BENJAMIN DUO

(647) 868-8758
blduo@uwaterloo.ca
linkedin.com/in/benjamin-duo
benjaminduo.com

3B MECHATRONICS ENGINEERING - MANAGEMENT SCIENCE OPTION
University of Waterloo, Class of 2022 – **8-month co-op available**

SKILLS

Computer Aided Design
- AutoCAD
- SolidWorks
- Siemens NX 11/12

Manufacturing
- GD&T
- Aluminum Extrusions
- CNC Machining
- DFM/DFA
- Sheet Metal Design
- Injection Molding

Prototyping
- Machining
- 3D-Printing
- Mill & Lathe

Electrical
- PCB Design
- Schematic Drawing
- Soldering
- Oscilloscope
- Circuit Analysis

Software
- C++ & C
- HTML/CSS/JS
- PHP & MySQL
- Python
- MATLAB/Simulink
- Git
- Arduino
- Linux & ROS

RELEVANT COURSES

- Thermodynamics & Heat Transfer
- Fluid Dynamics
- Kinematics & Dynamics of Machines
- Electromechanical Design
- Mechanics of Deformable Solids
- Intro to Optimization

INTERESTS

- Ultimate Frisbee
- Badminton
- Volleyball
- Painting/Art
- Piano
- Guitar

EXPERIENCE

Electrical Engineering Coop | *Nova Institute* — June 2020 – Aug 2020

- Researched circuit characteristics and behaviour of dielectric elastomer generators (DEGs) from certified papers
- **Designed original circuits** from the research to find an unpatented solution for DEG priming and harvesting
- Troubleshooted errors from experiments and designed a new test fixture in **SolidWorks** to solve torque and power problems

Mechatronics Engineering Intern | *KPM Power Inc.* — Sept 2019 – Dec 2019

- Designed multiple battery packs in **SolidWorks** to contain cells and components with constraints from forklift battery standards and regulations
- Led a project to extract CAN data from batteries and display it on a PHP webpage through a MySQL database
- Created **schematics, PCBs,** cables, and **3D-prints** for clients

Manufacturing Test Engineer Co-op | *Miovision* — Jan 2019 – Apr 2019

- **Reduced production time of *Scout* cameras by 50%** through manufacturing process improvements, **resulting in a 60% deduction in costs**
- Created fixtures and professional engineering drawings using **SolidWorks** to eliminate product damage during manufacturing and testing
- Designed and **3D-printed** fixture prototypes, PCB cases, and display products
- Reviewed and refined Miovision's Non-Conforming Report process to increase the flow of documents, information, and NCR labeled products

Hardware Engineer Co-op | *ECCC* — May 2018 – Aug 2018

- **Designed PCBs** to test the software of a sensor by simulating the inputs of varying sized cloud particles at different rates
- Operated oscilloscopes to characterize and verify circuit designs
- Manufactured mounts to endure extreme temperatures for weather sensors

PROJECTS & EXTRACURRICULARS

University of Waterloo Alternative Fuels Team — Jan 2018 – Aug 2019

- Modeled an interfacing device to navigate the car's computer in **NX11**
- Created mounts for fuel filter pumps, **HV** junction boxes, and cameras
- Researched car architecture and power/torque requirements of motors with a specific gear ratio and battery power to properly select car components

University of Waterloo Robotics — Sept 2017 – Apr 2019

- Designed a robot to follow a grayscale line while using a photoresistor to detect different shades to play different music notes
- Programmed a ROS node to overlay directions on top of a live camera feed by subscribing to camera and localization node topics

Tab Reading & Guitar Playing Robot — Oct 2017 – Nov 2017

- Programmed and calibrated a fretting mechanism in C++ to guarantee correct fret location and timing with strumming mechanism
- Designed and built the calibration hardware, fret mechanism, hard stops for the strummer, and the robot's base

More projects on my site at benjaminduo.com

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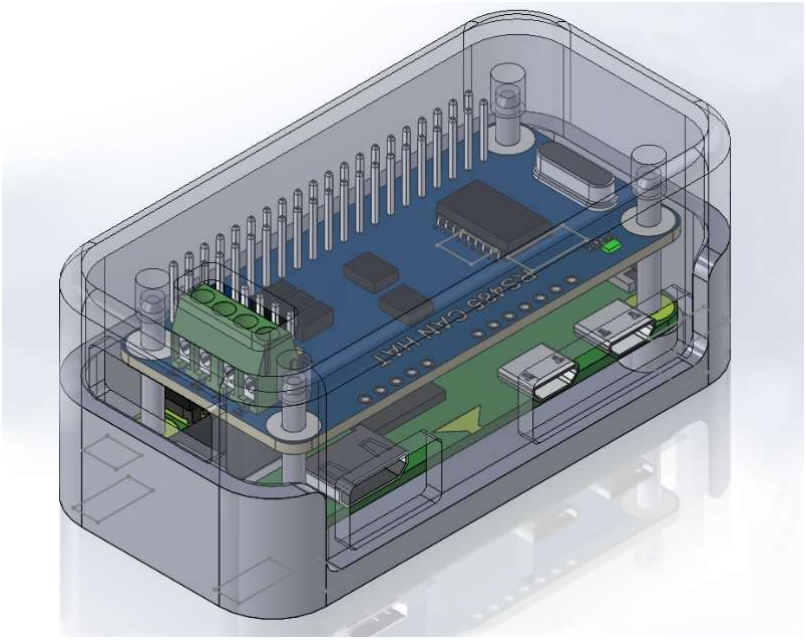
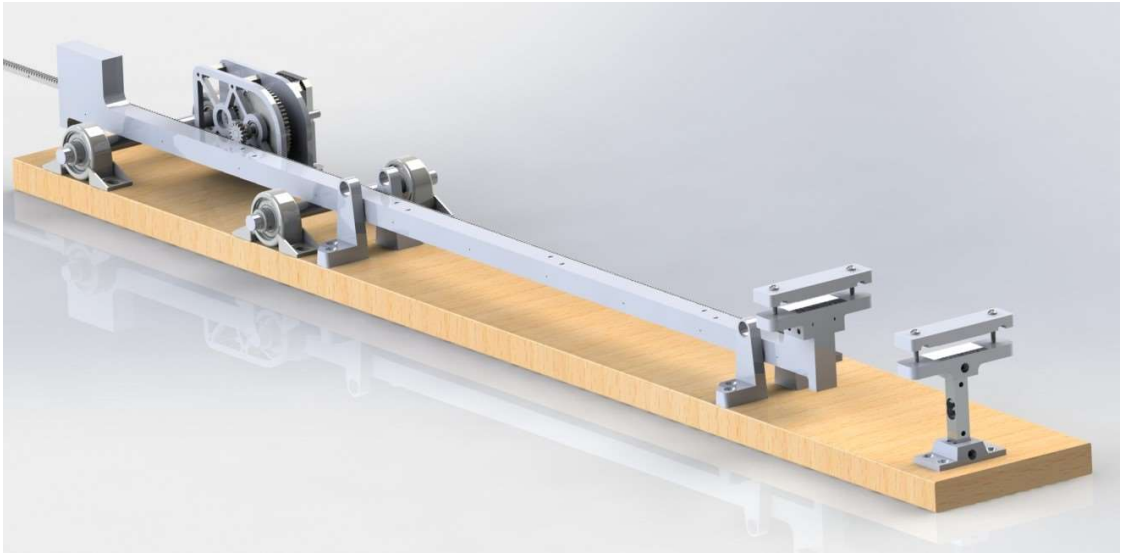
University of Waterloo (expected graduation: 2022

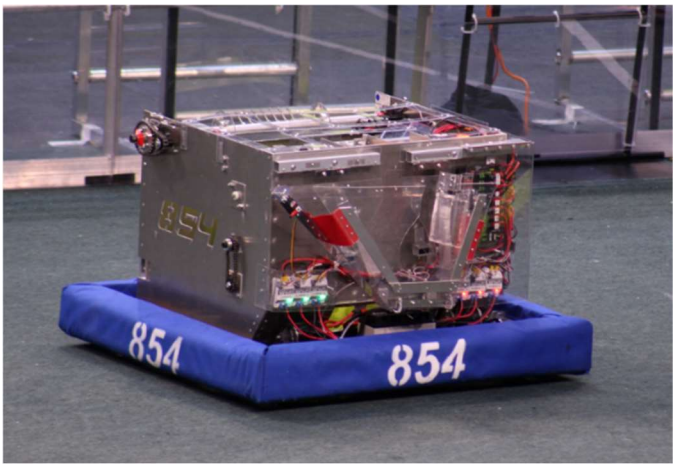
PORTFOLIO



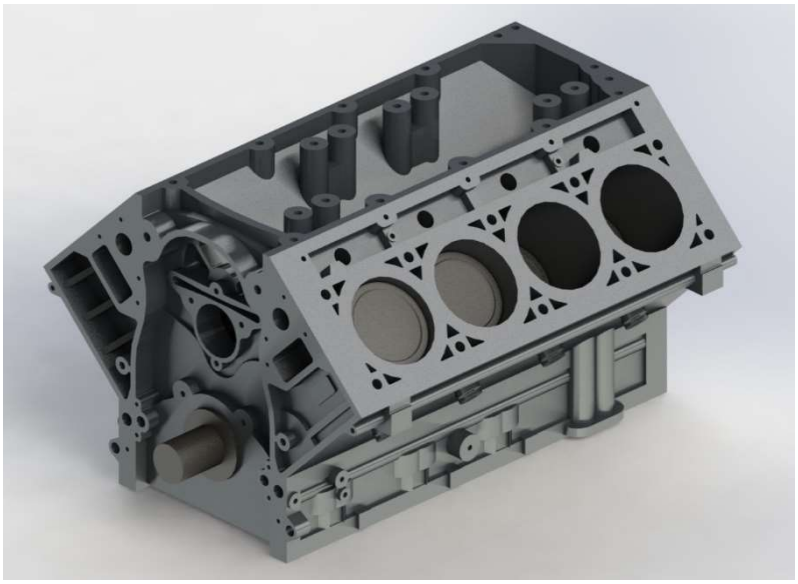
KPM Power Inc – extruded aluminum casing and injection molded cases
Above photos are property of KPM



Nova Institute – geared test platform
Above photos are property of Nova Institute



FIRST Robotics
Robot in 3 Days – University of Waterloo, 2018
Team 854 – Iron Bears, 2016/2017
Manufacturing and Design Team.



Personal Projects:

V8 Engine Model
to be 3-D printed, still work in progress

Folding Table
Maple wood scraps, machined

For more projects, please visit
https://www.benjaminduo.com