
Research focus on High-Performance Computing, Machine Learning, and Hardware-Accelerated Spatial Joins using RTX. Project lead on Neural Search for Satellite Imagery.
- 2014–2017 **M.Sc. Human-Computer Interaction**, *Ludwig Maximilians Universität (LMU)*, Munich, Grade: 1.0 (Thesis)  
Master's Thesis: "Trajectory Simplification using Persistence." Developed novel algorithms for movement data compression. Specialized in Brain-Computer Interfaces and Deep Learning.
- 2007–2011 **B.A. Process Design**, *FHNW Hyperwerk*, Basel, Switzerland  
Focus on Interactive Systems and Software Engineering. Developed a real-time collaborative game engine and high-resolution imaging systems.

## Publications

### Peer-Reviewed Conference Papers

- 2021 **M. Laass**, M. Kiermeier, M. Werner. "Improving persistence based trajectory simplification." *2021 22nd IEEE International Conference on Mobile Data Management (MDM)*, pp. 157-162.
- 2021 **M. Laass**. "Point in Polygon Tests Using Hardware Accelerated Ray Tracing." *Proceedings of the 29th International Conference on Advances in Geographic Information Systems (SIGSPATIAL)*.
- 2021 G. Dax, **M. Laass**, M. Werner. "Genetic Algorithm for Improved Transfer Learning Through Bagging Color-Adjusted Models." *2021 IEEE International Geoscience and Remote Sensing Symposium (IGARSS)*, pp. 2612-2615.
- 2021 S. Götzer, **M. Laass**, G. Dax, M. Werner. "ObservaToriUM: A Simple Scalable Earth Observation Processing Engine." *Symposium für Angewandte Geoinformatik (AGIT)*.

- 2020 M. Werner, G. Dax, **M. Laass**. "Computational challenges for artificial intelligence and machine learning in environmental research." *INFORMATIK 2020*, pp. 1009-1017.

## Academic & Teaching Experience

- 2020–2022 **Wissenschaftlicher Mitarbeiter (Research Associate)**, *Technical University of Munich*, Munich
- Conducted research in Big Geospatial Data Science and Distributed Systems.
  - **Teaching:** Tutored students in Fundamentals of Computer Science and Geospatial Computing.
  - **Mentorship:** Supervised student projects in Machine Learning, Change Detection, and High-Performance Computing.
  - Provided technical training in Matlab, C++, and Algorithms & Data Structures.

## Professional Experience

- 2022–Present **Fractional CTO & AI Developer**, *Freelance / Remote*
- Leading "AI-first" development initiatives using LLM Agents, RAG-Systems, and toolsets like Claude Code and Gemini CLI.
  - Training hundreds of engineers in advanced AI integration and agentic workflows.
- 2020–2021 **Software Developer (Lead)**, *Klang2 GmbH*, Munich  
Architected cross-platform mobile applications using Flutter and Python/Django.
- 2018–2020 **Backend Developer**, *Motius GmbH*, Munich  
Built mission-critical microservices (Node.js, MongoDB, Redis) for IoT and SSO platforms.
- 2016–2016 **CTO & Lead Developer**, *e-bot7 GmbH*, Munich  
Defined the software architecture for an enterprise chatbot platform.
- 2014–2015 **CTO & Lead Developer**, *Soap Audio*, Munich / Tel-Aviv  
Co-founded a hardware startup; developed prototypes using embedded Linux and Android SDK.

## Technical Skills

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|------------|--|
| Languages  | Python, C++, TypeScript, Go, C#, Java, Rust, SQL, Bash.                          |
| AI & Data  | PyTorch, Scikit-learn, LLM Orchestration, RAG, Big Data Analytics.               |
| Systems    | GPU (RTX), Distributed Systems, Docker, Kubernetes, PostgreSQL/PostGIS, MongoDB. |
| Web/Mobile | React, Svelte, Node.js, Flutter, Three.js, FastAPI, Django.                      |

## Languages

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|---------|--------|
| German  | Native |
| English | Fluent |