

BENJAMIN DUO

Candidate for Bachelor of Applied Science

MECHATRONICS ENGINEERING - MANAGEMENT SCIENCE OPTION

University of Waterloo (Cumulative GPA of 3.60)

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EXPERIENCE

Mechatronics Engineering Intern | KPM Power Inc.

September 2019 – December 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 the battery and display it on a **PHP** webpage through a private **MySQL** database.
- Created **schematics**, PCBs, cables, and **3D-prints** for clients with a strict deadline.
- Assembled live batteries and tested the charging cycle of the cells.
- Systemized lab and safety regulations for future safety of co-workers.

Manufacturing Test Engineer | Miovision

January 2019 – April 2019

- Improved the manufacturing process of the scout camera by **reducing production time by 50%** and **saved \$10,000 in costs per year**.
- Created fixtures and made professional engineering drawings to eliminate product damage during manufacturing and testing using **SolidWorks**.
- 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 | Environment and Climate Change Canada

May 2018 – August 2018

- Designed PCBs** to test the software of a sensor by simulating the inputs of varying sized cloud particles at different rates.
- Characterized circuit behaviour with an oscilloscope to verify circuit design.
- Manufactured mounts for weather sensors and endure extremely cold temperatures.

PROJECTS & EXTRACURRICULARS

University of Waterloo Alternative Fuels Team | University of Waterloo

January 2018 – August 2019

- Used **MATLAB** to write scripts to predict suspension behaviour and create a rudimentary PID controller using **Simulink**.
- Modeled an interfacing device to navigate the car's computer in **NX11**.
- Built several camera mounts to inspect the behaviour of the car's suspension.
- Designed, built and installed mounts for fuel filter pumps and HV junction boxes.
- 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 | University of Waterloo

September 2017 – April 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 subscribe to a camera and a localization node's topics to publish a new image with a direction overlay on top.

Tab Reading & Guitar Playing Robot | University of Waterloo

October 2017 – November 2017

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

more projects on my site at benjaminduo.com

SKILLS

Computer Aided Design

- AutoCAD
- SolidWorks
- NX11

Manufacturing

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

Prototyping

- Machining
- 3D-printing
- Mill
- Lathe

Electrical

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

Software

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

Interpersonal

- Leadership
- Problem Solving
- Critical/Creative Thinking
- Fast Learner
- Time Management

INTERESTS

- Painting
- Music (Piano, Guitar, Viola)
- Ultimate Frisbee
- Badminton
- Volleyball