

Alexander McClain

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Summary

Senior Systems Engineer with nearly a decade of software development experience, including 5 years specializing in Rust. Leader in the open-source community, having authored and maintained a foundational crate ecosystem with over 1 million downloads. Proven expertise in systems architecture, asynchronous programming, and API design, with additional proficiency in Python and Java.

Core Competencies

Languages	Rust, Python, Java
Domains	Systems Programming, Asynchronous Programming, Network Protocols, API Design, Open Source Leadership
Technologies	Tokio, WebAssembly (WASM), Docker, Git, CI/CD, Linux, x86-64 Assembly

Professional Experience

Independent Systems Engineer & Consultant

Self-Employed

Remote

2020 – Present

Open Source Development (2020 – Present)

- Authored and lead the development of **Lofty**, a production-ready audio metadata library, achieving **1 million+** cumulative downloads and adoption in **400+** public repositories.
- Manage the full open-source lifecycle for a portfolio of crates, including API design and community mentorship; successfully reviewed and merged **100+** contributor pull requests.
- Engineered a custom **Java Virtual Machine (JVM)** and a supporting **x86-64 assembler** from the ground up in Rust.

Client Engagements & Consulting (2024 – Present)

- **Tangle Network** | *Rust Engineer (Lead SDK Architect)*
 - Served as the lead engineer for the **Blueprint SDK**, owning the architecture for core components including the networking layer, asynchronous job engine, and protocol-specific test harnesses.
 - Designed and implemented sandboxed deployment targets, translating high-level security requirements into low-level Rust implementations.
- **Hardcore Engineering** | *Software Engineer (Sole Developer)*
 - Owned the full lifecycle of the **Huly Mobile App** from concept to completion as the sole contributor.
 - Engineered the cross-platform frontend using **Rust** and **Dioxus**. Designed a custom Rust API crate to provide a type-safe interface with the backend **TypeScript** services.

Key Open Source Projects

Lofty: Production Rust Audio-Metadata Crate

[GitHub Repository](#) 

- Authored and maintain a comprehensive, production-ready audio metadata library in Rust supporting all major formats (MP3, FLAC, WAV, etc.).
- Achieved widespread adoption within the Rust community, accumulating over **1 million** downloads and use in 400+ public projects.

JVM: Custom Java SE 24 Runtime

[GitHub Repository](#) 

- Engineered a custom Java Virtual Machine in **Rust**, implementing the entire runtime stack down to the class parsers and supporting native libraries.
- Implemented advanced memory layout techniques (e.g., pointer tagging/metadata packing) to minimize memory footprint.
- Built a supporting x86-64 assembler from scratch to handle native instruction encoding and execution.

Supassembler: Runtime x86-64 Assembler

- Developed a runtime x86-64 assembler in Rust to serve as the Just-In-Time (JIT) compiler backend for the JVM project.
- Supports numerous modern AMD/Intel instruction set extensions, including AVX-512.