Benedikt Howard

Vancouver, CA; Frankfurt, DE | benedikthoward@gmail.com | +1 (250) 516 4960 | +49 151 50240504

Education

Shawnigan Lake School, BC High School Diploma – Average: 97.5 Sep 2018 – Jun 2022

University of British Columbia, BASc, Engineering Physics – **Dean's Honor list** Sep 2022 – ongoing

- **Key Coursework:** Embedded Systems, Machine Learning, Computer Structure & Algorithms, Control Theory, Signals and Systems, Fluid Dynamics, Thermodynamics, Mechanics, Optics, Electrodynamics, Quantum Mechanics

Experience

BMW Software Engineer, Intern – *Munich, Germany* Jan 2024 - May 2024

- Designed and implemented a **live data-monitoring platform** for the Quality Assurance team, eliminating the need for massive manual searches to find vehicle error patterns.
- Achieved real-time error pattern detection in vehicle fleet by using **Python** and **Palantir** ecosystem to process and clean high-volume vehicle telemetry and warranty reports.
- Automated the detection of vehicle error patterns using **Machine Learning algorithms** (DBSCAN, Spectral-Net).
- Fine-tuned custom ChatGPT 3.5 model using manual case reviews to produce case reviews based on clustered data.
- The platform was approved for production and adopted by 60 engineers, reducing time spent on error detection by 93%.

UBC Self Driving Competition – *Vancouver, BC* Jan 2025 - May 2025

- Developed and tested autonomous robot control pipelines in **ROS** / **Gazebo** using **Python** on **Linux**.
- Applied **Reinforcement Learning**, **Imitation Learning**, and **Deep Neural Networks** for real-time decision making.
- Built a **PyQt-based** debugging application for real-time visualization and plotting to monitor system performance.

UBC Autonomous Robot Competition – *Vancouver, BC* May 2024 - Aug 2024

- Designed and built a 22-DOF robot to autonomously cook and assemble burgers, competing against peers in teams.
- Designed and fabricated circuits and **custom PCBs**: H-Bridge DC Motor driver, IR-Beacon detection and bandpass signal filter, Schmitt Trigger, and Main Motherboard housing 3 STM and ESP microcontrollers.
- Developed microcontroller firmware with **FreeRTOS** coordinating drivetrain, 40+ sensors and actuators, and IR detection.
- Built a custom **Websocket** on the ESP32 S3 for debugging, training, and calibration purposes.
- Designed and iterated on mechanical components, including a compact drivetrain for Mecanum wheels and a 16N-m torque worm gear gearbox, using bent 1mm aluminium.
- Wrote **bare-metal computer vision algorithm** on ESP32 microcontroller and cam to robustly detect food object.

UBC Formula Electric, Team Member – *Vancouver, BC* Sep 2022 – Sep 2023

- Designed and validated custom PCBA for the Battery Management module. Wrote firmware on embedded devices (NXP) for data collection, cell balancing and real-time state of charge (SOC) estimation.
- Used collected data to model Li-Po cell discharge behavior and improve the SOC estimation algorithm by >40% accuracy.
- Gained hands-on experience in high-voltage environments with applicable safety training.

Projects

Woodworking: Designed and built custom furniture for various client commissions independently.

Refugee Sponsorship: Managed seven sponsorship groups (∼25 members each) and coordinated fundraising efforts to bring refugees to Canada.

Proficiencies

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

Languages: German (German citizen, fluent), English(Canadian citizen, fluent), French (intermediate B1).

Engineering Software: Git, Linux, TensorFlow, PyTorch, OpenCV, ROS, Fusion 360 (CAD), Altium Designer and KiCad (PCB design), STM Cube IDE, VHDL/Verilog, Platform IO, Palantir, Matlab, Excel, FreeRTOS

Manufacturing: Lathes, Mills, 4-axis CNC, Laser cutter, Waterjet, 3D print (FDA, SLS), Sheetmetal bending, Carbon fibre wet layup, Soldering