# 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

Responsible for designing impactful 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 a similarity search algorithm called MedSearch that takes in the abstract of any COVID-19 research paper and returns other similar/related COVID-19 research papers to advance coronavirus 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:

- Develop 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 and programmed the dashboard and data visualizations using Dash and Plotly

**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.
- Created custom learning curricula and designed/planned final projects that assessed the students' problem solving skills while incorporating their interests and curiosities.

## PROJECTS

**Real-Time Collaborative Calculator** August 2020

- Constructed an interactive web-based calculator that allows real-time collaboration between users.
- Utilized Kotlin to program a server with unique IDs for each room and data structures that store each room's collaborators and their previous calculations.
- Developed a JavaScript client to communicate with the server, implemented WebSockets to effectively handle 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

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

**Image Filtering System** March 2020

- Programmed 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, MATLAB
*Frameworks/Technologies:* ReactJS, Flask, Streamlit, Dash, Git, TigerGraph, Firebase