Elijah Retzlaff

(541) 282-4650
elijah.retzlaff@columbia.edu

New York, NY
github.com/riverray121
linkedin.com/in/elijah-retzlaff/

Education

Columbia University — New York, NY
B.A. in Computer Science | GPA: 3.92/4.00 | ACT 35 — 2023 – 2025

- Coursework: Parallel Optimization for Robotics, Computer Architecture, Advanced Programming in C, Artificial Intelligence, Linear Algebra for ML

Skills and Technologies

Languages: Python, C, C++, PHP, HTML, CSS

Tools and Technologies: CUDA, Docker, ROS1/ROS2, MoveIt, Arduino, Flask, Git, AWS, GCP, Fusion360

Experience

SmartEd Systems, LLC — Remote
Software Engineering Intern — Jun. 2024 – Aug. 2024

- **Enhanced Security with MFA**: Integrated Google, Microsoft, and Email Multi-factor Authentication (MFA) for 3 school districts, improving login security and compliance.
- **Streamlined User Experience with SSO**: Implemented PowerSchool Single Sign-On (SSO) using PHP and JavaScript, reducing login friction for 400+ users and increasing system adoption.
- **Secured New Clients through Canvas LTI Integration**: Developed Canvas LTI 1.3 integration (OAuth & OIDC) for SES PHP web app, leading to a district-wide contract based on feature demand.

OpenVest, LLC — New York, NY
Software Engineering Intern — Jan. 2024 – May. 2024

- **Implemented iOS Payment Functionality**: Integrated payment processing methods into the OpenVest iOS app, including Apple Pay and Cash App, for one-time and recurring payments.
- **Overhauled Application Interface**: Restructured SwiftUI application control flow logic and designed a modernized interface aligned with user feedback, improving usability and enhancing the overall user experience.

Innovations Health Devices, LLC — Citrus Heights, CA
Product Manager and Software Engineer — Feb. 2021 – Aug. 2022

- **Developed Robotic Control Software**: Built a robotic control framework in C++ and Python using ROS and Gazebo, integrating path planning, simulation, and real-world control via serial peripherals to interface with custom hardware and embedded systems.
- **Led Product Development of Kinoped Medical Robot**: Directed a cross-functional team of 10 engineers, delivering a fully functional prototype within 10 months. (Visual Link | Google Drive Link)

Projects

- **GPU-Accelerated Graph Search Optimization - Dec. 2024**: Implemented GPU-accelerated graph search optimization for BFS through CUDA-based parallelization to reduce computational bottlenecks in real-time robotics and AI applications. (Code Link)
- **SIMD Vectorized Multiplication for Multi-Precision Arithmetic - Oct. 2024**: Implemented SIMD vectorized vector multiplication using Intel Intrinsics (specifically AVX2 instructions), achieving up to 57.2x speedup compared to naive implementations. (Code Link)
- **Web Server Implementation in C - Dec. 2023**: Developed a web server in C to handle HTTP/1.0 GET requests, static file serving, and secure request handling. Implemented error responses, logging, and directory traversal prevention. Integrated dynamic content via a persistent TCP connection for real-time database lookups. (Code Link)