Katherine Langille

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Skills

Technical: Python, C++, Git, SQL, HTML/CSS, JavaScript
Data & Analysis: Machine Learning, Predictive Modeling, Model Interpretability, Bioinformatics, Data Visualization, Statistical Analysis, Process Optimization, Experimental Design
Tools & Libraries: PyTorch, Pandas, NumPy, Scikit-learn, Matplotlib, Jupyter, MATLAB, R
Languages: French (Advanced), Spanish (Conversational)

Experience

Bioinformatics Software Research Student Sep. 2025 – Dec. 2025
The Hospital for Sick Children (SickKids) — Centre for Applied Genomics *Toronto, ON*

- Developing a **machine learning pipeline** to predict risk of **cognitive, language, and motor outcomes** in preterm infants using **demographic, clinical, and MRI data**.
- Contributing to the design and iteration of a **protein language model variant effect predictor**, with a focus on **model interpretability** through attention mechanism analysis.

Data Science and Process Mining Analyst Oct. 2024 – Mar. 2025
Software Solutions, Transport Canada *Ottawa, ON*

- **Led two process mining projects** and **analyzed large-scale process logs** using Python to identify inefficiencies in government workflows, delivering **data-driven recommendations**.
- Designed a **cost-effective, secure, and computationally efficient machine learning pipeline** to perform classification tasks to reduce administrative burden and save resources.
- Developed **process conformance models** and **interactive dashboards**, translating data insights into actionable strategies for cross-functional stakeholders.

Cognitive Engineering Research Assistant May 2024 – Aug. 2024
Advanced Cognitive Engineering Lab, Carleton University *Ottawa, ON*

- Developed a situational awareness task **video game** using Godot (Learn more here)
- Wrote Python scripts to create experiments and edited MATLAB scripts for **EEG data processing** and analysis
- Contributed to **UX/UI design** of an app including user needs assessment through focus group data analysis

Projects

EMG-Controlled Prosthetic Hand YouTube | Summer 2025

- Built a **low-cost myoelectric prosthetic hand** capable of grasping and manipulating objects via forearm muscle signals in a 3-person team.
- Designed and implemented the **electrical system and signal processing**: amplified, filtered, and digitized weak EMG signals for real-time control using an Arduino.
- Collaborated on a **tendon-driven whippletree mechanism** to distribute force evenly across fingers.

Kidney Perfusion System | Waterloo Bioengineering Competition — **2nd Place** Summer 2025

- Designed a **low-cost, off-grid kidney preservation system** for low-resource settings using normothermic perfusion to improve transplant equity.
- Developed a **hybrid flow system** with gravity-assisted perfusion, DC peristaltic pumping and feedback control.

Social Impact Consulting Program | Habitat for Humanity GTA — **1st Place** Summer 2025

- Partnered with Habitat for Humanity GTA to build a **quantitative impact framework** and analyze intake/update forms and datasets to identify key metrics.
- Designed and implemented an **interactive dashboard** to support data-driven decision-making.

Education

University of Waterloo Waterloo, ON
BASc. Biomedical Engineering, Honours, Co-Operative Program *Sep. 2023 – May 2028*

- GPA: 3.95 (94.36%) **First in Class 2B Term**
- Awards: Dean's Honours List, Alumni @ Microsoft Scholarship in Eng., Warriors Women's Excellence Award
- Engineering Society Rep, **Varsity Squash**, SERVE Volleyball Club, Intramural Hockey and Volleyball
- **Responder and Assistant Trainer** on the Campus Response Team where I contribute to the safety of the university community by responding to medical and mental health emergencies and run trainings