

Jason Nguyen

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SKILLS

Languages	TypeScript, Python, C/C++, Bash, SQL, Java
Platforms	Linux (Arch, Debian), ESP32/ESP32-C6, FPGA (Xilinx), Arduino
Web / Backend	Bun, FastAPI, WebSocket, REST API, HTML/CSS/JS
Infrastructure	Proxmox VE, Docker, Traefik, Cloudflare, ZFS, UFW, Nginx
Databases	SQLite, InfluxDB, Qdrant (vector search)
Monitoring	Grafana, Telegraf, MQTT, Home Assistant
Hardware / Design	KiCad, SolidWorks, Fusion 360, Multisim, LabVIEW, MATLAB
Equipment	Oscilloscope, Multimeter, Soldering (SMD/TH), FDM/SLA 3D Printing

TECHNICAL PROJECTS

Homelab Infrastructure Platform

- Designed and deployed a self-hosted virtualization environment on Proxmox VE running 23 Docker containers across 9 service stacks on LXC with ZFS-backed storage (2x8TB mirror)
- Configured Traefik reverse proxy with Cloudflare DNS-01 wildcard TLS and automated secrets management via self-hosted Inifisical
- Built Grafana monitoring dashboards fed by Telegraf and InfluxDB for real-time infrastructure observability
- Implemented network segmentation, UFW firewall rules, and SSH hardening across all nodes

SIGINT Market Intelligence Platform — TypeScript, Bun, SQLite

- Built a real-time market data aggregation system with 24 REST API endpoints serving 3 SQLite databases
- Developed automated importers for 25+ data sources with FTS5 full-text search and entity co-occurrence analysis
- Optimized database from 183 GB to 8.3 GB through denormalization, index tuning, and data cleanup pipeline

Rink Tracker — TypeScript, Bun, SQLite, Docker

- Built and deployed a production PWA for ice rink condition monitoring, used daily by facility staff
- Implemented interactive heatmap visualization, issue tracking with photo pipeline (EXIF rotation, metadata stripping, thumbnail generation), and role-based access control
- Deployed with Docker and Traefik to production; serves as primary operational tool for surface quality tracking

ESP32 Sensor Network and OTA Pipeline — ESPHome, C++, MQTT

- Developed ESPHome firmware for ESP32-C6 sensor nodes (SHT31-D, BH1750) publishing via MQTTS to InfluxDB through Mosquitto and Telegraf
- Designed OTA firmware update system for remote deployment across multiple devices with automated alerting

Honeywell Fire-Lite Regulated NAC Tester — Senior Capstone, KiCad

- Designed and built a production-ready Regulated NAC Tester for Honeywell, replacing a legacy proprietary device
- Delivered custom PCB design in KiCad with full documentation for future calibration and manufacturing

EDUCATION

University of New Haven

B.S. Electrical Engineering

August 2024

West Haven, CT

Capstone (Honeywell Fire-Lite) | Embedded Systems | Electronics I & II | Analog Circuits | Digital Systems & FPGA | Signal Analysis | C/C++

WORK EXPERIENCE

Champions Skating Rink

Facilities Daytime Lead

August 2024 – Present

Cromwell, CT

- Serve as primary technical escalation point for all facility systems — electrical, mechanical, refrigeration, and structural
- Diagnose and repair electrical faults using systematic methodology (visual inspection, NCVT, multimeter verification) across lighting, motor controls, and building systems
- Maintain and troubleshoot industrial equipment including Carrier 30XV screw chiller (glycol cooling system) and Zamboni ice resurfer
- Rebuilt failed Zamboni starter from salvaged components — no prior training, no documentation, no parts manual
- Install new electrical systems: designed and wired walkway lighting installation including concrete foundation, conduit, and circuit integration

Target

Tech Consultant, Electronics

May 2021 – August 2024

South Windsor, CT

- Managed day-to-day operations of the electronics department across a 3-year tenure
- Provided technical product consultations, maintained current knowledge of consumer technology, and managed inventory systems
- Trained and onboarded new team members on department procedures and product knowledge

Kumon Math and Reading

— Math and English Tutor, grades 1–12

May 2017 – June 2018

CERTIFICATIONS & INTERESTS

FCC Licensed Amateur Radio Operator — W1LSD (General Class) | Co-founded UNH Amateur Radio Club

3D Printing: 4 FDM printers (Bambu Lab), parametric modeling (OpenSCAD, Fusion 360), functional part design

Home Automation: Home Assistant integration, custom MCP bridge development, ESP32 sensor networks, real-time monitoring dashboards

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PROJECT DETAILS & LIVE DEMOS

Homelab Infrastructure

- Self-hosted on Proxmox VE (Ryzen 9 5950X, 64 GB RAM) with ZFS-backed storage pool (2x8TB mirror, 7.3 TB usable)
- 9 Docker Compose stacks across a dedicated LXC container: reverse proxy, monitoring, secrets management, personal assistant, knowledge base, market intelligence, rink operations, IoT bridge, and development tools
- Secrets management via self-hosted Infisical with machine-identity auth, auto-syncing agent, and file-based credential injection
- Full observability stack: 10-node ESP32-C6 sensor array publishing via MQTTS to Mosquitto, consumed by Telegraf into InfluxDB with Grafana dashboards
- Cloudflare Tunnel and DNS-01 wildcard TLS for secure external access without port forwarding

Calibration Shelf — Aquaponics Monitoring System

- Designed and built a sensor-instrumented aquatic ecosystem with real-time monitoring: 5 temperature probes, TDS chemistry sensor, power monitoring across 6 outlets, canopy environment sensing (SHT3x + BH1750), and PTZ camera integration
- Three-layer thermal defense architecture: passive house thermal mass (11:1 damping), active Inkbird heater control, and environmental envelope monitoring — maintaining $\pm 0.05^\circ\text{F}$ tank stability across 25°F outdoor temperature swings
- Custom Home Assistant MCP bridge exposing 37 entities with automated health evaluation, anomaly flagging, and a shelf health oracle returning structured diagnostics
- Automated lighting schedule with gradual sunrise/sunset transitions to minimize organism stress

Live Portfolio Integration

- Portfolio site at jason.pancake3d.com features a live process diagram (SCADA-style) driven by real sensor telemetry from the calibration shelf
- Ambient page theme shifts based on live system health status — teal (healthy), amber (warning), red (critical)
- Temporal replay slider with 35 days of backfilled historical data allows scrubbing through system operational history
- Self-hosted on the same Traefik + Cloudflare infrastructure that runs the rest of the homelab

ADDITIONAL INFORMATION

Amateur Radio (W1LSD): FCC General Class license. Co-founded the UNH Amateur Radio Club. Practical RF experience including antenna design, propagation analysis, and emergency communication protocols.

3D Printing & Fabrication: Fleet of 4 Bambu Lab FDM printers. Parametric modeling in OpenSCAD and Fusion 360 for functional parts — sensor mounts, cable management, enclosures, and experimental fixtures. Experienced with printer maintenance, repair, and assembly.

Hardware & Test Equipment: Oscilloscope operation and measurement, Brymen BM786 multimeter for precision diagnostics, NCVT for non-contact voltage detection, soldering (SMD and through-hole), and bench power supply operation. Comfortable with mixed-signal debugging and prototype bring-up.