

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 <i>Dlang, ECS Architecture, SDL, GTK</i>	Oct 2025 – Present
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MajorAudit – Yale Computer Society <i>TypeScript, Python, Django, PostgreSQL</i>	Sep 2025 – Present
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Flight Computer – Yale Project Liquid <i>Rust, Real-Time Systems, Radio Protocols</i>	Jul 2025 – Present
• Developed time-division multiplexed radio protocol with CRCs & ACKs achieving sub-100ms end-to-end latency.	
EGSE – Yale Project Liquid <i>C++, Sensor Integration, LTspice, HIL Testing</i>	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 <i>Dlang, Path-Based Ray Tracing, Physics, Rendering</i>	Mar 2025 – Jul 2025
• Engineered a path-based ray tracer entirely from scratch (no library imports) for generating photorealistic images.	
nnes – NES Emulator <i>Rust, Computer Architecture, Debugging</i>	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 <i>Python, Quantum Annealing</i>	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