

Tyrone Marhguy

Computer Engineering — Software Engineering / Systems / Backend / Developer Tools
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SUMMARY

Software engineer building production APIs, developer tools, native desktop software, and hardware-adjacent systems. Shipped public tools across VS Code, macOS, FastAPI/PostgreSQL, and browser/native clients, with upstream C++/Python contributions to large open-source codebases.

EDUCATION

University of Pennsylvania
B.S.E. Computer Engineering

Philadelphia, PA
Aug. 2024 – May 2028

EXPERIENCE

Software Engineer Intern

May 2026 – Aug. 2026

Aragorn AI

Remote

- Shipped **production backend services and REST APIs** for AI integrations; resolved cross-service failures blocking releases and hardened service boundaries through architecture/code reviews.

Hardware & Firmware Engineer

May 2026 – Aug. 2026

Vero Electric

Philadelphia, PA

- Developed **embedded C/C++ fault-detection firmware** for a BQ79616 battery-monitoring system; debugged firmware/hardware integration on a 240 kWh / 120 kW platform with lab instrumentation.

SELECTED SOFTWARE PROJECTS

FramePort - HDMI Capture Inside VS Code | [Open VSX](#) | [GitHub](#)

2026

- Published a VS Code extension for **live HDMI/USB video capture** with device/mode selection, pixel inspection, PNG screenshots, and H.264 MP4 recording; **727 downloads on Open VSX**.
- Built the capture/recording pipeline around **FFmpeg + VS Code webviews**, including backpressure, lifecycle recovery, save safety, diagnostics, browser tests, and real encode/decode regression coverage.

Envelop - Browser-to-Device Messaging System | [GitHub](#)

2026

- Built a browser messenger with a **Supabase durable queue/job backend**, bridge leases, replay-safe handling, and binary **ENVELOP/1** protocol; implemented TypeScript/JavaScript, Swift, and Android clients with Node/Swift/Gradle tests.

QueuePaste - Native macOS Productivity Utility | [GitHub](#)

2026

- Built a **Swift/SwiftUI + AppKit** global-hotkey clipboard queue using CGEvent/NSPasteboard and crash-safe state continuity; cut a real 2-hour workflow to **20 minutes (~6×)** and distributed via DMG, Homebrew cask, and curl.

Hardware Metrics API | [GitHub](#) | FastAPI / PostgreSQL / Docker

2026

- Built a **FastAPI + PostgreSQL** service and CLI that discovers/parses Vivado and OpenLane PPA reports, upserts normalized runs, exposes filterable REST endpoints, and ships with Alembic migrations, Docker Compose, and pytest fixtures.

Mango Tools - Offline CLI Utility Suite | [GitHub](#)

2026

- Built an installable **Bash/Python CLI hub** for PDF, media, image, and developer workflows with arrow-key navigation, file discovery, dependency diagnostics, and one-line setup/uninstall around FFmpeg and local document tooling.

OPEN-SOURCE ENGINEERING

OpenROAD, Verilator, LibreLane, OpenFPGA | C++ / Python

2026

- Merged upstream fixes to production repositories: repaired an **OpenROAD LEF58/ODB parser**, corrected **Verilator** Linux peak-memory accounting, and restored **LibreLane/Yosys** compatibility/reporting.

TECHNICAL SKILLS

Languages: Python, C/C++, TypeScript/JavaScript, Swift, Java, Bash, SQL, Embedded C

Backend / Data: FastAPI, Node.js, REST APIs, PostgreSQL, Supabase, Redis, Alembic, binary protocols

Cloud / DevOps: Docker, Kubernetes, GitHub Actions, CI/CD, Linux, Nginx

Frontend / Native / Testing: React/Next.js, HTML/CSS, VS Code Extension API, SwiftUI/AppKit, Android/Gradle, FFmpeg, pytest, browser tests