

Avinav Bhandari

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Seeking a 12-16 month position starting May, August or September 2025.


EDUCATION

- **University of Toronto** Toronto, Canada
B.A.Sc Computer Engineering Graduating May 2027
 - GPA: 3.7/4.0
 - Minor in Artificial Intelligence Engineering
 - Coursework: Computer Fundamentals (C), Programming Fundamentals (C++), Linear Algebra, Calculus, Engineering Strategies and Practices, Digital Systems (Verilog HDL), Computer Organization (Assembly), Computer Graphics (C/C++), Data Structures and Algorithms, Operating Systems, Probability

EXPERIENCE

- **Draft Party**  Remote
Full Stack Software Development Intern May 2024 - Aug 2024
 - Developed a daily game feature using Cloudflare Workers and Durable Objects, managing backend infrastructure for capable of scaling to 100s of players easily.
 - Created 20+ robust REST API endpoints with Typescript and Node.js, including thorough unit testing using Jest.
 - Designed and implemented a user dashboard as well as JWT login/signup flow on the frontend using Vue/Nuxt/Tailwind CSS/Typescript
 - Utilized version control (Git/Github) and project management tools (Jira) to ensure efficient development and collaboration.
- **Jr. Part-time Frontend Software Developer** Jan 2024 - May 2024
 - Developed interactive webpages for a draft-based team-building trivia game.
 - Implemented a website redesign from scratch, efficiently translating mock-up designs into functional frontend code using Vue/Nuxt, Typescript/JavaScript, HTML, and CSS.
 - Created adaptive and responsive web layouts that render effectively across various devices and screens, reaching over 800 players.
 - Implemented a brand new leaderboard page which brought new corporate customers immediately after releasing.
- **University of Toronto Aerospace Team - Rocketry Division**  Toronto, Canada
Avionics/Software Developer Sept 2022 - May 2024
 - Communicated with a team of approximately 20 people to develop avionics/software solutions to aid the successful launch of an experimental hybrid-fuelled rocket.
 - Developed a headless C/C++ Linux application that is responsible for driving signals to GPIO pins in order to actuate and read from different sensors in the fuelling system.
 - Led the development of a C++ backend application and networking solution that successfully parses thermocouple data and enables seamless data transfer over a small network.
 - Developed Python scripts to implement GPS/GNSS data parsing and storage functionality, enabling reliable live tracking and storing of position telemetry from the ground.
 - Successfully placed 3rd and 2nd at Launch Canada 2023 and 2024 competitions of over 30 university teams.

PROJECTS

- **Complete Breadboard CPU and Custom Instruction Set**  May 2024 - Present
Skills: Breadboarding, Digital Circuit Design
 - Designed a simple 8-bit CPU from scratch using only basic electronics (logic gates in ICs), showing a deep understanding of computer architecture.
 - Designed an ALU that includes an adder, subtractor, shifters, and simple logic operations, mirroring core functions of modern computers.
 - Implemented a memory system, register file, and program counter, allowing the computer to store and execute multi-step programs, just like commercial computers.
 - Wired ICs and other components on a breadboard to create a working CPU and variable-speed clock.
 - Created a custom 13-instruction with custom opcodes to be able to load and run programs.

- **Krumbz Recipe App: Recipe Searcher** [🔗](#)

May 2024 - Present

Skills: Golang, PostgreSQL, Typescript, React, React Native

- Created a recipe app where users can select ingredients they have and see recipes from a database of over 1000 that they can cook.
- Used React Native to implement an iOS and Android app.
- Used PostgreSQL to create and maintain a database containing data for more than 1000 recipes and capable of processing over 100 users.
- Used Go/Golang to create a REST API backend, maintaining 25+ endpoints, integrating with a PostgreSQL database, and implementing JWT authentication.
- Containerized backend using Docker Containers, and hosted on Google Cloud Run.

- **Rocket Projectile Simulator** [🔗](#)

Jan 2024 - May 2024

Skills: C/C++, Firmware/Embedded Systems Programming

- Created a physics-accurate projectile simulator disguised as a rocket game directly on a soft processor with no operating system using C/C++.
- Wrote custom drivers in C to drive a 640x480 60Hz VGA display with double buffering.
- Wrote custom drivers to interface with a keyboard using the PS/2 protocol.

- **Linux C/C++ OpenStreetMap GIS Mapper** [🔗](#)

Jan 2024 - May 2024

Skills: C/C++

- Design a city mapping application complete with a GUI and directions using over 2 million points of data from the OpenStreetMap API for 10+ different cities.
- Implemented a GUI with panning and zooming functionality that shows streets, street names, intersections, buildings, using C/C++ using the gtk graphics library on linux.
- Wrote a directions feature that implements Dijkstra's shortest path algorithm to give directions in a city between any two points

- **FPGA Human Benchmark Games Project** [🔗](#)

Sep 2023 - Dec 2023

Skills: Verilog HDL, SystemVerilog, FPGA Programming

- Designed an interactive game inspired by Human Benchmark games, focusing on reaction speed and a chimpanzee memory test, entirely in Verilog/System Verilog on the De1-SoC.
- Implemented double buffering and interfaced game data from the FPGA with a VGA display while integrating PS2 mouse input with the VGA display using Verilog.
- Enabled cursor functionality and improved user interaction by facilitating the visual experience.

SKILLS

- **Programming Languages:** C/C++, Javascript/Typescript, Go/Golang, C#/.NET, Python, Verilog, SystemVerilog
- **Web Technologies:** Vue/Nuxtjs, React/Nextjs, React Native, CSS/TailwindCSS
- **Database Systems:** SQL, PostgreSQL
- **Cloud Technologies:** Cloudflare Workers, Cloudflare Durable Objects, Google Cloud Run
- **DevOps & Version Control:** Git, Github, Docker