Simon Marcotte

marcotte.s2010@gmail.com – linkedin.com/in/simoncmarcotte - simonmarcotte.app
Canadian Citizen, Vancouver BC

Engineering Co-op Program

EDUCATION

University of Alberta **Expected Graduation: May 2026**
BSc. Computer Engineering Co-op *GPA: 3.4/4.0*

WORK EXPERIENCE

Amazon Web Services (AWS) **May 2025 – Present**
Software Development Engineer Intern Vancouver, BC

- Selected to join AWS RDS Custom for Oracle team to build high-scale control systems for managing cloud databases.

General Fusion **January 2024 – August 2024**
Software Engineer Co-op Vancouver, BC

- Designed and deployed a Python based data acquisition system for 20+ fusion reactor diagnostics using Docker.
- Enabled remote server health visibility by integrating Kibana, Elasticsearch and Fluentd for system monitoring.
- Visualized 98.9% DSP accuracy with matplotlib and achieved 9x speedup by migrating from MATLAB to Python.
- Deployed a Flask-based REST API, tested with Pytest, to bypass legacy code to serve metadata to an ETL pipeline.
- Reduced server downtime by 50% by automating server setup with GitHub Actions CI/CD, Docker and Python.
- Processed and validated 20,000+ experiment entries via a scalable Python tool with MongoDB/MySQL.
- Managed project status and documentation in Confluence and Jira, using Agile to accelerate project timelines.
- Optimized Git version control to maintain clean, modular code, manage branches, and improve team collaboration.

University of Alberta **May 2023 – August 2023**
Program Instructor Edmonton, AB

- Created an automated discipline quiz tool used by 450+ students, sparking a dean-level curriculum initiative.
- Launched a Python Discord bot hosted on GCP, streamlining onboarding for 400+ engineering camp members.
- Led virtual engineering camp redesign, coordinating tasks and deadlines, advancing project schedule by 1 month.

PROJECTS

GPU Accelerated N-Body Simulation | GitHub | *C++, ROCm HIP, OpenGL*

- Simulated a 20k+ body space, accelerated using ROCm HIP on an AMD 7800 XT GPU, with OpenGL computer graphics.
- Achieved a 10x performance gain over the CPU version, improving number of bodies to 10,000 from 1,000.
- Displayed the simulation on a glfw window using OpenGL, with multiple galaxy simulations of force interactions.

GPU Fractal Speedup | GitHub | *C++, CUDA, ROCm HIP*

- Accelerated Mandelbrot rendering by 79x using CUDA and HIP, reducing runtime from 158s (CPU) to 2s (GPU).
- Increased image data throughput by over 80% by leveraging CUDA and HIP thread and block architecture.

16-Bit CPU Design | *VHDL, Assembly, Vivado, Digital Logic Design*

- Built a 16-bit CPU with FSM control and dual-ALU datapath, supporting SIMD and custom assembly instructions.
- Ran a custom key-based encryption program using an assembly-like instruction set to validate CPU functionality.
- Verified CPU entities with testbenches covering edge cases, arithmetic operations, and parallel SIMD workflows.

Stock Data Pipeline | GitHub | *Python, Airflow, Docker, GCP, Cloud Build, Flask*

- Built Airflow ETL pipeline loading 200k+ stock data points into BigQuery daily, capturing daily top gainer's max growth.
- Achieved 100% uptime on Flask API deployed via GCP Cloud Build, reliably handling 25+ daily data requests.
- Containerized the Airflow environment with Docker Compose and Astro CLI to ensure cross-platform compatibility.

SKILLS

Programming Languages: Python, C, C++, Java, SQL, MATLAB, CUDA, HIP, Bash, VHDL
Frameworks & Libraries: Kafka, Airflow, Flink, MongoDB, FastAPI, Flask, Pandas, Matplotlib, NumPy, Terraform
Tools: Linux, Git, Jira, Confluence, GitHub Actions (CI/CD), AWS, GCP, SQL, NoSQL, Excel, REST API, gRPC
Concepts: Backend Development, Software Engineering, SDLC, CI/CD, Microservices, Automation, DevOps, Agile