

Maximilian Schwalenberg

AI Engineer with a track record of deploying production-grade RAG systems and award-winning Computer Vision research. Combines deep ML expertise with full-stack engineering to ship practical AI products.

+4917647798798 | Email | LinkedIn | GitHub | Portfolio

EXPERIENCE

AI Software Engineer (Working Student)

May 2024 – Dec. 2024

MicroNova AG, Munich

- Developed a production RAG-based contract analysis system using LlamaIndex, ChromaDB, and Vision Models on Azure, reducing manual legal review time from several hours to minutes.
- Engineered an end-to-end AI audit assistant using OpenAI Whisper (transcription) and RAG to transform conversations into structured knowledge; architected a Flask backend delivered as a Microsoft Word add-in.

AI Research Engineer (Internship, Research Assistant & Thesis)

Oct. 2021 – Jul. 2023

Fraunhofer Institute for Computer Graphics Research IGD, Rostock

- Engineered end-to-end PyTorch pipelines for multi-task learning and aerial imagery/geodata fusion, covering object detection, image classification, and instance segmentation; with full ownership of dataset curation, training, evaluation, and experiment tracking with MLflow.
- Trained Faster R-CNN and Vision Transformers to automatically detect and classify critical infrastructure from aerial imagery, generating UAV no-fly zones across Germany's airspace (fAIRport project).
- Achieved >50% relative error reduction over existing benchmarks (18% → 8.5%) through architecture improvements and data fusion strategies.

EDUCATION

Universiteit Utrecht

Sep. 2023 – Aug. 2025

Master of Science in Artificial Intelligence (Grade 8.01/10)

- Thesis: Engineered a Python pipeline using Representational Similarity Analysis to compare human 7T fMRI responses with Computer Vision models, investigating biological vs. artificial object detection mechanisms.

University of Rostock

Oct. 2019 – Apr. 2023

Bachelor of Science in Computer Science (Grade 1.6)

- Thesis (at Fraunhofer IGD): Multi-task learning model for UAV no-fly zone generation - awarded Best Thesis of the Year.
- Tutor, Functional Programming (Haskell): conducted exercise sessions and graded assignments (SS 2020).
- Research Assistant: investigated Variational Autoencoders for density estimation and benchmarked generative model performance.

PROJECTS

Brain Visualizer | React, Three.js, Flask, GenAI, Docker

- Full-stack 3D brain visualizer mapping the Destrieux Atlas; integrated LLMs to make complex neural anatomy accessible to non-specialist users.

Explainable AI (Alzheimer's MRI) | Python, TensorFlow

- Built an XAI tool using Layerwise Relevance Propagation to localise suspicious MRI regions for Alzheimer's classification, improving model interpretability.

Evolutionary Optimization | Python

- Applied evolutionary algorithms to Graph Bipartitioning, outperforming classical algorithmic heuristics.

TECHNICAL SKILLS

Programming: Python, JavaScript/TypeScript, C++

AI & MLOps: PyTorch, Torchvision, OpenCV, MLflow, LlamaIndex, ChromaDB, LiteLLM

Web & Backend: FastAPI, Flask, React, REST APIs, SQL

DevOps & Tools: Docker, Azure, Linux, Git, CI/CD, Testing

LANGUAGES

German (Native) | English (Fluent) | French (Basic)

AWARDS

Best Thesis of the Year (University of Rostock) | Fraunhofer IGD Computer Graphics Award