

# Mason Kurek

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## Skill Summary:

**Languages:** HTML | C/C++/C# | Python | Arduino | VEX | MATLAB | Java | R | ROS

**Software/Skills:** SolidWorks | Blender | Office Suite | PCB Design | Soldering | AxSTREAM SPACE | Stack | CAD

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## Work Experience:

### **Estimating Engineering**

**Jan 2025 – Apr 2025**

PCL Canada

Performed detailed quantity take-offs and cost analysis for Vancouver's North Shore Waste Treatment Plant, CSRC, and more through Stack, Excel, and Revizto. Coordinated with subcontractors and project teams to refine estimates, aligning deliverables with project timelines and budgets.

### **Technology and Innovation**

**Jan 2024 – Apr 2024**

Babcock Canada

Conducted in-depth data analysis to train an internal AI to identify potential risks, analyze obsolete aircraft and marine parts, and create maintenance schedules on aerospace and nautical equipment. Collaborated closely with various teams to integrate AI insights into strategic planning and decision-making processes. Successfully obtained and maintained high-level (NATO) security clearance.

### **3D Design/Entrepreneurship**

**Oct 2021 – Aug 2024**

AD ASTRA 3D

Spearheaded a dedicated team of three in delivering custom 3D projects, focusing on recreating out-of-market exterior lighting pieces and freelancing projects, while making an annual profit of ~\$5000. Leveraged extensive knowledge in material science to innovate and experiment with carbon fiber and various composites, enhancing structural rigidity to meet the demanding needs of intense sports applications.

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## Education:

### **Bachelor of Engineering | Minor in Mechatronics**

*Victoria, BC, CA*

**Sept 2022 – Present**

University of Victoria

Specializing in Mechanical Engineering

Minors in Mechatronics

### **West Island College**

*Calgary, AB, CA*

**Sept 2019 – June 2022**

Highschool

Graduated with Honors and the Engineering Institute Certificate

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## Technical Competencies:

**Software to Hardware:** Fluent in Solidworks, CAD, and other modeling programs to design and construct elements of Formula 1 cars and autonomous lunar rovers, focusing on optimizing fins and chassis for stability.

**Engineering Knowledge and Equipment Proficiency:** Fixed and rebuilt 3D printers ensuring precise prototyping and improved parts. Proficient in engineering software, CAD tools, oscilloscopes, and multimeters, ensured accurate recreation of custom mounts and replacement parts for a variety of devices.

**Programming Knowledge:** Applied my knowledge in C and Python to a range of projects, including programming autonomous lunar rovers and parts of the Xenia-2 rocket. Utilized platforms like Raspberry Pi and Arduino to demonstrate keen aptitude in the tech industry, continuing my passion for tech into freelancing.

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## **Projects:**

### **UVIC Formula Electric Cars:**

*Victoria, BC, CA*

**Feb 2023 – Present**

UVIC Formula Motorsport

Contributed across the accumulator, drivechain, and aerodynamics subteams in UVic Formula SAE, and currently work on aerodynamic development and carbon fiber part molding. Applied SolidWorks and Star-CCM+ in wheel dynamics and electric drivechain design work to support vehicle performance.

### **Autonomous “WALL·E” Robot - Local Voice Agent + Tracking:**

*Victoria, BC, CA*

**Oct 2025 – Present**

Personally Led Club Project

Building a Raspberry Pi-based, local voice assistant using wake-word detection, speech-to-text, a local LLM, and text-to-speech to act as the “brain” for a 0.75 m tracked robot. Set up a simple state-machine program that turns voice requests into clear robot commands (modes, safety stop, head/arm actions). Designed a servo-driven robotic arm for arm motions (shoulder, elbow, wrist, gripper), torque needs, etc. Designed and 3D printed mounts/enclosure parts and integrated the microphone, speaker, and power hardware for bench operation.

### **Robotic Sorting System:**

*Victoria, BC, CA*

**Dec 2025 - Apr 2026**

Mechatronics (MECH 481)

Built a mechatronics inspection/sorting system in C, translating requirements into a full system architecture, selecting sensors/actuators, and implementing real-time embedded control on a microcontroller to drive reliable inspection decisions. Led modeling, programming, circuit interfacing, and data acquisition (sampling, noise, timing), then validated performance through iterative testing while contributing cost and schedule deliverables.

### **P.A.R.K.R. (Parking Automation & Recognition Kit Radar):**

*Victoria, BC, CA*

**Jan 2025 - Jan 2026**

Personal Project

Built an AI dashcam with edge-computing system on Raspberry Pi that uses OpenCV and a YOLOv8 model to detect parking enforcement flashing lights in real time, log GPS-tagged visits, and alert the user via a mobile app/SMS. Designed the end-to-end architecture and stack (Python/PyTorch + Firebase + React), integrating computer vision, location tracking, and automated payment triggers to reduce parking ticket risk.

### **Lunar Rover + Robotic Arm:**

*Victoria, BC, CA*

**Dec 2022 - Apr 2023**

UVIC Robotics Club

Programmed sensors to autonomously control a small rover over rough terrain. Used machine learning to detect obstacles allowing the rover to adapt and improvise without intervention. Programmed and built of a 5-axis robotic arm for the 2023 UVIC Robotics competition rover to flip switches, turn knobs, and carry 2.0kg.

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## **Activities and Interests:**

**Online Formula 1 and Motorsport Driver:** Fueled by a profound passion for motorsport, I've refined my racing skills and vehicle understanding using advanced simulators Gran Turismo, F1 2024, etc. aspiring to excel in the virtual and real-world professional racing arena.

**3D Modeling CAD Design / Club Projects:** Active member of various clubs at UVIC, I am passionately contributing to various projects, leveraging my skills to innovate and drive advancements in aerospace technologies and racing.

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## **Certificates:**

### **Turbomachinery for Emerging Space Applications: Liquid Rocket Propulsion**

**April 2024**

American Institute of Aeronautics and Astronautics

Relevant topics include rocket cycles, turbine, pump, secondary flow, and rotor dynamics.

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**References available upon request**

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