Akshat Kalra

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Education

University of British Columbia — Vancouver, BC
BSc Statistics with Thematic Concentration in Computer Science (Co-op) — *Expected Graduation : May 2027*

- **GPA : 83.6% | Dean's Honour List**
- **Awards:** Faculty Of Science International Student Scholarship (2024) **[CAD 7,000]**, Outstanding International Student Scholarship (2022) **[CAD 10,000]**.
- **Relevant coursework:** Software Construction (**91%**), Models of Computation [Discrete Mathematics] (**93%**), Probability (**91%**), Statistical Inference (**89%**), Computer Systems (**88%**), Introduction to Data Science (**88%**)
- **Hackathons & Case Competitions** **UBC WiDS Case Competition Winner (1st Place)**, **nwPlus HackCamp 2024 (Mentor)**, **UBC CIC x AWS Gen AI and Sustainability Hackathon 2024 Winner (3rd Place)**

Technical Skills

Languages: C, C++, Java, JavaScript, TypeScript, Python, R, Racket (Dialect of Lisp), Assembly
Web: Next.js (ReactJS), Node.js, Express.js, Flask, MongoDB
Machine Learning: Scikit-learn, NumPy, Pandas, OpenCV
Developer Tools: Docker, AWS, Git, GitHub, LaTeX, Postman, Linux, ROS2, Ngrok

Experience

Software and Firmware Co-Lead — Vancouver, BC
UBC Subbots [Engineering Design Team] — *Sep 2024 – Present*

- Contributing to the development of an **autonomous underwater vehicle** (AUV) for the annual **RoboSub competition** in California.
- Currently leading the development of a **perception system** for the AUV by integrating a **custom computer vision model** for real-time **underwater object detection**.
- Using **ROS2** as the communication framework and writing the integration code in **C++**.

Undergraduate Teaching Assistant [Computer Science and Philosophy] — Vancouver, BC
University of British Columbia, Vancouver — *Sep 2023 – Present*

- Current **Teaching Assistant for CPSC 121 - Models of Computation** [Discrete Mathematics], focusing on **proofs**, **combinations logic circuits**, **functions and sequential circuits** and **finite state machines**, and **2x TA for PHIL 220 - Symbolic Logic**, covering **first-order logic** and **proofs**.
- **CPSC 121**: Led a weekly discussion section and co-led 2 lab sections, facilitating students' understanding of discrete mathematics and computational theory.
- **PHIL 220**: Held 2 hours of office hours weekly to support students. Graded 200+ exams and assignments with detailed feedback on logical proofs and reasoning.

Technical Projects

Tranquilo | Next.js, SQLite, Flask, Ngrok, RESTful APIs, BERTopic, RAG — Jan 2025

- An **AI-powered mental health journal** that provides therapist-like responses to journal entries.
- Featuring **Retrieval-Augmented Generation**, **Vector DB's**, **BERTopic topic modeling**
- **Fully locally hosted backend architecture** (including [**Llama 3.2**]) ensuring data privacy and security.
- Deployed **5+ Flask APIs**, leveraging **Ngrok** to enable temporary public accessibility for testing and integration purposes.

Predicting Revenue Impacts of Vancouver's Airbnb Policy | Scikit-learn, Pandas, NumPy — Nov 2024

- **Won 1'st Place Overall** at the **UBC WiDS Case Competition @ UBC**.
- Developed an end-to-end **machine learning pipeline** using the **scikit-learn** library (**Python**) , reducing **Mean Squared Error** from **1,638,519.88 to 1,189,222.25**, a **27.4% improvement** over the baseline model.
- Leveraged **feature engineering**, exhaustive **hyperparameter search** and **recursive feature elimination** to boost predictive accuracy and enhance model interpretability.
- Published a comprehensive **Medium article** detailing the approach, results, and insights drawn from the analysis.

Eco-Circle | **Hackathon Winning Project** | AWS, Next.js, Python — Oct 2024

- **Secured 3rd out of 75+ participants** at the **UBC CIC x AWS Gen AI and Sustainability Hackathon**.
- An AI-powered marketplace promoting sustainable buying and upcycling, leveraging the **Llama 3.1 70B Instruct model** for recommendations and **all-MiniLM-L6-v2 sentence transformer** from **Hugging Face** to perform the matching of seller and buyers using semantic search, built in a 12-hour hackathon.
- Integrated **4+ AWS services**—including **AWS Lambda** for serverless computing, **DynamoDB** for scalable data storage, **API Gateway**, and **Amazon Bedrock** for AI-driven upcycling suggestions, **Amazon S3** for image storage.