

# Kai Asaoka

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## SKILLS

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- **Software:** Python, VHDL, Assembly, Java, C, Git, Linux, MATLAB, LabVIEW, Office Excel, Azure DevOps, Power BI.
- **Robotics:** Computer Vision (OpenCV, SIFT, Masking), Machine Learning (PyTorch, Keras, TensorFlow), Robotics Control (ROS), Simulation and Reinforcement Learning (Q-Learning, Gazebo), Controls (PID), PLC.
- **Hardware:** KLayout, FPGA, Arduino/STM32, Digital Logic, Circuit Analysis, Soldering, Oscilloscopes.
- **Mechanical:** CAD (SolidWorks, Onshape, AutoCAD), 3D Printing, Laser/Waterjet Cutting, Technical Drawings.
- **Optics:** Ansys Lumerical, Waveguides, Amplifiers, Attenuators, Filters, Time Interval Analyzers, Signal Processing.

## EDUCATION

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### University of British Columbia

Sep. 2021 – May 2026

*BASc, Engineering Physics*

*Vancouver, BC*

- Engineering Physics is UBC's most competitive and academically challenging engineering specialization, combining electrical and mechanical engineering, honours physics, and advanced mathematics.
- Awarded Dean's Honor List and Trek Excellence Scholarship for GPA in the top 5% of faculty.
- UBC Supermileage Student Design Team, Powertrain Division member.

## EXPERIENCE

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### Quantum Communication Researcher (Co-op)

May 2024 – Dec. 2024

*Nippon Telegraph and Telephone Corporation (NTT)*

*Atsugi, Kanagawa, Japan*

- Led optical fiber-based multi-party quantum communication experiments by generating time-bin entangled GHZ state.
- Reduced experiment run time by up to 80% by designing automated experimental procedures with self-written Python libraries using PyVISA and PySerial for RS232 protocol and NI LabVIEW to remotely control equipment.
- Analyzed large datasets with Python scripts using NumPy, SciPy, and Matplotlib to obtain quantum interference results.
- Investigated the effect of altering filtration parameters on interference results by developing Excel simulation models.
- Improved generation efficiency of correlated photon pair source and fulfilled all KPIs by tuning experimental parameters.

### Industrial Engineer - Continuous Improvement (Co-op)

Jan. 2023 – Apr. 2023

*VIA Rail Canada*

*Vancouver, BC*

- Spearheaded implementation as lead project manager of 7 continuous improvement projects, increasing workplace task completion rate by 10% using Kaizen, 5S, Six Sigma, Lean Manufacturing and Visual Management in maintenance facility.
- Proposed projects, provided stakeholder consultation and technical documentation to management, communicated with suppliers to procure equipment, organized facility-wide training initiatives, led implementation from start to finish.
- Analyzed floor plan to relocate critical infrastructure and equipment and implemented centralized metal recycling station based on stakeholder consultation and usage data and developed new floor plan using floor labels for mobile equipment.
- Managed facility-wide tasks using Microsoft Azure DevOps, and presented data using Power BI for visualization.

## PROJECTS

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### 2 Degree of Freedom (DOF) Inverted Pendulum

Sep. 2024 – Present

*ENPH 459 – Engineering Physics Project II (Capstone)*

*Vancouver, BC*

- Developing cascaded PID control algorithm for control of a CoreXY gantry mechanism to balance a 2 DOF Inverted Pendulum from scratch using MATLAB Simulink.

### Machine Learning and Computer Vision Competition

Sep. 2023 – Dec. 2023

*ENPH 353 – Engineering Physics Project I*

*Vancouver, BC*

- Scored max points and placed 4th out of 18 teams by implementing self-driving and license plate recognition in Gazebo car simulation using OpenCV, PyTorch, Keras, TensorFlow, and ROS in Python on Linux. Used Git for collaboration.

### Autonomous Robot Competition

Apr. 2023 – Aug. 2023

*ENPH 253 – Introduction to Instrument Design*

*Vancouver, BC*

- Led mechanical design within team of 4 to design Ackermann steering geometry and chassis architecture in CAD using Onshape, fabricated using 3D printers, laser, and waterjet cutters. Designed and soldered IR detector circuit for STM32.