Luca Anthony Schwarz

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Career Profile

Ambitious *Computer Science* student at Leibniz Universtität Hannover graduating at the end of *March 2025*. Looking for *entry-level opportunities* to develop advanced hardware solutions that make the difference. Experienced in computer architecture, computer design and low-level software development with a hunger for knowledge.

Education

Leibniz Universität Hannover Hannover, Germany
Master of Science in Computer Science, Specialization in Hardware-Related Computer Science *Apr. 2023 – Expected Mar. 2025*

Selected Coursework: Architectures for Digital Signal Processing, Design of Integrated Digital Circuits, FPGA Design, Operating System Construction for Multicore Platforms, Application-Specific Instruction-Set Processors

Ongoing Coursework: Project Course: Microelectronics - Chip Design, Project Course: System and Computer Architecture, ASIPLab: Design of Application-Specific Instruction-Set Processors

Christian-Albrechts-Universität zu Kiel Kiel, Germany
Bachelor of Science in Computer Science, GPA 3.1, GPA-Thesis 4.0 *Oct. 2019 – Mar. 2023*

Selected Coursework: 3D Computer Graphics, High Performance Computing

Language Skills

Fluent in German and proficient in English (B2/C1).

Experience

Undergraduate Research Assistant Apr. 2022 – Mar. 2023
Christian-Albrechts-Universität zu Kiel - Reliable Systems Group *Kiel, Germany*

- Assisted the development team of HybridGWAIS, a software for detecting interactions between genetic variations in the human genome
- Designed, implemented and assessed highly parallelizable general-purpose GPU algorithms
- Found novel highly parallelizable algorithmic approach, which allows for tests on continuous datasets (one of the first tools to do so)
- Increased performance of selected algorithms in CUDA by a factor of up to 43 by using efficient use of hardware resources and advanced hardware features like Tensor-Cores

Projects

Project Course: System and Computer Architecture | *Operating Systems, Kernel Hacking, Driver Development* Apr. 2024 – Aug. 2024

- Gained first hand experience in kernel debugging and kernel hacking
- Developed custom driver software for a USB-powered device

StuBSmI and MPStuBS | *Operating Systems, Custom x86 OS Development* Apr. 2023 – Feb. 2024

- As part of coursework developed a custom operating system from scratch in C++ and later in Rust for x86-based systems
- Final system runs processes in parallel on multiple CPU cores with isolation and communication machanism seperating user and kernel spaces

RW-Pioneer | *Computer and System Architecture* Mar. 2020 – May 2024

- Designed, manufactured and tested a fully custom 4-bit computer system consisting of 7400-series ICs
- Later translated RW-Pioneer design to SystemVerilog and automatically verified design changes using Verilator

Scholarships

Two-time recipient of the Deutschland Stipendium scholarship.

Technical Skills

Programming Languages: C (Advanced), C++ (Advanced), Rust (Intermediate), Python (Intermediate)
Domain Specific Languages: GLSL (Advanced), HLSL (Intermediate)
Frameworks and Libraries: CUDA (Advanced), OpenGL (Advanced), OpenCL (Intermediate), D3D (Beginner), OpenMP (Advanced), MPI (Intermediate)
Tools: Git, VS Code, gdb and kgdb, qemu/kvm, make, Unix/Linux, Vivado, Verilator
Hardware: Xilinx Artix-7 FPGA, Logic Analyzer and Oscilloscope use