

# Sudharshan Kannan

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## EDUCATION

### University of British Columbia

*Bachelor of Applied Science in Engineering Physics*

Vancouver, BC

Sep. 2021 – Apr. 2026 (Expected)

## EXPERIENCE

### Electrical Division Member

Sept 2023 – August 2024

*UBC Supermileage*

*Vancouver, BC*

- Designed and specced Safety PCB on our Hydrogen Fuel Cell powered vehicle
- PCB responsible for ensuring safety of the driver by cutting off the power supply from the fuel cell if any spikes in power are detected, or if it receives a signal from a separate control board.
- Gained familiarity with KiCAD
- Version control and file sharing performed through Git.

### Manufacturing and Production Co-op

Jan 2023 – May 2023

*Moment Energy*

*Coquitlam, BC*

- Efficiently and accurately produced electrical assemblies for second-life energy storage systems
- Performed hands-on work soldering and harnessing electrical systems, with all finished harnesses passing QA
- Built and debugged various PCBs used in test benches as well as final products
- Supported development of test benches and helped perform quality control on manufactured parts

## PROJECTS

### Simulated Driving Detective | *AI, Machine Learning, Linux, Python, ROS, Gazebo, CNN*

2024

- Programmed a simulated car driving on a competition course in Gazebo, with my vehicle placing in the top 3 vehicles in competition.
- Created a Convolutional Neural Network (CNN) using TensorFlow in order to recognize letters on signposts throughout the track. The neural net worked with 100% accuracy during the competition.
- Image processing and computer vision techniques from OpenCV used to process camera input in order to stay on the track, read signs, and avoid obstacles.

### Autonomous Racing Robot | *Circuit Design, Microcontrollers, H-Bridges, Motors, ICs, Harnessing*

2023

- In a group, built an autonomous robot that would follow electrical tape to compete in a head to head race.
- Designed, built, and debugged all circuits and harnesses in the robot, including H-bridges, power distribution, and signal sensing and processing circuits.
- Circuits and sensors were controlled through use of a STM-32 microcontroller.

### Servo Control Loop Circuit | *Schmitt-Trigger Inverters, D-Latches, Op-Amps, Servos*

2022

- Designed, set up, and debugged a servo control loop circuit that used feedback to precisely control the speed of a servo motor.
- Circuit featured various components such as Schmitt-Trigger Inverters, D-Latches, counter chips, Op-Amps, and various types of transistors
- Debugging and analysis was performed through the use of oscilloscopes, function generators, and multimeters

### Cardboard Claw | *Arduino, CAD, Sonar, Servos*

2022

- Played an integral part of a team in order to design and build an automated mechatronic claw capable of lifting various small objects using cardboard, arduino boards, sensors, and servo motors.
- Claw was able to lift items with diverse shapes, from a golf ball to a piece of paper
- Servo was used for the opening and closing mechanism in the claw
- An arduino was used for automation, with the sonar sensor detecting when the claw has grasped the object

## TECHNICAL SKILLS

**Electrical:** KiCad, Circuit Design, Soldering, Harnessing, LTSpice

**Mechanical:** CAD, Machine Design

**Software:** Scripting, Machine Learning, Testing, Computer Vision

**Languages:** Java, Python, C, Javascript, HTML, CSS, SQL, Git