Navraj Bains

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EDUCATION

University of British Columbia Bachelor of Applied Science in Computer Engineering
GPA : 88% (A) Expected Graduation: May 2026

WORK EXPERIENCE

Mathematics Teaching Assistant ***University of British Columbia*** Jan 2023 - Present

- Administering multiple 1 hour weekly lectures to emphasize applications of integral calculus through active problem solving
- Grading and providing feedback on student's mathematical understanding through weekly written assignments
- Providing guidance and support to 120 students to encourage student collaboration and help build a strong mathematical foundation

Software Team Member ***UBC Subbots*** May 2022 - Present

- Programming with NumPy and LTspice to simulate circuits and analyze voltages to minimize error propagation
- Developing tools for robot navigation in ROS 2 and C++ on Ubuntu
- Collaborating with a team of 40+ engineers to create an autonomous underwater submarine

PROJECTS

Graphs, Games, and Interplanetary Travel

- Utilized **Java** to develop an abstract graph data type incorporating both an adjacency list and matrix representation
- Implemented algorithms such as Djikstra's shortest path and Kruskal's minimum spanning tree for disjoint and connected graphs
- Employed JUnit to generate a comprehensive test suite to ensure 90+% branch coverage and 95+% statement coverage

Rate My Professor Tool

- Led a project to build a probabilistic model in Java to accurately auto-complete reviews and utilize Bayesian analysis to predict a rating given a review
- Optimized time complexity to interpret training sets with 10,000+ reviews in less than 1 minute

RISC Machine

- Assembled a simple 16 bit CPU and testbench in **SystemVerilog** and ModelSim with a controller, datapath RAM, and registers over a 1 month period
- Ensured the CPU could interpret HALT, STR, LDR, and other ARMv7 instructions in less than 20 cycles
- Encoded various test instructions in ARMv7 using an assembler via SSH in Linux

Pub-Sub with Twitter

- Worked in a team of 3 to create a thread-safe messaging service in Java where users could subscribe to various theme, topics, and users on Twitter
- Interacted with Twitter API and implemented basic cryptography strategies such as password salting and **JSON** encryption

TECHNICAL SKILLS

- Java, Python, C, C++, Verilog, ROS 2, Linux, SystemVerilog, Quartus, LTspice, MATLAB

INTERESTS

- Soccer, hiking, basketball, swimming, reading, solving puzzles, volunteering