# Rodrigo Anasco

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## Education

**Simon Fraser University** Burnaby, BC

*Bachelor of Science in Computer Science* *Expected Graduation - Fall 2027*

- Concentration in Artificial Intelligence
- **Relevant courses:** Machine Learning, Data Science, Systems Programming, Software Engineering, Data Communication, Data Structures and Algorithms, Database Systems, Visual Computing.

## Experience

**Software Coordinator** Aug 2025 – Present

*Enactus SFU - Unify Mobile App* *Burnaby, BC*

- Contributing to design & development of Unify, a mobile app supporting immigrant integration.
- Collaborated on **mobile optimization and deployment**, testing app performance using **Android Studio's Pixel 7 emulator** to simulate real-device conditions and evaluate runtime efficiency.
- Integrated Supabase for auth, database, and real-time data with **RLS security**.

**Software Developer** Feb 2025 – Present

*SubVision Robotics – Zima Project* *Burnaby, BC*

- Developed and implemented a **Coverage Path Planning Algorithm** using a Graph-Based Neural Network (GBNN) for a hull-cleaning robot.
- Created a robust **3D hull discretization pipeline** with Python, Trimesh, and KDTree, converting STL meshes into graph-based point representations.
- Implemented **obstacle detection** through plane fitting and geometric analysis for autonomous navigation.

## Selected Projects

**Panorama Builder** | *C++, OpenCV, CMake, FAST, Harris, SIFT, RANSAC* Oct 2025

- Developed a **feature-based image stitching tool** that generates seamless panoramas from overlapping images.
- Implemented **custom FAST and FASTR** corner detectors from scratch for robust keypoint detection.
- Integrated **SIFT descriptors** and **KNN + Lowe's ratio test** for accurate feature matching across images.
- Applied **RANSAC homography estimation** to align and warp images, producing geometrically consistent panoramas.

**EEG Insights** | *Python, MNE, Pandas, BIDS, Matplotlib* Sep 2025

- Developed a data translation and visualization pipeline to **convert EEG datasets into BIDS-compliant format**.
- Automated metadata extraction and harmonization for cross-study EEG analysis and visualization.
- Implemented signal preprocessing, **spectral filtering**, and artifact removal using MNE-Python.
- Generated interactive plots to analyze neural responses across participants, enhancing research reproducibility.

**Exploring Image Filtering** | *MATLAB, Fourier Transform, Canny Edge Detection* Feb 2025

- Explored the effects of **spatial and frequency-domain filtering** on image clarity and aliasing.
- Implemented **Gaussian, Sobel, and Difference-of-Gaussians (DoG)** filters to visualize edge enhancement.
- Demonstrated **anti-aliasing and downsampling** through controlled experiments on synthetic images.
- Compiled a detailed HTML report integrating Fourier spectrum visualizations and edge detection analysis.

**LearnVerse: Skill Trading Marketplace** | *React, Firebase, CSS, Google DSC Hackathon* Jan 2025 – Apr 2025

- Built a **full-stack web app** enabling users to exchange skills and knowledge in a marketplace environment.
- Implemented **secure authentication and real-time data sync** with Firebase Authentication and Firestore.
- Created features such as **skill posting, chat messaging, and notifications** using Firestore's live updates.

**Accident Report Webpage** | *HTML, CSS, JavaScript, Leaflet, LocalStorage* Mar 2025 – Apr 2025

- Developed a **map-based accident reporting system** using Leaflet for real-time incident visualization.
- Implemented **localStorage-based persistence** to retain accident data across sessions and ensure offline access.

- Integrated **MD5-hashed admin login** and role-based permissions for secure report management.
- Created dynamic report listings with create, edit, and resolve functionality, improving data clarity and usability.

**Simple Group Chat Server with Fuzzing Clients** | *C++, Sockets, Concurrency, CMake* Nov 2024

- Developed a **multi-client TCP chat server** in C++ ensuring consistent global message ordering.
- Implemented a **fuzzing client** that generates random traffic and logs synchronized broadcasts.
- Designed a custom **binary protocol and two-phase commit system** for graceful distributed termination.

## Leadership & Community Engagement

**Peer Educator** Aug 2023 – Apr 2024

*Fraser International College* *Burnaby, BC*

- Delivered one-on-one and group tutoring in computing and mathematics, fostering academic confidence.
- Created supplementary study materials and collaborated with faculty to improve student performance.

**Orientation Leader** Sep 2022 & May 2023

*Fraser International College* *Burnaby, BC*

- Led orientation activities for new students, providing guidance on academic and cultural adaptation.
- Organized campus tours and information sessions, improving student engagement and retention.

## Technical Skills

**Languages**: Python, C, C++, Java, JavaScript, TypeScript, MATLAB, SQL
**Frameworks / Libraries**: NumPy, Pandas, PyTorch, Scikit-learn, Trimesh, MNE, React Native (Expo), Node.js
**Tools**: Git, Docker, VS Code, Eclipse, Linux, High-Performance Computing (DRAC), Jupyter, Streamlit
**Skills**: Computational Modeling, Data Analysis, Signal Processing, Algorithm Design, Scientific Visualization
**Languages Spoken**: English (Fluent), Spanish (Fluent), French (Intermediate)