Leandro Tomarchio

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Experience

Toronto Metropolitan Aero Design **October 2024 – Present**
Avionics Lead *Toronto, ON*

- Oversaw a team of five to design the competition avionics suite.
- Developed and prototyped a PX4 tilt-rotor tricopter for competition.

May 2024 2023 – October 2024
PADA Avionics Junior Lead *Toronto, ON*

- Integrated competition PADA avionics and created a successful test bed.
- Programmed flight controllers with ArduPilot, INAV and PX4, planned missions in QGroundControl, Mission Planner and INAV.
- Assisted internal team competition members with avionics configuration and testing.

October 2023 – May 2024
Rapid Prototyping Member *Toronto, ON*

- Manufactured and assembled the fuselage of competition plane.
- Experimentally calculated center of gravity of plane using nose as datum.
- Manufactured kevlar and carbon fiber composites using wet layup and vacuum bagging techniques.

Metropolitan Aerospace Combustion Hub **October 2024 – Present**
Structures Lead *Toronto, ON*

- Directed a team of five to create cylinder inverter and ground station equipment.
- Collaborated with other leads to design and manufacture static aero-structure.

March 2024 – October 2024
Propulsion, Structures and Manufacturing Member *Toronto, ON*

- Developed technical drawings for liquid propellant rocket engine injectors using SolidWorks.
- Utilized the Parker O-Ring Handbook to select industry standard seals and size design.
- Manufactured nitrous and ethanol tanks using lathe and mill.
- Worked with AN fittings for fluid connections and hydro-static tested tanks to ensure seal.

Metropolitan Aerospace Rocketry Society **October 2023 – June 2024**
Rocket Team and Research Division Member *Toronto, ON*

- Designed model rocket in OpenRocket to simulate multiple nosecones, fins and motors to optimize mach number, apogee and stability.
- Created SolidWorks models to simulate in Ansys Fluent to calculate mach, pressure, drag and lift gradients.
- Manufactured and flew a model rocket, attaining an apogee of 619 meters.

Toronto Metropolitan Launch Initiative **November 2023 – April 2024**
Junior Glider Competition Team Member *Toronto, ON*

- Computed Cd, Cl and pressure distribution for Clark Y airfoil using XFOIL and XFLR5.
- Modelled tapered wing ribs using CATIA V5 Generative Shape Design to create laser-cutting files.
- Compared multiple Drela glider airfoils graphically with Cm v. Alpha and Cl/Cd v. Alpha graphs as metrics.
- 3D Printed the glider with AeroPLA to reduce weight by 50%.
- Won the distance competition with full payload and flew 30% farther than calculated range.

Projects

BattleBot Gearbox | *Toronto Metropolitan University* **January 2024 — March 2024**

- Outlined customer problem statement to define objectives and metrics.
- Developed assembly CAD models for the gearbox, including designs for gears, bearings, and axles.
- Created technical drawings to illustrate assembly procedures for client.
- Compared multiples designs and iterations using metric analysis to determine final design, which was 33% lower than the clients wholesale budget.

Flight Simulator | *Toronto Metropolitan University* **March 2024 — April 2024**

- Created MATLAB script to calculate flight dynamics for Boeing 747 given initial values using flight equations.
- Implemented MATLAB script in Simulink for continual calculations.
- Integrated joystick and output to FlightGear for successful simulation.

Launch Pad Design | *Metropolitan Aerospace Rocket Society* **May 2024 – June 2024**

- Created CAD models and drawings for the launch pad assembly using SolidWorks.
- Used technical drawings for machining and construction of launch pad.

Skills

Computer-Aided Design (CAD): Experienced in the creation of parts, technical drawings and assemblies in CATIA V5, SolidWorks, Ansys DesignModeler, Onshape, Inventor and Fusion 360.
Geometric Dimensioning and Tolerancing (GD&T): Worked with industry standards (SAE, ASME, AN).
Computational Fluid Dynamics (CFD): Simulated 2-D and 3-D models in Ansys Fluent using Ansys Meshing.
Finite Element Analysis (FEA): Audited masters finite element course (AE8115), understanding theory and systematic solutions.
Programming: MATLAB, Simulink, C, Python, JavaScript, SQL and LaTeX.
Electrical: Quartus, Multisim, VHDL, Verilog, FPGA.
Microsoft Office 365: MS Word, MS Excel Macros, VBA and MS Powerpoint
Language: English (Native), French (Upper Intermediate)

Certifications

Certified SolidWorks Associate **August 2023**
Dassault Systemes

- Certified in the mechanical design, assembly and drawings in SolidWorks.

Basic Operations RPAS **November 2024**
Transport Canada

- Certified for basic operations of drones issued by Canadian Aviation Regulations (CAR).

MATLAB and Simulink Onramp **November 2023**
MathWorks

- Completed the introduction to MATLAB and Simulink.

Certified Associate in Project Management, In Progress **December 2023 – Present**
Project Management Institute

- Demonstrate understanding of the fundamental knowledge, terminology and processes of effective project management.

Education

Toronto Metropolitan University **September 2022 – April 2026**
Bachelor of Engineering, Aerospace Engineering *Toronto, ON*

References

Dr. Paul Walsh | *Professor, Director for AERIAS Engineering, TMU*

- Contact: 416-979-5000 ext. 557729, paul.walsh@torontomu.ca

Dr. Reza Faieghi | *Assistant Professor, Department of Aerospace Engineering, TMU*

- Contact: 416-979-5000 ext. 554147, reza.faieghi@torontomu.ca

Minsu Joo | *Applied Aerodynamics Lab of Flight, Graduate Researcher, TMU*

- Contact: 647-834-4375, minsu.joo@torontomu.ca

Basaam Rassas | *Autonomous Vehicle Laboratory, Graduate Researcher, TMU*

- Contact: 647-832-3782, basaam.rassas@torontomu.ca