

Brian Chen

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EXPERIENCE

Uber Production Engineering Intern	[<i>site reliability engineering, distributed systems, go, java, garbage collector, autoscaling</i>]	September 2023 – August 2024 San Francisco, CA
<ul style="list-style-type: none">I help ensure reliable and efficient operation of Uber's mapping and core services via participating in on-call rotation, incident response, and service ownership on the mapping production engineering (SRE) team, primarily focusing on capacity safety, efficiency, and performanceDesigned & delivered extension to CRE to build CPU & throughput-informed rectangular auto-scaling system for Uber's stateless microservices to improve failover safety and reduce cost. Approximately half of Uber's stateless compute is managed by this system.Diagnosed and fixed severe memory allocation issue causing excess garbage collector load, service degradation, and outages in a critical core service (>2.5 mil RPS) via 'hacking' the go runtime; reduced service compute cost by >\$700,000 while improving latency and reliabilityWorked with language foundation teams to improve go and java service observability into garbage collector performance. For example, I identified a non-linear relationship in GC signals for use to predict service performance degradation under high loadDeveloping end-to-end memory leak detection system including Go & JVM garbage collector monitoring, auto-scaling, and load-testing tooling		
Tesla Autopilot Intern	[<i>autonomous vehicles, c, c++, signal processing, embedded systems</i>]	May 2023 – September 2023 Palo Alto, CA
<ul style="list-style-type: none">Owned vision park assist ultrasonic sensor replacement v2 project; architected and implemented pipeline from GPU kernel and vision schedule optimization, to spatial-temporal filter design and performance tuning. Features developed in close collaboration with leadership and deployed to global Tesla fleetDeveloped selfie-based driver drowsiness and attention system, enabling a transition from torque sensor to vision-based driver monitoring as well as limited user hands-off driving, while meeting IIHS compliance specsRe-designed camera heater defogging control algorithm, extending vehicle range by up to 10 miles in nominal conditions.Developed high-speed shared-memory transport communication system to enable tracking verbose logs in production vehicles		
Kortex Founding Engineer	[<i>a little bit of everything</i>]	July 2023 – Present Remote
<ul style="list-style-type: none">Building kortex, a second brain for creators. I oversee and develop infra, backend, networking, devops, machine learning (LLMs), and more		
Open Source Robotics Foundation Software Engineering Intern	[<i>c, c++, python, ROS2, open source, Linux, distributed systems</i>]	May 2022 – September 2022 Mountain View, CA
<ul style="list-style-type: none">Co-authored REP2012: Service Introspection standard proposing new core functionality for runtime introspection and recording of ROS2 services. Designed, built, and deployed reference implementation with few iterations to while balancing stakeholder prioritiesSupported NASA contract in developing ROS2 and Gazebo packages powering the VIPER lunar rover's systems		
Toronto Intelligent Systems Lab Student Researcher		June 2024 - May 2025 Toronto, ON
<ul style="list-style-type: none">Undergrad thesis jointly supervised by Prof. Igor Gilitschenski and Nvidia research on autonomous vehicle simulation (in-progress)		
Intelligent Sensory Microsystems Lab Student Researcher	[<i>python (PyTorch), neuromorphic computers, supercomputers</i>]	Feb 2021 – September 2021 Toronto, ON
<ul style="list-style-type: none">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%. Second author paper published in <i>Neurocomputing</i>		
BC Parks Foundation Fullstack Software Developer	[<i>python, django, PostgreSQL, Vue.js, fullstack, GIS</i>]	July 2020 – September 2021 Vancouver, BC
<ul style="list-style-type: none">Built discoverparks.ca, a website that helps Canadians discover nature experiences in parks. Owned backend, CMS, and GIS integration		
Division of Engineering Science - University of Toronto Teaching Assistant	[<i>c, python</i>]	September 2021 - June 2023 Toronto, ON
<ul style="list-style-type: none">Taught undergrads computer science from 'Hello World' to dynamic programming and Dijkstra's algorithm (ESC180, ESC190)		

EDUCATION

Computer Engineering University of Toronto	2020 – 2025 Toronto, ON
<ul style="list-style-type: none">B.A.S.c in Engineering Science; Electrical & Computer Engineering + PEY co-op. cGPA 3.47/4.0Coursework includes OS, ML, algorithm design, compilers, semiconductors, distributed systems, electronics, control theory, law, and more	

PUBLICATIONS

- X. Dong, **B. Chen**, R. Genov, Mostafa Rahimi Azghadi, and Amirali Amirsoleimani, 'SITU: Stochastic input encoding and weight update thresholding for efficient memristive neural network in-situ training' *Neurocomputing*, pp. 128275–128275, Jul. 2024, doi: <https://doi.org/10.1016/j.neucom.2024.128275>

OTHER

For demos, please see chenbrian.ca/posts/projects

aUToronto (UofT Self-Driving Car Team) Autonomy Software Lead	[<i>c++, python, Simulink, PyTorch, TensorRT, CI/CD, ROS2</i>]	September 2020 – June 2023 Toronto, ON
<ul style="list-style-type: none">Leading 20+ students across trajectory motion planning, automated simulation testing, and deep learning acceleration teams to build a Level 4 autonomous vehicle for aUToronto's entry to the AutoDrive Challenge. Our team has placed 1st for the past 6 yearsDesigned and implemented real-time motion planning systems and algorithms for our vehicle to navigate complex urban environmentsAccelerated YOLOv5 by 20x via an Nvidia TensorRT ML pipeline to detect objects in real-time across 4 cameras with millisecond latencyOther projects include: automated simulation integration test framework, simulation noise modelling via CycleGAN, lanelet mapping libraries, and more		
GrocerCheck Foundation Co-Founder & Developer	[<i>python (Django), PostgreSQL, aws</i>]	April 2020 – December 2020 Vancouver, BC
<ul style="list-style-type: none">Created and scaled grocercheck.ca, a webapp that leverages big data to help 20,000+ shoppers #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		

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
- [chenbrian.ca/posts/2021/Teaching](#): Review content I prepared for my students, including a [custom Jupyter notebook](#) for teaching c