Jonathan DiGiorgio

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Technical Skills

CAD/FEA Software: Solidworks (CSWA), AutoCAD, Fusion360, COMSOL
Design Processes: GD&T, Drafting, FEA, DFMA, Quality Assurance, R&R, Rapid Prototyping
Manufacturing Processes: Engineering Drawings, 3D Printing, Laser Cutting, Machining, 5S
Programming: Python (PyAutoGUI, OpenCV), C/C++, MATLAB , HTML, CSS, Github, VS Code

Experience

Mechanical Engineer Team Member Sept 2023 – Present
Waterloo Aerial Robotics Group *Waterloo, ON*

- Designed and modelled a light-weight carbon-fibre drone landing gear with a crash failsafe, using **Solidworks**
- Designed an ESC circuit housing in **Solidworks**, including safety considerations and proper board ventilation
- Conducted **FEA** to determine landing gear load distribution, landing angles, and housing ventilation effectiveness

Quality Assurance Engineering Intern May 2023 – Aug 2023
S&C Electric Canada *Etobicoke, ON*

- Inspected high-voltage interrupt switches and subassemblies with **GD&T** drawings, leading to **0** defective returns
- Developed a **Python** script to automate inspection data/image collection that was implemented department-wide, increasing inspection efficiency by **43%** and collecting photographic evidence for use in customer quality disputes
- Led an automated package inspection project that uses Dori AI to detect and warn of missing parts from orders
- Conducted **30+** gauge calibrations/R&Rs, audits, hipot testing, and hardness testing every week to ensure quality
- Assembled various switches and sub-assemblies, gaining insight into manufacturing and **DFMA** principles
- Effectively tracked quality of **300+** products weekly using **Excel** and **Oracle**, to produce weekly quality reports

Airframe Design Team Member Sept 2022 – April 2023
Waterloo Rocketry *Waterloo, ON*

- Led the safety team for the oxidizer loading system, through the UV-light inspection and assembly of ball valves
- Working on the airframe subteam to machine and assemble a competition-ready rocket frame using carbon fibre

Projects

Autonomous Chess Robot | *Solidworks, AutoCAD, RobotC, Python* Jan 2023 – Apr 2023

- Led a team of 4 to design a robot which autonomously plays pro-level chess against a live opponent
- Used **Python** for move detection (**OpenCV**), move computation, and robot communication (**PyAutoGUI**)
- Utilized **RobotC** , motors, servos and sensors to facilitate a 3-axis gantry, resulting in a **>95%** succesful move rate
- Utilized **Solidworks**, **AutoCAD**, **3D printing** and **laser cutting** to create housings, racks, guides and more
- Conducted simulations using **Solidworks FEA** to determine the best structure for load distribution and tipping
- Created a work breakdown structure and Gantt chart for project management, resulting in timely completion

Magnetic Whirpool - Fishing Toy | *Solidworks, Machining, 3D Printing* Sept 2022 – Dec 2022

- Led a team of 4 to design a fishing toy with a magnetically influenced whirlpool and spring-powered 'fishing rods'
- Made whirlpool mechanism using a motor, magnets, potentiometer and switch, sustaining a **15+** min vortex
- Used **drill press** and **saw** to construct the PVC housing for a pinball-like launcher, resulting in a **∼70cm** range
- Used **Solidworks** and **3D printing** for a reel mechanism that friction-fits into a ball bearing, storing **1m** of reel

Lithophane Picture Stand | *Solidworks, 3D Printing* May 2023 – Jun 2023

- Designed pictures that display only when lit from behind, by using varying thicknesses to create different shades
- Used **Solidworks** to design a sleek LED housing with a lithophane mount, allowing for easy picture swapping
- Designed product to be easily **3D printed** without supports, saving material and around **2 hours** in print time

Portfolio Website – Click here to see my engineering project portfolio

Education

University of Waterloo Waterloo, ON
Bachelor of Applied Sciences in Mechanical Engineering (95.0% Average) *2022 – 2027 (Expected)*