Aspen Erlandsson

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EDUCATION

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

Relevant Courses

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

High School Diploma
Gulf Island's Secondary School | Salt Spring Island, BC — Sep. 2018 - Jun. 2022

SKILLS

Technical

- Prototyping, Assembling, and Programming Electronics
- Highly Proficient in Python and C/C++
- Strong Proficiency in Calculus and Linear Algebra
- Programmatic Automation and Robotics
- Detailed Note Taking and Technical Writing

Professional

- Teamwork and Collaboration
- Professional Communication (Verbal and Written)
- Time Management and Organizational Skills
- Strong Research, Analytical, and Problem-Solving Skills
- Adaptability and Willingness to Learn

WORK EXPERIENCE

Quantum Computing Researcher
University of Saskatchewan | Saskatoon, SK, Remote — Aug. 2024 - Present

- Worked closely with experts in biomolecular research to develop new computational methods for drug discovery and molecule interaction prediction
- Successfully designed, programmed, and ran quantum-accelerated algorithms on a real IBM quantum computer multiple times
- Optimized the algorithm structure to achieve superior runtime complexity compared to the same algorithm implemented on a classical computer, resulting in exponentially better performance
- Reported to supervisors weekly with progress updates, worked 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

Bartender
Village Genius Pub | Toronto, ON — Jul. 2023 - Aug. 2024

- Provided professional service to patrons in a pub with a capacity of 70 people, creating and delivering beverages promptly
- Handled customer inquiries and administered payments through a POS system, ensuring smooth operation of the establishment
- Supported staff team with a variety of general duties, balancing responsibilities during busy periods to improve customer and staff contentment

EXTRA-CURRICULAR EXPERIENCE

Firmware Programmer
University of Toronto Aerospace Team | Toronto, ON — Sep. 2022 - Aug. 2023

- Collaborated with 8 other subteams working on a hyperspectral imaging satellite intended demonstrate the viability of the first Volume Phase Holographic (VPH) grism in a small form-factor, and provide a proof of concept for crop residue mapping
- Designed firmware testing procedures and standards for a subteam of 11 students to improve the reliability and safety of firmware running on the satellite
- Developed and integrated the battery management system (BMS) driver with a realtime operating system (FreeRTOS) to ensure safe battery charging and discharging behavior, while not interfering with other mission software priorities

PROJECTS

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

- Designed and optimized a multithreaded Eulerian fluid solver in C++, simulating fluid flow around objects including airfoils and circles
- 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
- Actively working to improve the system with more compatability, and advanced solving algorithms for faster performance and to allow the software to be used as a practical utillity in my aerodynamics courses

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 teammembers
- 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

Personal Website

LinkedIn