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 – Present

- 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 **MySQL database**.
- Assembled prototype live batteries to perform charge and discharge tests.
- Created **schematics, 3D-prints**, cables and PCBs for company clients with a strict deadline.
- Help establish and maintain heath and safety regulations for the laboratory.

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 with **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.
- Manufactured mounts to support multiple weather sensors to endure the climate of Iqaluit.

PROJECTS & EXTRACURRICULARS

University of Waterloo Alternative Fuels Team | University of Waterloo
January 2018 – Present

- Used **MATLAB** to write scripts to predict suspension behaviour. Created a rudimentary PID controller using **Simulink**.
- Modeled an interfacing device to navigate the car 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.

University of Waterloo Robotics | University of Waterloo
September 2017 – August 2019

- Designed a robot to follow at 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

- Coded in C++ and C so the robot can calibrate and move a mechanism to the correct fret and correct timing. Code was shared between the group using Git.
- Built the calibration hardware, fret mechanism, hard stops for the strummer and the robot's base.

SKILLS

- AutoCAD
- SolidWorks
- NX11
- MS Office
- PCB Design
- 3D printing/prototyping
- Lathe
- Mill
- CNC
- Git
- HTML/CSS
- JavaScript
- PHP
- C++
- Band Saw
- Drill Press
- Soldering
- GD&T
- MATLAB
- C
- Python
- Arduino
- Linux
- ROS
- MySQL

STRENGTHS

- Leadership
- Problem Solving
- Critical Thinking
- Teamwork
- Creativity
- Time Management

TERM COURSES

Mechatronics Engineering 3A

- Kinematics and Dynamics of Machines
- Thermodynamics and Heat Transfer
- Actuators and Power Electronics
- Microprocessor Systems and Interfacing
- System Models 1

INTERESTS

- Painting (Oil, Acrylic, Gouache, Watercolour)
- Piano (RCM grade 8)
- Guitar (Fingerstyle, self-taught)
- Violin/Viola (High school orchestras)
- PC Building
- Robotics (Participated in FIRST)
- Ultimate Frisbee/Badminton
- Cooking