Brian Li

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Skills

Programming Languages:	Python, C++, Java, HTML/CSS, Tailwind CSS, Javascript, Typescript, SQL, Dart
Frameworks:	React, NextJS, NodeJS, Flutter, Langchain, Pytorch, Tensorflow, Keras, Selenium
Tools and Technologies:	Git, Linux, AWS, Docker, Kubernetes, STM32, Arduino, Raspberry Pi, OpenCV, FPGA, FFmpeg, Whisper, ElasticSearch

Relevant Experience

Eon Media
AI/ML Developer Intern April 2024 - August 2024

- Spearheaded research and integration of **NLP** capabilities into **Elasticsearch cluster**, performed testing and deployment of both **TorchScript models** and **ingest pipelines**. Utilized models for **natural language understanding (NLU)** of input text and processing of metadata into **dense vectors** for **data querying**.
- Designed and trained a custom **binary classifier** from scratch to identify logos in images using **Convolutional Neural Networks** (**CNNs**) and **transfer learning** with the **ResNet50 model**. Achieved **93%** accuracy, improving the existing company classifier's performance by **45%**.
- Improved the company's text detection model through introduction of **text dewarping function**, leveraging a **Generalized Additive Model (GAM)** to calculate curvature and map points to perpendicular offset using Bresenham's algorithm; resulted in a **50%** improvement in recall rate and an **80%** reduction in runtime of pod.
- Facilitated **cloud deployment of pods** through **EKS clusters**, performed and optimized **containerization** of various pods and algorithms, reducing **docker image** sizes by **40%** and **resolving bottlenecks in pipeline.**

Wat.AI
Lead Neural Network Developer September 2023 - Present

- Led sub team of 3 in designing and prototyping **sparse** and **denoising autoencoders** using **PyTorch** and **Tensorflow** for compression of IoT cybersecurity data (CICIOT 2023); optimized draft autoencoders with practices like **exponential learning rate decays** and **learning curve analysis**
- Contributed in writing and updating team substack articles to highlight progress of team project; helped with the testing of **machine learning models** focused on cyberattack detection for IoT devices

Waterloo Formula Electric
Lead Firmware Developer September 2023 - Present

- Created hardware-in-the-loop (**HIL**) tests using **Python** to validate electric car components and determine expected behavior of unit and **RTOS**; utilized tools such as **STM32IDE**, **Virtual Box** and **Vagrant** to find translation between code and firmware input values
- Analyzed the Battery Management Unit (**BMU**) by stimulating its state of charge; conducted in-depth examination of **multithreading** firmware code in **C** and schematics to identify source variables and functions

Projects

"Spotify-Roots" — *NextJS, Tailwind CSS, Typescript, Flask, Spotify API, Genius API, Langchain, HuggingFace*

- Developed web application that outputs the **origins** of songs, albums, or artists selected by users. Text generation component was constructed using Langchain's **HuggingFace model**
- Application built with **OAuth2 protocol** for Spotify account logins, allowing users to import personal playlists for analysis. Application enhanced with added functionality of **predicting potential liked songs for users**

Data Visualization Software — *Java, JavaFx, CSS*

- Created a software that visualizes **real-time** data sheets in various graphic forms; data sheets are pulled from OurWorldinData with seamless **processing** of complex data
- Visualizations are **dynamic** and customizable based on user inputs and adjustments

"Sumo Car Bot" — *Python, Arduino, Raspberry Pi, HTML, Linux, Flask*

- Led a group of 4 in developing a fully operational miniature car capable of **autonomous navigation** and user control via a **Flask** hosted web server; organized and planned individual tasks for members
- Utilized **Arduino** and **Raspberry Pi** for the implementation of the embedded system; coded car functions within a **Ubuntu** environment using **SSH protocol** and **VIM**. Constructed with WHIMIS guidelines

Education

University of Waterloo Waterloo, ON
Candidate for Bachelor of Applied Science in Computer Engineering September 2023 - Present