Jixuan Ruan

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Education

University of Science and Technology of China(USTC) Sep 2020 – Present
School of the Gifted Young, Senior Year
Huaxia Computer Science and Technology Talent Class

Academic Performance

Toefl: 104 (r 28, l 29, s 24, w 23)
Overall GPA: 3.77 / 4.30 (Top 15%)
Core Course GPA: 3.92 / 4.30
Operating Systems (H): 97; Computer Networks: 97; Computer Programming A: 96;
Network System Experiment: 95; Quantum Computing and Machine Learning: 93;
Principles and Techniques of Compiler(H): 92; Introduction to Information Security: 92;
Foundations of Algorithms: 92; Design and Practice of Robot: 93; Graph Theory: 90;
C Language Programming II: 93; Analog and Digital Circuits: 90;
Thermotics: 99; Mechanics A: 90;

Research Experience

OnePerc University of California, San Diego
Under the Supervisor of Prof. Yufei Ding *September 2023 – Present, Internship*
In light of the significant challenges posed by fusion failure and photon loss, we have developed an innovative framework for the compilation process. Our approach is based on the construction of a robust logical hardware system implemented on a fusion-percolated square lattice. Within this framework, we seamlessly map quantum programs as graph states onto this logical hardware, providing the capability to efficiently store photon qubits in cache. This novel framework demonstrates remarkable improvements compared to previous fusion-centric approaches and notably reduces program depth when compared to the cluster mapping method.

My work could be checked on https://github.com/Scarlett0815/OnePerc.

OneQ Optimization University of California, Santa Barbara
Under the Supervisor of Prof. Yufei Ding *Jun 2023 – September 2023, Internship*
We are developing a compiler-centric optimization framework tailored for photonic quantum computing. This advanced compiler excels in deploying quantum programs as graph states onto hardware powered by photonic quantum devices. My primary focus is on enhancing the performance of the foundational framework established by Picasso Lab, known as 'OneQ: A Compilation Framework for Photonic One-Way Quantum Computation.' This enhancement spans across three key dimensions: algorithmic improvements, diversification of resource states, and increased alignment with physical realism.

My work could be checked on https://github.com/Scarlett0815/OneQ-Optimization.

Build a VR Office system based on Oculus University of Science and Technology of China
Under the Supervisor of Prof. Kai Xing *Jul 2022 – Aug 2022, Part-time*
I took part in a small group consisted of several students interested in VR to build a office system based on Oculus. In this office system, we added the gesture recognition to Oculus and freed customers from the handlers. In addition, we realized 3 basic functions, which are 3D Object Importing, Remote Control as well as Model Plane.

Our work could be seen on https://github.com/OSH-2022/VR-fancy-office.

USTC Robo Game University of Science and Technology of China
Under the Supervisor of Prof. Yuhu Li *May 2022 – Nov 2022, Part-time*
We have made a curling robot in 6 months, during which I was responsible for the recognition part as well as the tracking part. In this process, I used neural network to realized our recognition part for better robustness.

Our work could be seen on https://github.com/WuTianming/robogame-code.

SysYF Compiler Design University of Science and Technology of China
Under the Supervisor of Prof. Yu Zhang *Dec 2022– Jan 2023, Coursework*

I made a compiler based on LLVM architecture. I designed this compiler from the lexical level to the final back end. Also, I optimized the register allocation part using graph coloring methods.

My work could be checked on https://github.com/Scarlett0815/compile/tree/master/compile_llvm/.

Attack under Split Learning Architecture University of Science and Technology of China
Under the Supervisor of Prof. Xiangyang Li *Aug 2022– Nov 2022, Part-time*
We attempted to perform the classical attack methods on the split learning architecture and compare its influence with the one under the federated learning architecture. Later, we came up with methods to strengthen the attacking results.

Honors And Awards

Huaxia Computer Science Talent Class Scholarship Dec 2022

Outstanding Student Scholarship Gold Award Nov 2022

The Second Prize in USTC RoboGame Nov 2022

Special Award for Girls in USTC Programming Competition(div1) Apr 2022

The Second Prize of the Undergraduate Mathematics Contest Dec 2021

China Collegiate Programming Contests for Girls Bronze Award Nov 2021

Outstanding Student Scholarship Bronze Award Sep 2021

Rose Light Scholarship Jul 2021

Freshman third-class scholarship Dec 2020

Skills

Programming: C / C++, Python, Verilog, Java, Pascal, Basic, C#
Libraries: OpenCV, PyTorch, TensorFlow, Mxnet, NumPy, Pandas, Matplotlib
Languages: Chinese, English

Teaching Experience

Computer Programming A University of Science and Technology of China
Organized by Prof.Jie Shen *2023 Fall*
Topic: C Programming, Introduction to Basic Data Structure, Foundation of Basic Algorithms

Research Interest

Quantum Computing, Programming Language
Operating Systems, Computer Architecture, Security

Extracurricular Activities

Core Member in the Alumni Liaison Group of the Computer Science Department
Member of Debate Team of School of the Gifted Young
Commissary in Charge of General Affairs

Personal Hobbies

Sketching; Calligraphy; Piano; Novel Writing; Mountain Climbing
Notation: Some of my work could be checked on my personal website https://scarlett0815.github.io/