Emily Lai

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EDUCATION

2022 - 2025 **Ontario Tech University**
Honours Bachelor of Engineering, Software Engineering
GPA: 3.98 / 4.3

2021 - 2022 **University of Toronto**
Bachelor of Applied Science, Chemical Engineering
GPA: 3.28 / 4.0

RESEARCH INTERESTS

My research interests are in advancing artificial intelligence, particularly in the development and optimization of large language models (LLMs), with specific regard to the computational approaches to linguistics in LLMs and responsible AI. I am also interested in human-computer interaction and accessible technology. Additionally, I am interested in challenges in big data, including the design of efficient data pipelines. I have done cybersecurity-related research, with a focus in aerospace applications.

WORK EXPERIENCE

May 2024 - August 2024 ***Apple Inc.***
Artificial Intelligence and Machine Learning (AIML) Engineer Intern

- Leveraged Apple Foundation Model LLMs to analyze deployment pipeline logs, identify key insights in a human-readable format to improve internal debugging efforts.
- Improved deployment pipeline efficiency with internship project to identify root causes of deployment issues.
- Optimized log collection, reduced data retrieval time by 75% across Splunk, Spinnaker, and Thanos.
- Collaborated with cross-functional teams to integrate AI-driven monitoring and analysis of system deployments.

May 2023 - August 2023 ***Magnestar Inc.***
Space Software Engineering Intern

- Performed database operations, satellite data cleaning, and normalization using MySQL.
- Conducted software development using JavaScript, React.js, and PHP
- Independently developed an aerospace traffic prediction model using Python, AWS, Amazon SageMaker, Skyfield API to accurately predict satellite orbits.

January 2022 - April 2023 ***Axcessiom Technologies Inc.***

Data Science / Machine Learning Intern

- Transformed a core computer vision product to hybridize with an offline voice recognition AI developed with GCP, Python, Pandas, TensorFlow and PocketSphinx, improved resulting accuracy by 26%.
- Project lead for a foreign language integration team, increased customer base by 83%.
- Gathered and created data visualizations used in funding applications and investor pitches.
- Contributed to Project Arrow, Canada's first original full-build zero-emission concept vehicle.

RESEARCH EXPERIENCE

November 2023 - January 2024 ***Ontario Tech University***

Undergraduate Research Assistant

- Assisted Dr. Carolyn McGregor AM in research on satellite streaming health data and analytics from the ISS (International Space Station) to Earth ground stations using big data, contributing to architecture decisions to enhance the system's efficiency and scalability.

January 2024 - May 2024 ***Ontario Tech University***

Undergraduate Research Assistant

- Assisted Dr. Pooria Madani in research on cybersecurity in aerospace software and ADS-B flight tracking, including data pipeline from ground station, data analytics, and database creation.

PROFESSIONAL DEVELOPMENT EXPERIENCE

September 2023 - December 2023 ***Special Topics: The Foundation of Large Language Model Engineering***

Course Auditor

- Audited LLM graduate course taught by Dr. Masoud Makrehchi covering Generative AI topics: prompt engineering, fine-tuning, embedding models, parameter tuning, RAG, NLP, ethical use of LLMs

May 2022 - August 2022 ***Meta and Major League Hacking***

Meta Production Engineering Fellow

- Created an open-source portfolio website using Python, Flask, Jinja, MySQL, NGINX, and unittest.
- Automated testing and deployment workflows using CI/CD.
- Set up system and container monitoring, alerting, and visualization using Prometheus and Grafana.

September 2021 - January 2022

University of Toronto LearnAI
Machine Learning Engineer

- 5-month AI course including NumPy, Pandas, Neural Networks, Computer Vision, Natural Language Processing
- Created a news summarization tool that takes in a multi-paragraph article and returns a one-sentence summary.
- Completed research and development in a 6-person team using NLP, NumPy, Pandas, and PyTorch.

May 2022 - August 2022

Google
Computer Science Summer Institute Participant

- Selected for computer science program for high-achieving students.
- Configured 20+ individual coding projects in JavaScript using object-oriented programming principles.
- Delivered a final project presentation including a live demonstration to Google employees.

HONOURS AND AWARDS

December 2024
$3000

Canadian Nuclear Laboratories Award for Innovation and Excellence
Canadian Nuclear Laboratories, Ontario Tech University
Awarded based on academic standing, extracurricular involvement, and campus leadership.

March 2024
$250

3rd Place: Engineering Communications
Canadian Engineering Competition 2024, Canadian Federation of Engineering Students
Awarded 3rd place at the national competition in the Engineering Communications category.

February 2024
$525

Top 6: Smart Cities Competition
Brilliant Catalyst
For advancing as a finalist in the Smart Cities innovative pitch competition.

January 2024
$1000

1st Place: Engineering Communications
Ontario Engineering Competition 2024, Ontario Society of Professional Engineers
Awarded 1st place at the provincial competition in the Engineering Communications category.

January 2024
$2000

Becky Dinwoodie Memorial Award
Ontario Tech University
Awarded based on academic standing.

November 2023

1st Place Overall
Ontario Tech Engineering Competition 2023
Awarded 1st place out of all competitive engineering categories university-wide.

September 2023 - September 2024
$2000

In-Course Scholarship
Ontario Tech University
Awarded based on GPA (3.8+).
Achieved President's Honours List: Winter 2022, Spring/Summer 2022, Fall 2022, Fall 2023, Winter 2024
Achieved Dean's Honours List: Winter 2023

May 2022
$75

1st Place: MLH Production Engineering Hackathon
Major League Hacking, Meta
For winning the MLH Production Engineering Hackathon.

June 2021
$500

Kiwanis Club 2021 Robert Franklin Scholarship Recipient
Kiwanis Foundation of Canada
For excellence in community and global service.

ACADEMIC COMMUNITY INVOLVEMENT

January 2024 - present

Ontario Tech Aerospace Design Team
Founder and President

- Sole student founder of an 18-member design team.
- Leading executive team and project management.
- Engineering and installing a satellite ground station, and monitoring ADS-B data to track aerospace traffic over campus.
- Developing an open-source website to support research by providing accessible data for collaborative use.

May 2023 - present

NASA International Space Apps Challenge Competition
Lead Hackathon Organizer

- Coordinating all aspects of the hackathon including logistics, outreach, venue, volunteers, and scheduling for over 125 competitors.
- Ensured that participants had access to necessary resources, including datasets, APIs, and technical mentors.
- Organized all external speakers and judges, including CEOs, founders, engineers, and acclaimed researchers.

March 2024 - present

Ontario Tech Space and Rocketry Design Team
Software Lead

- Software lead in the Technology Development team, developing an Advanced Control Unit using AI and machine learning to control rocket thrust vector.
- Lead developer of FLARE 1.0 rocket launch simulation testing software using Python, MATLAB.
- Presenting business pitch to Launch Canada with business analysis, market research, SWOT analysis.

September 2020 - present

Canada Learning Code
Mentor

- Instruct, attend, and mentor 300+ students in 20+ coding workshops using Python, SQL, JavaScript, HTML, CSS, and other online software
- Promote the organization and workshops, encourage STEM+ representation in underrepresented groups

June 2022 - June 2024

Ontario Tech Engineering Students' Society
Vice President, Finance and Administration

- Led meetings with university faculty, design teams, society leaders, and the student body to organize initiatives addressing priorities and concerns of all relevant university stakeholders.
- Planned sponsorship initiatives, sourced over $8000 of external funding from companies and advertising.
- Managed budget allocation between 8 main portfolios, ensuring efficient use of funds.

March 2022 - March 2023

Ontario Tech Women in Engineering Society
President

- Directed networking, career-building events and sponsorship meetings with local and national organizations.
- Conducted data analysis to optimize budgeting, resulting in 13% increase in attendance and reducing year-over-year spending by 10%.

PROJECTS

Academic Projects

Present

Assistive Device for the Blind/Visually Impaired
IoT smart device using computer vision to provide spatial insights.
Course: Capstone Systems Design, Fall 2024 - Winter 2025

Winter 2024

MindnBody: Health and Wellness Tracking Journal
Website using Cohere API to perform sentiment analysis on journal entries.
Course: Data Management Systems

Fall 2024 **SuperCoolFlights: Flight Booking System**
Website using Cohere API to perform sentiment analysis on journal entries.
Course: Data Management Systems

Hackathons

September 2024 **Connect.py**
Secure remote access into a Linux device in an air-gapped environment without exposing any ports on the device.
Hack The North 11, University of Waterloo

October 2023 **TutorBo: VR Chatbot Tutor**
Web and VR application using Cohere API (summarization, chatbot, similarity), Three.js to tutor students.
Hack The Valley 8, University of Toronto Scarborough

September 2023 **DJ Diary**
Web application using NLP and Spotify API to create a music playlist based on sentiment analysis of a journal entry.
Hack The North 10, University of Waterloo

Personal Projects

May 2022 **Sign Language Interpreter**
Web application detecting sign language alphabet, using TensorFlow, JavaScript, ml5.js

PRESENTATIONS

Conferences

March 2024 **"Launching Innovation: Leading the NASA Space Apps Challenge and Fostering a Space Community"**
Toronto Metropolitan Rocketry Conference 2024
Invited to present a 20-minute session on fostering the aerospace community through innovative competition.

October 2023 **Canadian Space Careers Panel Moderator**
NASA Space Apps Challenge Oshawa 2023
Moderated an expert panel including Canadian space industry CEO, founder, acclaimed researcher, lawyer, and engineer.

August 2023 **"Keys to Conscious Creation: The Intersection of Piano Artistry and Ethical AI"**

CppNorth 2023
Presented a 5-minute lightning talk on the intersection of musical artistry and developing ethical AI models.

Competitions

January 2025 — **"Data Centres in the AI Revolution"**
Ontario Engineering Competition 2025
Engineering Communications at McMaster University.

November 2024 — **"Data Centres in the AI Revolution"**
Internal Engineering Competition 2024
Scored 1st Place in Engineering Communications at Ontario Tech University.

March 2024 — **"Canadarm3 for the Lunar Gateway"**
Canadian Engineering Competition 2024
Scored 3rd Place nationally at University of Calgary. 30-minute presentation. Also presented at Queen's University (20-minute presentation) and Ontario Tech University (10-minute presentation).

TECHNICAL SKILLS AND CERTIFICATIONS

- Python, SQL, C++, Java, JavaScript, HTML, CSS, MATLAB, TensorFlow, AWS, Google Cloud
- Google Cloud Professional Cloud DevOps Engineer Certified (August 2022)
- Google Cloud Digital Leader Certified (May 2022 - present)

LANGUAGES

English: Fluent in speaking, listening, reading, and writing.
French: Intermediate in speaking, listening, reading, and writing.
Chinese (Cantonese): Proficient in listening and speaking, beginner in reading and writing.