Vibhas Tallapalli

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Education

University of Waterloo Waterloo, ON
Candidate for BASc in Nanotechnology Engineering *Sep 2025 – Present*
Expected Graduation: May 2030

Technical Skills

Mechanical & Manufacturing: SolidWorks, Onshape, CAD Modeling, Tolerances, GD&T, Carbon-Fiber Fabrication, 3D Printing, Machining (Mill, Bandsaw, Lathe), Assembly
Electronics & Hardware: Microcontrollers (Arduino, ARM, AVR), Circuit Prototyping, Embedded Sensors, Serial Communication, Wiring
Programming & Tools: C++, Python, C, Arduino(C++), MATLAB, Git, Java

Experience

Waterloop Design Team (University of Waterloo) Waterloo, ON
Mechanical Engineering Trainee *Sep 2025 – Present*

- Contributed to the design and fabrication of an experimental Hyperloop pod as part of a student-led team building a prototype for the SpaceX Hyperloop Pod Competition.
- Cut and trimmed carbon fiber pod sections based on SolidWorks/Onshape models so both halves aligned correctly during final assembly.
- Designed and machined aluminum clamps and brackets from CAD using a manual mill and bandsaw to mount braking components securely.

Electrium Design Team (University of Waterloo) Waterloo, ON
Mechanical Engineering Trainee *Sep 2025 – Present*

- Built a complete SolidWorks assembly of an existing e bike frame that previously had no CAD reference.
- Collaborated with the electrical subteam to package battery packs and brake controllers given space constraints.
- Updated mounting points and checked clearances in the CAD assembly to ensure electrical components could be installed cleanly.

Biomechatronics Design Team (University of Waterloo) Waterloo, ON
Mechanical Engineering Trainee *Sep 2025 – Present*

- Supported a student design team building a lower-body exoskeleton for the Applied Collegiate Exoskeleton competition, helping with early CAD concepts for strap integration and adjustment.
- Researched strap materials and padding options to balance comfort, flexibility, and durability.

Integra Youth Greater Toronto Area
Executive Coordinator *June 2024 – Present*

- Coordinated volunteer scheduling and tutor student pairings for community tutoring programs.
- Helped plan and run workshops by organizing volunteers and supporting event organization.

Projects

Smart Study Focus Timer
Python, SolidWorks, Arduino *Winter 2026*

- Designed and 3D-printed a SolidWorks enclosure, adjusting the layout to fit sensors and wiring.
- Used IR sensors to detect user presence, writing the control code in Arduino (C++) and Python.
- Developed a Python app that logs focus sessions and allows users to adjust study and break timers.

E-Bike Speed Control Simulation
C++, Python *Fall 2025*

- Built a C++ simulation to model e-bike speed and battery discharge under varying loads.
- Tuned a PID controller to reduce speed overshoot and improve stability during load changes.

Energy Collecting Turbine
CAD, Mechanical, Electrical *Fall 2025*

- Modeled a vertical-axis wind turbine, selecting PVC and Nylon to balance structural rigidity with rotational inertia.
- Fabricated rotor components, validating mechanical fits to ensure smooth rotation with minimal friction.
- Interfaced the mechanical turbine with a generator circuit, successfully powering a DC load during wind tests.