Kelly Shiptoski

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https://github.com/krs85/
https://krs85.github.io/

Statement

Detail-oriented and self-driven software engineer with a comprehensive background in designing, building, and maintaining large systems. Seeking to bring my extensive experience with Rust and system design to a Software Engineer role in which I can collaborate with and learn from a diverse engineering team.

Experience

University of Pennsylvania / Doctoral Researcher
August 2017 - Present

- Researched, designed and implemented two systems from scratch: ProcessCache, a system for automatic caching of arbitrary Linux programs at the process level, and DetTrace, a container system for Linux which guarantees reproducibility of unmodified Linux programs run through it, both of which are now open-source.
- Learned asynchronous runtime and future-based design, integration testing infrastructure, and design patterns for safe mutability across async tasks to implement Rust async wrappers around low-level synchronous Linux APIs.
- Coordinated and led all weekly meetings, topics included: project design and scope, short-term and long-term milestones, and any major issues on the critical path of implementation.
- Conceptualized all milestones with task breakdowns and clear goals, paying special attention to project scope and planned deadlines.
- Implemented integration, unit, and end-to-end testing to ensure ongoing correctness and detect and handle regressions.
- Researched real-world systems across many disciplines to construct a realistic benchmark suite to analyze speed and space performance and verify correctness of each system.
- Managed and mentored a masters student in the following capacities: onboarding, pair programming sessions, and mentoring in design, systems programming, project planning, Rust, Git, testing, benchmarking, and profiling.

VMware Research Group / Research Software Engineer Intern
Summer 2020

- Developed expertise with distributed systems and incremental computation to inform the design of a distributed API for Differential Datalog, a novel domain specific language for automatic incremental updates to SDN (software-defined networking) control planes.
- Adapted the APIs of the Differential Datalog language engine to utilize the observer pattern, allowing for dynamic reconfiguration of nodes within the network and providing robust fault tolerance.

- ❖ Implemented integration and unit tests to maintain backward compatibility and ensure correctness of new features.

Skills

Experienced: Rust, C, C++, Linux Systems Programming, Git

Familiar: Docker, Bash, Python, Java, C#, Golang

Education

University of Pennsylvania, 2017 - June 2023 (expected)
Ph.D. in Computer Science, advised by Joseph Devietti
M.S. in Computer Science (completed in 2019)

Drexel University, 2012-2017
B.S. in Computer Science & B.A. in Mathematics