Kiran Ostrolenk, PhD

Software Engineer

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PROFILE

Software engineer with 5+ years experience of professional programming and a background in Theoretical Physics. I specialise in Rust for distributed systems, systems programming, and command-line tooling. My focus is on building reliable and maintainable software through rigorous testing, reproducible builds (Nix), and clean version control.

My PhD in high-performance scientific computing involved translating complex mathematical models into efficient C++ algorithms for large-scale data simulation. This work, along with professional experience, has honed my ability to quickly master complex technical domains and communicate the results effectively (demonstrated via technical blogs and project documentation).

SKILLS

Rust

Nix

Git

Linux
Including both systems and application programming

CI/CD
Both GitLab and GitHub

Docker

Python

PROFESSIONAL EXPERIENCE

Sigma Financial, Platform Engineer 07/2024 – present
Remote

Engineered Rust programs to support the deployment of AI products for financial-market analysis. Within this small startup I took responsibility for the design and implementation of projects, whilst collaborating with managers to ensure the end products met company business goals.

Designed and implemented a public gateway to manage customer access to the company's AI market analysis tool. Exposed both a REST and gRPC API - all written in Rust. Engineered data persistence layers using the Diesel ORM, focusing on performance and safety when querying PostgreSQL and SQLite databases. Owned the project from initial design and choice of dependencies through to final deployment.

Proposed and implemented processes for managing the company codebase. For instance, defined a standard for build configuration across company crates and built an automated utility to assess compliance. This allowed us to maintain consistency and track advances in compiler tooling.

Codethink, Senior Software Engineer 05/2020 – 07/2024
Manchester

Delivered for clients in a broad range of domains - from low level / embedded applications to CI/CD pipelines. Focussed on safe, reproducible and (where applicable) open solutions.

Engineered and led several Rust-based client projects, such as delivering a performance-critical distributed system. Used async to meet performance requirements and carefully handled cancel/shutdown safety to ensure reliability.

Led client-facing projects: responsible for technical design, project planning in coordination with PMs, and mentoring junior engineers in Rust best practices.

WORK IN THE OPEN

Rust CI for Gitlab
Co-creator and lead maintainer. Provides a generic, configurable CI pipeline for use in any Rust GitLab project. Features include linting, testing and doc deployment.

Maintenance duties include supporting users, approving/denying feature requests, planning/avoiding breaking changes and cutting releases.

PDGID
A command-line tool (written in Python) to help physicists quickly get a particle's name from its ID and vice versa.

Upstream contributions
Some examples of my numerous improvements to open source projects:

- **Rust**: Improve croner's public API by switching to builder pattern.
- **Rust**: Add async API to HepMC2 crate. Avoids code duplication of sync implementation using maybe-async.
- **Rust:** Improve installation process for typy-cli.
- **Rust**: Fix a panic and improve error handling in git-url-parse crate.
- **C**: Contributed towards support for the RISC-V Vector Cryptography extension in QEMU.
- **Nix**: Various package additions / fixes in nixpkgs and home-manager.

Blogs
I enjoy writing technical blogs, both for the thrill of sharing knowledge and how it crystalises my own understanding of topics. I've done this both professionally and in my personal time.

EDUCATION

PhD Theoretical Particle Physics, University of Manchester 2016 – 2020
Improved the mathematical accuracy and efficiency of two particle collision simulators: MadGraph and Herwig - large C++ projects.

- Accelerated some MadGraph calculations by 50% by re-modelling them as DAGs. arXiv:2102.00773
- Evaluated two competing mathematical algorithms within Herwig. Determined why they disagreed and which was more accurate.

MPhys Physics with Philosophy, First, University of Manchester 2012 – 2016
Philosophy developed my critical thinking and abstract problem solving skills.

CERTIFICATES

LPIC-1
Linux Professional Institute

Cyber Security Practitioner
Exida

INTERESTS

Playing the guitar

Learning Italian
(mostly in vain)

Drinking copious amounts of tea