Charles Shi

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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 databases 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 research paper and returns the most 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 them 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 queries in GSQL.
- Programmed the patient dashboard and data visualizations in Python 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

- Developed an interactive web-based calculator that allows real-time collaboration between users.
- Utilized Kotlin to develop a web server with unique IDs for each room, build data structures that store each room's collaborators and their previous calculations, and use WebSockets to effectively deal with the constant influx of data/requests.
- Constructed a JavaScript client 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** words to produce accurate and pronounceable outputs and built/used 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