

Alex Spaulding

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PROFESSIONAL SUMMARY

Aspiring Software and Systems Engineer with a focus on macOS/iOS internals, reverse engineering, and low-level system mods. Experienced in hardware manufacturing for scientific instrumentation, technical IT support, and web development. Proven track record of architecting complex cross-platform systems using Swift, Rust, and C-family languages.

EDUCATION

Eastern Washington University, Spokane, WA

Mathematics Minor

Bachelor of Science (BS) in Computer Science

Expected May 2027

- **Relevant Coursework:** C and UNIX Programming (CSCD 240), Computer Networks (CSCD 330), Algorithms (CSCD 320), Data Structures (CSCD 300), Digital Circuits (EENG 160), Cybersecurity Fundamentals (CYBR 101)

PROFESSIONAL EXPERIENCE

Information Technology (IT) Specialist

Eastern Washington University, Cheney, WA

Jun 2025 - Present

- Tier 0 remote support; logins/passwords, connectivity, software/hardware; Freshservice tickets; average resolution time 5–20 minutes

Manufacturing Technician

Sunburst Sensors, Missoula, MT

Jan 2022 - Mar 2025

- Manufactured autonomous instruments for carbon measurement ($p\text{CO}_2/\text{pH}$); soldered high-precision PCBs and assembled **600+** custom battery packs and specialized cabling over a 3-year tenure

Information Technology (IT) Consultant

University of Montana IT Help Desk, Missoula, MT

Sep 2020 - Oct 2020 | Oct 2024 - Jan 2025

- Tier I phone support; printers; Wi-Fi; TeamDynamix; shadowing; monitoring; helped 20 people/week; closed 600+ tickets

PROJECTS

Apple Sharpener (154 ★)

[GitHub](#)

macOS Window/Dock Corner Radius Tweak

2024 - Present

- Reverse engineered **AppKit/QuartzCore** private methods (e.g., `_cornerRadius`) using **IDA**, **otool**, and **frida-trace** to implement system-wide UI modifications
- Developed a low-level **Objective-C** runtime patch using **method swizzling** and early runtime code injection targeting the **Ammonia** system injection framework
- Automated **universal builds** (`x86_64`, `arm64`, `arm64e`) via custom **Makefiles** with integrated **CLI** control using **XPC-compatible** notification persistence

Wawona (62 ★)

[GitHub](#)

Native Wayland Compositor for macOS, iOS, and Android

2025 - Present

- Architected a high-performance **Rust** core and multi-threaded rendering pipeline (**Metal**, **DMA-BUF**) supporting 57+ Wayland protocol globals and **wlroots** (Sway/tinywl) compatibility
- Developed native platform frontends (**AppKit**, **UIKit**, **Jetpack Compose**) via **UniFFI** to enable direct rendering to macOS window decorations and seamless OS integration
- Orchestrated hermetic, reproducible build systems using **Nix Flakes** and custom SDK wrappers to port Linux-exclusive desktop applications to mobile and macOS platforms

Whisperer

[GitHub](#)

Apple Watch Application (App Store submission in progress)

2023 - Present

- Engineered a native **watchOS** application with a real-time **async/await** audio pipeline integrating **OpenAI Whisper** for STT and low-latency **TTS** for continuous voice-driven conversations
- Architected a **Vercel serverless** backend and **CoreGraphics** engine to typeset complex **MathJax** functions (e.g., triple integration) for high-fidelity rendering on small-screen displays
- Implemented a secure **ChatGPT** interface supporting **Markdown** and encrypted proxy communication; optimized for watchOS performance using **GCD worker queues**

HIAHKernel

[GitHub](#)

iOS Virtual Kernel and Process Runner

2025 - Present

- Engineered a virtual process manager for iOS with a **Mach-O binary patcher** that converts executable binaries to loadable bundles (`MH_EXECUTE` → `MH_BUNDLE`) for `dlopen`-based execution
- Developed a low-level hooking framework for **POSIX syscall interception** and **symbol redirection**, implementing a **DYLD bypass** to load unsigned code without a global JIT entitlement
- Designed a secure **Unix domain socket** IPC layer for communication between app groups and **NSExtensions**, managed by a reproducible **Nix** and **XcodeGen** infrastructure

SKILLS

Languages: Swift, Objective-C, C/C++, JavaScript, TypeScript, Python, Rust, Java, Nix

Core OS & Systems: macOS/iOS, reverse engineering, kernels, operating systems, runtime mods

Tools: Xcode/xcodebuild, AppKit/SwiftUI, XPC, Unix, Makefile, LLDB/Clang