Benedikt Howard

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Education

University of British Columbia *Vancouver, BC*
BASc in Engineering Physics (Dean's List) *Sept 2022 - May 2027*

Coursework: Software Design, Controls, Signals & Systems, Circuits, Machine Learning, Electromagnetism.

Experience

Software Engineer Intern *Vancouver, BC*
Red Rabbit Robotics (Series A humanoid robotics startup) *May - Aug 2025*

- Reworked teleoperation stack decreasing latency by 73% and adding gravity comp. and force feedback.
- Designed and implemented a MPC-based joint-level controller with online payload estimation and feedforward torque compensation, high-precision trajectory tracking for robotic arms.
- Built a grasp-pose estimator and trajectory planner for the autonomous pick-and-place stack.

Embedded Software Lead *Vancouver, BC*
UBC Rocket, thrust vectoring *Aug 2025 - May 2027*

- Managed a small team of firmware engineers, working on the bring-up and testing of the flight controller.
- Built and validated device drivers and real-time MPC/PID control loops, with an EKF for state estimation.

Software Engineer Intern *Munich, BY*
BMW Group *Jan - May 2024*

- Collaborated across multiple teams to build a Python and Palantir dashboard that replaced manual review of repair files—60 QA engineers now surface faults with 40% less time spent.
- Fused 10M+ historical car telemetry and repair notes and used auto-clustering to surface new fault families.

Electrical & Firmware Team Member *Vancouver, BC*
UBC Formula Electric *Sept 2022 - Aug 2023*

- Designed PCBs for the battery system, including a cell balancing circuit and a test board.
- Wrote firmware for state of charge estimation, and cell balancing, validating it on the test board.

Projects

Burger-Cooking Robot, *Featured on CTV News* *Aug 2024*

- Designed custom PCBs (H-bridge, IR-beacon filter, motherboard) and wrote FreeRTOS firmware to control 40+ sensors and actuators for a 22-DOF burger-making robot.
- Wrote bare-metal computer vision for autonomous navigation with real-time ESP32 WebSocket debugging.

Humanoid Push-Recovery Policy *June 2025*

- Cut fall-rate of bipedal robot by 32% for 50 – 75 N pushes by re-training a deep-RL whole body policy.
- Expanded recovery envelope via Automatic Domain Randomization and arm-motion injections, discovering momentum-canceling arm swings.

Self-Driving Car Competition, *1st place* *May 2025*

- Trained an end-to-end imitation learning model in ROS and Gazebo for real-time autonomous driving.
- Deployed a TFLite CNN model for character recognition that reached 99.85% accuracy over 20+ runs.

Rocket Path Planning *Ongoing*

- Developing an SCvx guidance stack and thrust vectoring simulator to prototype rocket landings.

Technologies

Languages: C++, C, Python, Rust, Java, SQL, JavaScript

Tools & Frameworks: Git, Linux, ROS 2, Gazebo, MuJoCo, PyTorch, TensorFlow, OpenCV, FreeRTOS, STM32 (CubeIDE), Fusion 360, Altium Designer, KiCad, CNC & 3-D printing