




# Sean Kim

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## EDUCATION

### University of Toronto

Sep 2021 – Present

*Bachelor of Applied Science in Computer Engineering*

*Toronto, ON*

- **cGPA: 3.84** / 4.0
- **Honours:** NSERC Undergraduate Student Research Award (2023), Dean's Honour List in All Semesters
- **Coursework:** Computer Fundamentals (C), Programming Fundamentals (C++, OOP), Digital Systems (FPGA, Verilog), Computer Organization (ARM Assembly, 16-bit Processor Design), Software Design and Communication (C++ GIS Design), Linear Algebra, Signals and Systems (MATLAB)

## EXPERIENCE

### Undergraduate Researcher Intern

May 2023 – Sep 2023

*iQua Research Group - University of Toronto*

*Toronto, ON*

- Evaluated **Strato**, an inter-cloud overlay network, by extending over **10** different **Rust** test functions to analyze **TCP** connection and metric transmission
- Developed a **WebSocket** server utilizing **Node.js**, integrating with a **Rust**-based dataplane for increased data processing speed and transmission efficiency by **120%**
- Engineered an analytics dashboard for web and command line, using **Next.js**, **TailWindCSS**, and **Python**, providing real-time tracking and display of bandwidth from highest to lowest by per-node, per-link, and per-flow
- Devised a Max-min fairness re-router algorithm with **SciPy** linear programming and the **NetworkX** library, optimizing the lowest flow bandwidth by up to **300%**

### Full-stack Web Engineer

Jul 2022 – Present

*UofTHacks*

*Toronto, ON (Remote)*

- Developed the website and dashboard for the **Canada's first student-run** hackathon, UofTHacks X, benefiting over **600+** hackathon participants with seamless access
- Utilized Atomic Design with **React.js**, **Next.js**, and **stitches.dev**, resulting in a **20%** reduction in file size

## PROJECTS

### CareerTrace | *React.js, Node.js, Express.js, MongoDB, Google OAuth 2.0, AWS*

2023

- Developed a responsive web app that effortlessly track user's job applications, monitor application stages, and keep a record of important interview dates, built with **MERN** stack and **Google OAuth 2.0**, deployed with **AWS**

### Aazami | *Qualcomm Tiny ML Kit, Arduino Nano 33 BLE Sense, Edge Impulse, Neo Pixels*

2023

- **MakeUofT 2023 Winner** of Most Innovative Power Efficient Hack using Tiny ML Kit
- Created an innovative voice recording device, utilizing **Tiny ML Kit**, **Arduino Nano 33 BLE Sense**, and **Neo Pixels**, to aid individuals with dementia, which captures and replays the last **10 seconds** of audio upon recognizing the voice command, "I forgot," using a Machine Learning (UMAP) voice recognition system

### OTFMap | *C++, GTK, Glade, EZGL, OpenStreetMap API*

2023

- Developed a functional GIS application built with **C++** (STL) and **OSM API**, along with a customized database
- Implemented **Dijkstra**, **Parallel Dijkstra**, and **A\*** algorithms for optimized path-finding in **20** different cities and Travelling Courier Problem, surpassing all TA algorithms in travel time and ranking within **top 10%** of the class

### 16-bit Processor | *Verilog HDL, ARM v7 Assembly, ModelSim, DESim*

2023

- Developed a **16-bit** architecture processor with **8** registers using **Verilog**, enabling execution of various instructions including mov, movt, add, sub, ldr, str, and b
- Employed tools including **ModelSim** and **DESim** to rigorously test the processor's functionality

## TECHNICAL SKILLS

**Languages:** C, C++, Python, HTML5, CSS3/SCSS, JavaScript (ES6+), Rust, ARM v7 Assembly, SQL, MATLAB

**Technologies:** React.js, Redux, Next.js, Node.js, Express.js, MongoDB, PostgreSQL, MySQL, Git/GitHub, Docker, Vim, tmux, Valgrind, GTK/Glade

**Others:** Verilog (HDL), ModelSim, NI MultiSim, FPGA/Intel Quartus Prime, DE1-SoC Boards, WebSocket, TCP/IP Networking, Data Structures and Algorithms