

# Brian Chen

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## EDUCATION

### B.A.Sc in Engineering Science (Electrical and Computer Engineering Major)

2020 – 2024

University of Toronto

Toronto, ON

- Third year B.A.Sc in Engineering Science; Computer Engineering major, Machine Intelligence minor. Dean's list, 3.65 GPA
- **Coursework:** Computer Security, Operating Systems, Advanced Algorithm Design, Machine Learning, Software Engineering, Foundations of Computing, Computer organization, Control Theory, Semiconductor Devices, Signal Analysis, Electronics, Economics, Engineering & Law

## EXPERIENCE

### Software Engineering Intern

May 2022 – September 2022

Open Source Robotics Foundation

Mountain View, CA

- Developed **60+ features and bugfixes** in collaboration with **NASA** while balancing open source community feedback for the [ROS2](#) and [Gazebo](#) packages powering the [VIPER lunar rover's](#) critical ground control and autonomy systems – *leaving earth in 2024!*
- Co-authored [REP2012: Service Introspection](#) standard. Designed, built, and deployed **reference implementation** enabling runtime introspection and recording of ROS2 services while working in a fast-paced team setting This **widely-requested feature** garnered strong community support because it **unblocks tens of thousands of users**, enabling them to use ROS2 services in their robots
- Maintained ROS2 & Gazebo; improving the development experience for **800,000+ users** by spearheading a mypy compliance initiative, **fixing race conditions** in ROS2 libraries, adding an AsyncParameterClient interface, and **improving test coverage**

### Software Sub-team Lead

September 2020 – June 2023

aUToronto

Toronto, ON

- **Led 20+ students** across trajectory motion planning, automated simulation testing, and deep learning acceleration teams to build an autonomous vehicle for [aUToronto's](#) entry to the [AutoDrive Challenge](#). **Our team has won 1st place for five consecutive years**
- **Worked to a leadership position** through self-learning ROS, computer vision, systems programming, and robotic motion planning while proactively mentoring new members, iterating with my colleagues, and taking on ownership of software projects
- Designed **time-critical** vehicle trajectory motion planning algorithms to generate kinematically feasible trajectories using hybrid A\*
- Accelerated YOLOv5 by 20x with a TensorRT ML pipeline to **detect objects in real-time** across 4 cameras with **millisecond latency**
- **Reduced developer testing time by 10x** by developing "aUToTest", a parallelized automated simulation integration test framework
- Built AI sensor noise modelling tool on CycleGAN to improve Sim2Real transfer, build test confidence, and **deliver simulation value**

### Fullstack Software Developer

July 2020 – September 2021

BC Parks Foundation

Vancouver, BC

- **Translated stakeholder needs into functional requirements and practical tasks** to build fullstack 'DiscoverParks' webapp and data collection solution. I was responsible for the internal content management interface, backend, and front-end experiences
- Applied profiling to rearchitect database to better model user data and remove cycles; **improved code health and query speed**

### Teaching Assistant

September 2021 - June 2022

Division of Engineering Science - University of Toronto

Toronto, ON

- **Taught ~50 undergrads** computer science from 'Hello World' to dynamic programming and Dijkstra's algorithm ([ESC180](#), [ESC190](#))

### Co-Founder & Developer

April 2020 – December 2020

GrocerCheck Foundation

Vancouver, BC

- Created [grocercheck.ca](#), a webapp that leverages big data to help **20,000+ daily users** #ShopSafeStaySafe by finding the least busy place to shop for groceries in **15,000+** stores across North America in response to the COVID-19 pandemic
- Founded GrocerCheck Foundation, a **registered non-profit** to better scale project; secured support valued at **\$200,000+**
- **Architected and deployed horizontally scalable distributed system architecture** to meet unexpected growth and demand

### Research Intern

Feb 2021 – September 2021

Intelligent Sensory Microsystems Lab - University of Toronto

Toronto, ON

- Innovated novel 'thresholding' concept which **improves longevity and power consumption** characteristics of neuromorphic [memristor](#) crossbar **machine learning accelerators** during in-situ training by **up to 90%**. **First author paper** under review

## SKILLS

- **Languages:** c++, python, c, go, rust, lua, javascript, html5, css, java, bash, SQL, verilog, MATLAB/simulink, assembly
- **Frameworks & Libraries:** ROS, ROS2, numpy, scipy, OpenCV, Pandas, Jenkins, CI/CD, Docker, LXD, flask, Django, mobile, PyTorch, Tensorflow, Keras, TensorRT, CUDA, PostgreSQL, MySQL, MongoDB, NodeJS, VueJS, ThreeJS, FPGA, Cloud, AWS, GCP, git
- **Other:** Linux, UNIX, vim, debugging, object-oriented programming, embedded, systems software, infrastructure, databases, REST APIs, MapReduce, user experience, Fusion360, Googling, technical writing and communication

## PROJECTS, AWARDS, & MORE

For demos, please see [chenbrian.ca/posts/projects](http://chenbrian.ca/posts/projects)

- **"butternut"**: Implementing [gltr](#) on [CTRL](#) to combat AI-generated text. nwHacks bronze, KPMG Data Analysis & Salesforce Award.
- **"the Humerus Bot"**: Directed project with [UTMIST](#) to build a NLP bot designed to win Cards Against Humanity
- **Teaching:** Review content I prepared for my students, including a [custom Jupyter notebook](#) with c kernel for interactive learning
- **Awards:** Schulich Leadership Scholarship nominee, Bert & Greta Quartermaine Badminton Scholarship Recipient, BC District Scholarship & BC Achievement Scholarship Recipient, Canada Service Corps Student Service Grant, ESROP-UofT research grant
- **Badminton:** ClearOne Nationals Team, 2018 Junior Nationals Finalist, Eric Hamber Provincial Team Captain, [UTBC](#) Exec
- **Theatre:** Wrote and directed full-length show: 'To Bleach a Pigeon'. Oversaw actors, crew, set design, and creative process