🖳 MASc Electrical and Computer Engineering
🏛 University of Waterloo (Class of 2022)
📞 (317) 820-4214

✉ ben.zhang@uwaterloo.ca
🌐 benzhang.xyz
 /ben-z

Ben Zhang

(Some also call me "Chuan Tian")

TL;DR

- Hands-on experience with autonomous vehicles from working with WATonomous (a student team in the AutoDrive challenge) and MIT-PITT-RW (previously 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

Controls Lead @ MIT-PITT-RW, previously Team Captain @ Waterloo Autonomous Racing

July. 2020 - present

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

Jan. 2020 - present

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

May 2019 - Aug. 2019

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

Jan. 2019 - Apr. 2019

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