# Sean Kim

Toronto, ON, Canada

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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, 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 ML pipeline 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%**
- Wrote a comprehensive paper on the above rerouter algorithm and linear programming, applying complex equations and visualizations with precision, using **LaTeX** and **Overleaf**

**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

**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 **Djikstra**, **Parallel Djikstra**, 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

**TrackTC** | *React.js, Node.js, Express.js, MongoDB, TTC API* 2022

- Developed a responsive web app that alerts commuters of potential TTC and bus delays via email reminders and real–time transit information to users, built with **MERN** stack and **TTC API**

## 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, 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