

Nicholas McKee

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EDUCATION

Honors Bachelors of Science in Computer Science, University of Toronto

September 2021 - June 2025

Cumulative GPA: 3.72/4.0

Awards: Deans List Scholar 2021-2025, New College Council In-course Scholarship.

Relevant Coursework: Algorithm Design and Analysis, Deep Learning, Operating Systems, Computer Architecture, Database System Technology, Compilers and Interpreters, Computer Graphics, Computer Vision, Computer Security.

SKILLS

Languages: Python, Java, C, C++, Rust, Go, R, JavaScript/TypeScript, HTML/CSS, SQL

Libraries & Frameworks: NumPy, Pandas, PyTorch, OpenCV, LLVM, Django, Express.js, React, Vue.js, Node.js, SvelteKit.

Tools & Platforms: Git, GitHub, Docker, AWS EC2, Bash, Postman, Linux, PostgreSQL, MySQL

EXPERIENCE

Research Assistant

September 2024 - December 2024

University of Toronto

Toronto, ON

- Working in a team of 7 in creating a **Rust**-based pedagogical **operating system kernel** for use in the University's operating systems curriculum.
- Implemented POSIX system calls as part of a team of three, ensuring compatibility with **UNIX** standards.
- Created a standard library for both **Rust** and C binaries to help facilitate system call execution for user programs.

Web Developer, Competition Organizer

April 2023 - Present

Speedcubing Canada

Toronto, ON

- Created a user-friendly full-stack app with a **React** fronted and **Flask** backed to help participants easily find and register for local competitive Rubik's cube-solving competitions.
- Created powerful searching features to make it easier for users to find relevant cubing competitions within their geographic area.
- Redesigned Speedcubing Canada's existing website to be **responsive** and easily navigable on mobile devices.
- Assisted in organizing over **30+** day-long events with up to **300** participants each, with over **\$100,000** in revenue.

STEM Education Director

May 2022 - August 2022

Griswold Scout Reservation

Gilmanton Ironworks, NH

- Led a team of 4 instructors in teaching science and engineering concepts to **over 2000** scouts aged 12-17.
- Designed and developed new curriculum and engineering projects including lessons on CAD software and 3D printing.

PROJECTS

MiniC | C++, ANTLR, LLVM, CMake

- Developed a compiler frontend for a subset of the C99 standard, leveraging the **LLVM** compiler infrastructure.
- Implemented support for fundamental data types and control flow structures including **array types and recursive function calls**.
- Designed and integrated a custom **symbol checker**, providing detailed error reporting to the user.
- Created a machine-independent **intermediate representation (IR) optimizer** that improves executable efficiency across a series of benchmarks by **10%**.

Cubing Competition Forecaster | Vue.js, Rust, WebAssembly, Typescript, TailwindCSS

- Created a web application to predict a competitor's odds of winning competitive Rubik's cube competitions by simulating competitions with predicted results, achieving a validation accuracy over **75%** and a **top-3 error rate** of less than **5%**.
- Designed custom prediction model written in **Rust** with **SIMD acceleration**, to run **over 200,000** simulations per second in the browser.
- Created a responsive frontend UI with custom **data visualizations** to display simulation results and statistics, using **Vue.js**.
- Attracted high user engagement within the Speedcubing community, averaging over **20,000** page views, and **over 1,200** unique visitors per month.

One on One | React, Django, Python, TypeScript, Bootstrap CSS, PostgreSQL

- Led a team of 4 students to create a **full-stack web application** to help users easily schedule online meetings with each other.
- Created a responsive client-side web app using **React** which communicates via a **RESTful API** with a **Django** backend.

MISC

Work Authorization: Dual Citizen of USA & Canada

World Cube Association (WCA): Member of the WCA Appeals Committee, the highest board of appeal, tasked with resolving regulation and disciplinary disputes within the organization.