John Graeme Dockrill

Mechatronics Engineering Student

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EDUCATION

University of British Columbia (UBC) – Vancouver **September 2018 – May 2024**

3rd Year Mechanical Engineering, Mechatronics

TECHNICAL SKILLS

Mechanical Design
- SolidWorks, Onshape, Ansys FEA
- Additive Manufacturing (FDM)
- Machine Design, Drafting
- Rapid Prototyping

Electrical/Hardware Design
- Utilized Motors and Sensors in Design
- NI Multisim, VHDL
- Circuit Analysis/Design

Programming
- MATLAB, Simulink, Arduino, C, C#, Python, Perl, HTML, CSS
- Unity & Mobile design
- 8051 Assembly

Tools and Techniques
- Oscilloscope, Function Generator, Microcontroller
- Lathe, Mill, Waterjet cutter
- Soldering

WORK EXPERIENCE

UBC Department of Mechanical Engineering – *OER Developer*, UBC **May 2021 – August 2021**

- Authored and coded 100+ mechanics problems in Perl, with full solutions for use in an Open Education Resource first year engineering textbook.
- Automated file management with a Python script to modify 200+ existing files in our GitHub repo, improving workflow.

TECHNICAL PROJECTS

Portfolio Website, Personal Project **December 2021**

- Designed and coded a portfolio website using HTML, CSS, and JavaScript, to showcase my projects to potential employers.
- Learned HTML and CSS, coded, and debugged the entire website in the span of 7 days.

LED Bicycle Lights, Personal Project **September 2021**

- Designed and 3D printed a housing to mount electronics to the inner frame of my bicycle.
- Soldered wired connections between LED strips and waterproofed them appropriately to ensure they would not fail.
- Coded and tested a program in Arduino to loop several randomized functions to control the LEDS.

3D Printed RC Tank, Personal Project **May 2021**

- Designed a radio control circuit. Researched and procured compatible motors, speed controllers, and battery.
- Programmed the radio control circuit in Arduino to wirelessly control the speed of the BLDC motors.
- Modelled and 3D printed a 40:1 compound reduction gear box to reduce the motor speed to the rear sprocket.
- Prototyped a sprocket and tread meshing concept for feasibility. Identified and implemented improvements from tests.

UBC ENGINEERING STUDENT TEAMS

UBC Rapid 3D Printing – *Consulting Team Lead*, UBC **January 2021 – Present**

- Consulted directly with clients to design and 3D print their requests whilst maintaining clear documentation.
- Developed and 3D printed initial prototypes for medical testing equipment, which were sent to Europe to be developed.
- Organized a team of 12 members, by assigning them consulting projects, and guiding them through the consulting workflow.
- Leading a team of 4 students to design the z-axis scissor lift mechanism of a custom portable 3D printer.
- Designed initial components for motor clamps, scissor arms, and base plate clamps for portable 3D printer.

UBC Solar – *Vehicle Mechanics Team Member*, UBC **September 2021 – Present**

- Researched and designed a comprehensive plan for testing the use of staked bearings on our car's aluminum A-arms.
- Manufactured a jig assembly using a waterjet cutter to hold the top half of the car's aeroshell.
- Performed static structural FEA with Ansys to test strength of suspension ball joint pin and verify hand calculations.
- Mounted suspension system on vehicle, including wheels, connecting suspension linkages, and torquing fasteners according to specifications.
- Bled and replaced brake fluid from front and rear brake lines and later tested brakes to ensure they were working properly.
- Machined aluminum spacers for rear parking brake caliper, to properly align it over the brake disc.

UBC Supermileage – *Powertrain Team Member*, UBC **September 2018 – April 2020**

- Designed in SolidWorks and conducted SolidWorks Finite Element Analysis on a bearing housing and a U-channel which were implemented into the drivetrain system of a gas-powered vehicle.
- Created properly dimensioned engineering drawings in SolidWorks for the manufacturing of bearing housing and U-channel.
- Collected data on the fuel consumption and efficiency of the powertrain system using a dynamometer.