

## TL;DR

- Hands-on experience with autonomous vehicles from working with WATonomous (a student team in the AutoDrive challenge) and Waterloo Autonomous Racing (a student team in the Indy Autonomous Challenge).
- Previously Bachelor of Computer Science, AI Option @ UWaterloo (graduated in 2020).
- Received an "Outstanding" (highest) evaluation on University of Waterloo's coop system during all 5 work terms.
- Able to quickly adapt to and thrive in different work environments through experiences at companies of all sizes.
- Practical understanding of embedded systems and real-time programming obtained through building a real-time microkernel from scratch in [CS 452](#) (Real-Time Programming, aka "Trains").

## Serious Stuff

### Team Captain @ Waterloo Autonomous Racing

*Autonomous vehicles for racing, with a focus on planning and control.*

July. 2020 - present

Waterloo, Ontario, Canada

- Integrated and improved upon a Nonlinear Model Predictive Path Following Controller.
- Set up the infrastructure for communicating with the simulator, racing line optimization, docker-based development environment, website, data pipeline, and the data visualization platform.
- The team placed 4th (out of 18 teams) in the 3rd mini-competition in Jan. 2021.

### Path Planning @ WATonomous

*Member: Jan.-Apr. 2020, Manager: May-Aug. 2020, Advisor: Sep. 2020-present*

Jan. 2020 - present

Waterloo, Ontario, Canada

- Implemented efficient obstacle avoidance algorithms by generating trajectories in the Frenet frame.
- Experimented with PID and Model Predictive Control algorithms.
- Introduced Dockerized development environment to the team. This enabled everyone to work remotely during the pandemic.

### Software Engineer (Intern) @ Apple Inc.

*"He is a self motivated, focused engineer who strives to look at problems in depth..."*

May 2019 - Aug. 2019

Cupertino, California

- Implemented network bandwidth prediction infrastructure and bandwidth recording optimizations that improved the time to reach HD and UHD tiers by over 30% in Apple's HTTP Live Streaming video player.
- Created a Media Source Extensions conformance suite to streamline the certification process for external hardware.

### Software Engineer (Intern) @ Hive.AI




















*"Ben is the best intern we have ever had on our team and one of the strongest engineers at the company."*

Jan. 2019 - Apr. 2019

San Francisco, California

- Rewrote a data export pipeline and over 50x'd the speed for large exports by making use of idle resources and optimizing caching and concurrency.
- Invented a polygon consensus algorithm using vertex-voting and multi-density clustering techniques. This algorithm landed the company multiple large-scale projects.
- Implemented a Node.JS Streams library with batching, bucketing and concurrency control capabilities.

## Languages & Frameworks

 Experienced	 So-so	 Novice
 C	 C++	
 Docker	 Python	
 Javascript	 React	
 Node.js	 ARM asm	
 OCaml	 PHP	
 SQL	 Java	
 Bash	 Go	
 Nix	 Swift	

## Not-So-Serious Stuff

### [Free Sidecar](#)

- Enables Sidecar on Unsupported iPads and Macs running iPadOS 13 and macOS Catalina.
- Received 700+ stars and 30K+ downloads on GitHub.

### [Vocode \(Hackathon Project\)](#)

- 100% voice-enabled, JavaScript-based text editor. Powered by Nuance's Natural Language Understanding API.
- First place winner of the Nuance API prize at McHacks 2016.

### [Waterloo Warriors Band \(non-techy, ongoing\)](#)

- Lead trumpeter
- Deputy Chief Centurion (Vice-president) and Technomancer (Webmaster)