Charles Shi

shi46@illinois.edu | 612 - 986 - 0487 | Eden Prairie, MN
linkedin.com/in/cshi02 | github.com/CharlesShi12 | charlesshi12.github.io

EDUCATION

University of Illinois at Urbana-Champaign Expected May 2023
Bachelor of Science, Statistics and Computer Science GPA: 3.9/4.0

EXPERIENCE

Futurist Academy *Software Developer Intern* June 2020 - September 2020

Responsible for designing projects that utilize TigerGraph's graph database and presenting the finished projects to a group of businesses ranging from startups to Fortune 500 companies.

MedSearch:

- Created MedSearch—a similarity search algorithm that takes in the abstract of any COVID-19 research paper and returns other similar/related COVID-19 research papers—to empower collaboration and advancement in COVID-19 research.
- Extracted keywords from over **125,000** COVID-19 research papers using Natural Language Processing and stored each paper's ID and keywords in TigerGraph (stored over **350,000** nodes & **1,000,000** edges).
- Wrote GSQL queries that found the most similar COVID-19 research papers using the NLP-extracted keywords, user-inputted abstract, and Jaccard similarity index.
- Built and used a RESTful API for MedSearch's backend to safely interact with TigerGraph and enhance overall security.

Patient Dashboard:

- Developed a personalized patient dashboard that gives doctors and researchers an in-depth analysis of synthetic patient data through informative visualizations and statistics.
- Obtained Synthea-generated patient data and computed patient statistics by writing multiple GSQL queries in TigerGraph.
- Programmed the patient dashboard and data visualizations using Dash and Plotly.

STEM Builders *Computer Science and Robotics Teacher* September 2018 - Present

- Taught various programming languages (Python, HTML/CSS, MIT App Inventor, Scratch) and robotics to K-8 students.
- Created custom learning curricula and designed/planned final projects that assessed the students' problem solving skills while incorporating their interests and curiosities.
- Monitored the students' progress and provided daily feedback to their parents.

PROJECTS

Real-Time Collaborative Calculator August 2020

- Designed an interactive web-based calculator that allows real-time collaboration between users.
- Utilized Kotlin to develop a server with unique IDs for each room and data structures that store each room's collaborators and their previous calculations.
- Constructed a JavaScript client to communicate with the server, implemented WebSockets to effectively deal with the constant influx of data, and interacted with a RESTful API to compute equations inputted by the user.

AI Tumor Scanner July 2020

- Collaborated with a team of three other developers to create a Convolutional Neural Network capable of identifying tumors from brain MRI scans.
- Built the neural network with TensorFlow/Keras and used data augmentation to train it with over **7,000** images.
- Tested and modified the neural network to obtain a final average accuracy of **95%**.

Gibberish Generator May 2020

- Programmed an algorithm in Java that generates random English-like words using a trained model and highly optimized data structures.
- Trained the model with over **80,000** English words to produce accurate/pronounceable outputs and built a Trie data structure for efficiency.

Image Filtering System March 2020

- Implemented a Python program that uses unsupervised machine learning to filter/reduce an image down to however many core colors its users select.
- Applied PPM raster image formatting and k-means clustering to group the pixels of an inputted image into its dominant color clusters and filter/reduce the image based on the clusters.

SKILLS

Languages: Python, Java, HTML/CSS, JavaScript, Kotlin, GSQL, LaTeX
Frameworks/Technologies: ReactJS, Flask, Streamlit, Dash, Git, TigerGraph, Firebase