

Nathan Abebe

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EDUCATION

Yale University

New Haven, CT

B.S. Computer Science, B.S. Electrical Engineering (ABET) — 3.84/4.00

May 2028

- Computer Architecture, Computer Networks, Game Engines, Algorithms, Computer Systems, Data Structures

EXPERIENCE

Computer Graphics Group (Yale University)

Jul 2025 – Present

Performance Engineering Researcher — Advisor: Dr. Mike Shah

Part-time, New Haven, CT

- Implemented multithreaded Wavefront parser with SIMD, outperforming industry-standard parser speeds by 9x.
- Delivered 500× speedup over baseline by profiling and optimizing critical code paths over semester-long sprint.
- **Publication:** Coming soon.

Yale School of Engineering and Applied Science

Aug 2025 – Present

Teaching Assistant — Computer Systems

Part-time, New Haven, CT

- Supported 120+ undergraduate students by holding weekly office hours on systems programming fundamentals.

Efficient Computing Lab (Yale University)

Jun 2025 – Aug 2025

Systems Engineering Researcher — Advisor: Prof. Lin Zhong

Full-time, New Haven, CT

- Accomplished 80% reduction in development time by engineering a virtual file system for multi-FPGA control, validated by DECONET/HELIOS, a production-grade distributed quantum error code decoder.
- Developed distributed network for server-FPGA communication with custom UDP/TCP protocols, achieving 100% critical packet delivery and less than 1 minute end-to-end time for remote FPGA configuration.

Student Technology Collaborative (Yale University)

Oct 2024 – May 2025

Hardware Specialist

Part-time, New Haven, CT

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PROJECTS

Quark Game Engine | Dlang, ECS Architecture, SDL, GTK

Oct 2025 – Present

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MajorAudit – Yale Computer Society | TypeScript, Python, Django, PostgreSQL

Sep 2025 – Present

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Flight Computer – Yale Project Liquid | Rust, Real-Time Systems, Radio Protocols

Jul 2025 – Present

- Developed time-division multiplexed radio protocol with CRCs & ACKs achieving sub-100ms end-to-end latency.

EGSE – Yale Project Liquid | C++, Sensor Integration, LTspice, HIL Testing

Oct 2024 – Nov 2025

- Designed, simulated, fabricated, and tested PCB for liquid rocket fuel control with Altium Designer and LTspice.

ntraycer – Path-Based Ray Tracer | Dlang, Path-Based Ray Tracing, Physics, Rendering

Mar 2025 – Jul 2025

- Engineered a path-based ray tracer entirely from scratch (no library imports) for generating photorealistic images.

nnes – NES Emulator | Rust, Computer Architecture, Debugging

Mar 2025 – Jul 2025

- Built 5K+ LoC NES emulator in Rust, down to the various graphical glitches in the NES (plays Donkey Kong!).

TD-QAP – MIT iQuHack D-Wave 1st Place Prize | Python, Quantum Annealing

Jan 2025

- Solved the time-dependent quadratic assignment problem for dynamic facility layout optimization.

TECHNICAL SKILLS

Languages: Rust, C, C++, Dlang, Python, Golang, x86 Assembly, TypeScript, JavaScript, C#, SystemVerilog

Tools & Libraries: Git, GDB, Valgrind, Altium Designer, LTspice, SDL, GTK, OpenGL

Embedded: STM32, RTOS, Linux, Yocto, bare-metal, PCB design, FPGA design

Protocols: UDP, TCP, UART, SPI, I²C, TDMA, CSMA, CRC