Axel Sanchez

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Education

University of Calgary, Master of Science in Electrical Engineering — September 2026 – April 2028
- GPA: N/A

University of Calgary, Bachelor of Science in Software Engineering — September 2021 – April 2026
- GPA: 3.4/4.0

Work Experience

Undergraduate Researcher, University of Calgary – Calgary, Alberta — September 2025 – Present
- Designed and implemented **BridgeMart**, a cross-chain data marketplace enabling trustless dataset listing, semantic discovery, and purchase using **LLM embeddings**, smart contracts, and off-chain storage
- Built a privacy-preserving data vending pipeline using encrypted datasets and embeddings on **IPFS**, anchoring integrity on-chain via cryptographic hashes
- Implemented semantic dataset retrieval by encoding tabular data and natural-language queries into a shared embedding space for similarity search

Software Engineer Intern, Microsoft – Vancouver, British Columbia — May 2025 – August 2025
- Implemented custom **CUDA** all-reduce for intra-node tensor parallelism on **NVIDIA H200** clusters; integrated as a **TensorRT** plugin with **NVLink/P2P** fallback in **C++**
- Built GPU communicators and kernel launchers in **C**; benchmarked against **NCCL** and optimized **GEMM** paths across **FP16/FP32**
- Translated peer-reviewed research into reproducible system designs and experiments in collaboration with AI research teams

Cloud Developer Intern, Aptum – Calgary, Alberta — May 2024 – April 2025
- Managed production infrastructure using **Terraform**, **Helm**, and **Kubernetes**; doubled throughput via optimized **Jenkins** pipelines
- Refactored monolith into **gRPC**-based microservices with **Spring Boot** and **MySQL**, improving performance by **66%**
- Authored DevOps documentation and onboarding runbooks to accelerate intern ramp-up

Software Engineer Intern, Sigma Foodservice – Calgary, Alberta — May 2023 – August 2023
- Integrated Copomex API using **C#/.NET** across **10,000+** locations, improving address accuracy by **80%**
- Built **Playwright** test suites and **Jenkins CI/CD** pipelines, reducing QA effort by **98.75%**
- Led sprint reviews with business stakeholders to align engineering scope and priorities

Leadership Experience

Full Stack Engineer, Agrivanna – Calgary, Alberta — September 2024 – April 2025
- Architected **RESTful microservices** in **Go** and **Spring Boot**; integrated a Gradient Boosting model for personalized health recommendations
- Productionized a time-series model in **PyTorch** from **Kafka** streams; deployed via **FastAPI**, **Docker**, and **Kubernetes**
- Led internal **Docker/Kubernetes** workshops to strengthen DevOps capabilities across the team

Backend Engineer, ReThread – Calgary, Alberta — September 2023 – April 2024
- Developed **TypeScript/Express** microservices with **Redis** caching; deployed on **AWS Kubernetes**
- Built a **PyTorch** CNN for fabric classification; containerized with **Docker** and deployed via **Jenkins CI/CD**
- Established Git workflows and CI standards to improve code quality and release velocity

Vice-President, Software Development — Student Energy UCalgary – Calgary, Alberta — September 2023 – April 2024
- Led a team of engineers to launch a **Next.js/TypeScript** web platform, increasing chapter engagement by **70%**
- Directed infrastructure automation using **AWS**, **Terraform**, and **GitHub Actions CI/CD**
- Owned hiring pipeline: conducted interviews, defined evaluation rubrics, and authored executive succession documentation

Frontend Engineer, Bandist – Calgary, Alberta — September 2022 – April 2023
- Integrated third-party APIs into a **Django/PostgreSQL** system serving **10,000+ MAU**; deployed on **GCP**
- Shipped a **Flutter** mobile app to iOS and Android with **99.95%** uptime
- Translated user feedback into production-ready UI/UX improvements

Projects

DeFi Stablecoin
- Engineered a decentralized stablecoin smart-contract system in **Solidity**, enabling algorithmic minting/redemption and maintaining a USD peg with exogenous **ETH** and **BTC** collateral on **EVM**-compatible networks
- Implemented automated unit/integration tests and security checks with **Foundry (Forge)** to verify correctness, reentrancy safety, and gas usage
- Automated deployments and network integrations using **Forge** scripts and reproducible workflows (ABI generation, address registry, verifications) across testnet/mainnet

Ride Sharing
- Architected a **microservices** platform in **Go** and **TypeScript** with an API gateway plus driver, trip, and payment services; containerized with **Docker** and

orchestrated on **Kubernetes**

- Built end-to-end ride matching, trip scheduling, and payment workflows: request intake, driver ranking/selection, trip state management, and transaction processing using **RabbitMQ** and **Stripe**
- Established **CI/CD** and environment automation using **Tilt**, Docker, and Kubernetes manifests to enable automated builds, blue/green rollouts, and horizontal scaling

ChoreShare

- Delivered a cross-platform roommate task app: **React/React Native** UI, **Spring Boot** services, and **PostgreSQL** persistence, improving shared household task management
- Secured authentication/authorization with **JWT** and role-based access controls (RBAC); enforced protected routes and data isolation
- Provisioned cloud infrastructure on **GCP** with **Docker**, **Kubernetes**, **Terraform**, and **Jenkins** to automate CI/CD and ensure high availability and autoscaling

The Last Show

- Launched a serverless web application with **React** (frontend), **AWS Lambda (Python)** (backend), **Terraform**, and **DynamoDB** to generate personalized obituaries via **OpenAI** and deliver audio with **Amazon Polly**
- Integrated **Cloudinary** for image/audio asset storage and streaming; implemented REST APIs to upload, retrieve, and play obituary media
- Defined **Infrastructure as Code (IaC)** in Terraform for Lambdas, IAM, storage, and VPC networking to enable repeatable, scalable deployments

Certifications

AWS Certified Cloud Practitioner, Amazon Web Services   May 2024

Microsoft Certified Azure Fundamentals, Microsoft   February 2025

Skills

Programming Languages: Python, Java, C++, C#, Go, JavaScript, TypeScript, SQL

Frameworks & Libraries: Spring Boot, .NET, Django, FastAPI, React, Next.js, Node.js (Express), GraphQL

Cloud & DevOps: AWS, Azure, GCP, Docker, Kubernetes, Terraform, CI/CD (GitHub Actions, Jenkins), Helm, Nginx

Databases & Messaging: PostgreSQL, MySQL, MongoDB, Redis, DynamoDB, Kafka, RabbitMQ

Architecture & Concepts: Microservices, REST APIs, Distributed Systems, Infrastructure as Code (IaC), System Design, MLOps

Tools: Git, Linux, Jira, Postman