Ali Aboelela

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Education

University of Toronto **Sep. 2019 – May 2024**
Bachelor of Applied Science in Computer Engineering *Toronto, ON*

Work Experience

JCA Technologies **September 2022 – August 2023**
Software Developer *Winnipeg, MB*

- Designed, developed, and tested ROS nodes. Nodes collect data from field operations & facilitate requests from a UI to command machinery using MQTT & REST.
- Collaborated with PM, team members, and occasionally client to identify requirements and assess feasibility and time-frames during sprint planning.

Reshift Media **June 2021 – August 2021**
Software Developer Intern *Toronto, ON*

- Assisted the fullstack team to resolve client facing issues & test new features. Worked mainly with firebase & node.js
- Wrote documentation to integrate HubSpot's CRM with existing middleware.

Projects and Activities

UTRA - Autonomous Rover | *C++, ROS, Docker* **September 2023 - June 2024**

- Wrote a text conferencing app in C using TCP sockets. Users connect to a server by passing its IP address & the port number. Once connected users can send messages and transfer files. File transfer was implemented using UDP sockets.

Capstone Project: ChatBot | *React, Flask, LangChain, Docker, sklearn* **September 2023 - April 2024**

- Built a ChatBot using React, Flask, LangChain, & OpenAI's LLMs. At the time, OpenAI had not yet released PDF upload functionality.
- The project addresses the problem of finding the best/most relevant "chunk(s)" of uploaded document(s) given a user query. Different algorithms attempted (greedy, probabilistic, random, etc.)
- Setup a pipeline for cleaning/formatting the input documents (tables, text); Fine-tuned the LLM on a custom set of financial data.

Smart Garden | *Arduino, C* **January 2024**

- Used an arduino, moisture sensors, a relay, and some water pumps to automatically water my plants when they get too dry.

University Project Highlights | *Python, C++, C Verilog, ARM* **2019-2024**

- **Software Engineering:** Worked in a team of 5 to develop a social media app for UofT students. React / Flask / Firebase was our tech stack. I worked primarily with flask and firebase. Additionally, contributed to the open source project Matplotlib as a part of this course.
- **Computer Networks:** Wrote a text conferencing app in C using TCP sockets. Users connect to a server by passing its IP address & the port number. Once connected users can send messages and transfer files. File transfer was implemented using UDP sockets.
- **Software Eng & Design:** Built a geographic information system using C++ in a team of 3. Geographic information was collected using the OpenStreetsMap API. Graphics were rendered using the GTK library. The GIS also provided pathfinding capabilities using Djkstra's Algorithm.
- **Intro to AI:** Wrote two simple image classifiers using CNNs in PyTorch. One classified cats/dogs, the other classified American sign language.
- **Computer Architecture:** Built a simple processor/FSM on the De-1-soc board in Verilog. Tested and debugged using modelsim. Developed the game Mastermind by reading from the board's key inputs and writing to the board's VGA display / memory using C.

Skills Summary

Languages, Tooling, Infrastructure: Python, C++, Haskell, Docker, Jenkins, Git, Atlassian
Embedded Development: ROS2, Gazebo
Full Stack Development: Flask, SQL (Psycopg2), Firebase/GCP
ML/Data Science: Numpy, PyTorch, sklearn, matplotlib, LangChain