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, Computer Organization, Embedded Systems, Digital Logic, Unix/C, DSA, OOP
- **Overall GPA:** 3.8/4.0

Experience

Software Engineer Intern — May 2024

NVIDIA — *Santa Clara, CA*

- Incoming Software Engineer Intern on the GPU Architecture team for Summer 2024

Software Engineer Intern — Jan 2024 - Present

Canada Life — *Toronto, ON*

- Developed a reference implementation for rapid microservice deployment on **AWS EKS**, utilizing **Spring** and **Kafka**, aiding in the transition from legacy monolithic services by reducing repetitive setup work for developers.
- Utilized **OAuth 2.0** for securing API calls, migrating from **Apigee APIM**, improving user security for 13,000,000+ clients.
- Implemented automated **GitLab** CI/CD pipelines for building, containerizing, and deploying microservices on **EKS**.

Software Engineer Intern — May 2023 - Dec 2023

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 transcription and insight extraction utilizing **Whisper** model on **Databricks** GPU cluster; 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.

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