Krish Arora

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Education

University of British Columbia — Vancouver, BC
Bachelor of Science in Mathematics (Science Co-op) — *Graduating May 2027*

- **Relevant Courses**: Artificial Intelligence, Machine Learning, Software Engineering, Data Structures & Algorithms, Object-Oriented Programming, Computer Systems, Relational Databases, Statistics, Probability

Work Experience

Software Developer Co-op — January 2026 – April 2026
National Research Council Canada — *Saskatoon, SK*

- Built a digital research platform solo from scratch for **205 NRC researchers**, consolidating scattered documents, spreadsheets, drives, and email threads into one system for structured lab records, versioned approvals, and attachments.
- Saved **7 hours/researcher/week** (pre/post survey) via structured templates, vocabularies, and full-text search.
- Captured **50,000+** tamper-proof audit events in 2 months via an **append-only audit trail** with immutable versioning.
- Eliminated unauthorized access across **180+** endpoints via a **SAML SSO** gateway with 4-tier role-based access.
- Cut documentation time by integrating **Azure OpenAI** (**GPT-4o-mini**) for content restructuring & metadata autofill.

Projects

Apex Go-Karting | ***Java 21, Spring Boot, Next.js, Kafka, Terraform, AWS (ECS, RDS, ALB)*** Repo | Demo

- Delivered a production-ready go-karting venue booking system solo, taking it from design to a live deployment where customers reserve slots online, scheduling conflicts are prevented in real time, and bookings trigger notifications.
- Sustained **98.7%** booking success at **100 concurrent users**, by eliminating race conditions with **optimistic locking**.
- Guaranteed at-least-once event delivery with zero dual-writes, by implementing the **Transactional Outbox** pattern.
- Provisioned production **AWS** stack (ECS Fargate, ALB, RDS, Secrets Manager, CloudWatch, IAM) using **Terraform**.

ModelOps | ***MLflow, FastAPI, CatBoost, Prometheus, Grafana, Docker, GitHub Actions*** Repo | Demo

- Built a self-managing machine learning system that trains, tests, and deploys a credit card default prediction model on a weekly schedule with no manual intervention, including live experiment tracking and production drift monitoring.
- Reached **75% accuracy** and **0.53 F1** on 30K records, by tuning **CatBoost** with Bayesian search and **SHAP** analysis.
- Cut deployment to zero manual steps across **52 retraining cycles**, by gating **GitHub Actions** promotion on F1 score.
- Surfaced model decay before it reached users, by instrumenting **4 Prometheus** metrics on a live **Grafana** dashboard.

Image Processor | ***C++20, WebAssembly, TypeScript, CMake, Emscripten*** Repo | Demo

- Built a browser-based image tool that lets users paint animated flood-fill effects on any image and export as animated GIFs, running fully in the browser with no server, no software installation, and instant drag-and-drop usability.
- Eliminated main-thread blocking, by off-threading **WASM** work to the **Web Worker** via Transferable ArrayBuffers.
- Shipped a **27.7 KB** self-contained **WASM** binary with no runtime deps, by compiling **C++20** via **Emscripten** LLVM.
- Validated cross-platform correctness, by running **Catch2** unit and golden-image tests through **GitHub Actions** CI.

DreamCar | ***Next.js, TypeScript, PostgreSQL, Prisma ORM, OpenAI API, Redis, TailwindCSS*** Repo | Demo

- Built a car recommendation app that asks users **28** plain-English lifestyle questions instead of car specs, then returns a personalized ranked shortlist with AI-generated explanations of how each match fits their needs and compromises.
- Delivered ranked recommendations in **sub-100ms**, by scoring via weighted SQL queries and **Redis** preference caching.
- Maintained zero downtime during API outages, by building a fault-tolerant **LLM** client with primary/fallback routing.
- Caught zero regressions across the entire app, with **Vitest** unit, **Playwright** E2E, and server-side **Zod** validation.

Technical Skills

Languages: Java, Python, C++, TypeScript, SQL
Databases: PostgreSQL, MySQL, MongoDB, Redis, Firestore
Cloud & DevOps: Amazon Web Services (AWS), Terraform, Docker, Git, GitHub Actions, CI/CD Pipelines
Testing: JUnit, Pytest
AI/ML: Machine Learning (ML), Large Language Models (LLMs), OpenAI API, Gemini API, Agentic Workflows
Other: Apache Kafka, Prometheus, Grafana