

Mohammad Mahfooz

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Education

York University, Lassonde School of Engineering

Expected May 2025

Spec. Hons. Bachelor of Engineering, Software Engineering

Toronto, ON

- **Relevant Coursework:** Operating Systems, Embedded Systems, Unix/C, Data Structures & Algorithms, OOP
- **Overall GPA:** 3.8/4.0

Experience

Software Engineer Intern

May 2023 - Present

Ontario Teachers' Pension Plan

Toronto, ON

- Migrated internal chatbot from **Azure** Cognitive Services to Azure OpenAI **GPT-4** and developed internal tools: execute **SQL** queries with natural language for a low-code environment; call center transcription and insight extraction utilizing **Whisper** model in **Databricks**; Q&A with documents from vector embeddings, enhancing retrieval of relevant information.
- Designed application architecture with **Redis** cache for chat history storage and leveraged **Azure** Blob Storage with **Snowflake** for efficient data management improving response times by up to 200% for over 1300 employees.
- Deployed **HTTP/2 Flask** endpoints in **Azure Kubernetes** Service (AKS) for scalable container orchestration and implemented a streamlined CI/CD pipeline with **GitHub Actions**, **Jenkins**, and **AKS** to manage the chatbot.

Software Engineer Intern

Oct 2022 - Jan 2023

YURide

Toronto, ON

- Implemented app front-end using **SwiftUI**, utilizing features such as custom gestures and animations.
- Developed app back-end using **Swift**, implementing custom data models and using **Core Data** for persistent storage.
- Built scalable server-side infrastructure using **JavaScript** and **Node.js**, and utilized **MongoDB** for efficient storage and retrieval of large volumes of data. Created **RESTful** APIs utilizing **OpenAPI** specification for seamless communication with the client.

Individual Contributor

Open Source Software

- Contributed patches to various **Linux** kernel drivers, improving stability with different hardware configurations. Reviewed and updated legacy code to incorporate modern coding best practices and to make the code more efficient and maintainable.
- Aided in porting **Solaar** (an open source device manager for Logitech devices) from Linux to macOS and Windows.

Projects

Cobra | Rust, C, C++, LLVM

- Developed **Cobra**, a robust and expressive statically typed programming language with a syntax inspired by **Python**.
- Implemented **LLVM** frontend compiler components including the lexer, parser, IR builder, JIT compiler, and driver in **Rust**.

FPGA Pong | Verilog, Quartus, ModelSim

- Developed the classic Pong game using **Verilog** for the MAX 10 **FPGA**, using combinational logic for paddle and ball control, and leveraging sequential logic for managing memory elements, including score counters and game state transitions.
- Implemented **FPGA** specific logic for **VGA** display output, featuring horizontal and vertical synchronization signals and RGB color components, responsive player input mechanisms, collision detection algorithms, and a scoring system.

YorkU RMP | JavaScript, Node.js, GraphQL

- Developed a browser extension using **JavaScript** and **Node.js** to grab professor info (difficulty, rating, etc.) from RateMyProfessors and display it on VSB (Visual Schedule Builder) and the YorkU course portal.
- Implemented custom **GraphQL** schemas to pull professor data from the RateMyProfessors **API**.
- Received **1,000+** downloads across GitHub and the Chrome/Firefox Web Store.

Volunteer Experience

Team Lead

Sep 2017 – Jun 2021

VEX/FIRST Robotics #6977

Toronto, ON

- Oversaw controls development of the robot for the **Infinite Recharge** competition, using **C/C++**.
- Lead team to provincial semi-finals by developing autonomous strategy to help compensate for a low budget.

Technical Skills

Languages: Python, C, C++, Rust, Go, Java, C#, Verilog, JavaScript, TypeScript, Bash, SQL

Tools and Frameworks: Linux, CMake, GDB, ASan, Docker, K8s, Azure, Databricks, CUDA, Git, Flask, Quartus, Snowflake, Redis