Rea Ahuja

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Education

University of Toronto — Toronto, Ontario
Bachelor of Applied Science in Computer Engineering — *Sep. 2022 – May 2027*

Experience

Undergraduate Researcher — May 2024 – Present
University of Toronto — *Toronto, Ontario*

- Designing and developing a versatile Voltage Source Inverter (VSI) for converting DC to AC power with high efficiency and low harmonic distortion, under the guidance of Professor Hamid Timorabadi.
- Implementing control algorithms to regulate output voltage and frequency for various applications, ensuring scalability and flexibility.

Undergraduate Researcher and Software Developer — May 2023 – January 2024
University of Toronto — *Toronto, Ontario*

- Spearheaded the development of a Visual Studio Code Extension for the first-year engineering programming course (APS105), under the guidance of Professor Salma Emara.
- Employed advanced technologies such as Typescript, REST APIs, MongoDB, Azure, and Git in the extension's development process.
- Conducting extensive research to assess the educational impact of the extension and actively exploring innovative approaches for project enhancement.

Projects

Discrete FFT Visualizer | *C++, DE1-SoC Board* — April 2024

- Developed a C program for the De1-SoC board to analyze and visually render the frequency spectrum of audio inputs or generated waveforms, providing an engaging auditory experience.
- Designed a graph drawing algorithm and program that integrated various peripheral devices, including a microphone, speaker, VGA display, PS2 keyboard, PS2 mouse, switches, keys, HEX display, and LEDs, enabling an immersive and interactive user experience.

HerWay Map — April 2024

- Developed a mapping application leveraging C++, EZGL, and Glade, incorporating Dijkstra's algorithm to generate optimal routes for safe night-time commutes tailored to female users, minimizing exposure to high-risk areas and maximizing security.

Music Box | *C++, Arduino* — June 2023

- Engineered an innovative music box, integrating C++, an Arduino Uno Board, a custom-designed PCB, and 3D CAD modeling techniques.
- *Awarded Bronze in the National SSCS Competition* for creating a unique musical instrument, showcasing engineering creativity and skill.

Technical Skills

Languages: C, C++, Javascript, Java, Python, Verilog, Assembly, MATLAB, SQL, HTML5, CSS3
Frameworks: React, Node.js
Databases: MongoDB
Developer Tools: Git, Azure, Google Cloud Platform, Visual Studio Code (VSC), VSC Extension API, Monitor Program, ModelSim, Quartus, PyCharm, IntelliJ
Hardware Platforms: Nios II Processor, DE1-SoC Board, Arduino, Raspberry Pi

Awards

First Year Summer Research Fellowship — 2023

Dean's Honour Roll (2) — 2023

Schneider Electric Canada Scholarship (2) — 2023