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* July 2020 - September 2020

- Created a similarity search algorithm called MedSearch that takes in the abstract of any research paper and outputs similar COVID-19 research papers to advance COVID-19 research.
  - Extracted keywords from over **125,000** COVID-19 research papers using Natural Language Processing.
  - Stored each paper's ID and keywords in a TigerGraph graph database (stored over **350,000** nodes & **1,000,000** edges).
  - Wrote GSQL queries that found the most similar COVID-19 research papers using the Jaccard similarity index.
  - Built and used a REST API for MedSearch's backend to safely interact with TigerGraph and enhance overall security.
- 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 in Python.

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

- Taught programming languages (Python, Java, HTML/CSS, MIT App Inventor, Scratch) and robotics to **K-8** students.
- Successfully mentored more than **75** students and gained leadership experience after adapting to unforeseen circumstances.
- Designed/planned final projects that assessed the students' problem solving skills while incorporating their interests.

PROJECTS

CalcShare — *JavaScript, HTML/CSS, Kotlin, Javalin, WebSockets, APIs* August 2020

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

Tumor Scanner — *Python, OS Module, TensorFlow/Keras, Streamlit, Neural Network* 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 more than **7,000** images.
- Tested and modified the neural network to obtain a final average accuracy of **95%**.

Gibberish Generator — *Java, Trie Data Structure, Conditional Probability* May 2020

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

Image Filtering System — *Python, Machine Learning, PPM Image Formatting* 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 constructed a k-means clustering algorithm to find the dominant colors of an inputted image and filter/reduce the image based on those colors.

SKILLS

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