

# Philipp Erhardt

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## EDUCATION

### Technical University of Munich

*Master of Science in Informatics*

- Ongoing, expected graduation by summer 2027
- Focus Area: Database internals and **systems-level programming**

Munich, Germany

Oct 2024 – Present

### Technical University of Munich

*Bachelor of Science in Informatics, Minor in Medicine*

Munich, Germany

Oct 2020 – Dec 2024

- Thesis: *Efficient Cross-Platform Columnar Compression*: cost-based evaluation of compression algorithm implementations for ARM-based cloud instances (Grade: 1.0)
- Overall Grade: 1.9

## EXPERIENCE

### Working Student (Testing)

*OroraTech GmbH*

Aug 2025 – Jan 2026

Munich

- Extended test suite for hardware-in-the-loop testing of wildfire detection satellites
- Expanded service for coordinating test runs across multiple hosts and created **dashboards for other teams**
- Created data visualization tooling for verification reports using Python and *matplotlib*

### Kernel & Operating Systems Engineer Intern (EC2)

*Amazon Web Services*

Aug – Oct 2023

Berlin

- Created a performance data analysis tool using multiple AWS cloud services (EC2, S3, DynamoDB) in **Python**
- Implemented automated hypervisor performance evaluation using industry-standard and custom benchmarks
- Developed release pipeline integration to detect performance regressions before hypervisor deployment to EC2

### Tutor – Computer Architecture Lab Course

*Technical University of Munich*

May – Sep 2022

Garching near Munich

- Held two exercise sessions per week, teaching C, **x86-64 Assembly** and optimization techniques (SIMD etc.)
- Supported students' learning by answering questions via an internal chat platform
- Reviewed and graded student project work in accordance with assessment criteria

## EXTRACURRICULAR ACTIVITIES

### Scientific Workgroup for Rocketry and Spaceflight (WARR)

*Software Developer – Satellite Student Club (MOVE)*

May 2023 – Present

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- Contributed to MOVE's **Real-Time Operating System** in C++, including fixes for bugs found while testing
- Created LoRa communication driver, achieving data transmission over 100 km during stratospheric balloon launch

### Software Lead (MOVE)

Apr – Oct 2025

- Worked with interdisciplinary subsystem teams to clarify and negotiate software requirements for our satellite
- Supported onboarding and maintained internal knowledge base to improve team efficiency and collaboration

## PROJECTS

### STONCS CubeSat Payload | *Rust, C++, STM32, Hardware Testing*

Nov 2023 – Aug 2024

- Co-developed an embedded, radiation-tolerant STM32 bootloader in **Rust** for reliable satellite firmware updates
- Enhanced reliability through model checking (Rust/Kani) and hardware-in-the-loop testing scripts
- Created a specialized testing tool to induce radiation-like flash memory corruption for bootloader validation
- Payload launched to orbit aboard Rocket Lab's OTC-P1 mission on March 26, 2025

### x86-64 Emulator for WebAssembly | [GitHub](#) | *Rust, WebAssembly, C, x86-64, Python*

Sep 2022 – Jun 2023

- Implemented a minimal x86-64 emulator supporting the 315 most important opcodes ( $\approx 9\%$  of total)
- Built **automated test case generation** scripts to validate behavior of instructions/flags against real hardware
- Designed JavaScript API to run basic ELF binaries and handle syscalls per System V ABI
- Created demo web app showcasing program execution and programming playground for a friend's custom language

My open-source work includes **Go**, web development, and many more projects – see [my website](#) or [GitHub](#).