

# Marcel Roth

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## LinkedIn & Portfolio

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## Professional Experience

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|----------------|---|
| 2023 – present | <b>Knowledge Engineer</b> – Working Student<br>denkbares GmbH   Würzburg <ul style="list-style-type: none"><li>▪ <b>Project COOM</b><ul style="list-style-type: none"><li>– Front-End Development with TypeScript and React to implement features for configurator tables.</li><li>– Utilized ASP and CSP solvers for backend algorithms.</li></ul></li></ul>   |
| 2021 – 2023    | <b>Software Developer</b> – Working Student & Internship<br>eXXcellent solutions GmbH   Ulm <ul style="list-style-type: none"><li>▪ <b>Project PatentEngine</b><ul style="list-style-type: none"><li>– Full-Stack Development with Java, TS, Vue and React.</li><li>– <b>Document Export Module:</b> Implemented a feature for exporting legal documents from a web app to Word, ensuring compliance with specific formatting.</li><li>– <b>LLM-based Recommendations:</b> Developed an AI tool to simplify and clarify long, complex sentences while preserving technical terminology.</li></ul></li></ul> |
| 2018 – 2021    | <b>Work Safety</b> – Working Student<br>Liebherr-Components Kirchdorf GmbH  |

## Education

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|----------------|---|
| 2022 – present | <b>M. Sc. Computer Science</b><br>Julius-Maximilian-Universität   Würzburg <ul style="list-style-type: none"><li>▪ <u>Expertise:</u><ul style="list-style-type: none"><li>– Machine Learning &amp; Deep Learning</li><li>– Data Science &amp; Computer Vision</li><li>– Artificial Intelligence &amp; AI Safety</li><li>– Reinforcement Learning</li><li>– Virtual &amp; Extended Reality (VR/XR)</li></ul></li></ul> |
| 2018 – 2022    | <b>B. Sc. Computer Science</b><br>University of Applied Sciences   Ulm <ul style="list-style-type: none"><li>▪ <u>Expertise:</u><ul style="list-style-type: none"><li>– Software-Engineering</li><li>– Web &amp; Android App Development</li></ul></li><li>▪ Exchange Semester at Halmstad University, Sweden</li></ul>   |
| 2017 – 2018    | <b>B. Sc. Physics</b><br>University   Ulm   |

# Machine Learning Challenges

Mar. 2023 – Jul. 2024

## Tierzählstation Challenge | 1st Place

- Developed an AI model with 95% accuracy for wildlife identification, using EfficientNet B3 and ImageNet1k data.
- Employed advanced validation techniques including 10-Fold Cross-Validation and a weighted ensemble strategy.

Nov. 2023 – Jan. 2024

## Vesuvius GP Challenge | Progress Prize Winner

- Applied state-of-the-art transformer architectures to train binary segmentation models with weak super-vision for precise ink detection of ancient Greek letters.
- Performed large-scale distributed training on two NVIDIA DGX H100 with 640GB VRAM each.
- Designed and utilized customized loss functions.

Aug. 2023 – Oct. 2023

## NeurIPS: Foundation Model Prompting for Medical Image Classification Challenge 2023 | 2nd Place

- Applied state-of-the-art computer vision foundation models for efficient binary and multi-label medical image classification.
- Applied one-shot and few-shot learning to improve foundation model training with minimal amount of data.
- Employed advanced ensembling strategies to take advantage of over 1,000+ trained model predictions.

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## Technical Proficiencies

### Programming Languages

Java	4 years
TypeScript	3 years
Python	2 years
C#	Intermediate
C++	Basic

### Frameworks & Technologies

Frontend	React, VueJS, HTML, SCSS, MUI & styled components
Backend	NodeJS, Flask
Mobile Development	Android Studio, Flutter
Versioning	GitHub, GitLab
Machine Learning	PyTorch, Lightning, Scikit-Learn, timm, WandB, Tensorboard, Albumentations, MMCV
Data Analysis	NumPy, Pandas, Pillow, OpenCV
Game Development	Unity
Database	PostgreSQL, Firebase, H2

### Languages

German (native), English (fluent), Swedish (beginner)

### Hobbies

Volleyball, Cooking, Board games, Gaming