

Julian Lapenna

UBC ENGINEERING PHYSICS

✉ 7jlapenna@gmail.com | 🏠 www.julianlapenna.ca | 📧 julianLapenna12 | 📺 julian-lapenna

Education

University of British Columbia, Engineering Physics

Vancouver, BC

ENGINEERING PHYSICS, BASC

Sept. 2020 - Dec 2025 (expected)

- Awarded the Trek Excellence, Donald J. Evans, and Walter H Gage and Elsie M Harvey Scholarships for academic excellence.

ETH Zurich, Electrical Engineering

Zurich, Switzerland

INFORMATION TECHNOLOGY AND ELECTRICAL ENGINEERING, BASC

Sept. 2023 - Feb. 2024

- Exchange student studying computer and electrical engineering through project based learning.

Technical Skills

Programming Python • Low Level (C, Assembly) • OOP (C++, Java) • Git/GitHub • Linux • MATLAB • Perl • HTML/CSS • SQL

Electrical STM Microcontrollers • Oscilloscope • Multimeter • eCAD (Altium) • Raspberry Pi • Arduino • Soldering

Technical Work Experience

Systems Engineer - Safety-critical Assurance Cases, Technical Writing, State Machine Design

Vancouver, BC

CRITICAL SYSTEMS LABS

May 2024 - Aug. 2024

- Designed and analysed safety-critical software systems for automotive and naval vessels.
- Produced client-ready technical reports, safety assessments and system requirements for client projects.
- Developed assurance cases for rail cars and naval vessels to identify safety hazards and support maintenance decision-making.
- Consulted with clients to evaluate the safety of automotive control software (FMEA, Requirements writing, State Machines/Charts).

Software Engineer - Python, Django, Docker, Database Optimization

Vancouver, BC

PLOM GRADING

May 2023 - Aug. 2023

- Plom is an open source, ed-tech start up and grading platform that gathers test/grading data with the goal of improving education.
- Developed a dashboard feature for processing and understanding data during and after exams.
- Optimized database queries by 16% for faster client runtimes on large scale tests.
- Improved test suite and pipeline coverage by 3% throughout codebase to test new features.

Open Education Resources (OER) Developer - Perl, Python, Git, Docker, Problem Solving

Vancouver, BC

UBC DEPT. OF MECHANICAL ENGINEERING

Jan. 2022 - Apr. 2022

- Developed Education Resources for dynamics using Python and Perl for the open source WeBWork library.
- Coded in Perl and Python 51 dynamics problems and solutions, translated 50 files from alternate formats, and debugged using Docker.

Physics Laboratory Teaching Assistant - Leadership, Communication, Time Management

Vancouver, BC

UBC DEPT. OF PHYSICS

Sept. 2022 - April 2023

- Taught introductory physics and led a discussion section, currently working as a TA for a physics lab section.
- Leading and teaching problem solving and experimental lab techniques to younger students.

Technical Project Experience

Machine Learning Unicycle Robot - Python, Onshape, Controls, Reinforcement Learning

Vancouver, BC

UBC ENGINEERING PHYSICS CAPSTONE PROJECT

Sept. 2023 - Present

- Design and construction of an autonomous unicycle robot capable of navigating using classical and RL control in a team of 5.
- Testing inverted pendulums, and benchmarking PID controllers, state space controllers (LQR), and sim2real (RL) model performance.
- Designing OO frameworks and state machines for point-to-point navigation using Lagrangian dynamics and modern controls.

Micro-controller Satellite Image Classification - Python, C/C++, STM32, TensorFlow

Zurich, Switzerland

ETH ZURICH PROGRAMMING PROJECT

Sept. 2023 - Dec. 2023

- Developed a machine learning model optimized to run on a STM32 micro-controller performing satellite terrain image classification.
- Analyzed STM32 flash and RAM requirements to maximize model size, computational demands and input/output sizes.
- Trained a Convolutional Neural Net of size 563 kB flash size, requiring 68 kB RAM to maximize board performance of 81% accuracy.

Additional Projects/Interests:

Treasure Collecting Robot, Analog-to-Digital Converter, Hardware Calculator, Rock Climbing, Writing Short Stories, Guitar