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Stephen Lu

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EDUCATION

McGill University   Montreal, Canada
*B.Sc. in Honours Computer Science and Biology; **GPA: 4.00/4.00***   *Sep 2021 – Present*
*Minor Degree in Mathematics; **GPA: 4.00/4.00***   *Sep 2022 – Present*

- **Awards:** Schulich Leader Scholarship (80 000$), Emily R Crawford Scholarship (1 000$), Dean's Honour List
- **Coursework:** Representation Learning, ML in Genomics & Healthcare, Honours Discrete Mathematics, Quantum Computing, Parallel Computing, Probability, Statistics, Honours Algorithms & Data Structures
- **Exchange Semester at the National University of Singapore (Winter 2023)**

PROFESSIONAL EXPERIENCE

Hero AI   Toronto, Ontario
Co-Founding Engineer   *Jun 2020 – Sep 2022*

- Designed a server-side rendering library that produces interactive React components from static JSON schemas, enabling the team to deliver near real-time frontend updates through a low-code platform.
- Hired and onboarded three full-time frontend developers and organized weekly scrum, sprints, and code reviews.
- Deployed dashboards, mobile app, and web app to 80 000+ yearly patient users and 5 000+ hospital staff users.

Lino Estate   Montreal, Quebec
Software Development Intern   *Jun 2019 – Oct 2019*

- Built web-scraper in BeautifulSoup to dump raw listing data from real estate websites into MongoDB datalake.
- Developed Flask application with API endpoints to run model inference and render HTML templates.

Cito International   Montreal, Quebec
Software Developer   *Jun 2018 – Aug 2018*

- Developed an order tracking Flask application that parses CSV files into a SQL database.

RESEARCH EXPERIENCE

McGill University - Supervised by Prof. Yue Li   Montreal, Quebec
Undergraduate Researcher   *Aug 2023 – Present*
Ongoing Project: Genome sequence modelling with transformers for cell-type specific CRE prediction

- Adapted sparse attention transformer models with long-term context to the DNA modelling task.

T-CAIREM/University of Toronto - Supervised by Dr. Devin Singh   Toronto, Ontario
Undergraduate Researcher   *Jun 2023 – Present*
Ongoing Project: Evaluating the benefits and limitations of LLMs in clinical context

- Setup a conversational Q&A agent with chat history and semantic document retrieval in LangChain.
- Deployed a vector database using Zep with ingestion pipeline for adding new searchable text documents.
- Built a dashboard & chat interface in SvelteKit for patients to interact with the augmented language model.

McGill University - Supervised by Prof. Rose Bagot   Montreal, Quebec
Undergraduate Researcher   *Jun 2022 – Aug 2022*
Project: Exploring the transcriptional mediators of stress in the nucleus acumbens

- Clustered single-cell RNA-seq data in Scanpy using KNN, NMF, and Louvain methods.
- Produced heatmap, violin, and dot plot visualizations to identify differentially expressed genes
- Trained multiview pose estimation models on mice videos using DeepLabCut

The Hospital for Sick Children - Supervised by Dr. Devin Singh   Toronto, Ontario
Collegiate Researcher   *Oct 2020 – Jul 2021*
Publication: From Clinic to Computer and Back Again (Curr Treat Options Peds)

- Explored time-series regression methods to forecast emergency room wait-times and patient inflow.
- Trained multi-modal neural network from triage data (textual, categorical, scalar) to screen for respiratory illnesses.

Projects

Technical Blog | *Website*   *2022-Present*
- A technical blog where I document my learning process on machine learning, math, and software development.
- Some highlight posts include variational autoencoders, semantic gpt3 embeddings, and network science.

Real Estate Portfolio | *GitHub* | *Website*   *2023*
- Professional real estate agent portfolio written in Rust and SvelteKit
- The project highlight is a multi-threaded filewatcher service in Rust that updates the agent's listings every day.

React Dynamic Renderer | *GitHub* | *npm*   *2022*
- Built and published a public npm package for dynamic rendering of ReactJS components from JSON templates.
- Package has around ∼100 weekly downloads on the npm package registry.

McGill Course Map | *GitHub* | *Website*   *2022*
- Maintaining a course map platform for McGill University written in the Dash python framework.
- Students can search for a course and see its prerequisites and future coursework in the form of a DAG.

Awards & Honours

Schulich Leader Scholarship - Undergrad (80 000$)	*2021-2024*
Emily R Crawford Scholarship (1 000$)	*2022*
Loran Scholarship Finalist - Undergrad (2 000$)	*2021*
Youth Can Innovate Award (8 000$)	*2019*
The Actuarial Foundation of Canada Award (1 000$)	*2019*
Canada Wide Science Fair - Silver Medal	*2019*
Expo-Sciences Hydro-Quebec (1 500$) - 1st place in Quebec	*2019*
Full Ride Scholarship to University of Quebec Network (Declined)	*2019*

Community Involvement

McGill iGEM   *Sep 2022 – Dec 2022*
Member - Drylab Team
- Setup Docker images for sequence enrichment analysis using HOMER motif and MEME suite libraries.
- Developed the iGEM team presentation website in React.

McGill NeuroTech   *Jan 2022 – May 2022*
Member - Software Team
- Worked on a project to build a mind-controlled keyboard through EEG signals for mobility impaired patients.
- Developed the React keyboard app used for data collection, testing, and final product.

Skills

Programming: Python, JavaScript, Typescript, Rust, C++, Java, OCaml, SQL, Bash

Data Analysis: Jupyter, Pandas, Numpy, PyTorch, Networkx, Scanpy

Frontend Frameworks: React, SvelteKit, Vanilla HTML & CSS, Dash, Plotly, Android Studio, XCode

Backend Frameworks: Flask, NodeJS, Rust Rocket, Rust Diesel, Celery

Other: Git, Docker, AWS, Oracle Cloud, Unix, Linux, Nginx

Languages

Native: English, French

Fluent: Standard Mandarin Chinese

Working Proficiency: Spanish

Press

McGill Reporter. Relations Office (2021, August 31). *Six McGill students receive Canada's largest STEM scholarships*

LaPresse. n.a. (2019, 16 April). *LaPresse tête d'affiche: Élève honoré Stephen Lu*