

Ahmed Elzaria

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EDUCATION

McMaster University

Hamilton, ON

Bachelor of Engineering (B.Eng.) in Software Engineering (CO-OP)

Expected Graduation: April 2026

Coursework: Software Design I & II, Object-Oriented Programming, Data Structures & Algorithms, Databases, Software Engineering Practice, Requirements Engineering & Security Considerations, Computer Architecture, Digital Systems & Interfacing, Engineering Design II, Linear Optimization, Discrete Mathematics I & II, Statistics

Awards: Dalvi Family Research (\$6000), George and Nora Elwin (\$5000), McMaster Award of Excellence (\$3000)

EXPERIENCE

University of Quebec in Montreal (UQAM)

Sept 2024 – Present

On-Device NLP Research Assistant - Remote

Montreal, QC

- Continuing part-time work from my previous internship remotely while pursuing my Fall 2024 studies.

McMaster's Centre for Software Certification (McSCert)

May 2024 – Aug 2024

AI/NLP Software Engineer Intern

Hamilton, ON

- Spearheaded the development of **MindMend**, an AI-powered mental health journaling app, achieving cross-platform functionality on iOS and Android using **Vue.js**, **Quasar**, and **Capacitor**.
- Integrated and fine-tuned sentiment analysis models using **Hugging Face Transformers** and **TensorFlow**, improving sentiment classification accuracy by **15%**.
- Downscaled **MobileBERT model** to **28MB** while maintaining **90% F1 score** and under **300ms latency** by implementing dynamic quantization, optimizing it for on-device deployment.
- Designed an on-device AI solution that enhanced user privacy and reduced latency by **20%**, overcoming resource limitations on mobile platforms compared to cloud-based alternatives.

McMaster's Centre for Software Certification (McSCert)

May 2023 – Aug 2023

Compiler Optimization Research Intern

Hamilton, ON

- Developed a **pass microscope tool** to analyze LLVM optimization pass interactions, reducing Angha Project benchmark size by **99.6%** (1M to 3,600 C programs) for efficient analysis.
- Generated **transition graphs** with NetworkX and Matplotlib, enhancing code optimization insights and improving program clustering accuracy using scikit-learn by **15%**.
- Presented findings at the **McMaster Undergraduate Research Fair**, showcasing practical solutions for visualizing and understanding compilation processes.

PROJECTS

AI-Driven Lab Extraction API | *Python, FastAPI, Docker, OpenAI, LlamaParse*

Nov 2024

- Built a **RESTful API** to automate data extraction from scanned lab result PDFs for **healthcare providers**, reducing manual entry time by **90-95%** and processing documents in seconds.
- Engineered robust text parsing with the **LlamaParse API** to handle complex, scanned PDFs for **high accuracy**, even with noisy input, ensuring reliable results for healthcare applications.
- Designed for scalability and extensibility, enabling **seamless integration of new models** (e.g., **LayoutLM**) and additional document types to meet evolving needs in healthcare data management.
- Delivers up to **70% cost savings**, cutting costs from **\$500,000** to **\$150,000** per month for 1M lab results.

Rescue Mission | *Java, Apache Maven, JUnit, JSON, PlantUML, GitHub*

Jan 2024 – Mar 2024

- Designed and implemented a **rescue drone control program** to locate stranded individuals and identify optimal rescue points, integrating efficient battery management algorithms to maximize operation time.
- Applied **SOLID principles** and **GoF design patterns** to build a scalable, maintainable system, leveraging object-oriented design and robust unit testing with **JUnit** to ensure functionality and reliability.
- Used Agile methodologies, delivering an MVP within **2 weeks** and iteratively improving based on feedback.

TECHNICAL SKILLS

Languages: Python, Java, JavaScript, C, Swift, SQL, HTML/CSS, Matlab, Verilog

Developer Tools and Frameworks: Git, GitHub, Unix, React, Vue, Tailwind CSS, Figma, SwiftUI, FastAPI, Apache Maven, Docker, JUnit, Jupyter Notebook, Google Colab, R, PlantUML

Libraries: Pandas, NumPy, Matplotlib, NetworkX, HuggingFace Transformers, TensorFlow, scikit-learn, OpenAI