

TL;DR

- Hands-on experience with autonomous vehicle planning and control algorithms 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, dockerized 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	 Javascript	
 React	 Node.js	
 ARM asm	 C++	
 Python	 OCaml	
 Docker	 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)