Mischa Johal

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Education

University of British Columbia — Vancouver, BC
Bachelor of Applied Science in Engineering Physics — *Sep 2020 – May 2026*

Work Experience

RCI Sustainability — Jun 2025 – Sep 2025
Solutions Department Intern — *Taichung, Taiwan*

- Created EnergyPlus models for a 6-storey LEED v4.1 BD+C mixed-use commercial project, driving early-stage integrative design with HVAC and lighting engineers to unlock 45% yearly energy savings
- Conducted cradle-to-gate and end-of-life LCAs for 6 third-party-verified EPDs, meeting ISO/EN standards and LEED v5 embodied carbon requirements to enable transparent material impact reporting

Sanctuary AI — May 2023 – Dec 2023
Embedded Firmware Engineer (Co-Op) — *Vancouver, BC*

- Architected real-time data pipelines for tactile sensing on a robotic hand, extracting measurements over I2C from 35 pressure sensors and transmitting data on a 8 MHz CANFD bus
- Directed embedded bringup of an omni-wheeled mobile SLAM robotic platform, coordinating cross-team collaboration between 4 ML researchers and 5 hardware engineers to align project objectives

Ciena — Jan 2022 – Apr 2022
Hardware Engineer (Co-Op) — *Ottawa, ON*

- Executed component validation and second sourcing within Ciena's lifecycle management team, responsible for 3 generations of WaveLogic fiber optic datacenter modems
- Presented corrective actions to factory testing teams after identifying 8 instances of improper fault behavior by conducting fault-injection testing on 40 power rails

Technical Projects

UBC Solar Design Team — Jan 2021 – Present
Electrical Team Lead — *Dec 2022 – Sep 2024*

- Led the Electrical team at UBC Solar, an 80-person engineering design team designing and building solar-powered race cars competing in the American Solar Challenge
- Managed 30 members and 4 team leads across the BMS, Power and Signals, Strategy, and Embedded Firmware subteams
- Administered a $60,000 budget, including international importing, customs brokerage, and outreach and maintenance of relationships with 12 corporate sponsors
- Fostered an agile development environment through collaboration with the team Captain and Mechanical Lead to create and uphold realistic deadlines for a 2-year design cycle

High Voltage Battery Pack Designer — *Jan 2021 – Nov 2022*

- Spearheaded the hardware and firmware design of a 135V, 5.4kWh lithium-ion battery pack to power UBC Solar's third-generation solar vehicle
- Led development on a test-case and issue tracking workspace, increasing issue documentation by 60% and successfully completing 58 safety validation tests
- Implemented Git-based firmware version control with automated CI/CD build workflows in Make and Python

Quadruped State Estimation — Sep 2023 – May 2024

- Implemented an invariant extended Kalman filter (IEKF) using sensor fusion to estimate the pose of a quadrupedal robot
- Integrated custom Python bindings for C++ IEKF libraries into a multi-processed sim2real Drake framework to achieve a 250Hz pose estimation rate, resulting in 40% improved walking performance on rough terrain

Technical Skills

Languages: C, C++, Python
Frameworks/Libraries: ROS2, ARM, FreeRTOS, RealTime Linux, EtherCAT, DDS, Drake, Matlab/Simulink
Developer Tools: Git, Docker, Linux, CMake, Ceedling
Electrical Hardware: Altium Designer, Oscilloscope, THT and SMD soldering, SPICE simulation