

# Mahad Hassan

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## EDUCATION

### McMaster University

Honours Software Engineering Co-op, B.Eng (3.9 GPA)

May 2027  
Hamilton, CA

- Achievements: Entrance scholarship for exceptional performance | 2<sup>nd</sup> Place at MacEngComp 24' | Finalist at MacEngComp 23'
- Courses: Data Structures & Algorithms | OOP (Java) | Development Basics (C, Git, Bash) | Math in Python | Linear Algebra
- Leadership: Events VP, MacPSA | VP Operations, Voices at Mac | Attendee Relations Exec, DeltaHacks | Website Dev, MacSES

## TECHNICAL SKILLS

**Languages:** Python, Java, C/C++, JavaScript, TypeScript, SQL, MATLAB, Bash, Verilog, Latex, Markdown, YAML, UML

**Web Dev:** HTML, CSS, React.js, React Native, Tailwind CSS, Node.js, Django

**Technologies & Tools:** Visual Studio Code, PyCharm, Jupyter, GitHub, Confluence, Jira, Firebase, Maven, Vim, NoSQL, GIT, Anaconda, Putty, AWS, TensorFlow, Matplotlib, NumPy, Pygame, Pandas, DataDog, KPOW, Apache Kafka Topics, Astro

**Other Skills:** AutoCAD, MS Office, Quanser, Social Media Marketing, Computer Assembly, Management, Data Analysis

## EXPERIENCE

### Software Engineer Intern

TD Bank

May 2025 – August 2025  
Toronto, CA

- Developed **FRAM**, a microservice implementation in **Java/Spring** on **Azure** using **Kafka** for data transfer and async design
- Migrated **API client** processing to **non-blocking** calls, improving efficiency and delivering ~\$1M in annual cost savings
- Improved **CI/CD** by configuring GitHub Actions for **20%** faster deployments of **7 microservices** to the **PAT** region
- Updated **Terraform** configurations to support infrastructure **failover testing** in secondary environments

### Software Developer

McMaster iBioMed Society

January 2025 – Present  
Remote

- Developing a **mobile app** with **React Native** and **Firebase** to centralize **mental, physical, and financial support** for patients
- Implementing end-to-end **encrypted features**, including a **secure medical resume** section and **protected data storage**
- Designing an **accessible**, user-focused interface to **ensure privacy, data security, and seamless patient interaction**

### Cybersecurity Engineering Intern

Ras Laffan Power Company

July 2023 – August 2023  
Ras Laffan Industrial City, Qatar

- Designed and developed **DCS logics/graphics, controllers, I/Os, HMIs, and Historians** improving efficiency by **15%**
- **Updated Anti-Virus definitions**, increasing threat detection rates by **20%**, and completed **switch configurations** via **Putty**

## PROJECTS

### Cybersecurity System | Python (OpenCV, Flask, Cryptography), SQL, Git

2<sup>nd</sup> Place @ MacEngComp 24'

- Designed a security system combining **facial recognition**, a **password manager**, and **file encryption** to enhance data protection
- Leveraged Python and SQL to develop a solution within a **7-hour coding sprint**, securing **2nd place among 30+ teams**

### Portfolio | JavaScript (React, Node, Tailwind CSS)

- Developed a **full-stack** portfolio website with **React** and **Tailwind CSS** for the frontend showcasing skills and personal info
- Implemented a **Node.js backend** to handle server-side functionality for and support dynamic content features

### Digit Recognizer AI | Python (TensorFlow, Matplotlib)

- Built an **8-layer CNN** with **99.3% accuracy** on MNIST, trained on **60,000** grayscale digit images, and tested on **10,000**
- Used **Matplotlib** to visualize model predictions with confidence levels for each digit class, including probabilities

### Tic-Tac-Toe AI | Python (PyGame)

- Compiled an **unbeatable Tic-Tac-Toe AI** by implementing the **Minimax Function** using **Object-Oriented Programming**
- Used **PyGame** to enable gameplay against either a **human or the AI** through a **selectable game mode interface**

### C-View | C, Bash, Git

- Developed a versatile **C-based utility** to enhance images with filters like **grayscale, reflection, rotation, edge detection, and blur**
- Designed for low-resource environments, processing images up to **30% faster** than comparable tools with reduced memory use