

RHYS TUOHY

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UofT Engineering Science '29 (PEY Co-op; expected Apr. 2030) | Systems/Aerospace + Mechatronics | V&V / Controls

PROFILE

UofT Engineering Science (PEY Co-op; specialization TBD) systems-minded engineer spanning embedded prototypes, modeling/simulation, and CAD. Build requirements-to-test workflows, instrument hardware, validate models against data (Python/MATLAB/Simulink), and document decisions via FMEA/RCA and test reports in an aerospace-style V&V mindset. Seeking internship/co-op in systems/aerospace engineering, controls, or test/verification.

TECHNICAL SKILLS

Systems, V&V & Test: requirements decomposition; ICDs (interface control documents); acceptance criteria; verification planning; test matrices and tuning logs; design reviews; test reporting; FMEA and root-cause analysis; Git/Github.

Modeling, Controls & Analysis: ESP32/Arduino (C/C++); SD/serial logging; interrupts/timers; PWM/ADC; sensor fusion; I²C/SPI/UART; CRC/error checks; MATLAB/Simulink dynamics + controls (PID/feed-forward); Python time-series pipelines, numerical integration, curve fitting, and Monte Carlo-style sweeps.

CAD, DFM & Prototyping: Onshape (Certified Professional), SolidWorks, AutoCAD; parametric CAD, assemblies, drawings; tolerance-driven interfaces; DFM/DFAM; FEA-informed redesign; fixtures/test rigs; FDM printing (PLA/PETG) and laser cutting.

EDUCATION

University of Toronto

Toronto, ON

BASc, Engineering Science

(PEY Co-op 2028–2029) Sept. 2025 – Apr. 2030

- Design teams: AEAC UAS (Flight Dynamics); UTAT Rocketry (Aerodynamics & Liquid Propulsion); UTFR (Aero & Vehicle Controls).
- Selected coursework (by Summer 2026): Calculus I–II; Linear Algebra; Engineering Mathematics & Computation; Classical Mechanics; Electric Circuits; Structures & Materials; Programming, Algorithms & Data Structures.
- Engineering practice: requirements decomposition; acceptance criteria; verification planning and technical reporting through design-project deliverables (Praxis I–II; Structures & Materials project work).

St. Michaels University School (SMUS)

Victoria, BC

AP Capstone Diploma & BC Dogwood Diploma

Sep. 2022 – Jun. 2025

- Academic: 97.4% Grade 12 average; Honours with Distinction; AP Scholar with Distinction.

EXPERIENCE

Morin 3D — Island Additive Manufacturing

Hybrid (Victoria, BC)

Design Engineer (CAD & Additive DFM)

Jul. 2025 – Present

- Reverse-engineer customer parts from scans/drawings into fully parametric CAD; translate envelopes, interfaces, serviceability, and load paths into manufacturable geometry for large-format additive builds.
- Performed FEA-informed redesign on load-bearing parts (stress concentration + lever-arm reduction); achieved **16%** material reduction while improving stiffness/durability via feature redistribution (ribs/fillets) and print-orientation-aware strength; validated with fit-check prints and benchmark hand-calcs/simple cases.
- Built internal tooling (print/process database, cost/time estimator, revision templates) to standardize quoting and planning, reducing iteration churn and improving schedule predictability across client jobs.
- Established release discipline: drawing checklist + revision notes + fit-check workflow; deliver STEP/STL/DXF, drawings, assemblies, BOMs, and traceable change summaries through structured review cycles.

AEAC UAS Design Team — University of Toronto

Toronto, ON

Flight Dynamics Division Member

2025 – Present

- Develop flight-dynamics analysis assets (stability/response estimates, parameter sweeps, simulation blocks) and convert requirements into explicit assumptions and checkable acceptance criteria for integration across all design subteams.
- Plan verification: define what to measure, how to measure it, and how success is scored; present results and subsystem rationale at student R&D showcases using concise, engineering-credible visualizations.

UTAT Rocketry — University of Toronto Aerospace Team

Toronto, ON

Aerodynamics & Liquid Propulsion Division Member

2025 – Present

- Support subsystem iteration through analysis-backed trade studies; document constraints, assumptions, and decisions so design choices are traceable and test planning is actionable.
- Build/extend lightweight tools (MATLAB/Python calculators, sizing scripts, verification checklists) to standardize repeated decisions and reduce integration risk.

Royal BC Museum

Victoria, BC

Lead Archives & Research Volunteer

Jun. 2023 – Present

- Led reorganization/relocation of a large reference library and archives (hundreds of boxes; thousands of entries); used parsing/programming workflows to reconcile and cross-reference records, improving retrieval reliability and staff usability.
- Collected and synthesized visitor feedback at scale (**200+** responses per 8-hour shift) and delivered concise verbal briefings supported by short memos, informing exhibit communication and operational decisions.
- Contributed **100+** hours across logistics, research support, and stakeholder-facing work; strengthened disciplined documentation and follow-through in a public-facing institution.

MAJOR ENGINEERING PROJECTS

Solid-Motor Rocket Design & Flight Testing | *CAD, Model Validation*

2023 – Present

- Built and flight-tested **15+** rockets (A–E motors), scaling to a **2 m** vehicle; standardized CAD-defined interfaces and serviceability features to improve repeatability across revisions.
- Instrumented flights with IMU (accel/gyro) + barometric altimeter logging to SD (**1 ms** target period); built a Python pipeline for time-series cleaning, dropout flagging, curve fitting, and uncertainty-aware metric extraction (apogee, flight time, attitude/rotation trends).
- Reconstructed trajectory/attitude using Euler-method state propagation and quaternion-based attitude integration, and compared predictions to measured behavior to drive redesign; removed a spin-stabilized iteration after diagnosing precession/slipstream torque effects through root-cause analysis.

Guided Rocketry GNC (TVC + Fin Actuation) | *Embedded, Verification*

2024 – Present

- Developed a simulation-to-hardware workflow: MATLAB/Simulink trade studies under actuator/power constraints using motor thrust-curve forcing functions; implemented ESP32/Arduino C++ feed-forward prototypes and PID tuning experiments (~**10 ms** loop period) with traceable tuning logs.
- Built an instrumented aero characterization rig (fan “wind-tunnel” proxy + **3-axis** force sensing) to map lift/drag vs fin deflection; smoothed/parameterized force curves to update the plant model and improve simulation fidelity.
- Executed verification at scale: waypoint simulation harness with randomized parameter variation (wind, sensor noise, mass properties) and logged scoring metrics; achieved **5.7 m** mean closest-approach error across **10** randomized targets (50–200 m XYZ) and iterated using systems artifacts (requirements + acceptance criteria, interface notes, test matrix, and test reports) plus SIL (Simulink) simulation and instrumented bench validation.

Strength–Weight Bridge Optimizer | *Algorithm Design, Structures, Benchmarking*

2024 – 2025

- Designed an algorithm to rank girder geometries by strength-to-weight under moving-load envelopes; benchmarked against hand calculations and simple FEA cases, then expanded constraint coverage via secondary research (e.g., lateral-torsional buckling, diaphragm/bracing effects) to improve agreement between predictions and tested performance.

LEADERSHIP & OUTREACH

STEM Vancouver Island — Youth Workshop

Canada

Founder / Program Lead

Apr. 2024 – Present

- Designed and delivered **4** hands-on engineering workshops (~**45** instruction hours) for ~**40** returning students (13–19), producing **12** completed builds and ~**90%** retention across sessions.
- Built a reusable curriculum kit (project guides, build checklists, code templates/debug playbooks) and evaluated learning/engagement using pre/post surveys with Canada Service Corps support; iterated delivery using measured feedback rather than anecdotal takeaways.
- Led **4** volunteers and partnered with UVic/Camosun/SMUS and national support programs; delivered CAD, 3D printing, laser cutting, microcontrollers, and Python modeling through build-test mini-competitions.

AWARDS & CERTIFICATIONS

Scholarships/Awards: Faculty of Applied Science & Engineering Scholarships (UofT); Wallberg Admission Scholarship (UofT); District Authority Scholarship (BC); PEA Scholarship (BC).

Funding: Promise1000 Youth Leadership Grant (Canada Service Corps / YEP); Canada Service Corps program support.

Honours: Head of School Award; AP Scholar with Distinction; Schulich Leaders Nominee.

Certifications: Onshape Certified Professional; CPR/AED/First Aid (exp. Apr. 2027).