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MYKAL WESTEINDE

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Vancouver, BC

EXPERIENCE

Robotics Engineer | Nootka Saunas, Squamish BC
Jun 2023 – Jun 2024

- Full software, mechanical & electrical build of a robotic CNC machine with a Kawasaki 6-axis robot.
- Designed a CSA-approved PLC control cabinet with a Beckhoff IPC, integrating 30+ sensors, including 6-axis force torque sensor, pressure & limit switches, photoelectric & proximity sensors, & a 12-solenoid pneumatic system.
- Developed a robust, object-oriented control system in Structured Text for Beckhoff IPCs, incorporating extensive unit testing & CI/CD pipelines to ensure reliable, safe & efficient upgrades.
- Created an intuitive, web-hosted touchscreen HMI with Beckhoff TwinCAT, HTML & CSS.
- Programmed & optimized the Kawasaki robot in AS language, utilizing RoboDK for digital twin simulation to achieve precise motion planning & reduced cycle time.
- Built cell to ISO 13849 PLc standards using 2-channel safety sensors on a safety PLC with Beckhoff TwinSAFE.
- Engineered a servo-driven work-clamping system, coordinating servo gantry & robot movements.
- Designed the full mechanical system in Fusion360, performing stress, motor torque, speed, robot kinematics, & pneumatic calculations to ensure reliable performance in the first design.
- Trained 3 employees in safe, efficient robot operation & worked with operators to design intuitive controls.
- Automated CAM path exports with Python, reducing toolpath update time from 2 hours to 5 minutes.
- Crafted a detailed maintenance & user manual for shop floor operation to minimize downtime.

Automation Engineer Intern | Nootka Saunas, Squamish BC
May 2022 – Aug 2022

- Developed a C++ application on STM32 to automate a smart miter saw, eliminating 90% of miscuts.
- Designed & fabricated a 20-foot-long, adjustable-angle conveyor belt in Fusion360, tailored to efficiently transport sawdust into a waste bin & reduce clean up time by 3 person-hours per day.
- Engineered an injection-molded enclosure for an LTE sauna controller, leveraging fill analysis & Quasi Static FEA to optimize moldability & create robust snap-fit joints. Collaborated closely with PCB designer to ensure seamless integration with electrical components & cabling.

Instrumentation Engineer Co-op | Precision NanoSystems Inc., Vancouver BC
May 2021 – Dec 2021

- Created a Python motion control app to automate friction data collection for a pump head.
- Analyzed datasets with scipy & NumPy, presenting unambiguos & actionable suggestions with matplotlib.
- Built a pressure sensor interface in Python to automate fluid fouling detection in microfluidic cartridges.
- Conducted peak current testing to diagnose & upgrade stepper motors, achieving 10x flow rate increase.
- Designed & evaluated innovative output nozzle geometries for injection molded microfluidic cartridges.
- Created a non-fluid contacting pressure sensor & interface in Python with PySerial & Tkinter to automate the detection of fluid fouling in microfluidic cartridges for lipid nanoparticle drug development.

EDUCATION

BASc. Engineering Physics | University of British Columbia, GPA: 85/100
Sep 2018 – May 2023

- 1st place in OpenCV Autonomous Vehicle Competition & in Autonomous Collector Robot Competition.
- Teaching assistant in Robotics & Instrument Design, Relevant Coursework: Industrial Robotics, Computer Vision.

TECHNICAL SKILLS

Robotics: Industrial robot programming, RoboDK, Object classification, PLC schematic design, Safety PLC programming
Software: Python, C++, Structured Text, Ladder Logic, MATLAB, HTML/CSS, ROS, Tensorflow, Git, Linux, Microsoft Office
Mechanical: Solidworks CSWA, Fusion360, FEA, Machine shop, DFM (injection mold, sheet metal, CNC)
Protocols: EtherCAT, Ethernet IP, Serial, Modbus TCP **Libraries**: OpenCV, pandas, NumPy, Scipy, Matplotlib

Projects

Mechatronics Team Member | Activism Through Technology & Art   Sep 2022 - Apr 2023
- Worked with a team of 8 to prototype a shape-shifting public art installation to inspire action on air quality.
- Led the installation & coordination of 8 stepper motors, programming them in C++ to compress & extend canvas panels, mimicking the act of breathing to visually represent the impact of pollution on air quality.

Fentanyl Quantitation Device | 4th Year Capstone Project   Sep 2021 – Apr 2022
- Integrated a novel electrochemical method into a portable device to detect fentanyl concentration.
- Built a multithreaded Python app for sample injection, flow control, & displaying results, interfacing a potentiostat & syringe pump through ASCII protocol.
- SLA printed a $40\mu l$ flow cell that housed an electrode for sensitive electrochemical measurements.

OpenCV Autonomous Vehicle Simulation | ENPH 353, 1st of 16 teams   Jan 2021 – Apr 2021
- Implemented neural networks with TensorFlow & OpenCV methods to identify license plates in a live feed video & navigate a simulated driving environment in ROS GazeboGym.
- Automated the labeling of 1500+ plates & 4500+ images with Python, achieving 100% competition accuracy.
- Built a test framework that is now a reference for future course instruction, ensuring robust implementation.
- Worked in a purpose-built Linux environment & maintained version control with a partner on GitHub.

Autonomous Collector Robot | ENPH 253, 1st of 64 robots, 1st of 16 teams   May 2020 – Aug 2020
- Designed an autonomous robot for can collection & shooting ping pong balls into cups.
- Programmed STM32 microcontroller in C++ on PlatformIO framework to process sensor data & control actuators.
- Designed & soldered circuitry from scratch, with motor drivers, tape tracker, & infrared signal processing.
- Conducted 100+ trials to test edge cases, documenting results & collaborating with a team of four.
- Mentored students in mechanical & electrical design the following year, earning a 5-star TA rating.

Involvement

Volunteer Crisis Responder | Kids Help Phone, Remote   Nov 2023 – Present
- Holding empathetic text conversations with youth in mental health crisis.

Club Lead | UBC Nordic Ski Team, Vancouver BC   Aug 2019 – May 2023
- Led a team of 25 high performance athletes while racing as a national level cross-country skier.
- Cultivated relationships with clubs & sponsors, fundraising 8k+ a year, organized training & racing logistics.