



WHO AM I?

I build stuff. Mostly embedded systems, though *many hats*. I've been told one of my main talents is identifying gaps and rallying people around a fix.

Some gaps I've helped fill were continuous build/test systems, cross-platform-ifying existing code, and improving safety and reliability through modernizing tooling and techniques. Going beyond core responsibilities is important to me, especially when it lets me learn new things.

Entering the startup world (post-Microsoft) has been a rollercoaster.

WasteWizer let me get strong ownership over a full software system from firmware to dashboard. Silvertree let me explore the challenges of the consumer product space. Consulting/freelancing has let me see a wide range of technologies, though only small glimpses.

It's time to dive back into a deep problem and project.

EXPERIENCE

- 2/2024 – Present **Owner & Freelancer** XV Engineering - Boston, MA
 - Owner, providing freelance services, focusing on (but not limited to) embedded systems.
 - Delivered projects relating to system design, firmware feature implementation, and technology research.
 - Clients in the medical, waste, IoT, and consumer electronics industries.
 LoRaWAN / Edge-AI / Zephyr RTOS / Rust / C / C++ / React
- 2/2023 – 2/2024 **Staff Firmware Engineer** Silvertree Labs - Cambridge, MA
 - Developed firmware for a wearable device for older adults, utilizing the Zephyr RTOS.
 - Improved stability through system re-architecture, enabling aggressive emulated and hardware testing.
 - Developed improved WiFi driver and emulator for DA16200 WiFi chip, enabling improved network stability.
 - Developed UDP-over-BLE network interface for connectivity via a user's phone (and test Rust client).
 - Educated team on Zephyr build system, design principles, and techniques for improving testability.
 - Mentored one QA developer as he transitioned into contributing to firmware.
 C17 / Zephyr RTOS / Rust / BLE / NRF52
- 2/2021 – 2/2023 and ongoing consulting **Lead Software/Firmware Engineer** Scalable Systems Group (formerly WasteWizer Technologies) - Atlanta, GA & Remote
 - Fourth employee at a startup developing internet-connected scales for dumpsters (up to 22 tons).
 - Architected and implemented a complete system to ingest and aggregate sensor data on a dashboard.
 - Developed a React dashboard to display data, manage customers, and enable customer self-service.
 - Created fault-tolerant application and calibration firmware, achieving a 2-month average battery life.
 - Additional data pipeline work, including automated calibration, and automated service-needed notifications.
 - Rebranded company and built marketing website and materials.
 C++17 / Particle DeviceOS / React / Typescript / MongoDB / Python
- 10/2018 – 4/2021 **Software/Firmware Engineer II** Microsoft - Applied Sciences Group - Seattle, WA
 - Developed firmware for a suite of edge-AI devices using the Myriad X *Vision Processing Unit*.
 - Conducted various systems integration tasks related to image processing pipeline and peripherals.
 - Designed and built a continuous build and hardware-in-the-loop test system for several edge-AI devices.
 - Implemented a telemetry and update system using/abusing USB HID.
 - Rewrote the build system into cross-platform CMake, including both firmware and host applications.
 - Served as the architect and release manager for firmware and USB host tooling for validation and calibration.
 - Successfully contributed to the release of the Surface Hub 2 Smart Camera.
 C++17 / C / RTEMS / Linux / Myriad X / Make / CMake / USB
- 3/2017 – 10/2018 **Software Developer** Microsoft - Cosmos Big Data Group - Seattle, WA
 - Designed and implemented an automated canary analysis system for the *Extent Node* distributed service.
 - Developed and deployed a *documentation-as-code* platform for troubleshooting and guides.
 - Performed various on-call duties for the data storage layer of an exabyte-scale system.
 - Researched and implemented stream repair solutions for multiple types of permanent data loss.
 C++11 / Windows Server / C# / C / Powershell

EDUCATION

- 2011 – 2016 **B.S., M.S. in Electrical Engineering** Georgia Institute of Technology - Atlanta, GA and Metz, France
 Focus on Embedded Systems, Signal Processing, and Control Systems. Graduated with Highest Honors.

(SOME) PERSONAL PROJECTS

- 2024 **LoRaWAN Wearable**
 Ported Zephyr RTOS to LilyGo T-WATCH-S3 hardware (including writing missing drivers). - Ongoing project.
- 2022 **New England Pinball League Data Dashboard**
 Scraped & cleaned 10 years of NEPL data to create an analysis and simulation dashboard. - Ongoing project.
- 2019 **Snow Forecast Ski Art**
 Backlit wall-art skis that display abstract rendition of weekend's snow and weather forecast.

HOBBIES

Skiing, sailing, tennis, and a healthy obsession with pinball. Casually play bass guitar and piano.

NEED SOME HELP?

Have questions? Want to bounce around ideas? I'm always happy to talk – I love chatting about anything I have done!

For freelance work, I operate as *XV Engineering*. Please contact me at noah@xv.engineering