Fidenzio Nucci

Summary

Highly experienced Rust software engineer with 6+ years of professional experience in systems programming and blockchain technology. Expertise in designing, building, and deploying scalable, high-performance solutions using Rust's safety and concurrency features. Proven track record of optimizing low-level code, leading cross-functional teams, and contributing to the Rust open-source ecosystem. Passionate about solving complex technical challenges, from embedded firmware and network protocol design to distributed ledger and smart contract development.

Skills

- **Rust:** Advanced proficiency in ownership/borrowing, lifetimes, async/await, unsafe code, memory management, crate ecosystem (Tokio, Actix, Serde)
- **Systems Programming:** Multithreading, concurrency, performance optimization, embedded systems, real-time programming, Linux kernel interfaces
- **Blockchain & Cryptography:** Smart contract development (Substrate, WebAssembly), consensus algorithms (proof-of-work, proof-of-authority), cryptographic primitives (ECDSA, Ed25519, SHA-3), blockchain node implementation
- **Networking & Distributed Systems:** Asynchronous I/O (Tokio, async-std), network protocol design, peer-to-peer architectures, microservices, RESTful APIs
- **DevOps & Tools:** Git, Docker, Kubernetes, CI/CD (Jenkins/GitLab CI), Linux/Unix environments, automated testing frameworks
- **Additional Languages & Technologies:** C/C++ (embedded development, FFI), Python (automation, scripting), WebAssembly (Yew for front-end Rust), SQL/NoSQL databases

Experience

- **Senior Rust Software Engineer**, Tech Solutions Inc. (2021–Present)

  - Led the architecture and development of a distributed services platform in Rust, migrating legacy C++/Python systems to improve performance and reliability.
  - Implemented core blockchain components including transaction validation, state management, and consensus logic, collaborating with cryptography experts on secure protocol design.
  - Enhanced system throughput by 35% by introducing asynchronous task execution (Tokio) and optimizing data structures and memory usage.
  - Conducted extensive code reviews and mentoring, establishing Rust best practices and coding standards for the engineering team.
  - Coordinated with DevOps to containerize services using Docker and orchestrate deployments with Kubernetes, enabling zero-downtime releases and rapid scalability.

- **Software Engineer (Systems)**, Innovative Systems Ltd. (2018–2021)

- Designed and developed embedded firmware and systems software in Rust for resource-constrained IoT devices, focusing on memory safety and low-level hardware integration.
- Contributed numerous patches to Rust open-source projects (e.g., added features to the Serde serialization crate, improved documentation for the Tokio async runtime).
- Led the reimplementation of a C++ networking library into Rust, reducing memory footprint by 25% and increasing reliability through Rust's compile-time safety checks.
- Built continuous integration pipelines for Rust projects (GitLab CI), writing automated test suites and benchmarks to ensure code quality and performance.
- Collaborated with security teams to integrate hardware security modules (HSM) via Rust FFI for secure key management on embedded devices.

- **Blockchain Developer (Contract)**, Distributed Ledger Org. (2017–2018)

  - Developed a proof-of-authority consensus mechanism in Rust for a permissioned blockchain prototype, implementing block validation and peer-to-peer networking using libp2p.
  - Authored and audited smart contracts using the Substrate framework in Rust, enabling multi-signature transaction workflows for a financial consortium.
  - Optimized cryptographic operations in Rust, including multi-threaded signature generation and hashing, achieving near-native performance comparable to C implementations.

Projects

- **Distributed Storage Network (Rust):** Architected and implemented a peer-to-peer file storage network using Rust and libp2p. Handled peer discovery, data chunk distribution, and content-addressable storage with cryptographic integrity checks. Achieved robust data replication across nodes and seamless scaling in a dynamic network environment.
- **Blockchain Explorer & Analytics (Rust/WebAssembly):** Extended an open-source blockchain explorer by adding client-side analytics modules compiled to WebAssembly. Developed frontend dashboards with Rust and Yew, enabling real-time visualization of blockchain metrics (transactions per second, block propagation times) directly in the browser.
- **High-Performance Web Server (Rust):** Contributed to an open-source Rust web framework by implementing a new middleware component for logging and metrics. Improved request handling efficiency by 15% through asynchronous optimizations. Developed a modular plugin architecture in Rust for dynamic middleware insertion.
- **Open-Source Contributions:** Actively contributed to the Rust community with 100+ commits across various crates. Maintained a popular Rust library for encryption utilities with comprehensive documentation and examples. Participated in Rust conferences and workshops, presenting on topics like "Asynchronous Rust in Systems Programming."

Education

B.Sc. in Computer Science, University of Technology, 2017

- Graduated with Honors. Relevant coursework: Operating Systems, Cryptography, Distributed Systems, Algorithms.
- Capstone Project: Implemented a simplified operating system kernel in Rust with a focus on memory safety and task scheduling.