

# James Bates

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## TECHNICAL SKILLS

### CAD/CAE/CAM

SolidWorks, Autodesk suite, Ansys, PDM/PLM, Keyshot, Unreal Engine 4

### Product Development

DFM/DFA, GD&T, sheet-metal design, FEA, surfacing, rendering, animation

### Manufacturing

CNC mill/lathe, plastic injection molding, resin infusion, 3D printing, crimping

## EXPERIENCE

### Teledyne Technologies - DALSA, Mechanical Design Engineering Intern

Jan 2021 - Present

- Conceptualized, prototyped and built a **3 DOF** system utilizing servo motors, modular electronics fixtures and other sensing equipment to autonomously inspect image filters resulting in an estimated **\$80,000** saved annually.
- Assisting mechanical development of a new CMOS satellite camera; responsible for **5** revisions and drawing releases.
- Developed a detached HEPA filter enclosure limiting particles **> 0.3 micron** from reaching the filter inspection system.
- Improved tolerance validation process on PCBs reducing manufacturing costs **5%** using **GD&T, functional gauging**.
- Designed a camera fixture using Mic-6 aluminum to bypass parallelism validation reducing fabrication costs **35%**.
- Wired, programmed and troubleshooted production servo motors using **crimping, LabVIEW, TestStand**.

### UW Hyperloop, Mechanical Team Lead

May 2020 - Present

- Leading a **15-person** team in rapid CAD development (**SolidWorks**), analysis (**CFD/FEA**) and manufacturing.
- Designed a spring-loaded PCB mount to hold electrical connection between the battery and PCB at speeds of **144km/h**.
- Optimized high-voltage battery enclosure by designing a disconnect switch to manually cut power, a thermistor temperature monitoring system, and modular mounting slots for **10x** faster battery removal.
- Designed and manufactured multi-purpose sensor enclosures using **DFM/DFA** and **SolidWorks sheet-metal**.
- Finalized integration and initial mounting of all pod components in a production assembly of **1500 parts**.
- Conducted **DOEs** on composite shell prototype to resolve cosmetic issues at design and manufacturing level related to **adhesive delamination and resin pockets**.

### Toyota Motor Manufacturing Canada, Systems Engineering Intern

Sept 2020 - Dec 2020

- Coordinated a **5-person** shop floor engineering team with design reviews, meetings and project scheduling resulting in the successful factory wide roll-out of a **10x** more reliable internal factory alerting system.
- Designed low battery detection system (**C#**) for Autonomously Guided Vehicles resulting in **\$100,000** of annual savings.

### Kai Cao Nuclear Energy, Mechanical Engineering Intern

Jan 2019 - April 2019

- Led fuel channel design project communication with clients to clarify timelines, constraints and supply availability.
- Developed technical installation procedure reports for Darlington nuclear turbine refurbishment.

## PROJECTS

### Helpful Neighbor Initiative, Co-Founder

March 2020 - Present

- Created an organization that connects people in need during COVID-19 to willing volunteers to help with grocery shopping, prescription pick-ups and more. [www.helpfulneighbour.ca](http://www.helpfulneighbour.ca)

### Smart Watch Frame, Solo-project

Oct 2020 - Nov 2020

- Designed a **consumer smart watch** exterior focussing on aesthetics and manufacturability.
- Optimized for **plastic injection molding** using **material selection, draft analysis** and **parting line analysis**.
- Prototyped using **PLA 3D-printing** for user interaction testing.

### Automated Lidar Cleaning, Solo-project

Aug 2020 - Sept 2020

- Designed a mechanical spray system configured to clean a Velodyne HDL-64E rotating lidar sensor of any bugs or dirt.

## EDUCATION

### University of Waterloo, Mechanical Engineering

Sept 2018 - April 2023

- **Relevant Coursework:** CAD, Mechanics, Electromechanics, Materials, Thermodynamics, Manufacturing
- **Relevant Projects:** Autonomous garden robot, water powered clock, heat transfer in vegetables.