Brian Chen

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EDUCATION

B.A.Sc in Engineering Science (ECE option) 2020 – 2024
University of Toronto *Toronto, ON*

- Third year B.A.S.c in Engineering Science; Computer Engineering major, Machine Intelligence minor. Dean's list, cGPA 3.65
- **Coursework:** ECE352 Operating Systems, ECE568 Computer Security, CSC473 Advanced Algorithms, ECE350 Semiconductor Devices, ECE444 Software Engineering, ECE358 Foundations of Computing, ECE421 Machine Learning, ECE355 Signal Analysis, ECE360 Electronics

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, clear and concise communication of ideas and technical information

EXPERIENCE

Software Engineering Intern May 2022 – September 2022
Open Source Robotics Foundation *Mountain View, CA*

- Collaborated with **NASA** on the VIPER **Lunar rover** project scheduled for launch in 2024; developed **60+ new features and bugfixes** on the ROS2 and Gazebo Simulator packages upon which their **critical autonomy and ground control systems** are based.
- 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, simulation, automated testing, and deep learning acceleration software sub-teams to build a Level 4 autonomous vehicle as part of aUToronto's entry to the international SAE Autodrive Challenge.
  - **Won 1st place out of 10 teams for five consecutive years**
- Designed **time-critical** local **trajectory motion planning** algorithms to generate kinematically feasible trajectories using hybrid A*
- Accelerated YOLOv5 by 20x using TensorRT to **detect objects in real-time** on 4 concurrent video streams 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
- Identified and resolved two content management strategy bottlenecks through **data-driven solutions, boosting efficiency by 10x**

Teaching Assistant September 2021 - June 2022
Division of Engineering Science - University of Toronto *Toronto, ON*

- **Taught ~20 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 and LivePopularTimes scraping library, a **full-stack webapp** that analyzes and **leverages big data** to help **20,000+** daily users find the least busy and safest time to shop for groceries across **15,000+** stores in 20+ cities
- 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 rapidly growing availability demands

Research Intern Feb 2021 – September 2021
Intelligent Sensory Microsystems Lab - University of Toronto *Toronto, ON*

- Developed 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** pending submission

PROJECTS, AWARDS, & MORE

For demos, please see 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
- **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