

# STEVEN XU

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## Education

### The University of British Columbia

September 2022 – April 2027

*Bachelor of Applied Science in Engineering Physics*

*Vancouver, BC*

Awards: Presidential Scholars Award, Dean's Honour List

Relevant Coursework: Software Construction, Data Structures & Algorithms, Machine Learning, Signals & Systems

## Technical Experience

### Robert Bosch GmbH

May 2025 – Present

*Embedded Systems Intern in Quantum Sensing, Corporate Research (CR)*

*Renningen, Germany*

- Developed a softcore Microblaze microprocessor in C using UART to control digital signal processing and gyroscopic rotation, increasing functionality in Vitis. Extended interface protocol to document functionality transfer on Linux.
- Programmed a Xilinx FPGA board for a space quantum gyroscope to increase rotation sensitivity and durability, and implemented hardware and software radiation hardening research techniques through Single Event Upset Detection.
- Implemented a Python testing interface using PyQt to simulate gyroscopic behaviour and optimize threading to operate data processing, graphical user interfaces, and UART. Conducted integration testing with mock data pipeline.
- Optimized Vivado hardware design using VHDL to integrate communication, signal processing, and IP modules, increasing optimization using Vitis HLS to allow for increased control over magnetic and heating parameters.

### Meta Materials

January 2024 – May 2024

*Software Development Co-op*

*Vancouver, BC*

- Developed a Python Data Pipeline for researchers to validate structures in nanotechnology banknote designs.
- Implemented simulation in Jupyter Notebooks, iterating through sample feedback and managing GDS layout databases.
- Leveraged expertise in Python, Git, and Docker to enhance project workflows. Applied mathematical knowledge of linear algebra and 3-D transformations to find optimal rotations capable of increasing simulation efficiency by 30%.
- Conducted optical research in photographic measurement using analyzing the effects of light to optimize colour effects.
- Collaborated with interdisciplinary teams to understand stakeholder requirements, promoting effective communication.

### UBC Sailbot Design Team

January 2023 – Present

*Software Controls & Simulation Subteam Member*

*Vancouver, BC*

- Developed Python applications for simulating component choices to increase simulation efficiency by around 50 %.
- Conducted statistical analysis using a multivariate Gaussian vector generator and designed a rudder PID simulation.
- Gain hands-on experience with Git, Linux, ROS, and Docker and developed object-oriented boat state classes. Honed my skills in Confluence technical documentation and discussions with team members.
- Participated in multidisciplinary design reviews to optimize sailboat design specifications and software integration.

## Technical Projects

### Machine Learning Robot Simulation

September 2024 - December 2024

- Developed ROS Gazebo environment for an autonomous robot, capable of avoiding obstacles and detecting language.
- Utilized OpenCV, PyTorch and TensorFlow for image processing, PID tuning, and to train deep learning models.
- Built a Convolutional Neural Network for image recognition and 95% accurate letter prediction to capture hidden clues.
- Explored deep learning techniques such as Q-Learning and Imitation Learning methods and feature detection techniques such as SIFT and homography to determine effective competition strategies.

### Study Scout | *nwHacks-CSE Best Air Gap Application, MLH's Best Use of MongoDB Atlas*

January 2024

- Engineered space availability software utilizing Raspberry Pi and Motion Sensors, enabling real-time data visualization.
- Recognized with multiple sponsor awards, including CSE's Best Airgap Application, MLH's Best Use of MongoDB Atlas, and an accolade for Best Use of MappedIn's SDK, achieved through compelling presentation among 176 projects.
- Enhanced library management strategies by collecting and analyzing data on user frequency, area popularity, and other pertinent metrics, contributing to the optimization of spaces for student convenience.
- Proficiently developed interactive webpages using React, HTML/CSS, and established seamless connections to the back-end infrastructure using MongoDB databases, MappedIn, Javascript, and Next.js.

## Technical Skills

**Languages:** Python, C++, C, Java, HTML/CSS, Javascript, OpenCV, TensorFlow, PyTorch, VHDL, Numpy, Pandas

**Software:** Linux, Docker, JupyterHub, MongoDB, VS Code, ROS, Gazebo, AWS, Confluence, Vivado, Vitis, PyQt

**Tools:** FPGA Development, Micro Controllers, STM-32, Circuits, Sensor Control, Raspberry Pi, UART, Oscilloscopes