John Liu

liuyuhengs@gmail.com | (403) 383-6907 | JohnlLiu | John Liu | Portfolio

Education

University of Waterloo *2021 – 2022*
Master of Engineering – MEng, Electrical and Computer Engineering
Specialization in Artificial Intelligence and Machine Learning

University of Waterloo *2015 – 2020*
Bachelor of Applied Science – BASc, Honours Mechanical Engineering (With Distinction)

Skills

Languages Python, C++, SQL, JavaScript/TypeScript, HTML, CSS, MATLAB
Libraries/Tools PyTorch, TensorFlow, Keras, Scikit-Learn, Pandas, Node.js, React, AWS, GCP, Docker, Kubernetes, Git, Linux

Experience

MIT-PITT-RW | **Software Engineer** *July 2022 – Present*
- Created an application using Python to generate vehicle race lines and velocity profiles for an autonomous racecar which enabled self-driving attacking and defending maneuvers at 150mph+ for various Indy Autonomous Challenge (IAC) competitions
- Designed data pipeline that allows for streamlined integration and use of large amounts of data for race line and velocity profile generation and used Plotly to create an interactive graph UI for ease of use and visualization
- Developed collision checking and path cost functions scripts in C++ as part of a vehicle path prediction controller resulting in better autonomous pathing decisions

Wyheng Technologies Ltd. | **Software Developer** *Sep 2020 – Aug 2021*
- Developed scripts in Python to automate and streamline performance calculations of various oil and gas piping equipment allowing for preliminary sizing calculation work to be done significantly faster
- Used Pandas and openpyxl libraries to build a ETL pipeline of oil and gas production data resulting in more organized databases that allowed for easier data analysis and use, leading to increased work productivity
- Tested existing software for bugs and performance, fixing bugs and revamping code to increase performance speeds by up to an additional 20%

Nytric Ltd. | **Product Engineering** *Jan 2018 – Apr 2018*
- Wrote a program using VBA to simulate touch screen performance and cost metrics which lead to the realization of a more cost-efficient solution allowing for more than a 50% cost reduction by using alternative components
- Developed a script to streamline company design procedures by automating product and CAD model revision change records
- Used SolidWorks macros to automate some 3D CAD modelling allowing for quick revision design changes of touchscreen enclosures

Projects

MLOps End-to-End: Mini GPT (Pytorch, Streamlit, Docker, Kubernetes (GKE), Google Cloud Build) *Feb 2023 – Apr 2023*
- Designed and built a text GPT model from scratch using a bigram language model capable of returning contextually generated text based on user input using Pytorch
- Created and deployed a chatbot web app from the GPT model using Streamlit which accepts a user input and returns a response like ChatGPT
- CI/CD through containerized deployments to GCP Kubernetes Engine and automatic build updates using Cloud Build triggers

Slime Artificial Life Simulation (NumPy, SciPy, Pillow) *Nov 2022 – Dec 2022*
- Used Python to create a swarm intelligence simulation to mimic the growth and development of slime mold
- Simulation created by defining thousands of agents controlled independently through a simple set of rules to interact using the principle of stigmergy resulting in the spontaneous emergence of organic behaviours and patterns
- Post processing using the Pillow library to allow for smooth visualization of the simulation even with low hardware specifications

Sentiment Analysis on Movie Reviews (Pytorch, Scikit-learn, Pandas, NumPy) *June 2022*
- Developed and trained an NLP model to predict and differentiate positive and negative movie reviews with high accuracy (87%)
- Preprocessed data using Bag of Words before using a Word2Vec approach to train a custom designed neural network using Pytorch
- Additional image classification on various data sets using custom CNNs and data analytics using Scikit-learn to perform PCA, K-means clustering, DBScan, and T-SNE