Yufei Cai

Email: caiyf2018@mail.sustech.edu.cn
Phone: (+86) 187-6182-5982
Github: https://github.com/zhmgczh/

Education

Southern University of Science and Technology, Shenzhen, China Sep.2018 - Present
Bachelor in Mathematics and Computer Science, expected June 2023
GPA: 3.76/4.00 Rank: 28/131
University of Notre Dame, United States Jan.2022 - Feb.2022
Visiting Student in Department of Applied and Computational Mathematics and Statistics
GPA: 4.00/4.00 2022 Statistical Methods in Data Science and Machine Learning (DSML)
National University of Singapore, Singapore July.2019 - Aug.2019
Visiting Student in Department of Computer Science
GPA: 4.00/4.00 Best Project of Functional Programming

Experience

Research Assistant, Southern University of Science and Technology July.2020 - June.2021
Worked on the Seastar system - Vertex-Centric Programming for Graph
Neural Networks
supervised by Prof. Bo Tang and Prof. Xiao Yan
Member of ACM/ICPC Training Team, Southern University of Science and Technology Dec.2018 - Dec.2020
Trained for ICPC and CCPC contests and won one silver medal and two bronze medals
supervised by Prof. Bo Tang
Visiting Student, University of Notre Dame Jan.2022 - Feb.2022
Joined in the 2022 Statistical Methods in Data Science and Machine Learning (DSML) program
supervised by Prof. Jun Li
Visiting Student, National University of Singapore July.2019 - Aug.2019
Worked on a project in group of two students and won the award "Best Project of Functional Programming"
supervised by Prof. Martin HENZ

Teaching Assistant, Southern University of Science and Technology Sep.2020 - Jan.2022
Assisted in teaching two courses - Data Structures and Algorithm Analysis (DSAA) and Algorithm Design and Analysis (ADA)
supervised by Prof. Bo Tang and Prof. Yuhui Shi

Research Project

Vertex Centric Programming for Graph Neural Networks Oct.2020 - Present
Research Project with Chinese University of Hong Kong (CUHK) supervised by Prof. James Cheng and Prof. Xiao Yan
To avoid significant time and memory cost in data-centric programming model such as DGL, the Seastar system is proposed, which describes a vertex-centric programming model for GNN training on GPU. The model proposed can reduce the memory cost and increase the efficiency of GNN training process.

- Implement and improve the vertex-centric programming system by Python

Theoretical Paper: Vertex-Centric Visual Programming for Graph Neural Networks
SIGMOD (Special Interest Group on Management Of Data) Demo: Click to view

Gomoku AI July.2019 - Oct.2019
group project Code Project Poster
The project is about an ancient Asian game named Gomoku. We want to teach computer to help players finish all these tasks and make players only need to focus on how to move. The desired outcome of our users is that they just input the position on which they want to move and the program will determine the status of the game (Playing, Win, Lose and Resigned). And when there is only one player, we will provide a program to play with him or her. The program must be clever enough to fight the player sometimes.

- Design a beautiful graphical user interface (GUI)
- Design an algorithm which is clever enough to beat humans
- Won the award "Best Project of Functional Programming" in NUS Summer Workshop

supervised by Prof. Martin HENZ from National University of Singapore (NUS)

Notable Course Project

Website of Chinese Railway like 12306 2020.5 - 2020.6
group project Code Presentation Video

The project is to design a database about Chinese railway like 12306 website and provide command line interface for that.

- Design a database which satisfies requirements
- Crawl data from 12306 website
- Make beautiful webpages and backend server programs
- Got the highest score in the course

Othello AI with three algorithms 2020.9 - 2020.10
individual project Code Report
The project focuses on some specific fields in order to learn some algorithms which I was not familiar with. In this project, three algorithms are realized which are completely different. Through this project, I learned some advanced artificial intelligence algorithms.

- Implement traditional alpha-beta algorithm
- Implement traditional randomly MCTS algorithm
- Implement AlphaZero algorithm based on the paper of Deep Mind

Influence Maximization 2020.10 - 2020.11
individual project Code Report
Influence maximization is to find a group of nodes under a specific network propagation model to maximize the final influence of this group of nodes.

- Exploit the IMP algorithm and adapt it to multi-process version

Standard Tests

TOEFL Test: 96 (24R, 26L, 21S, 25W) July.2021
GRE General Test: 334 (164V, 170Q, 4.5AW) Nov.2021

Honors and Awards

Silver Medal, 2020 China Collegiate Programming Contest (CCPC), Mianyang Site Nov.2020
Bronze Medal, 2020 ICPC Asia Shanghai Regional Contest Dec.2020
Bronze Medal, 2019 ICPC Asia Nanjing Regional Contest Oct.2019
3rd Prize, 2020 Guangdong-Macau Computer Programming Competition Dec.2020
3rd Prize, The 2nd SUSTech Programming Contest Dec.2019
2nd Prize, Scholarship for Outstanding Student Sep.2020
2nd Prize, Scholarship for Outstanding Freshmen Sep.2018

College Prize for Academic Competition May.2021

National Physics Olympiad (National Second Prize) Nov.2017

Certificates