

Liam Patterson

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EDUCATION

Northwestern University

Masters of Science in Computer Science

Bachelor of Science in Computer Engineering and Math, Integrated Science Program

Evanston, IL

Expected June 2025

June 2024

- **3.87/4.00** GPA

- Relevant Coursework: mathematics, systems programming, data structures, probability, compilers, high performance computing, CUDA, embedded systems, machine learning, cloud computing, and physics

PROFESSIONAL EXPERIENCE

Hudson River Trading

Software Engineering Intern

New York, NY

May 2024 - Present

- Redesigned portions of the post-trade risk infrastructure to support more dynamic constraints on trades including groupby and complicated matches, reduced technical debt, and decreased memory usage by 18%
- Created a gRPC service to track open orders, handling large volumes of exchange messages, allowing risk systems and trading strategies to query their pending orders even when the order system is offline or goes down

Hudson River Trading

Software Engineering Intern

New York, NY

June 2023 - August 2023

- Implemented weighted reservoir sampling to enable real-time statistical analysis of job scheduling on the HPC research cluster with minimal overhead
- Designed performant interop layer between KDB, Pandas, Arrow, and other proprietary data formats for market data
- Improved performance of internal C++ functional reactive programming/graph-based data stream library

Northwestern University

Peer Mentor / Teaching Assistant

Evanston, IL

September 2022 - Present

- 2x TA for CS 213, an introduction to systems programming, hosting office hours and discussion sections, assisting students and on topics ranging from floating point representations to virtual memory and kernel programming
- 1x TA for CS 310, Scalable Software Architectures, an introduction to cloud architectures and asynchronous programming with labs utilizing AWS
- 1x TA for CS 397/497, Wireless Protocols for the Internet of Things, designing and assisting students with labs implementing BLE, LORA, Thread, and other wireless protocols on embedded devices

Terran Orbital

Flight Software Intern

Irvine, CA

June 2022 - August 2022

- Gained familiarity with Agile workflow, JIRA, Git, and Bamboo CI/CD
- Revamped C++ tool for testing the transmission of UDP messages to satellites
- Integrated automated testing of message transmission and reception into CI/CD pipeline
- Created a virtual environment with QEMU and Docker that emulates the flight computer to facilitate rapid prototyping and development of the flight software

RESEARCH EXPERIENCE

Northwestern Computer Science

Research Assistant

Evanston, IL

December 2022 - Present

- Research assistant working with Professor Dinda on a project extending the Parallel-ML programming language to distributed memory clusters:
- Modified MLton runtime and scheduler to automatically distribute threads between nodes:

Stony Brook University Applied Mathematics

High School Research Apprentice (DOD Grant)

Stony Brook, NY

June 2019 - September 2019

- Gained experience with C/C++/Fortran computational modeling and FVM technique for PDE solving
- Parallelized parts of parachute simulation with MPI and began efforts to develop a GPU accelerated CUDA version
- Wrote a paper and delivered a presentation to the Stony Brook Applied Mathematics department faculty on contributions to the Frontier++ Parachute simulation software

SKILLS

Certifications: American Heart Association BLS / ACLS / PALS, NREMT / Illinois / New York Paramedic Certification, Chicago Region X/VII Paramedic Certification

Technical: C/C++, Python, Javascript, HPC, Parallelism, Operating Systems, Compilers, LLVM, Kernel Programming

Competitions: 2024 ICPC Mid-Central Regional (3rd place school), Qualified for 2024 ICPC North American Championship