

# Gulkaran Singh

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## EDUCATION

### McMaster University

*Bachelor of Applied Science in Computer Science, Minor in Business*

Sept 2022 - Apr 2026

**GPA: 3.95/4.0**

- **McMaster Award of Excellence:** final admission average in the top 10% of the Engineering faculty
- **Related Coursework:** Data Structures & Algorithms, Databases, Computer Architecture, Operating Systems, Concurrent Systems, Computer Networks, Compilers, Applied Cryptography, Statistics

## EXPERIENCE

### Scotiabank

Jan 2024 - Apr 2024

Toronto, ON

*Software Developer Intern*

- Designed frontend components and backend systems for **3+ projects** leveraging **C#, Vue.js, SQL, Javascript, and jQuery** for capital market teams through **agile** development.
- Centralized individual trade floor visitation requests into a bulk import/approval dashboard, using **ClosedXML, SQL, and Vue.js**, increasing processing speed by **70%**, enabling faster response times.
- Developed a condensed, editable dashboard that merged new operational resilience workflows into an existing system by leveraging **SQL transactions** and **rollbacks**, reducing data processing time by **50%**.

### Canada's Wonderland

Apr 2023 - Aug 2023

Vaughan, ON

*Software Engineer Intern*

- Optimized scheduling processes for **1,000+ employees** by configuring **AWS elastic load balancers** to handle **concurrent requests** for computationally heavy scheduling tasks, reducing latency by **300%**.
- Implemented **k-means clustering** alongside a **CNN in Python** to analyze social media posts based on captions and comments to provide actionable insights to the marketing department.
- Engineered an efficient backtracking algorithm that adheres to shift times, breaks, certifications, and unexpected call-ins, resulting in a **300% improvement** in supervisors' workflow efficiency.

### ByteKode Hackathon

Apr 2021 - Aug 2022

Toronto, ON

*Event Organizer*

- Organized and facilitated two successful **non-profit hackathon events** for novice programmers, introducing **200+ attendees** to basic programming concepts such as API usage and JSON parsing.
- Secured **sponsorships** from **12+ organizations**, contributing to a **prize pool of \$22,755** for participants.

## PROJECTS

### Fluid Simulation Engine | Rust, Bevy, Cargo

- Engineered a real-time 2D fluid simulation in **Rust** using the **Bevy** game engine, implementing Smoothed Particle Hydrodynamics (SPH) for 1,500+ particles with density estimation, pressure forces, spatial grid optimizations and elastic collisions.

### Handtex - AI Image Detection | Python, React, Typescript, TensorFlow, OpenCV

- Designed a convolutional **neural network** with **TensorFlow**, utilizing **machine learning** to achieve a **97% accuracy** in predicting mathematical symbols from images, integrated into a **React** and **Flask API** app.

### Markdown Documentation Site | AWS (S3, DynamoDB, Lambda, API Gateway), React, Typescript, Next 13

- Created a dynamic documentation site with **CI/CD automation** with **Next 13** and **AWS** for seamless file upload to **S3** and synchronization with **DynamoDB** to showcase completed LeetCode problems.

## TECHNICAL SKILLS

**Languages:** Python, JavaScript, C#, Java, Typescript, SQL, C, Rust, C++, HTML, CSS, LaTeX, MATLAB, R

**Libraries & Frameworks:** React.js, Vue.js, Next.js, Node.js, Three.js, jQuery, Bootstrap, Tailwind CSS, ASP.NET, Spring Boot, Flask, Tensorflow, Socket.IO, Bevy

**Data:** PostgreSQL, Microsoft SQL Server, Firebase (Firestore), MongoDB

**Cloud:** AWS, S3, DynamoDB, Lambda, API Gateway, ELB

**Other:** Docker, GitHub Actions, Linux, Git, Postman, MS Office (Excel, Outlook, Teams, Word, PowerBI)