Geoffrey Bian

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Education

University of British Columbia September 2022 – May 2027
Bachelor of Applied Science, Computer Engineering, GPA 4.0/4.0 *Vancouver, BC*

Technical Skills

Languages: Python, C++, C, JavaScript (React), Java, Go, Rust, SQL
Systems & Tools: MATLAB (Simulink), PyTorch, Linux, Docker, Git, Bazel, SCons, AWS IoT, Jenkins
Domains: Control Algorithms, Firmware, Distributed Systems, Cloud Computing, Robotics, Machine Learning

Work Experience

Tesla February 2025 – August 2025
Software Engineer Intern – Energy Engineering *Palo Alto, CA*

- Designed scalable **automation and control logic** using *Python*, *Rust*, and *Structured Text*, integrating telemetry and fault detection to enhance system uptime and data reliability across 12+ **Balance of Plant** subsystems.
- Developed predictive **Battery Energy Storage System** and **Solar** supervisory control algorithms in *MATLAB Simulink*, optimizing real/reactive power dispatch for deployment on 40MWh+ industrial sites.
- Architected and built Human-Machine Interface (HMI) dashboards in *React* and *JavaScript* for real-time analytics across distributed **Energy Systems**, visualizing 50+ live data streams and KPIs.
- Recognized with a top-tier performance evaluation for exceptional technical execution, ownership, and impact.

Rivian and Volkswagen Group Technologies November 2024 – February 2025
Software Engineer Intern – Body Controls (Extension) *Irvine, CA and Vancouver, BC*

- Developed customer-facing **Body Control** features (**Vehicle Access** and **Exterior Lighting**) in *C* and on an *RTOS* environment to adhere to system requirements, *MISRA* coding standards, and rigorous *ASIL A/B/C* procedures.
- Integrated 30+ **key performance indicators** to capture user-vehicle interaction data, upholding functional safety standards and supporting data-driven decision-making.
- Optimized build and dependency management with *Bazel*, improving scalability of large-scale system architecture.

Rivian May 2024 – November 2024
Software Engineer Intern – Test and Integration *Vancouver, BC*

- Deployed unit tests and automated *Python* testing scripts for **Hardware-in-the-Loop** (HiL) systems to ensure comprehensive testing of vehicle firmware and to satisfy 100% statement and 95% branch code coverage metrics.
- Performed in-vehicle **system integration** and leveraged *CANape* (*Vector*) tools to analyze CAN, LIN, and Ethernet signals, perform root cause analysis, and resolve 20+ firmware-to-system inconsistencies.

Acuren May 2023 – August 2023
Mechanical Engineering Intern *Richmond, BC*

- Analyzed large-scale **Stress-Strain Datasets** (15,000+ data points) to predict material failure using regression and curve-fitting techniques in *Ansys* and *Excel*.
- Authored technical reports summarizing statistical findings, providing actionable insights for industrial clients.

Academic Experience

Bird Species Classification with Deep Learning December 2025 – Present
Machine Learning Engineer *Vancouver, BC*

- Designed and trained image classification models in *PyTorch* to predict bird species from raw images using both a **custom CNN** and a **ResNet-50 transfer learning** architecture.
- Implemented an end-to-end training and inference pipeline including dataset loading, image preprocessing, GPU acceleration, checkpointing, and single-image prediction.
- Compared from-scratch training versus pretrained feature extraction, analyzing tradeoffs in **accuracy, convergence speed, and generalization** on limited datasets.
- Applied regularization and generalization techniques including **batch normalization**, **dropout**, and validation monitoring to mitigate overfitting.

Adaptive Kalman-Based Autonomous Navigation System September 2025 – Present

Software Developer *Vancouver, BC*

- Developed a real-time positioning, motion planning, and navigation stack for an autonomous **F1Tenth vehicle** in *ROS* with *Python*, analyzing telemetry to iteratively optimize trajectory planning and guidance.
- Implemented a **Kalman Filter**–based sensor fusion and state estimation pipeline, combining wheel-encoder odometry and perception data to robustly model vehicle dynamics.
- Integrated PID control with **machine learning**–based predictive maneuvering, achieving a 95% success rate in dynamically avoiding moving tennis balls through real-time trajectory adaptation.

UBC Baja SAE August 2024 – Present

Software and Hardware Developer *Vancouver, BC*

- Providing **technical leadership and mentorship** to a sub-team of 9 members, guiding them through embedded development, CAN debugging, and mechatronic systems integration.
- Building a robust **real-time control system** for adaptive suspension, using STM32, Arduino, and Raspberry PI ECUs running embedded algorithms with data communication over a distributed CAN bus and SPI interfaces.

UBC CIRRUS Lab September 2025 – Present

Undergraduate Research Assistant *Vancouver, BC*

- Developing an **optimization algorithm** to quantify energy savings from data center workload migration during peak hours, achieving an estimated 40% reduction in cluster energy demand through load balancing strategies.
- Researching **blockchain-integrated machine learning** for transparent and verifiable GHG emission tracking across **cloud data pipelines**.

UBC Formula Electric SAE September 2022 – June 2024

Hardware Developer *Vancouver, BC*

- Enabled firmware testing and validation of **PCB boards** by leveraging *ChimeraTool* and *Python* scripts.
- Designed and validated the **Tractive System Active Light** PCB board with *Altium* ensuring compliance with competition standards, enhancing functionality, and prioritizing driver safety.