



EXPERIENCE

Bloomberg LP Software Engineering Intern | Trading Solutions

Jan 2018 - present

Bloomberg LP, creator of the ubiquitous Bloomberg Terminal, is the largest financial data company in the world.

- Trained and tuned **XGBoost** boosted decision tree models in Python to forecast failures in **hundreds of thousands** of automated trading workflows.
- Took initiative to rewrite the entire existing machine learning pipeline from scratch, which added readability through encapsulation and documentation, decreased prediction error by **over 50%**, uncovered many critical bugs while writing automated tests, and sped up runtime by **more than 350%**.
- Pitched and **deployed the system to clients**, where it revealed bugs with external services that would not have been discovered otherwise.
- Implemented an experimental **Apache Spark** distributed version of this model training pipeline using PySpark and MLlib on a Spark/HDFS cluster.

Waterloo Hyperloop Team Technical Director

Sep 2017 - present

Waterloop represents Canada in SpaceX's Hyperloop Pod Competition, developing the technology for a supersonic train spanning the continent.

- Leading a growing team of **over 70 students** in designing an all-new SpaceX Hyperloop Competition 2018 pod. Invited by SpaceX to submit a detailed design package, placing us in the **top 47, selected from hundreds worldwide**.
- Facilitating and contributing to work team-wide, including a sophisticated and reliable Hyperloop design expressed in a **131-page engineering design package**, several **in-house embedded software libraries**, and physical tests of high-power lithium batteries, rare-earth magnets, and more.
- Coordinated the establishment of nearly daily meetings across all subteams, partnerships with businesses, universities, and government (**raising \$100,000 and counting**), and entirely new branding, website, management structure, outreach programs, and more.

Bloomberg LP Software Engineering Intern | Research Discoverability

May 2017 - Aug 2017

- Developed an **Latent Dirichlet Allocation topic model** on a large document corpus using gensim, sklearn, and Jupyter, rewrote parts of a Python caching service into C++ for speed, and refactored and documented the existing C++ codebase.
- **Featured on the Bloomberg Careers Blog.**

Waterloo Hyperloop Team Software Systems Lead and Web Lead

Jan 2017 - Sep 2017

- Designed, implemented, and tested Waterloo's **first-ever fully operational control system** with a team of 5, including a WebSockets/UART telemetry pipeline, C++ state machine, and React dashboard. Placed **15th out of over 150** teams at the 2017 SpaceX Hyperloop Competition.

SkillFlow Backend Software Engineer (part-time)

Jul 2016 - Mar 2017

- Helped develop a highly scalable NodeJS stack, with **1000+ peak simultaneous users**, and published **3 open-source modules**.

EDUCATION

University of Waterloo Software Engineering, Co-op Class of 2021

- Overloading 7 courses per semester with the intention of earning the **Statistics, Combinatorics & Optimization**, and **Physics** minors.
- Carl A. Pollock Engineering Scholarship, Ontario Professional Engineers Foundation Scholarship, President's Scholarship

PROJECTS

Web Development Projects

Jun 2014 - present

- Wrote many webapps and websites in HTML/CSS/JS, NodeJS, and PHP, including WashU Chemistry Tournament Scorer, Vocative Chat Platform, Math Club Website & Tournament Platform, Science Bowl Database, and LexSciBowl.
- Cofounded VitaeDev, a student-run startup creating websites for local businesses and nonprofits.

Amazon EC2 Server Suite

Feb 2016 - present

- **Server instrumentation and maintenance** tools in NodeJS, Bash, Go, and other languages, used in production on **~9 websites**.
- Deploys a new NodeJS webapp from source **in a single command** to a process-managed server behind an SSL-secured reverse proxy, with live log monitoring via a Facebook Messenger bot.

C++ Neural Networks

Feb 2015 - present

- Wrote a **neural network and matrix math** library in C++, with optimizations for parallelism.
- Implemented backpropagation, genetic algorithms, and a predator-prey coevolution simulation.

Boole Proof Assistant

Sep 2017 - present

- Rebuilding a **formal verification system** from scratch to replace the George system written by the *SE 212 Logic and Computation* course instructors, adding missing features such as transformational proof verification.

AWARDS

Score of 32 @ Putnam Mathematical Competition rank 326/4640 (median score = 1)

2017-2018

1st Place @ McHacks 2017 Signbot

Jan 2017

Best Hardware Hack @ ECHacks 2016 Sandwich-O-Matic

Nov 2016

Platinum Division US Computing Olympiad

Jan 2016

Silver Medalist US Physics Olympiad

Mar 2016

LANGUAGES & FRAMEWORKS

Native speaker: C++, NodeJS (ES6), Python, HTML5, CSS3, JavaScript, Git

Conversationally fluent: C, Java, PHP, Linux, Matlab, SQL, jQuery, Bash, CloudFlare, SciKit-Learn, XGBoost

Curious tourist: AWS, MongoDB, Docker, React, R, TensorFlow, Keras, Go, Nginx, Spark & MLlib