# Ahmed Elzaria

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## Education

**McMaster University** Hamilton, ON
*Bachelor of Engineering, Software Engineering CO-OP* *Sept. 2022 – Present*
**Relevant Coursework:** Software Design I, OOP in Java, Data Structures and Algorithms, Software Engineering Practice, Computer Architecture, Digital Systems & interfacing, Engineering Design II, and Discrete Mathematics I & II

## Experience

**Software Engineering Intern - AI/NLP for Mobile Applications** May 2024 – Present
*McMaster's Centre for Software Certification (McSCert)* *Hamilton, ON*

- Enhancing RESO, a suicide prevention app, with **NLP models** to improve user support accuracy and timeliness
- Leveraging **advanced libraries and frameworks**, including Hugging Face Transformers, Tokenizers, Datasets, TensorFlow, and Python data science libraries (NumPy, pandas), for **model training and fine-tuning**
- Developing a **benchmarking tool** to measure the performance of AI models for on-device usage
- **Deploying on-device AI to prioritize data privacy**, addressing mobile platform challenges for **iOS and Android** compared to cloud/server-based AI solutions

**Software Engineering Intern - Compiler Optimization and Visualization** May 2023 – Aug. 2023
*McMaster's Centre for Software Certification (McSCert)* *Hamilton, ON*

- Analyzed interactions and dependencies of **LLVM** optimization passes during compilation
- **Utilized pandas and NumPy** for data manipulation and analysis, and **scikit-learn** for clustering programs
- Created **transition graphs** using **NetworkX and Matplotlib**, aiding code optimization understanding
- Implemented a **pass microscope** tool to analyze and draw conclusions on specific pass interactions
- **Downsized Angha Project benchmark** from **1 million to 3600 C programs** for practical analysis
- Presented research at **McMaster Undergraduate Research Fair**

## Projects

**Maze Runner** | *Java, Maven, JUnit, JSON, Javadoc, UML, Git* Mar. 2024 – Apr. 2024

- **Prioritized Agile methodologies**, incorporating iterative and incremental approaches
- **Implemented key software engineering principles** and patterns including **SOLID, GRASP, and GoF**, along with effective **version control** and **project management via GitHub Projects**
- Developed algorithms for pathfinding and **shortest path discovery**, including **Tremaux, Righthand, DFS, and BFS**, with features for path verification and algorithm comparison
- Designed the application for **seamless algorithm integration** and provided performance comparisons

**Rescue Mission** | *Java, Maven, JUnit, JSON, Javadoc, UML, Git* Jan. 2024 – Mar. 2024

- Followed **Agile development lifecycle with iterative approaches over 2 months**, focusing on **requirements gathering, MVP development, feedback integration, testing, and deployment**
- Applied key software engineering techniques: **SOLID principles, GRASP and GoF design patterns, object oriented design, encapsulation, information hiding, and unit testing**
- Developed a control program for a rescue drone to locate stranded individuals, and identify rescue point
- Optimized commands for efficient battery use and control integrity, ensuring effective command execution

**Twitter Sentiment Analysis** | *Python, JavaScript, HuggingFace, TensorFlow* May 2024 – June 2024

- Developed a sentiment analysis project, **fine-tuning models with TensorFlow and HuggingFace libraries**
- **Achieved 91% validation accuracy** by fine-tuning on the Cardiff Twitter Sentiment datasets
- Improved model accuracy by over **10%** through robust evaluation techniques on sentiment classification tasks.
- Developed a tool to **benchmark models** on the web using **F1, accuracy, recall, and precision**

## Technical Skills

**Languages**: Java, Python, JavaScript, C, Swift, HTML/CSS, Elm, Assembly, Matlab, Verilog, Bash
**Developer Tools and Frameworks**: Git, GitHub, Apache Maven, JUnit, Linux, Unix, SwiftUI, VS Code, IntelliJ, Xcode, Jupyter Notebook, Google Colab, plantUML, SonarQube, PMD, Quasar, Capacitor, Figma
**Libraries**: pandas, NumPy, Matplotlib, NetworkX, HuggingFace libraries, TensorFlow, scikit-learn