Markus Heimerl

Embedded Systems Engineer

Contact

✉ contact@markusheimerl.com

○ markusheimerl

Technical Skills

Programming
C/C++, Python, VHDL/Verilog

Architectures
ARM, RISC-V

Signal Processing
State Space Models, Kalman Filters

Hardware
PCB Design, FPGA Development

Safety-Critical
AUTOSAR, MISRA C

Protocols
SPI, I2C, UART, CAN

Languages

German
Native Speaker

English
C1 Level (TOEFL iBT 105/120)

Certifications

Aerial Robotics
University of Pennsylvania (2021)

Professional Summary

Embedded Systems Engineer with strong background in signal processing, bare-metal firmware development, and hardware-software co-design. Passionate about pushing the boundaries of embedded systems.

Professional Experience

Automotive Developer   May 2024 - Present
intive GmbH, Regensburg

- Developing safety-critical ECU network diagnostic and visualization tool for BMW
- Leading refactoring effort to improve performance and maintainability

Software Development Engineer   Jul 2023 - Dec 2023
Vector Informatik GmbH, Regensburg

Contributed to bootloader development with OTA capabilities for automotive MCUs

Digital Design Teaching Assistant   Mar 2022 - Dec 2022
OTH Regensburg

Taught FPGA development and digital signal processing fundamentals

Technical Projects

Real-Time Flight Control System   2021 - Present
github.com/markusheimerl/quad

Designed complete autonomous quadcopter featuring custom PCB, bare-metal firmware, and experimental state space model implementation for state estimation. System integrates IMU sensor fusion, motor control and vision.

High-Performance State Space Models   2024
github.com/markusheimerl/ssm

Implemented optimized C/CUDA state space models for embedded deployment.

RISC-V Processor Implementation   2022
Bachelor's Thesis

Designed complete RV32I processor in VHDL with custom peripherals, VGA controller, and DMA. Implemented hardware debugging interface and achieved stable 100MHz operation on Xilinx Artix-7 FPGA with comprehensive testbench verification.

Education

B.Sc. Computer Engineering   2018 - 2022
OTH Regensburg

Focus: Embedded Systems, Signal Processing, Real-Time Control, Computer Architecture

Volunteering

Event Organizer   Mar 2019 - Aug 2019
TEDxOTHRegensburg

- Recruited speaker for the event
- Implemented online ticketing system for seamless attendee experience
- Contributed to sponsorship acquisition efforts