Sambhav Khanna

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EDUCATION

University of Waterloo   Waterloo, ON
Candidate for Bachelor of Computer Science, Specialization in Artificial Intelligence   *Sep. 2022 – Arpil 2027*
- GPA: 3.94
- Relevant Coursework: Data Structures and Algorithms, Object-Oriented Programming, Sequential Programs, Computer Architecture, Statistics

TECHNICAL SKILLS

Languages: Python, TypeScript, JavaScript, C/C++, HTML/CSS
Frameworks: PyTorch, Numpy, Pandas, Langchain, LlamaIndex, Express JS, Next JS, Node JS, React JS, Flask
Developer Tools: Ollama, MongoDB, PostgreSQL, MySQL, AWS, GCP, Docker, Git, Linux, Azure

EXPERIENCE

Programmer Analyst   Sep 2023 – Dec 2023
Toronto Transit Commission   *Toronto, ON*
- Implemented preventive measures to protect against cyberattacks by developing an encrypted password management application using **React** and **SQL Server**; stored and managed **1000+** logins for **40+** databases.
- Migrated the application tech stack from **Tkinter** to React, using the **Electron JS** architecture to build the React code for desktop app, thereby decreasing the render time by **80%**.
- Containerized the application using **Docker**, reducing the build time from **5 minutes to 5 seconds** by using caching. Deployed the image on **Azure**.
- Optimized the query performance, enhancing the processing speed by **20%**. Built a robust SQL backend by implementing triggers and stored procedures for **15** relations.

PROJECTS

llama3 RAG (LLM) | *Python, Langchain, Ollama*
- Developed a **RAG** pipeline for Meta's llama3:8b model using Langchain and Ollama to pull the model locally.
- Used **ChromaDB** vector database to store the docs embeddings and Ollama embeddings to embed the docs.
- Tested the RAG model with PDF files containing tables and achieved successful response on **80%** of the prompts, asking about data entries of specific cells.

ChatrBox | *MongoDB, React, Express, Node JS, socket.io, nginx, Docker, AWS* ⦵
- Developed an end-to-end chat app using the **MERN** stack (**MongoDB** as database and **React** front-end).
- Implemented a real-time chat server using the **websocket** implementation provided by **socket.io** API.
- Implemented custom hooks and custom contexts using **React Context API** to avoid prop-drilling.
- Developed a client-side routing system using **React-Router-DOM** for smooth transition.
- Containerized the application using **Docker** and deployed the image on an **AWS EC2** instance.

Multi Layered Perceptron (MLP) | *Python* ⦵
- Developed a MLP from scratch without using PyTorch. Defined class to keep track of the gradient when arithmetic operations are applied.
- Created a functions to perform forward pass and back propagation through the neural network.
- Created training and testing datasets and trained the model in multiple batches, performing gradient descent on the loss function at each iteration.

COMPETITIONS

Joint Entrance Examination Advanced 2022 | *Ranked 5161 out of 155538*   Sep 2022
- Scored in the top **3.3%** of engineering students and got selected into the Indian Institute of Technology.

Joint Entrance Examination Main 2022 | *Ranked 3890 out of 1026799*   Aug 2022
- Scored in the top **0.43%** of engineering students.