Ismail Bennani

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Education

University of Toronto — Toronto, ON
Bachelor of Applied Science (BASc) in Computer Engineering, 3.86/4.0 GPA — *Sep 2019 – Apr 2024*

Professional Experience

Software Engineer Intern — May 2022 – Aug 2023
Intel Corporation — *Toronto, ON*

- Collaborated with the FPGA Device Modeling team to develop efficient **C++/Python** code to support Intel's Quartus Prime enterprise software.
- Optimized the runtime of a **C++ API** for IP block modeling by **60%**, through implementing a thread safe cache for SQL queries, resulting in a compilation time reduction of up to **20%** for customer designs.
- Designed and implemented a new **Python** class, adhering to **OOP** principles, to serve as a namespace for XML elements, effectively reducing the need for repetitive names by **10%** within the team's XML parsing tool.
- Spearheaded the **CppUnit**-based testing infrastructure for two subsystems and wrote **9** modular tests leading to a **90%** improvement in the team's unit test line coverage.
- Resolved outages for the team's test benchmarking web app built on **MongoDB, Flask** and **Cloud Foundry**, by finding and fixing **3** system architecture oversights.
- Modernized an internal development tool by successfully migrating over **5000** lines of code from Python2 to Python3 using the **python-future** library.

Founder — May 2023 – Present
Ask a Stock — *Toronto, ON*

- Co-founded and led the development of Ask a Stock, an AI-powered stock assistant that provides market insights through an intuitive chat interface, attracting **400** users within the first month of product release.
- Built a robust NLP pipeline in **Python** that fetches 10-K fillings via the **SEC API**, performs data cleaning/parsing of the content, and creates a semantic index using **OpenAI** embeddings and **Pinecone**.
- Designed a responsive **React** frontend that interfaces with scalable **Flask microservices** capable of streaming real-time answers from **ChatGPT API** to **4** concurrent users while utilizing only **0.1** CPU cores.

Projects

UrCiti Map | *C++, OpenStreeMap API, EZGL Graphics Library, Git*

- Created a **C++** geographical information system GUI to visualize and navigate the maps of **20+** major cities
- Used **OpenStreetMap API** to organize features such as roadways and points of interest into data structures
- Implemented a multithreaded A* algorithm to find the most optimal path between **2** given locations on the map

Find-It AI | *Python, PyTorch, NumPy, Google Street View API*

- Trained a computer vision model in **Python** to guess the city of a random Google Street View image
- Created a data sampling script to fetch **5000** images from **7** cities using **Google Street View API**
- Implemented transfer learning by using **AlexNet's CNN** to achieve a testing accuracy of **∼70%**

Artsy | *JavaScript, React, Node.js, Express, MongoDB, Cloudinary API, Heroku*

- Built a full stack web application that allows artists to draw and share art using **React**, **Express** and **MongoDB**
- Paired **MongoDB Atlas** with **Cloudinary API** to create a cloud based infrastructure for storing artist drawings
- Enabled client-server communication by writing a **RESTful API** made up of **15+** API routes in **JavaScript**

Splash Ball Shootout | *C, CPUlator, DE1-SoC board*

- Developed a **30 FPS** basketball shootout game, using **C** and double buffering, on the **DE1-SoC FPGA** board
- Coded realistic basketball features such as projectile motion and collision detection algorithms

Text Conferencing | *C, UNIX TCP, Git*

- Built a command line text conferencing application using **C**, **UNIX TCP** and synchronous I/O multiplexing
- Allowed up to **100** users to register, chat and create conference sessions on the server
- Broadcasted text messages to all clients that are participating in a conference room through server multicasting

Technical Skills

Languages: C/C++, Python, JavaScript, HTML/CSS, SQL (Postgres)
Technologies: React, Flask, Express, Node.js, NumPy, PyTorch, MongoDB, Git, Vim