Zhuoqin (Jack) Wang

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Education

University of Chicago 2024 – 2026
BS in Computer Science and BS in Economics *Chicago, IL*
Coursework: Systems Programming 1

University of Texas, Austin 2023 – 2024
BS in Computer Science, Turing Scholars Honors Program *Austin, TX*
Coursework: Data Structures, Discrete Mathematics, Computer Architecture

Experience

Game Development Intern May 2024 – September 2024
Dreamworld(YCombinator W21) *Redwood City, CA*

- Designed and implemented the lighting system(ambient light, light blending, as well as coded items that serve as light sources) for underground exploration(over 80 percent of the explorable area) for a massive-multiplayer online game using a combination of C++ and Unreal Engine Blueprints.
- Ensured the lighting system is scalable for 10000+ concurrent players as well as high player density by writing a server-side replication scheme that only replicates key information to send to individual clients

Research

Research Intern January 2022 – Jan 2023
Shanghai Jiaotong University *Remote*

- Worked on an ML project for detecting and drawing bounding boxes around cars in BEV(Bird-eyes view) images of city streets by leveraging openMMLab's MMdetection toolbox.
- Improved the EqMotion detection system (proposed in CVPR2023) by designing and implementing a matrix operation to preserve the spatial property of each matrix layer in the learning process to better capture the invariant relationship between agents, improving inference results on coco dataset by 23 percent.

Projects

Custom Language Compiler | *C++*

- Developed a X64 compiler for a custom language that is Turing complete(support loops, conditional, and functions), built over a week to gain a better understanding of systems-level programming concepts.
- Prototyped using a simple recursive descent parser, then slowly improved upon to improve performance and scalability by introducing schemes such as abstract syntax trees for parsing, as well as optimization techniques such tail-call optimization and constant folding.

Web Crawler | *Java*

- Created a web crawler that can crawl a section of the web based on inputted keywords and logic.
- Implemented features tokenizers to tokenize the input, a parser to parse the tokens through recursive descent, and a query that transforms the parsed tokens into a tree to allow for comparison with the words in a webpage.

ARM Emulator | *C++*

- Created an emulator that can emulate a given set of ARM commands and generate correct output.
- Learned how to interpret opcodes, simulate registers and memory, and gain a better understanding of the AArch64 architecture. Recreated complex bitmasking algorithms (found in XOR) despite their absence from the handbook.

Bullethell Game | *C++*

- Developed a bullet hell game involving surviving incoming waves of bullets by navigating an avatar.
- Implemented features such as parametric and boomerang shots, health bar, and bullet destroying consumables.

Image/Text Encoder | *Java*

- Developed an image encoder/decoder based on a matrix transformation algorithm.
- Improved upon this project by adding a text encoder/decoder based on RSA after user feedback.

Technical Skills

Programming Languages: C++, Unreal Engine, Java, Python, Javascript
Languages: English, Chinese