Jakub Lisowski

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PROFESSIONAL EXPERIENCE

ARISTA Networks - Software Engineer Intern 07.2025-10.2025 (3 months)

- **OpenConfig** compiler team - based on internal language.
- Actively participated in the full development cycle. Implemented several syntax improvements that boosted developer productivity by simplifying code. Refactored the entire codebase using custom Python script powered by Gemini to modernize syntax, which proved highly successful and significantly streamlined future refactoring.
- Technologies: Compilers, AST, C/C++, Python, Bash, UNIX, Unit Testing (gtest), git, Build Systems, LLMs

DELL Technologies - R&D Software Engineer Intern 04.2024-07.2025 (1 year 3 months)

- **PowerFlex Core** project - distributed software-defined storage system.
- Actively participated in the full Scrum development cycle. Implemented inter-process commands using Protocol Buffers libraries. **Implemented** I/O processing for migration feature. **Designed and implemented** comprehensive migration balancing algorithm which enabled equal distribution of resources shared by multiple cooperative worker processes.
- Technologies: Storage, Distributed Systems, C/C++, Python, Bash, UNIX, unit testing (gtest), regression testing, low-level design, OS-level programming, multithreaded programming.

RESEARCH

pyradiomics-cuda – GPU-accelerated extension of PyRadiomics

- Researched and developed GPU acceleration for radiomic shape feature extraction (volume, surface area, 3D diameters), replacing the CPU-only implementation with optimized CUDA kernels.
- Designed and implemented multiple optimization strategies (shared memory tiling, Structure of Arrays layout, atomic operation reduction, load balancing) to maximize GPU throughput across diverse architectures.
- Built an automated benchmarking and validation framework, ensuring numerical correctness against CPU reference values while measuring performance across datasets and GPU generations.
- Achieved massive performance improvements, with up to **1000× speedup on NVIDIA H100** compared to the baseline CPU implementation, tested on **kits19**
- Technologies: CUDA, C/C++, Python, CMake, HPC benchmarking, GPU profiling.

EDUCATION

Warsaw University of Technology **Final semester** - October 2022 - March 2026
Faculty of Mathematics and Information Science, Poland
B.Sc. **Computer Science and Information Systems**, 3-year GPA: **4.66 / 5.0**

ENGINEERING THESIS

AlkOS - x86_64 Operating System

- Developing an **x86_64 operating system** from scratch as part of a three-person team.
- Implemented an **interrupt handling infrastructure**, including an interrupt table and multiple interrupt routines, enabling seamless addition and modification of interrupt service routines. Enhanced debuggability with improved error messaging and enabled interaction with various external devices.
- Designed and developed a **testing** module with a **gtest**-like interface, featuring a host-side application that communicates with AlkOS via QEMU's serial port forwarding. This significantly improved development quality by introducing testability to the kernel, ensuring robust and reliable code.
- Implemented portions of the **C and C++ standard libraries**, including various meta-programming headers, reducing redundant code and allowing developers to leverage well-known C/C++ utilities.
- Implemented drivers for hardware clocks and core communication, enabling multi-core support, precise time measurement, inter-core interrupts, and time-driven scheduling.
- Implemented many drivers for hardware clocks and core communication, allowing to use multiple cores, measure time, trigerring inter core interrupts and schedule time driven interrupts - scheduler parts.
- Implemented core **data structures**, including linked lists, hash maps, binary trees, and heaps, providing efficient memory management and fundamental building blocks for the kernel.
- Created a comprehensive **CMake** build system with scripts for environment setup, test execution, OS deployment, and **GitHub Actions** integration.
- Actively participating in most of the **Pull Requests** ensuring high code quality.

HACKATHONS

AngelHack Grand Finals Singapore 2024

- Attended the Global Finals in **Singapore** alongside teams from **six** countries around the world.

AngelHack Warsaw Hackathon 2024

- Awarded **second place** and advanced to the **international finals** in Singapore.

Best Hacking League Hackathon 2024

- Awarded **first place** in the cybersecurity category.

PROGRAMMING LANGUAGES

C++ (C++20), C, Python, C#, Java

SKILLS

Bash, x86_64/x86 ASM, AVX, CUDA, Algorithms and Data Structures, OS development, Multi-Threaded Programming, Thread Synchronization, IPC, Compilers, CPU architecture, Distributed Systems, Storage Software, UNIX Systems, TCP, UDP, Sockets and Networking Protocols, POSIX Libraries, gtest, protobuf OOP, Git, Agile, Scrum, Jira, cmake, Make, Ability to work on and debug unfamiliar code, numerical computations, strong mathematical background, REST API, FastAPI,

LANGUAGES

English (C1), Polish (Native)

AGREEMENTS

I agree to the processing of personal data provided in this document for realising the recruitment process pursuant to the Personal Data Protection Act of 10 May 2018 (Journal of Laws 2018, item 1000) and in agreement with Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation).