TREVOR MCCOURT

Candidate for BASc, Mechanical Engineering
University of Waterloo, Dean's Honors

SUMMARY OF SKILLS

- **Engineering Analysis:** Conventional hand calculations, finite element methods, tolerance stack up, material testing
- **DFM:** Familiar with creating parts manufacturable via Injection molding, low-pressure molding, sheet metal, machining, 3D printing, and laser cutting. Experienced in mass producing via injection molding
- **CAD:** SolidWorks, including simulation, plastics, sheet metal, and surfacing. Familiar with fusion360 CAM
- **Drafting:** Experience in creating engineering drawings for fabrication and in creating installation drawings to aid in construction. Have used both MicroStation and AutoCAD professionally. Familiar with GD&T
- **Programming:** Have developed various pieces of software in C-like languages. Familiar with task automation methods

PROFESSIONAL EXPERIENCE

Lava Computer MFG	Mechatronics Designer	Jan '17-Apr '17

- **Machine Design:** Designed a production thermoforming machine to be used to produce "blister" packaging. Designed both pneumatic and timing belt driven linear stages. Cost to Lava ~10% of commercial machine
- **R&D:** Researched current methods of low-pressure polymer PCB over-molding and proposed a solution that could save lava the cost and trouble of designing and manufacturing plastic clamshell enclosures
- **Plastic Part Design:** Designed parts for injection molding based mass production. Learned and exercised injection molding DFM practices. Designed clips and living hinges. Brought parts to mass production in quantities ranging from 10-100k /year.
- **Sheet Metal Design**: Developed a secure sheet metal enclosure for Samsung tablets in the capacity of a contractor for Smart Cabinets Inc**.** Developed designs optimized for both tool/die and standard press brake fabrication. Communicated with machine shops through prototyping and eventual mass production. Enabled the sale of thousands of boards
- **Software:** Completed the development of a web-based temperature sensor control platform for use on an embedded webserver. Created front end and middleware using C, js, and a proprietary version of BASIC

UW - Mayer Lab	Undergrad Research Assistant	May '17-Current

- **Machine Design:** Developing a machine to apply organometallic fabric to textiles in the pursuit of smart clothing. Machine is currently composed of a 2 axis gantry adapted from a laser engraver, a custom designed end-effector, and a surplus fluid applicator. Fabricated prototype end effector parts out of aluminum using a mill and press-brake

UW Aerial Robotics Group	Mechanical Design Team Lead	Sep '15-Apr '17

- **VTOL aircraft development (2016/17):** Created 3 conceptual designs for aluminum VTOL aircraft landing gear with varying feature sets. Chose the most practical concept and created a detailed design. Performed analysis, created drawings, and fabricated final design. Performed analysis on various VTOL airframe components • Created wing locking mechanism • Lead team in development of object retrieval mechanism• Performed analysis on VTOL wing components
- **Project SPIKE fixed wing aircraft enhancement (2015):** Used SolidWorks to design a 3D printed brushless gimbal. Used successfully in 2015 unmanned systems Canada competition (See video on website!)

Toronto Transit Commission	Assistant Mechanical Designer- ATC	May '16-Sep '16

- **Strut Design:** Designed assemblies using unistrut compatible components that allowed for the mounting of trackside radio equipment. Performed analysis on assemblies to verify structural integrity under static and cyclic loading
- **Component Design:** Created various metal components for CNC machining to solve specific fixturing problems
- **Drafting:** Created detailed drawings to be used in the installation of radio and signal equipment. Issued 100+ in 4 months
- **Troubleshooting:** Performed surveys to diagnose problems in existing mechanical systems. Created improved designs

PROJECTS (SEE WEBSITE FOR MORE)

Bicycle Frame Design: Designed and surfaced an anatomically correct bicycle frame compatible with modern Shimano parts
Truss Solver: Implemented the direct stiffness method in MatLab to create a program that solves 2D truss displacements
Hybrid Aircraft: Worked with a team to develop a helium based hybrid aircraft. Focused on structural elements
Li-fi Transceiver: Developed an Arduino based visual light transceiver. Transmitted 85% of an image over visual light
Learning Search Engine (Hack the North 2016): Used IBM alchemy API to build a search engine that presents users with a tree of results based on relevant terms found using their original search terms

INTERESTS:

Cycling (mountain/road), bicycle maintenance, e-sports (CEVO main CS: GO), cooking

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