

Jal Desai

 jal2003.github.io |  j9desai@uwaterloo.ca |  linkedin.com/in/jal-desai |  github.com/jal2003

Skills

Languages: C++, Python, Golang, Java, JavaScript, TypeScript, C, SQL

Frameworks/Libraries: React, TensorFlow, PyTorch, GDAL, GraphQL, Node.js, PostGIS

Infrastructure: AWS (Lambda, S3, DynamoDB), Kubernetes, Docker, PostgreSQL, Redis, GCP, Distributed Systems

Work Experience

BitGo

May 2025 – August 2025

Staff Software Engineer

Boston, MA

- Developing large-scale navigation platform with **C++**, **Golang** and **Kafka** to process geospatial data from **200,000+** sources and optimize routing algorithms for real-time path planning and navigation

1851 Labs

Sept 2024 – Dec 2024

Staff Software Engineer

Toronto, ON

- Built high-performance mapping visualization system with **C++**, **React**, **WebGL**, and **AWS**, serving **10,000** DAUs with real-time geospatial data rendering
- Engineered and implemented route optimization algorithms using **Python** and **PostGIS**, enabling intelligent path planning and **10x** performance improvements
- Refactored map data processing pipeline using **Golang**, **Flask**, and **AWS Lambda**, improving system capacity by **10%** and reducing latency for real-time navigation updates

Regional Municipality of York

Jan 2024 – Apr 2024

Staff Software Engineer

Newmarket, ON

- Spearheaded a geospatial data processing system for **2,000+** employees using **Python**, **C++**, and **React**, analyzing and visualizing location data from **300+** sources, improving navigation accuracy by **30%**
- Structured and normalized geospatial data schemas in **PostgreSQL** with **PostGIS** to enforce data integrity and optimize spatial queries
- Implemented a **CI/CD** pipeline using **GitHub Actions**, automating testing of mapping algorithms and improving efficiency through **30%**

DOZR

May 2023 – Aug 2023

Staff Software Engineer

Kitchener, ON

- Spearheaded a fleet location tracking system with **C++**, **Python**, and **AWS**, enabling real-time equipment location monitoring and optimizing routes by **50%**.
- Optimized geospatial database queries using **PostgreSQL indexing** and **Redis**, reducing routing algorithm execution time from **2.1s** to **400ms**.
- Automated **CI/CD** with **GitHub Actions** and **Kubernetes**, ensuring continuous integration of mapping features and cutting deployment time from **30** to **5 minutes**.

Avolta

Sep 2022 – Apr 2023

Staff Software Engineer

Toronto, ON

- Built a **React Native** mobile navigation app using **C++** backend for real-time vehicle location tracking with **GCP** for notifications, achieving **95%** user engagement
- Implemented routing optimization algorithms with **Golang**, reducing request latency by **60%** and enabling **2M+ route calculations/month**.
- Developed a **React dashboard** with map visualization for monitoring vehicle status and routes, streamlining user interactions and reducing UI latency by **50%**.

Waterloop - Design Team

May 2022 – Aug 2022

Staff Software Engineer

Waterloo, ON

- Led the development of a geospatial data processing system for **550+ transportation routes** using **Python** and **C++**, implementing high-performance pathfinding algorithms, and improving route optimization by **40%**.

Manulife - Waterloo Experience Accelerate

May 2022 – Aug 2022

Staff Software Engineer

Waterloo, ON

- Led a team of **4** developers to build a location-based application using **React.js** and implemented backend routing algorithms with **Python** and **Express.js**, creating an efficient navigation system that optimized travel paths by **35%**

Projects

NavigationAI  | C++, Python, TensorFlow, Geospatial Algorithms, Maps API

- Developed an intelligent navigation system using **C++, Python, and TensorFlow** for dynamic route optimization serving **50+ users**

MapOptimizer  | Golang, Python, PostGIS, Routing Algorithms

- Created a geospatial data optimization tool that processes and enhances mapping data for improved routing and navigation for **200+** users

Education

University of Waterloo

Sep. 2021 – Apr. 2026

Candidate for Bachelor of Mathematics, Computational Mathematics

Waterloo, ON

- **Coursework:** Algorithms, Data Structures, Distributed Systems, Cloud Computing, Geospatial Analysis, Machine Learning