Jack Nelson

jack@jackn.org · jackn.org · github.com/jack60612 · linkedin.com/in/ajacknelson

U.S. Citizen · Seeking Summer 2027 robotics and systems software internships

Education

Carnegie Mellon University, Pittsburgh, PA — May 2029

B.S. Electrical and Computer Engineering; minor in Robotics
Focus: Hardware & Software Systems; aiming to take the 18-525 tapeout capstone.
Hands-on coursework at CMU: machining and woodworking.

Research & Teaching

Robotics & ML Researcher, CMU Robotics Institute — Nov 2025–Present

- Led an agricultural robot's Foxglove interface, integrating camera feeds, telemetry, GPS, and disease-detection overlays.
- Built a TypeScript/Leaflet map with IndexedDB tile caching for offline use; team earned the 2026 Farm Robotics Challenge Amiga Innovation Award.
- Currently researching plant simulation for reinforcement learning in Prof. George Kantor's FARM Lab.
- Set up lab infrastructure supporting robotics research.

Teaching Assistant, Intro to ECE, Carnegie Mellon University — Jan 2026–Present

- Teach circuits, digital and logic design in hands-on small groups for Prof. Jimmy Zhu's 180-student Intro to ECE course.

Engineering Experience

Founder & Chief Technology Officer, Peak POS — Jan 2026–Present

- Founded and lead engineering for Peak POS, setting technical direction across payments, point-of-sale (POS) software, and Android terminals; lead two engineers within a 10-person team and coordinate operations and processor partners.
- Designed microservice architecture for time-sensitive payments, separating payment execution, tokenization, merchant management, and device services with authenticated boundaries and high-availability data infrastructure.
- Built processor-agnostic transaction routing using card and issuer metadata, merchant policies, account health, approval predictions, and processing costs.
- Built a fraud decisioning system with transaction risk scoring, velocity and history signals, configurable merchant policies, and pre- and post-authorization enforcement.
- Built a training and validation pipeline for payment-approval and recovery models, covering feature preparation, logistic models, calibration, and holdout evaluation.
- Built a Bazel build platform for backend services, Android apps, and shared SDKs with custom Starlark rules, code generation, pinned toolchains, and remote execution.
- Designed and operated infrastructure across cloud providers using Terraform, Kubernetes, shared build caches, and autoscaling execution capacity.
- Led technical work for PCI certification and payment certifications across Visa, Mastercard, American Express, and Discover; coordinated PCI and bank audit evidence and security policies.

Software Engineer Intern (part time), Chia Network — Jan 2022–Present

- Built Chia's developer-facing blockchain simulator, giving developers a controllable local chain for testing applications and reproducing blockchain behavior.
- Delivered chain setup, block generation, automatic farming, and rollback/reorganization controls through CLI and RPC interfaces; integrated simulator tooling and tests into Chia's main codebase.
- Developed shared coin-selection algorithms for standard and asset-token wallets, including exact-match and knapsack strategies for transaction construction.
- Built wallet CLI/RPC tooling and improved full-node synchronization, transaction scheduling, and peer-discovery services.
- Strengthened Rust CLVM runtime validation with typed errors and shared fuzzing infrastructure.

Owner, Myriad Networks — Jan 2020–Present

- Operate network services and coordinate address ownership transfers, routing authorizations, reverse DNS, and customer investigations.

Technical Skills

Languages & HDLs: C, Python, Rust, SystemVerilog, Kotlin/KMP, TypeScript, SQL
Systems & tools: IP networking, routing, DNS, Linux, Git, Bazel, Docker, Kubernetes, Terraform, Google Cloud, Azure, AWS, PostgreSQL, Cloud Spanner, Foxglove
Manufacturing: Proficient in Autodesk Fusion CAM.

Recognition

- 2025 Silver Knight, Vocational-Technical winner (Miami-Dade–Monroe)
- 2025 CyberPatriot (cybersecurity competition): 3rd, All Service nationals; 1st, Boeing Cyber-Physical Systems Challenge (team).