Aspen Erlandsson

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EDUCATION

Bachelor of Applied Science in Engineering Science + PEY Co-op
Aerospace Engineering Major | University of Toronto | Toronto, ON   Sep. 2022 - Jun. 2027
    | Relevant Courses   (expected)

- Aerodynamics
- Vector Calculus & Fluid Mechanics
- Introduction to Spaceflight
- Dynamics

SKILLS

- **Computer Aided Design:** Onshape, Fusion360, Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD)
- **Manufacturing:** Design for Manufacturing (CNC, 3D Printing, Laser Cutting), Basic Welding & Manual Machining Skills
- **Electronics:** Altium PCB Design, Power Systems Design, Oscilloscope Debugging, Soldering, Assembly, RF Design
- **Programming:** Python, C/C++ (Desktop & Embedded), MATLAB, STM32 Firmware, Arduino
- **Professional:** Teamwork and Collaboration, Professional Communication (Verbal and Written), Time Management
- **Leadership:** Prioritizing Critical Tasks, Resolving Task Blockers, Establishing Realistic Timelines

WORK EXPERIENCE

System Design and Integration Intern
Safran Landing Systems | Toronto, ON   Jul. 2025 - Present

- Contributing to the design and integration of landing gear systems for the Bell V-280 Valor tiltrotor aircraft, part of the U.S. Army's Future Vertical Lift program.
- Supporting cross-functional collaboration across mechanical, electrical, and hydraulic subsystems.
- Participating in system-level reviews, requirements validation, and component interface documentation.
- Gaining hands-on experience with DOORS, CATIA, and aerospace design documentation practices.

Research Analyst (Quantum Computing)
University of Saskatchewan | Saskatoon, SK, Remote   Aug. 2024 - Jul. 2025

- Working closely with experts in biomolecular research to develop new computational methods for drug discovery and molecule interaction prediction using quantum computing
- Successfully designed, programmed, and ran quantum-accelerated algorithms on a real IBM quantum computer
- Working to optimize algorithm structures to achieve superior runtime complexity compared to the same algorithm implemented on a classical computer, resulting in exponentially better performance
- Reporting to supervisors weekly with progress updates, working closely with other researchers in the organization to apply our novel techniques to their data to better understand how various respiratory illnesses persist in the lungs
- Utilized Excel and PowerPoint to record and present data to a wide audience, communicated professionally with supervisors using Outlook, and used Word

EXTRA-CURRICULAR EXPERIENCE

Avionics System Lead
University of Toronto Aerospace Team - Rocketry | Toronto, ON   Sept. 2024 - Present

- Leading a 10+ member student engineering team to develop, test, and validate the avionics system for a 15,000 ft liquid bipropellant rocket, targeting launch in August 2026
- Collaborating closely with other subsystem teams (propulsion, recovery, airframe, etc.) to ensure seamless integration and meet mission requirements
- Spearheading high-level systems design, internal interfaces, and cross-system compatability, balancing mission requirements with time and resource constraints
- Leading design of multiple custom PCBs in Altium Designer, integrating advanced power management systems, safety monitoring, and thermal considerations
- Leading STM32 RTOS firmware development, incorporating real-time telemetry, control, and safety functions, with a focus on robust, maintainable code and reliability
- Operating ground support systems for engine tests, maintaining safety and calibration protocols for sensor systems, solenoid valves, and servo-controlled components to gather engine performance data accurately and inform propulsion system development

PROJECTS

C++ Developer
Custom High-Performance Fluid Simulation Software | Toronto, ON   Aug. 2024 - Oct. 2024

- Designed and optimized a multithreaded Eulerian fluid solver in C++, simulating fluid flow around objects including airfoils and cylinders, with a detailed report including pictures available on my website
- Implemented an advanced solving algorithm, the Red-Black Gauss-Seidel method, to parallelize computations. This algorithm achieved a 10x performance improvement, reducing solve time from 451ms to 44.5ms compared to baseline
- Implemented efficient rendering techniques, improving frame render time by 70x compared to baseline
- Produced cross-platform functionality, demonstrating real-time simulations on both desktop and mobile devices
- Applied software to visualizing real problems from my aerodynamics classes to gain a better intuition of the fluid mechanics principles

System Designer & Developer
Custom 3D Printed Fixed-Wing UAV Drone | Toronto, ON   Feb. 2024 - Present

- Designed and built a 1.1m wingspan fixed-wing UAV with a custom airframe, avionics, and communication protocol, with a detailed report including pictures available on my website
- Developed a bi-directional communication system using LoRa modules on custom-designed and self-soldered PCBs (Altium Designer) in a compact form-factor, achieving a 3km range using RF power amplifiers
- Validated airframe performance using CFD simulations, iterating designs to optimize for lift and drag characteristics at target flight conditions
- Designed and implemented real-time telemetry streaming with a custom C++ GUI, integrating a 600MHz Arduino microcontroller for flight control and an MPU6050 gyroscope/accelerometer for real-time orientation tracking, debugging and optimizing the entire system using an oscilloscope
- Designed for modular assembly using bolt-together 3D-printed components, created and iterated using finite element analysis (FEA) in Fusion 360, and reinforced the airframe with carbon fiber rods for structural integrity
- Actively working to finalize ground-station and control systems logic, targeting a maiden flight in mid winter 2024

Student Designer & Project Lead
Automatic Cat Trap and Messaging System | Toronto, ON   Jan. 2023 - Apr. 2023

- As part of an engineering design class my team worked closely with stakeholders from the Annex Cat Rescue organization to understand their needs and ensure our design aligned with their requirements and preferences
- Managed project deadlines and team-member task distribution to ensure timely completion of project objectives in line with stakeholder expectations and available resources
- Engineered a fully automated cat trap with a 4G communication module, providing real-time alerts to trappers upon successful cat capture and enhancing trapping efficiency
- Designed and produced a fully functioning prototype within our team's $500 budget and 6 week time constraint, resulting in a successful demonstrating it to our stakeholders that was received with approval

Student Designer & C++ Developer
Structural Engineering Design Software | Toronto, ON   Oct. 2022 - Nov. 2022

- Developed a 6000 line C++ desktop application to streamline the design process of optimal bridge structures for a class engineering competition at U of T, resulting in improved design quality and workflow efficiency for my team
- Designed and implemented a cross-platform compatible user interface, allowing easy collaboration between team-members
- Applied software to rapidly iterate designs consistent with our team's specific requirements, resulting in placing 5th out of 100 competing teams

Video Creator
Educational YouTube Channels | Online   Jul. 2017 - Aug. 2023

- Created and managed two educational YouTube channels, one dedicated to C++ programming and the other to the technical aspects of 3D animation, providing in-depth tutorials and insights to assist learners in these fields
- Planned and executed all aspects of video production, including filming, editing, and technical enhancements, ensuring high-quality content delivery and engaging visual presentations for complex C++ and 3D animation topics
- Effectively integrated feedback from viewers to improve quality, growing my audience to a combined 1.3 million views across all educational videos uploaded