Markus Heimerl

Systems Engineer

Contact

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markusheimerl

Technical Skills

Programming
C/C++, Python (Pytorch/JAX), VHDL/Verilog

Embedded
Bare-metal, ARM, RISC-V

AI/ML
State Space Models, Transformers, Stochastic Methods

Hardware
PCB Design, Digital Logic, FPGAs

Automotive
AUTOSAR Classic, ECU Development

Tools
Git, GitHub Platform, KiCad, GNU Tools

Languages

German
Native Speaker

English
C1 Level (TOEFL iBT 105/120)

Certifications

Aerial Robotics
University of Pennsylvania (2021)

Professional Summary

Results-driven Embedded Systems Engineer with exceptional expertise at the intersection of hardware and software development. Specialized in implementing cutting-edge AI algorithms in constrained environments and optimizing complex systems for automotive and aviation applications. Proven excellence in technical leadership and delivering innovative solutions.

Professional Experience

Automotive Developer May 2024 - Present
intive GmbH, Regensburg

- Development of BMW's critical ECU network processing and visualization tool
- Spearheaded refactoring effort of complex legacy codebase using agents
- Coordinated cross-functional teams

Software Development Engineer Jul 2023 - Dec 2023
VECTOR Informatik, Regensburg

- Participated in project focused on flash bootloader development with OTA capabilities
- Contributed to development process optimization initiatives within agile framework
- Collaborated with senior engineers on automotive software development best practices

Academic Tutor - Digital Design Mar 2022 - Dec 2022
OTH Regensburg

- Supervised weekly practice sessions for digital logic design and VHDL coursework
- Applied evaluation system that improved student preparation for examinations

Key Technical Projects

Quadcopter Control System 2021 - Present
github.com/markusheimerl/quad
Complete flight control system with custom PCB design, state space models, and imitation learning for autonomous flight. Real-time algorithms optimized for embedded systems.

State Space Model Implementation 2024 - Present
github.com/markusheimerl/ssm
Highly efficient C/CUDA implementation for embedded applications with outstanding performance improvements and numerical stability - Proven to replace Kalman Filter - PID controller combination in simulation for quadcoptor

Small Language Model 2024 - Present
github.com/markusheimerl/slm
Lightweight language model for neural architecture research

Education

B.Sc. Computer Engineering 2018 - 2022
OTH Regensburg - 1.x / 1.0
Thesis: Development of a RISC-V RV32I Processor with VGA Interface using VHDL

Leadership Experience

Event Organizer - TEDxOTHRegensburg 2019
TEDxOTHRegensburg
Recruited speaker, secured sponsorship, implemented ticket systems