Joshua Lim

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SKILLS

Programming: Python • Java • JavaScript • C • C++ • C# • HTML • CSS
Frameworks: NumPy • SciPy • MATLAB • OpenCV • TensorFlow • ROS • PlatformIO • React • Node.js

EDUCATION

University of British Columbia — **Vancouver, BC**
- Bachelor of Applied Science in Engineering Physics, Minor in Commerce — *SEP 2020 - MAY 2026*

WORK EXPERIENCE

UBC Emerging Media Lab — **Vancouver, BC**
Project Lab Coordinator — *JAN 2022 - APR 2022*
- Updated and maintained UBC websites and project pages using **HTML, CSS, and JavaScript via WordPress**.
- Collaborated on and presented numerous VR/AR projects with **React** and **Node.js**, including a geo-located spatial audio web application.
- Developed small platformer and role-playing games for students to demo using **Unity** and **Blender**.

PROJECTS

Self-Driving Robot Software | UBC ENPH 353
Python, OpenCV, TensorFlow, ROS — *JAN 2022 - APR 2022*
- Creating an autonomous **machine learning** robot capable of autonomous driving, following traffic rules, and capturing license plates within a **ROS-simulated** parking lot using **2D image processing**.
- Processing and generating data for training the **Python-based neural network** to identify objects such as license plates and pedestrians.
- Enabling smooth navigation by developing a self-driving CNN model and image processing with **OpenCV / TensorFlow**.

Simulated AM Radio System | Personal (Inspired by UBC ELEC 221)
Python, NumPy, SciPy — *NOV 2022*
- Implemented a **simulated AM radio system** consisting of a radio broadcast that consists of 5 stations with a corresponding song at the following frequencies (in kHz): 580, 600, 620, 640, and 660.
- Utilized **Python's NumPy and SciPy framework** for data collecting, handling the demodulation and processes, and graphing each song's Fourier Spectrum.
- Added a dial for the user to play any of the 5 songs that can be tuned by the user by adjusting the station frequency.

Autonomous Treasure Collecting Robot | UBC ENPH 253
C++, PlatformIO, STM32 Microcontroller, Soldering, Machining, Onshape, 3D Printing — *APR 2022 - AUG 2022*
- Designed a **fully autonomous robot** from scratch that follows tape, collects treasure idols within the robot, navigates with an infrared sensor, and carries all its treasures to the end of an obstacle course in a team of 4.
- Integrated a **control algorithm in C++** on an STM32 microcontroller to communicate with reflectance sensors, sonar sensors, infrared sensors, Hall Effect sensors, and motors using PlatformIO IDE.
- Used **Onshape** to create CAD for multiple components of the robot and **3D printed** them.
- Used **Altium** to design and **solder** custom protoboards for the robot's H-bridge to achieve differential rear steering.

Wikipedia Scraping Server | UBC CPEN 221
Java, Wikipedia API — *NOV 2021 - DEC 2021*
- Developed a multithreaded **Java** program that uses a **Wikipedia API** to create an interactive server, allowing for different operations to be performed on wiki pages.
- Used thread-safe buffers and concurrent HashMap to implement a server application to find pages containing a keyword.
- Constructed an algorithm that finds the shortest path between Wikipedia pages.

OTHER EXPERIENCE

The UBC Engineering Physics Student Association — **Vancouver, BC**
Vice President Treasurer — *MAY 2022 - PRESENT*
- Handled all financial activities and transactions. This includes creating and balancing the budget, giving reimbursements, liaising with the AMS Finance office, and acting as a booking representative for the club.

UBC Sailbot Design Team — **Vancouver, BC**
Electrical Team Member (Firmware Developer) — *SEP 2020 - PRESENT*
- Designed numerous PCBs for the battery boxes and flowcharts that depicted the electrical system.
- Used **Python and C** to create scripts and user-test firmware on the boat's sensor system, specifically on the rudder, winch, sail encoder, navigation light, and GPS.
- Performed various troubleshooting tasks to address compilation issues.