

# Avinav Bhandari

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



## EDUCATION

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- **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

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- **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 **RESTful** 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 responsive and interactive webpages for a draft-based team-building trivia game.
  - Implemented a website redesign from scratch, efficiently translating mock-up UI/UX 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

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- **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++*
  - Designed 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

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- **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