Zisheng Cai

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Education

Brandeis University 08/2022 – 05/2024

M.S. in Computer Science – 3.75/4.00 GPA

- Relevant Courses: Java programming, Data Structures, Machine Learning

Dalian University of Technology 09/2018 – 06/2022

B.E. in Environmental and Ecological Engineering – 86.9/100 GPA

- The Second Prize Scholarship, The First Prize in National Olympiad in Informatics in Provinces
- Relevant Courses: C++ programming; Python for Data Analysis; Mathematical Modeling with MATLAB

Technical Skills

Programming languages: C/C++, Python, Java, JavaScript (HTML/CSS), SQL, Bash, R, MATLAB

Frameworks & Tools: Git, Django, Flask, React.js, Express.js, Node.js, MongoDB, PostgreSQL, MySQL, NoSQL

Industry Experience

XPeng Motors **Intern, Autonomous Driving Center** 12/2021 – 05/2022

- Processed and **visualized** about **20 million pieces of data** to analyze the performances of the algorithm in over 10 different situations by **Python**.
- Leveraged algorithms, such as **Dijkstra and A*,** to help find the shortest way of autonomous parking.
- Discovered that the data generated by the new parking algorithm did not fit the key-value pairs like SQL, and applied **NoSQL** to store and analyze data, which reduced about **20% running time** of data searching.
- Collaborated with the testing department and driving center to access the new algorithm outcomes and negotiate the weakness of the new parking algorithm.

Fengyun IOT Technology Ltd **Data Analyst Intern** 07/2021 – 11/2022

- Collected routine data by **SQL**, with **Python and R** to clean, summarize and analyze data of chemical indicators, filtered abnormal data by statistical methods in **SPSS** to identify possible issues, and send daily data analysis reports
- Implemented clustering algorithms like **K-means** to classify water quality data from different sewage plants and summarized similarities and differences among those plants.
- Communicated with environmental engineers about the result of K-means and helped prioritize future tasks.

Coding Projects

Personal Website (Brandeis coursework)

- Designed a personal website using **HTML5, CSS, Bootstrap, JavaScript, and React.js.**
- Built the **RESTful** APIs by object-oriented code in **Node.js** to implement **CRUD** operations on **MongoDB** database.

TCP/IP Protocol

- Built a whole **TCP/IP Protocol, IP Router, and ARP Protocol** based on the architecture of Standford CS144.
- Created byte streams and stream reassemble based on **deque and vector** in C++ respectively and achieved TCP sliding window and overtime retransmission.
- Achieved TCP **3-way handshake** and **4-way handshake** via ACK, SYN, and FIN.

Cancer Detection

- Led the direction for a team consisting of 4 people for the final project of the machine learning course.
- Devised a **convolutional neural network (CNN**) image classification system based on the architecture of **VGG16** to detect cancer in over **0.2 million** pathology images by using **Tensorflow and Keras.**
- Reduced **overfitting** by using **dropout** layers and improved accuracy from **80% to about 90%** by parameter optimization.
- Constructed a simple website in which **React** is the front-end and **Flask** in Python is the back-end.