

# Trevor McCourt

Candidate for BAsC, Mechanical Engineering

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[www.trevormccourt.com/projects](http://www.trevormccourt.com/projects)



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Valid Driver's License

## SKILLS AND QUALIFICATIONS

- Familiar with many engineering solid analysis methods, including advanced static analysis, along with FEA and CFD using the SolidWorks platform
- Expert 3D modeller, specifically in SolidWorks, with experience in component/assembly design
- Experienced Drafter, with professional experience in detailed engineering drawing creation, who is proficient with both AutoCAD and MicroStation
- Versed in fabrication methods including 3D printing, composite mold making, and light machining
- Excels in a multi-disciplinary environment; familiar with many programming languages and electrical engineering concepts as a result of multi-faceted professional experiences
- Excellent technical troubleshooting and problem-solving skills, with an intuition gained through the enjoyment of hands on mechanical work
- Highly organized with time management skills developed through continuous teamwork
- Familiar with geometric dimensioning and tolerancing (GD&T) techniques

## PROFESSIONAL EXPERIENCE

### Toronto Transit Commission Assistant Designer- Automatic Train Control (DCS + CBI)

Toronto, Ontario

May 2016-  
September 2016

- Designed assemblies and components related to the installation of Digital Control Systems equipment that are currently in use in both the existing YUS line and the upcoming Spadina Extension
- Performed mechanical analysis on assemblies, calculated stresses, designed components to survive cyclic loading
- Developed engineering drawings with detail and precision that were peer reviewed, approved and issued for construction
- Used functional dimensioning techniques to ensure problem free large scale production
- Created million dollar power cable layout from circuit drawings and personally collected survey data that are currently being implemented in the Wilson Yard re-signaling and expansion project

### University of Waterloo Aerial Robotics Group

Waterloo, Ontario

September  
2015-  
Present



### Mechanical Design Team Lead (Structural)

- 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 VTOL aircraft fuselage (by hand + FEA), derived equations to be used in cross section generation and material selection
- In the process of designing and testing/fabricating tilt-wing mechanism
- Used SolidWorks to design and manufacture a brushless gimbal. Used successfully in 2015 unmanned systems Canada competition (See video on website!)
- Created a 3D assembly of the 2015 aircraft for systems integration purposes
- Communicated team goals and progress to members during team meetings

## PERSONAL PROJECTS (SEE FOR MORE)

### Bicycle Frame Design

- Designed and modeled an anatomically correct classic geometry carbon road bike frame based on principles found in *Lugged Bicycle Frame Construction* by Marc-Andre Chimonas
- Used CFD and FEA to verify the structural and aerodynamic properties of the frame and cockpit
- Designed the frame to be compatible with modern Shimano components

### Bicycle Restoration

- Bought 1989 Norco Monterey in disrepair and rebuilt the bike to its original state using solely original parts

### Hybrid Aircraft

- Designed, analyzed, and manufactured a helium based hybrid aircraft
- Experienced working with quadcopter components
- Performed material and structural analysis

### Custom Multi-Rotor

- Handpicked and assembled components to make up a fully autonomous quadcopter
- Handmade wires, soldered joints

### Everyday Design

- Ongoing design and prototyping of components/assemblies that serve to improve my quality of life
- Examples include cooling chamber for laptop, pebble watch charging station, magnetic clamp to hold bike handlebars straight during maintenance , ergonomically correct iPhone 5S case

### Li-Fi Transceiver

- Developed software to be used on embedded systems to facilitate the transfer of data over the visible light spectrum
- Experienced cross-platform interaction- Java C interface
- Successfully transmitted 85% of an image over visual light

### University of Toronto Space Design

- Created long-term plan that outlined the process of mining near earth asteroids
- Researched and calculated maximum payloads and orbital trajectories
- Used AutoCAD to create 3D models of rocket and lander prototypes

## EDUCATION

### University of Waterloo

### Candidate For Bachelor of Applied Science, Honors, Mechanical Engineering

Academically ranked 9<sup>th</sup>/211

September 2015 - Present

## PERSONAL ACHIEVEMENTS

- Extremely positive academic standing, with a CGPA of 3.95
- Bronze Medal, 3 years in a row, University of Toronto Metro Science Fair
- Strong in academic competitions (top 5% SIN physics exam, top 6% Avagadro chemistry exam, etc.)
- Silver Medal Overall, University of Toronto Space Design Competition
- Silver Medal, OFSSA Archery
- Top First Year Cadet, 330 Squadron, Royal Canadian Air Cadets

## INTERESTS

- Road Cycling
- Bicycle Mechanics
- Electronics, especially custom PCs
- Trumpet
- Archery, recreational hockey
- Pick up hockey and baseball