# John Graeme Dockrill

**Mechatronics Engineering Student**

Vancouver, BC, Canada | (902) 719-9990 | graeme.dockrill01@gmail.com | www.linkedin.com/in/graemedockrill | graemedockrill.ca

## 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**
- Servo Motors + Drivers
- NI Multisim, VHDL
- Digital/Analog 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

**ENVO Drive Systems – *R&D Engineering Associate*,** Burnaby, BC **May 2022 – August 2022**

- Designed and conducted FEA on a welded aluminum frame for a small snowmobile to fix several issues from previous versions.
- Designed a custom chain tensioner for an electric snow bike to maximize chain wrap and prevent the chain from disengaging.
- Used additive manufacturing to produce several prototypes to test fits and demonstrate parts to supervisors.
- Optimized performance and throttle response of motor controller to reduce noise and vibrations of hub motor at higher rpm.
- Sourced off-the-shelf components and fasteners. Maintained a BOM for the projects, to facilitate supply chain procurement.
- Kept a detailed log of my work including thought process and calculations for documentation purposes.
- Prepared and delivered technical presentations on project updates and costing for the engineering team.
- Communicated regularly with manufacturers for quotes on CNC parts and welded frames.
- Prepared several complete engineering drawing packages, employing GD&T, to be manufactured overseas.
- Participated in weekly R&D meetings to share project progress and ideas within the engineering team.

**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 Open Education Resource first year textbook.
- Automated file management with a Python script to modify 200+ existing files in our GitHub repo, improving workflow.

## TECHNICAL PROJECTS

**4-Axis 3D Printed Robotic Arm,** Personal Project **June 2022**

- Designed a fully 3D printed split-ring compound planet epicyclic gearbox with a 96:1 gear reduction to function as joints.
- Sourced compatible stepper motors and stepper motor drivers to actuate the 3D printed gearbox.
- Tested stepper motor, driver, and the gearbox prototype with an Arduino and a DC power supply to identify issues.
- Designed and tested 3D printed structure to connect the axes.

**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.

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

- Designed an Arduino radio control circuit. Researched and procured compatible motors, speed controllers, and battery.
- Modelled and 3D printed a 40:1 compound reduction gear box to reduce the motor speed to the rear sprocket.

## 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.
- Lead a team of 4 students to design the z-axis scissor lift mechanism of a custom 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 to specs.