Axel Sanchez

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Education

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

Experience

Undergraduate Researcher, University of Calgary – Calgary, Alberta   September 2025 – Present
- Prototyped an **AIoT data marketplace** using **Python**, **LangChain**, and on-chain smart contracts in **Solidity** and **Rust** to autonomously collect, preprocess, and tokenize IoT data for decentralized trade on **Ethereum** and **Solana**
- Allowed cross-chain interoperability with **LayerZero**, supporting multi-asset settlement (**SOL**, **ETH**, **BTC**) and unified on-chain e-commerce flows
- Devised privacy-preserving data vending mechanisms (inspired by FLMarket / Distributed Data Vending), optimizing gas usage and anchoring verifiable off-chain storage via **IPFS** and cryptographic proofs

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** all-reduce plugin with **P2P**/**NVLink** fallback in **C++**
- Built GPU communicators and kernel launchers in **C**; benchmarked against **NCCL** and tuned **GEMM** paths across **FP16**/**FP32**
- Synthesized peer-reviewed literature with internal constraints and translated findings into system designs and reproducible experiments in collaboration with research/AI teams

Full Stack Engineer Part-Time, Agrivanna – Calgary, Alberta   September 2024 – April 2025
- Architected **RESTful microservices** in **Go**, **Java**/**Spring Boot**; integrated a **scikit-learn** Gradient Boosting model to deliver personalized health recommendations
- Operationalized a supervised time-series model in **PyTorch** for livestock health prediction from **Kafka** streams; persisted features in **PostgreSQL** and shipped a **FastAPI** service as a **Docker** image on **Kubernetes**
- Mentored team DevOps by mentoring an engineer through hands-on **Docker**/**Kubernetes** workshops and deployment best practices

Cloud Developer Intern, Aptum – Calgary, Alberta   May 2024 – April 2025
- Administered production/dev environments with **Terraform** and **Helm** on **Kubernetes**; doubled processing throughput by orchestrating **Jenkins** cron pipelines
- Refactored a legacy monolith into **gRPC**-based microservices using **Java**, **Spring Boot**, and **MySQL**, improving scalability and boosting performance by **66%**
- Accelerated onboarding for new interns through stack documentation and DevOps runbooks, reducing time-to-productivity

Vice-President Software Development, Student Energy UCalgary – Calgary, Alberta   September 2023 – April 2024
- Launched an interactive chapter news web app with **Next.js**/**TypeScript**, increasing engagement by **70%** and stabilizing UI state with **Redux**
- Automated infrastructure provisioning and hosting on **AWS** using **Terraform** and **GitHub Actions CI/CD**, cutting deployment time and improving release reliability
- Directed chapter-wide hiring: led interviews for junior engineers, defined selection rubrics, and authored succession guidelines for future executives

Backend Engineer Part-Time, ReThread – Calgary, Alberta   September 2023 – April 2024
- Engineered **TypeScript**/**Express** microservices with **Redis** caching; reduced latency and deployed on **Kubernetes** in **AWS**
- Prototyped a **PyTorch** CNN for fabric classification; managed datasets in **Amazon S3** and shipped **Docker** images via **Jenkins** to Kubernetes
- Instituted Git workflows and **GitHub Actions** standards (branching, code review, CI), elevating code quality and delivery cadence

Software Engineer Intern, Sigma Foodservice – Calgary, Alberta   May 2023 – August 2023
- Integrated the **Copomex** API into location services using **C#** and **.NET** for **10,000+** locations, improving address accuracy by **80%**
- Delivered end-to-end tests and a **Jenkins CI/CD** pipeline for the eCommerce UI with **JavaScript** and **Playwright**, cutting QA effort by **98.75%** increasing deployment frequency
- Facilitated sprint reviews with business stakeholders, aligning scope and priorities through actionable feedback

Frontend Engineer Part-Time, Bandist – Calgary, Alberta   September 2022 – April 2023
- Integrated **Ticketmaster** and **Spotify** APIs into a **Python**/**Django** monolith, reducing registration friction and cutting development costs by **20%**; managed **PostgreSQL** and **GCP** hosting for **10,000+** monthly active users (MAU)
- Shipped a cross-platform mobile app in **Flutter**/**Dart** to the Apple App Store and Google Play; maintained **99.95%** uptime on **Firebase**
- Produced iterative **Figma** prototypes; synthesized user feedback into UI/UX improvements and developer-ready handoffs

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

Technical Skills: C, C++, C#, Java, JavaScript, TypeScript, Python, Go, Rust, PHP, Swift, Dart, SQL, Solidity, Distributed Systems, Microservices, API Design, MLOps, Parallel/GPU Computing, Performance Optimization, Data Structures, Algorithms, Azure, AWS, GCP, Blockchain, Kubernetes, Docker, Helm, Terraform, Kafka, RabbitMQ, MySQL, PostgreSQL, Firebase, .NET, Spring Boot, Express, Django, React, Next.js, Vue.js, Redux, Expo, Flutter, Vite, Tailwind, jQuery, Less, CSS, Framer Motion, gRPC, Prisma, JWT, PyTorch, CUDA, NCCL, Jenkins, GitHub Actions, Azure Pipelines, Azure DevOps, JUnit, Jest, Spock, Cucumber, Playwright, Git, Linux/UNIX, Atlassian, Jira, Trello, Figma, SAP, Agile, Ruby, SaaS, IaaS, PaaS, NPM, HTML, Confluence, Nginx, REST APIs, Ecmas, Mathematics, Statistics, PowerShell, Shell Scripting, Vim, Operating Systems, LLM, iOS, AWS DynamoDB, AWS VPC, AWS Lambda, GraphQL, Selenium, Version Control, Apache, Automated Tests, Cloud Computing, NoSQL, Software Development Life Cycle, Machine Learning, Mobile Development, UI Developer, Multi-Threaded, MacOS, TCP, UDP, Kotlin, Distributed Systems, Infrastructure as Code, Design Patterns, Project Management, Code Review, MongoDB, Flask, FastAPI, Fintech, Postman, AWS CloudWatch, AWS Secrets Manager, AWS Polly, Cloudinary, ChatGPT, Gemini, Claude, Grok, Ansible, Groovy, Grafana, Containerization, Distributed and Parallel systems, Natural Language Processing, UI Design, Golang, VueJS

Soft Skills: Analytical problem-solving, Technical communication, Leadership, Mentorship, Cross-functional collaboration, Initiative, Ownership, Empathy, Stakeholder management, Prioritization, Time management, Decision making, Conflict resolution, Adaptability, Accountability, Attention to Detail, Communication Skills, Content Management, Team Collaboration, Troubleshooting, Risk Management, Active Learning, Talent Development