

Nicholas Russo

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Summary

Backend engineer with 2.5 years of experience building and optimizing distributed systems. Work includes performance optimization, API development, database systems, and testing infrastructure. Open source projects focus on systems programming and developer tooling.

Skills

Languages: Python (Advanced), Rust (Advanced), Go (Advanced), C (Intermediate), C++ (Intermediate), JavaScript (Beginner), Mojo (Beginner)

Backend/APIs: FastAPI, Flask, Django, Zenith, Ruby on Rails, gRPC

Databases: PostgreSQL, SQLite, MySQL, Redis

Infrastructure: Docker, Linux (Fedora, Ubuntu, RHEL/CentOS, CoreOS, Gentoo), Kubernetes (Beginner)

Cloud Platforms: AWS, GCP, DigitalOcean, Cloudflare

Tools: Git, GitHub Actions, Zed, Neovim, mise, uv, Ghostty, Fish, ripgrep, fzf, fd, Tailscale

Experience

Software Engineer

January 2021 – May 2023

Omnitier, Inc.

- Reduced Python backend service runtime by ~90% (45 min → 5 min) by migrating to `os.scandir()` and Path objects, minimizing filesystem system calls
- Built comprehensive regression testing infrastructure using Go and Python, improving code stability across distributed services
- Developed gRPC API integrations and enhanced React frontend features, maintaining full-stack service reliability

Projects

OmenDB | github.com/omendb | *Rust, Vector Database, Database Systems*

- PostgreSQL-compatible vector database in Rust with HNSW indexing and binary quantization. Implementing hybrid HTAP architecture with ALEX learned indexes for SQL. Targeting 10x faster queries and 24x better memory efficiency than pgvector at 10M+ vectors

Zenith | github.com/nijaru/zenith | *Python, Web Framework, API Design*

- Python web framework with chainable query APIs, zero-config setup, and async request handling. Built for developer experience and production performance

sy | github.com/nijaru/sy | *Rust, CLI Tools, Systems Programming*

- File synchronization tool implementing rsync algorithm with TRUE O(1) rolling hash (2ns/op), Adler-32 + xxHash3 checksums. Streaming delta sync with constant 256KB memory, adaptive block sizing. 2-11x faster than rsync

Kombrucha | github.com/nijaru/kombrucha | *Rust, Package Management, Developer Tools*

- Homebrew-compatible package manager with fully parallelized API operations, breadth-first dependency resolution, and in-memory LRU caching (1000 formulae + 500 casks). 5.5x faster for upgrade operations

Pacabot | *Python, AI/ML, Finance*

- Trading bot with market analysis, automated strategy execution, and risk management. Real-time data processing for algorithmic trading

Awards

2nd Place & Ingenico Winner, Money 20/20 Las Vegas 2016 | *Team Kairos*

- Developed cross-terminal payment application with REST API for business partnerships. Built with Go and PostgreSQL, deployed on CoreOS

Education

42 Silicon Valley

Computer Science

2018 – 2020

Fremont, CA

Las Positas College

Computer Science

2014 – 2015, 2016 – 2018

Livermore, CA

- Computer Science Club President 2016 – 2017

Dev Bootcamp

Web Development

March 2016 – May 2016

San Francisco, CA