

AARON PAZDERA

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EXPERIENCE

AUGUST 2022 – DECEMBER 2022

COMPILER ENGINEER JULIA COMPUTING (JULIAHUB)

Bug hunting and implementing new compiler features for the Julia programming language and ecosystem. My contributions are public, and you can find them [on Github](#).

- Optimized the layout of system images, drastically improving binary size and load times.
- Modified the garbage collector sweep phase to take heap snapshots.
- Fixed dozens of esoteric, technically challenging, and critical bugs in the compiler and runtime.

AUGUST 2021 – AUGUST 2022

FIRMWARE ENGINEER WOODWARD

Design, development, and formal verification of DO-178 firmware for safety critical airplane components and weapons systems.

- Led the certification of firmware for an autopilot motor.
- Wrote tests for the certification of electronic engine controller device drivers.
- Wrote planning and design documents for the firmware of a hypersonics platform.
- Supported over a dozen other projects.

PROJECTS

I spend a lot of my free time programming. See <https://apaz-cli.github.io> for my portfolio, which explains my projects in much greater depth. It has many projects on it, including:

Compilers:

- A prolog-like theorem prover for type unification.
- Pgen, a tokenizer and parser generator for implementing programming languages.
- Daisho, a trait-oriented programming language that transpiles to C11. (Work in progress)
- A standard library for C meant to wrap libc. Includes a memory debugger, three specialized allocators, containers, full UTF-8 support, a threadpool, and safe stack unwinding backtraces.

Machine Learning and Data Engineering:

- A perceptual image hashing framework (Java), and research with my honors college advisor.
- An implementation of the Google Brain paper “MLP-Mixer Architecture for Computer Vision”.
- A deep learning based perceptual image hash algorithm (Python/PyTorch).
- A cache optimized computational geometry data structure for k-nearest-neighbor search in C.
- An HTTPS server from scratch in C with raw TCP sockets and OpenSSL.

EDUCATION

AUGUST 2017 – MAY 2021

BACHELOR'S IN APPLIED MATH/COMPUTER SCIENCE, UW-STOUT

Relevant Coursework:

MACHINE LEARNING, REAL ANALYSIS, SWE CAPSTONE (AWS, NGINX, FIREBASE, REACT, NODEJS), NUMERICAL ANALYSIS, SYSTEMS PROGRAMMING, ABSTRACT ALGEBRA, CALCULUS I - III, LINEAR ALGEBRA, PROOFS, NETWORKING, DATABASES