Benedikt Howard

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Education

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

- **Engineering:** Software Design, Data Structures & Algorithms, Controls, Signals & Systems, Circuits.
- **Physics:** Machine Learning, Electromagnetism, Classical Mechanics, Fluids, Linear Algebra, PDEs.

Experience

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

- Overhauled the end-to-end teleoperation system, implementing gravity compensation, arm null-space regulation, and force feedback while decreasing latency by 73%.
- Developed a 500 Hz impedance + residual Neural Net controller, boosting payload-arm tracking accuracy
- Designed the teleoperation data-acquisition pipeline for hardware-in-the-loop fine-tuning.
- Built a grasp-pose estimator and trajectory-planner for the autonomous pick-&-place stack.

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

- Collaborated across multiple teams to build a Python + 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 into latent vectors and used auto-clustering to surface new fault families and outliers.
- Fine-tuned GPT-3.5 to draft first-pass QA reports for every cluster, further reducing human triage time.

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

- Designed a battery-management PCB and wrote firmware for cell balancing and real-time SoC estimation.
- Gained high-voltage safety training and track-side system validation experience.

Projects

Humanoid Push-Recovery Policy *June 2025*

- Cut fall-rate of bipedal robot by 32% for 50 – 75 N pushes by tuning a deep-RL balance policy.
- Expanded stable-recovery envelope via Automatic Domain Randomization and high-entropy arm-motion injections, enabling momentum-canceling arm swings.

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

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

Burger-Cooking Robot, *Ft. on CTV News* Aug 2024

- Led controls & electronics for a 22-DOF burger-making robot: designed custom PCBs (H-bridge, IR-beacon filter, motherboard) and FreeRTOS firmware driving 40+ sensors/actuators.
- Added ESP32 WebSocket debugging and a bare-metal Computer Vision routine for autonomous navigation.

Technologies

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

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