

# Emmanuel Sales

<https://emsal.me> | em@emsal.me

## EDUCATION

### University of British Columbia

M.Sc., Computer Science

- 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

- 4.33/4.33 GPA (Distinction). Honours thesis supervised by Dr. Nicholas Harvey.

• Undergraduate Hons. Thesis: "Restricted-dimension subgradient descent: asymptotic bounds on error".

Vancouver, BC

September 2020-August 2022

## 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
- Tools: Version control systems (Git, Perforce), AI coding assistants power-use (Google Gemini CLI and code editor plugins), Linux command line