




Tim Jensen

Software Engineer

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Profile

Software Engineer with an interdisciplinary background and three years of experience in Rust. Specializing in low-level systems, I thrive on writing simple yet robust code that combines compile-time safety with runtime performance. Eager to collaborate on modern technologies and continuously learn in a dynamic environment.

Education

BSc Mechatronics (Focus: Computer Science)

Sep 2019 – present

Technical University of Applied Sciences Mannheim

- Interdisciplinary integration of mechanical, electrical, and software engineering principles. Focused on microcontrollers, systems programming, and hardware interfacing.
- Thesis: Implementation of a software-based, OSEK-compatible real-time scheduler in Rust for preemptive control of async tasks.
- Current Grade Average: 1.4

Core Curriculum

Jul 2021 – Jan 2023

42 Heilbronn

- Developed strong self-reliance through purely project-based learning of C/C++ and computer science fundamentals without instructors.
- Engaged in peer-to-peer learning within an international environment, involving mutual code reviews and discussions. Learned to approach technical problems from different perspectives and effectively share knowledge.
- Won 1st Place at MHP Mobility Hack 2022: Developed an end-to-end OTA firmware update solution for IoT devices in a 72h sprint, competing against 150+ participants.

Experience

Software Engineer (Intern, Working Student, Thesis)

Feb 2023 – present

Vector Informatik GmbH | R&D Embedded Systems

- **Thesis & Continued Development:** Executed the Bachelor Thesis research. Subsequently extended the scheduler to support deadlock-free resource sharing (OSEK-PCP).
- **Async Rust:** Conducted a design-space exploration of async runtimes (e.g., Embassy, RTIC, Tokio) and investigated `io_uring` and zero-copy IPC mechanisms for automotive use cases.
- **Interoperability & Protocols:** Evaluated Rust/C++ interop strategies (e.g., CXX, Cap'n Proto) and implemented SOME/IP (de)serialization in Rust. Analyzed communication patterns in MICROSAR Adaptive versus native Rust ecosystem solutions.
- **Tooling & Infrastructure:** Co-developed a C#/Java prototype for a new declarative Software Product Line approach, implementing an ANTLR grammar for a custom DSL and analyzing Git internals. Established the team's Rust development infrastructure by creating standardized Docker images and GitLab CI templates.

Formula Student Team Member | Electronics
Delta Racing Mannheim Electric e.V.

Oct 2019 – Sep 2021

- Development of the safety-critical Tractive System Active Light (TSAL): PCB design, mechanical design (CAD & 3D printing), assembly, wiring, and hardware bring-up.
- Programming distributed systems on TM4C123x MCUs using FreeRTOS; system-level debugging and error analysis on the CAN bus.

Web Design & Server Administration
Freelance

Feb 2016 – Dec 2022

- Design and development of websites (HTML, CSS, JS, WordPress) and creation of design proposals (UI/print) using Figma, Affinity Designer, and Pixelmator.
- Setup and administration of Linux servers (VPS). Configuration of Nginx, DNS, mail servers, and automated backups, later utilizing Plesk for management.

Selected Projects

Autonomous 2x2 Rubik's Cube Robot

Mar 2025 – June 2025

C/C++, ESP32, Computer Vision, 3D Printing

- Developed an autonomous robot using an ESP32-CAM board and 3D-printed parts.
- Implemented servo control and computer vision for state detection. Compressed the solution space into a binary lookup table for O(1) move retrieval on constrained hardware.

miniRT – Physics-Based Ray Tracer

Mar 2022 – June 2022

C, Linear Algebra, Computer Graphics | [Sources](#)

- Developed a ray tracer from scratch, translating optical physical laws directly into code.
- Implemented ray-object intersections (spheres, cubes, cylinders) and simulated shadows, diffuse/specular reflections, texture mapping, and refraction.

minishell – Bash-like Shell Implementation

Nov 2021 – Jan 2022

C, Unix Systems Programming | [Sources](#)

- Developed a fully functional shell from scratch, managing process lifecycles and IPC.
- Wrote a custom lexer/parser to handle command arguments, environment expansion, wildcards, and logical operators (&&, ||).

Skills & Technologies

Programming Languages: Rust, C, C++, Bash, Typescript, Python

Development Tools: Linux, Git, Docker, GitLab CI/CD, Cargo, Make, VS Code

Documentation: Typst, mdBook, draw.io, HTML, CSS, Figma

Spoken Languages: German (Native), English (Fluent, B2–C1)

Hobbies & Interests

As a counterbalance to digital work, I recharge outdoors through calisthenics, bikepacking, and hiking. I love acquiring new skills, currently training to master the freestanding handstand and kettlebell juggling. My engineering passion translates into the physical world through DIY projects like my camper van conversion and custom bike building. Driven by curiosity, I also experiment with nutrition, cultivating sprouts and exploring fermentation.