
Work Experience

June 2024 - **Software Engineer**, *Snowflake*, San Mateo CA

Ongoing *SQL Compiler Platform Team*

- Maintained and improved the quality of Snowflake's SQL compiler, which executes over 1 billion queries a day. Participated in a support rotation that involves triaging and resolving customer cases.
- Designed a mechanism to serialize query metadata into a **Protobuf** message as part of a project to create an API for the compiler, with the aim of reducing the developer effort required to extend it

Data Governance Team

- Led a project to design new SQL syntax enabling the application of multiple policies on a table, eliminating boilerplate code and reducing likelihood of human error when applying privacy constraints.
- Designed algorithms to enforce Join Policy semantics on the parse tree of a SQL query, reducing the manual effort required to sanitize data before sharing it
- Designed optimizations on query execution plans to increase the query flexibility while maintaining privacy guarantees, reducing the amount of rewriting required for a query to satisfy constraints

Aug 2023 - **Software Engineer - FPGA Compiler**, *Intel*, Toronto ON

- June 2024
- Enabled users to generate an Avalon-based **RTL** interface for compute kernels specified in **SYCL**
 - Created an FPGA-specific **LLVM** optimization pass in **C++** that improved performance by 15% on a standard **OpenCL** benchmark suite, by using scalar evolution analysis to narrow induction variables
 - Debugged complex issues across the hardware-software boundary, including investigating compiled binaries, LLVM IR, OpenCL runtime libraries, Quartus compilation pipelines, Modelsim simulations, and HAL functionality

Sep 2022 - **Software Engineering Co-op - SQL Compiler**, *Snowflake*, San Mateo CA

- Dec 2022
- Developed data privacy features at the **SQL** query engine level for Snowflake's cloud database platform
 - Added rules to an **ANTLR 3** grammar to enable managing data aggregation policies in **SQL**, enabling customers to share data while maintaining their users' privacy
 - Implemented compiler changes in **Java** to parse and generate code for applying policies to a table
 - Implemented changes to a custom **FoundationDB** layer to store information about policies

Jan 2022 - **Software Engineering Co-op - ML Compiler**, *Groq*, Toronto ON

- Apr 2022
- Increased neural network inference throughput by up to 20% by designing algorithms in **C++** to efficiently utilize hardware resources for common tensor operations (e.g. convolutions)
 - Created optimization passes in **C++** using the **MLIR** compiler framework to manipulate neural networks described in **ONNX** format
 - Created machine learning models in **PyTorch** to run end-to-end compiler tests and measure cycle-accurate performance when run on custom neural network accelerator hardware

Education

Sep 2018 - **University of Waterloo**, *Computer Engineering B.A.Sc*, Waterloo ON

Apr 2023 Graduated with distinction