Curriculum Vitae

Marcel Roth

in | | marcelroth100@aol.com

Research Interests

My core passion lies in advancing ML for CV applications, with particular interests in DL and XAI. I tackle challenging problems across diverse domains including medical imaging, document processing, and the reading of ancient scrolls. I'm driven by research that pushes visual AI boundaries while delivering practical, real-world impact!

Professional Experience

denkbares GmbH
ML Engineer, Working Student 1 yr 7 mos
- *Semantic search with embeddings for concept matching.*
- *SOTA ML-based OCR system for invoice processing.*
- *UI/UX features for product configuration knowledge bases.*

11/2023 – 05/2025, Würzburg, GER

Julius-Maximilians-Universität Würzburg
Chair for HCI, Research Intern 6 mos
- *Standardized large-scale XR motion datasets* [1].
- *Developed BOXRR-24 dataset featuring 15M motion capture recordings of XR devices.*

10/2023 – 12/2024, Würzburg, GER

Chair for DS, Research Assistant 8 mos
In-depth literature review of environmental variables in ecosystem forecasting models for NDVI vegetation modeling research.
08/2023 – 03/2024, Würzburg, GER

Chair for AI & KS, Research Intern 6 mos
Few-shot learning for thorax, pathology, and endoscopy image classification using FMs to improve limited data scenarios.
08/2023 – 02/2024, Würzburg, GER

eXXcellent solutions GmbH
Software Engineer, Working Student 2 yrs 3 mos
Software Engineering Intern 6 mos
- *Full-stack development of intern HR management software.*
- *Full-stack development of legal document web editor.*
- *LLM-based recommender system for legal document texts.*
- *Advanced document export module for legal documents.*

02/2021 – 11/2023, Ulm, GER

Selected Skills

Programming Languages (by relevance)
Python 3 yrs, Java 4 yrs, TypeScript 4 yrs

Machine Learning & Computer Vision
PyTorch, Lightning, wandb, albumentations, timm, NumPy, Pandas, Pillow, OpenCV, Scikit-Learn

Architectures
CNNs, Transformers, UNETR, ViT, LayoutLMv3, BERT

Web & Infrastructure
React, MUI, PostgreSQL, SQLite, Docker, slurm

Languages
German, English B2, Swedish A1

Education

Julius-Maximilians-University Würzburg
M.Sc. Computer Science, *GPA: 1.1/1.0*
Thesis: *"Domain-Adaptive Pre-training of Self-Supervised FMs for Medical Image Classification in GIE"* [2].
10/2022 – present, Würzburg, GER

University of Applied Sciences Ulm
B.Sc. Computer Science, *GPA: 1.5/1.0*
Thesis: *"The Metaverse: Definition [...] & Current State."*
07/2018 – 02/2023, Ulm, GER

Halmstad University
Graduate Exchange Student, *GPA: A/A*
08/2016 – 02/2017, Halmstad, SWE

Challenges & Awards

Capsule Vision 2024 Challenge 3rd Place
Domain-adaptive pre-training of self-supervised FMs for medical image classification in GIE [2]. 2024

Ultimate Jailbreaking Championship 1st Place
Prompt engineering for bypassing LLM safety systems, jailbreaking models with only 0.008% success rate. 2024

"Tierzählstation" Challenge 1st Place
DL for multi-species classification from camera trap images for wildlife animal population monitoring. 2024

Vesuvius GP Challenge 2023 Progress Prize Winner
DL for binary segmentation for ink detection on ancient papyrus scrolls, buried by the ashes of Vesuvius. 2023

NeurIPS 2023 MedFM Challenge 2nd Place
Few-shot learning for thorax, pathology, and endoscopy classification using FMs to improve limited data scenarios. 2023

Hackathons & Workshops

Healthcare Hackathon Würzburg
Developed a web app that uses voice biomarkers to monitor cardiac deterioration and severe heart failure in 3 days. 2025

Magnet4Cardiac7T Spring School 1st Place
Optimized MRI coil configurations with physics-informed NNs for B1+ field homogeneity while minimizing SAR. 2025

Publications

[1] *Navigating the Kinematic Maze: Analyzing, Standardizing and Unifying XR Motion Datasets*. IEEE'24.

[2] *Domain-Adaptive Pre-training of Self-Supervised Foundation Models for Medical Image Classification in Gastrointestinal Endoscopy*. ArXiv'24.