Tairan Xi

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Education

University of Alberta — Edmonton, AB
Bachelor of Science in Computer Engineering- Software Engineering Coop — *Sep 2022 – Apr. 2027*

Experience

Undergraduate Research Assistant| *TensorFlow, scikit-learn* — Jan. 2025 – Apr. 2025
University of Alberta — *Edmonton, AB*

- Optimized slurry evaporation rate predictions and tailing pond simulations by developing machine learning models, including **TensorFlow**-based ANNs, **Lasso regression** with **scikit-learn**, and other neural networks, achieving significant improvements in predictive accuracy.
- Processed and analyzed large datasets through data cleaning, pipelining, and scaling using **pandas** and **NumPy**, ensuring high-quality inputs for modeling and enhancing data reliability.
- Conducted iterative training of ANN models with **TensorFlow** to improve stability and reduce randomness, achieving measurable gains in predictive performance and consistency.
- Developed and evaluated machine learning workflows, including data splitting into training, validation, and test sets using **scikit-learn**, while achieving high model accuracy and performance benchmarks.
- Participated in lab activities and field data collection focused on evaporation rate simulations and tailing pond optimization, contributing to real-world data acquisition and experimental processes with **empirical formulas** and **data augmentation techniques**.

Electrical/Software subteam member — Sep. 2023 – Apr. 2024
University of Alberta EcoCar Team — *Edmonton, AB*

- Implemented a modular ImGui-based user interface component for knob controls in C++
- Built C++ applications for multiple platforms using cmake
- extended the Imgui Library to render speedometers for the vehicle's telemetry interface.
- Proposed an energy diagram of the car for the Shell Eco-marathon competition.
- wrote tests and set up GitHub to automatically build and release code.
- Actively participated in outreach events aimed at sharing ecocar and discipline course information with the public, including high school and junior high school students.

Projects

Personal Website | *JavaScript, HTML, CSS* — Dec. 2023 – Present

- Developed and maintained a personal website showcasing my information from scratch with JavaScript, HTML, and CSS through independent learning.
- Integrated social media links, Incorporated Font Awesome icons for a modern and cohesive design, and displayed documents to enhance user engagement.
- Visualized GitHub data to show collaboration.

Face Recognition System | *Python, OpenCV API, Git* — Jun. 2024 – Present

- Developed a real-time face recognition system using Python, OpenCV, and face recognition library.
- Implemented an efficient face detection and recognition pipeline, capable of identifying multiple faces in video streams.
- Documented the project thoroughly, highlighting key challenges and solutions, and shared the source code on GitHub for public use.

Technical Skills

Languages: Java, Python, C/C++, JavaScript, HTML/CSS, Rust, VHDL, BASH, VBA
Frameworks: React, Node.js
Developer Tools: Git, Docker, VS Code, Visual Studio, PyCharm, IntelliJ, Eclipse
Libraries: Pandas, NumPy, Matplotlib, ImGui, OpenCV