

EDUCATION

University of British Columbia

M.Sc., Computer Science

Vancouver, BC
September 2020-August 2022

- Thesis: "Generalization bounds and size generalization for graph neural networks". Advised by Dr. Nicholas Harvey with input from Dr. Renjie Liao.

B.Sc., Double Major: Honours Computer Science, Major Statistics

September 2015-May 2020

- 4.33/4.33 GPA (Distinction). Honours thesis supervised by Dr. Nicholas Harvey.
- Undergraduate Hons. Thesis: "Restricted-dimension subgradient descent: asymptotic bounds on error".

EXPERIENCE

Google - Vertex AI Vector Search Software Engineer III Kirkland, WA | October 2023-Present

- Working on data ingestion pipelines for vector-embedding search indices for RAG systems for AI agents.
- Working on improving reliability of streaming updates to vector-embedding indices.
- Respond to and debug reliability issues with vector index data and serving during rotations.

Worked with: Java, Apache Beam (internal version), Google-internal metrics tooling, Google Cloud Platform

Google - BigQuery UI Software Engineer

Seattle, WA | Nov 2022-October 2023

- Worked on front-end components and model evaluation testing for the Gemini for BigQuery project.
- Designed and implemented the front-end components for a new column-level security feature in BigQuery.

Worked with: Typescript, Java

Google - BigQuery Geospatial Software Developer Intern

Vancouver, BC | Summer 2020, 2021

- 2021: Created BigQuery GIS S2Geography functions. Included design, implementation, and leading of customer discussions about their usage.
- 2020: Designed and implemented the DBSCAN unsupervised learning algorithm for geospatial data as a function in BigQuery, as well as the convex hull function.

Worked with: C++, Google BigQuery

Google - Earth Engine Software Engineering Intern

Mountain View, CA | Summer 2019

- Designed and developed a cloud application allowing users to query Earth Engine's repository of satellite images using the open Web Map Tile Standard.

Worked with: Python, Flask, Google App Engine, Java

Cockroach Labs Backend Engineering Intern

New York, NY | Summer 2018

- Improved the performance of a class of delete operations by a factor of 10 billion.
- Developed a workload simulator for testing the performance of a geo-distributed CockroachDB cluster.
- Introduced programming language features in CockroachDB for compatibility with PostgreSQL semantics.

Worked with: Go, Git

SELECTED PROJECTS

Direction-of-Voice filter

<https://github.com/AudioMLLab/dov-audio-filter>

- Created an application to filter undesired voice audio by using machine learning to eliminate the portion of audio originating from speakers not facing the microphone. Joint work with Abiramy Kuganesan.

Twitter Clustering Project

<https://emsal.me/blog/4>

- Conducted a machine learning analysis using Python and Julia.
- Implemented the DBSCAN clustering algorithm on a social network graph structure to identify distinct groups.

TECHNICAL EXPERTISE

- Areas of expertise:** Backend development, Frontend development, Database development, Geo-spatial computing, Machine learning
- Programming languages:** worked with: Java, Python, Typescript, C++, Go, Scala
have done projects and coursework in: Julia, R, Matlab, C, X86 Assembly, Racket
- Tools:** Version control systems (Git, Perforce), AI coding assistants power-use (Google Gemini CLI and code editor plugins), Linux command line