

Usman Amir

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SKILLS

Mechanical & Software: SolidWorks, Onshape, CFD, GDT, MATLAB, Python, C, Robotics, Excel, Microsoft Office

Electrical & Controls: Circuit Soldering, Sensors/Actuators Integration, Wiring Harnesses

Project Execution: Rapid prototyping, Cross-functional Collaboration, Agile Development, Documentation, Automation

PROJECTS

Parametric Adjustable Laptop Stand (*SolidWorks Assembly + Simulation*)

- Designed a fully adjustable laptop stand assembly to improve ergonomics and support stable typing angles.
- Built a parametric model in SolidWorks using configurations and a hinge/slot mechanism; validated fit with mates, interference checks, and a static Simulation study on the load-bearing members.
- Achieved < 1.5 mm peak deflection under a 60 N applied load with a factor of safety ≥ 2.0 , while reducing part mass by $\sim 18\%$ through iterative thickness optimization.

Belt-Driven Conveyor Module (*SolidWorks Assembly + Motion Study*)

- Designed a compact belt-driven conveyor module with adjustable tensioning for small-scale automation and prototyping applications.
- Modeled rollers, pulley geometry, tensioner slots, and bearing seats in SolidWorks; assembled using mates and performed motion studies to validate belt path, alignment, and smooth rotation across the full travel range.
- Optimized pulley spacing and belt tension to maintain stable belt tracking at 250 RPM, limiting lateral drift to under 1.0 mm during a 60 s motion test with zero part interference.

EXPERIENCE

Mechanical Design Team Member

Toronto, ON

Met First Creates

Apr 2025 – Present

- Supported iterative design of competition robot frames by contributing to early CAD layouts and material decisions, resulting in cleaner assembly and linkage fit during prototyping.
- Collaborated with mechanical and electrical sub-teams to align mounting points and wiring paths, ensuring clean mechanical fit and reducing rework during build phases.
- Led internal technical workshops focused on CAD and mechanical assembly, developing build-ready files and guiding new members through design-to-fabrication workflows used in early-stage prototypes.

Aerodynamics Design Engineer

Toronto, ON

Toronto Met Formula Racing

Sep 2025 – Jan 2026

- Designed and developed aerodynamic components for a Formula-style race car to improve downforce and overall vehicle stability at speed.
- Performed iterative CAD design in SolidWorks and conducted CFD simulations to evaluate pressure distribution, airflow separation, and drag trade-offs across multiple design iterations.
- Optimized aerodynamic geometry through testing and simulation, achieving up to a 10% improvement in downforce-to-drag ratio across final design revisions.

EDUCATION

Toronto Metropolitan University

Toronto, ON

BEng Mechanical Engineering - Deans List - 3.56 GPA

Sep 2024 – Apr 2029

Relevant Coursework: Materials Science, Engineering Design and Graphics, Statics, Mechanics, Calculus I-III, Linear Algebra, Computer Programming (C/Python), Electric Circuits, Thermodynamics, Dynamics, Statistics, Manufacturing Fundamentals