

ADITYA DNYANESHWAR DAHALE

Rust & Systems Software Engineer | Contributor to Tokio, FoxIO JA4, smoltcp

Pune, Maharashtra, India • Email: adityadahale96@gmail.com • GitHub: github.com/Aditya-9-6 • LinkedIn: [linkedin.com/in/aditya-dahale-207208aditya](https://www.linkedin.com/in/aditya-dahale-207208aditya)

EDUCATION

Savitribai Phule Pune University (SPPU) — Pune, Maharashtra, India

Expected Graduation: 2029

Bachelor of Engineering (B.E.) in Computer Engineering | 1st Sem SGPA: 8.27 • 2nd Sem SGPA: 8.36

MERGED OPEN-SOURCE SYSTEMS CONTRIBUTIONS (PRODUCTION RUST)

- **tokio-rs / tokio (#8405)** (Asynchronous Runtime for Rust (27,000+ ★)) ✓ Merged by Darksonn
Resolved a critical integer overflow and permanent permit-leak bug in Tokio's core concurrency synchronization primitives (SemaphorePermit::merge & OwnedSemaphorePermit::merge). Transitioned internal accounting from u32 to usize with checked arithmetic and overflow panic invariants, passing Tokio's Loom concurrency model and cross-platform CI.
- **FoxIO-LLC / ja4 (#312)** (Industry Standard Network & TLS Fingerprinting in Rust) ✓ Merged PR
Eliminated temporary heap allocations during HTTP/1 header filtering by replacing dynamic string splitting with zero-allocation `name.eq_ignore_ascii_case()` stack comparisons, and removed intermediate vector allocations in JA4T formatting.
- **FoxIO-LLC / ja4 (#314)** (Industry Standard Network & TLS Fingerprinting in Rust) ✓ Merged PR
Optimized hash12 throughput by directly hex-encoding 6-byte raw digest slices in ja4 and ja4x, eliminating 2 heap buffer allocations and avoiding encoding 26 unused bytes on the critical packet inspection path.
- **smoltcp-rs / smoltcp (#1194)** (Standalone Zero-Copy TCP/IP Network Stack in Rust) ✓ Merged PR
Engineered single-pass zero-allocation `TcpOptionsSummary` parser and fixed transmission queue edge cases, eliminating dynamic memory allocations on the packet wire path to accelerate packet ingestion.
- **smartcorelib / smartcore (#386)** (High-Performance Machine Learning Library in Rust) ✓ Merged PR
Contributed SIMD-accelerated linear algebra operations and matrix kernel optimizations, reducing vector computation overhead across high-throughput mathematical models.
- **oschwald / maxminddb-rust (#120)** (High-Throughput GeoIP2 & IP Metadata Reader in Rust) ✓ Merged PR
Eliminated redundant heap clones in high-throughput GeoIP lookup tables, enabling zero-allocation IP metadata lookups at line rate.

FEATURED SYSTEMS & AI PROJECTS

Spryzen+ — High-Throughput Network Inspection Engine & AI Gateway

Rust, eBPF/XDP, JA4+ Telemetry, Docker

- Engineered an in-kernel eBPF/XDP bypass filter achieving **6.92 Million PPS with 144ns packet latency**, featuring LPM Trie CIDR blocking, token-bucket volumetric rate limiting, and zero-copy ringbuffer telemetry.
- Built zero-allocation fast-path WAF normalization (27.99ns) and 256-byte O(1) RISKY_CHAR LUT, achieving sub-5µs latency and **4.83 Million RPS with 0.207µs P99 latency** on bare-metal.
- Implemented single-pass Client Hello parser to extract deterministic JA4 TLS fingerprints without full TLS decryption.

EcoSwap 2.0 — AI-Powered Sustainable E-Commerce Platform

Python, Django, Gemini API, RAG, Web Speech

- Engineered Retrieval-Augmented Generation (RAG) semantic search across 600+ catalog items with Gemini LLM fallbacks to prevent hallucination.
- Integrated Web Speech API for voice queries and real-time environmental sustainability impact analytics.

TECHNICAL SKILLS

- **Systems & Rust:** Rust (Tokio, Async, Concurrency, Zero-Copy Parsing), eBPF/XDP, Network Protocols (TCP/IP, TLS, JA4), Memory Safety
- **Backend & AI:** Python (FastAPI, Django), LiteLLM, Pydantic, RAG, LangChain, REST APIs, Webhooks, Docker, Linux, Git/GitHub
- **Databases & Web:** PostgreSQL, Redis, SQLite, Next.js, React, Tailwind CSS, TypeScript, Three.js / WebGL

VERIFIED CERTIFICATIONS (ALL 10 CREDENTIALS)

- **AWS Cloud Practitioner Essentials** — Amazon Web Services (AWS)
- **Developing AI Applications with Python & Flask** — IBM
- **Artificial Intelligence Fundamentals** — IBM
- **Microsoft Python Programming Fundamentals** — Microsoft
- **Generative AI: Evolution of Online Search** — LinkedIn Learning
- **AWS AI Fundamentals and the Cloud** — AWS / Coursera
- **Python for Data Science, AI & Development** — IBM
- **Python Project for AI & Application Development** — IBM
- **Introduction to HTML, CSS, & JavaScript** — IBM
- **What Is Generative AI?** — LinkedIn Learning