

# Andrew Du

[andrew.selkirk17@gmail.com](mailto:andrew.selkirk17@gmail.com) | [LinkedIn](#) | Project Portfolio: [andrewd0.github.io/projects](https://andrewd0.github.io/projects)

## TECHNICAL SKILLS

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Hardware: [Altium](#), [LTSpice](#), [PCB Manufacturing](#), [Oscilloscopes](#), FPGAs, MCUs (STM32, RPi, Arduino), SOLIDWORKS, OnShape  
Software: [Python](#), [C/C++](#), Java, MATLAB, Linux, Git

## PROFESSIONAL EXPERIENCE

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### UBC Systopia - Systems Intern

May 2024 - August 2024

Designed a self-balancing inverted pendulum using electronics, mechanical tooling, and feedback controllers.

- Designed and manufactured custom PCBs for power distribution, sensor integration.
- Wrote C++ firmware on [STM32, Raspberry Pi, for UART and I2C communication protocols](#) and real-time telemetry.
- Implemented PID and LQR control algorithms for pendulum balancing; used Lagrangian methods to design an energy-based error controller for pendulum swing-up.

## PROJECT EXPERIENCE

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### UBC AeroDesign - Avionics Hardware

September 2023 - Present

Engineering design team competing in annual SAE Aero Design Competition.

- Designed and manufactured [avionics hardware such as:](#)
  - A crucial wiring hub PCB to consolidate power distribution, sensor modules, and peripheral systems.
  - A custom power distribution buck converter PCB using a LM5146 controller chip; outlined power efficiency, component selection, schematic, and PCB layout considerations. [Voltage and current delivery up to 99.7% accurate.](#)
- Wrote firmware in C using [STM32 microcontroller and RTK-capable GNSS module](#) for communication to plane.

### Autonomous Racing Robot

July 2023 - August 2023

In six weeks, designed a line-following robot to compete in racing competition.

- Designed and manufactured an h-bridge circuit for motor control; designed and soldered multiple key circuits for infrared sensing, IMU, and collision detection.
- Implemented PID control algorithm for steering and speed optimization using STM32 as well as created a state machine based on sensor data inputs from sections of racetrack.
- Designed, manufactured robot chassis and created custom-made metal parts using water jet, laser jet, and various light power tools.

### Closed-Loop Motor Speed Controller

January 2023

Designed a feedback control circuit to adjust the speed of a motor.

- Circuit was constructed using digital logic counters, clock pulse generators, digital-to-analog converters.
- For troubleshooting, employed the use of oscilloscopes, multimeters, frequency generators.

## EDUCATION

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### Engineering Physics, University of British Columbia

Graduation: April 2026

Engineering Physics combines honors-level math and physics with applied learning in electrical and computer engineering.

- Relevant Coursework: Signals and Systems, [Electronic Circuit Design](#), Microcontrollers and Digital Systems.