Jack Gaffney

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Education

University of Michigan, Ann Arbor, MI — Expected May 2026
Bachelor of Science in Engineering – Computer Science
Relevant Coursework: Data Structures & Algorithms, Database Management Systems, Operating Systems, Artificial Intelligence, Cybersecurity, Discrete Mathematics, Multivariable Calculus, Linear Algebra, Physics I & II

Experience

Quantum Opus LLC | *Software Engineering Intern* — Plymouth, MI | Summer 2025

- Built and deployed a full-stack internal database (Go/Gin backend, Next.js frontend, PostgreSQL, Docker Compose) that centralized fragmented workflows and improved operational scalability
- Designed modular Go API endpoints that could be consumed independently, enabling seamless integration with Python-based data generation pipelines and reducing redundant data transfers
- Implemented automated data ingestion and validation pipelines with dynamic entity linking and relationship mapping, improving reliability and reducing manual intervention across datasets

Renewit Decking | *Carpenter* — Charlevoix, MI | Summer 2024

- Constructed large-scale outdoor living spaces by applying precision carpentry techniques, coordinating multi-phase project planning, and adapting designs to structural constraints under limited resources
- Coordinated logistics and scheduled material deliveries for seven distributed crews within a 50 mile radius, optimizing resource allocation and significantly reducing downtime across simultaneous job sites
- Transitioned from carpentry to logistics and pre-construction project planning after identifying workflow inefficiencies, improving operational efficiency and project turnaround times

DTS Enterprises Inc. | *Engineering Intern* — Ellsworth, MI | Summer 2022

- Produced 2D/3D CAD renderings and detailed technical schematics, supporting cross-functional communication between engineering design and production teams to accelerate product iteration
- Authored a comprehensive technical manual for a mechanical boat door system, allowing customers to independently complete installations and reducing reliance on on-site engineering support
- Reorganized a database of 10,000+ assembly files and component drawings, implementing a new structure and indexing scheme that greatly improved retrieval speed and reduced production bottlenecks

Projects

Cross-Platform Game Engine | *C++17, Lua, SDL2* — Winter 2025

- Engineered a high-performance game engine in modern C++17 with cross-platform support for Windows, macOS, and Linux, implementing real-time rendering, audio systems, and a custom data oriented particle engine
- Integrated Lua scripting via efficient C++ bindings, enabling rapid prototyping and flexible runtime modifications while preserving native execution speed in critical performance paths, making it easy for anyone to build a game using my engine
- Optimized C++ code and leveraged STL features to achieve massive performance improvements, maintaining consistent 60 fps when rendering millions of actors on large maps

Custom Operating System | *C, C++* — Fall 2025

- Collaborated in a three-person team to design and implement a minimal operating system, gaining hands-on experience with low-level systems programming and kernel development
- Built a kernel supporting multitasking and thread scheduling, leveraging multithreading to optimize resource allocation and process execution efficiency

Technical Skills

Languages:	C++/C (advanced), Python, Go, Rust, JavaScript, Lua, Assembly, MATLAB
Systems & Tools:	Linux, Git, Docker, CMake, GDB, Valgrind, Make
Frameworks:	Next.js, PostgreSQL, Gin, Django, SDL2, Tailwind CSS
Focus Areas:	Systems programming, Performance optimization, Real time data infrastructure, Multithreading

Activities

Autonomous Robotic Vehicle Project Team – Lights Team — Winter 2024 – Present
Michigan Data Science Team – Algorithm Development — Winter 2024 – Present