Qirui Fu

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EDUCATION

University of Pennsylvania   Philadelphia, USA
MSE in Computer Graphics and Game Technology   *August 2024 - Present*
- **GPA: NaN**

Nanjing University   Nanjing, China
B.Sc. in Computer Science and Technology   *September 2020 - July 2024*
- **GPA: 4.42/5.0**
- Major Courses: Digital Logic and Computer Organization(92.5), Data Structures(91), Algorithm Design & Analysis, Introduction to Computer Systems(91), Operating systems, Principles and Techniques of Compilers(93), Formal Languages and Automata(90), Numerical Method(92), Pattern Recognition(91)

RESEARCH EXPERIENCE

Meta Graphics & 3D Vision Lab, Nanjing University
Research Assistant | Github Link   *August 2023 – June 2024*
- Participated in implementing a range of algorithms of Computer Graphics in Taichi language, including elastic simulation via FEM, cloth simulation with spring-mass system and fluid simulation with APIC method.
- Developed a simulator based on SPH & VOF to simulate multiple-fluid phenomena and reproduced some results from the paper *Multiple-Fluid SPH Simulation Using a Mixture Model (Ren et al. 2014)*.

PROJECT EXPERIENCE

UAV Swarm Flight Strategy Validation Platform
Team Leader, College Student Innovation Project | Video Link   *October 2022 – December 2023*
- Developed a UE5-based renderer. Including C++ classes UAVs, trees, and cubes to implement rendering for corresponding objects; implemented C++ class CmdCenter to receive socket messages and manage instances of other classes.
- Led the development and implementation of the Virtual-Reality platform for UAV swarm flight strategy validation, including rendering module, abstract drone module, and intermediate data server module.
- Oversaw team coordination and project management, including technical discussions, strategy formulation, and administrative tasks, culminating in the project's recognition as a national-level college student innovation project.

C - - Language Compiler Project
Individual Project | Github Link   *February – June 2023*
- Developed a comprehensive compiler for C - - language, capable of converting source code into MIPS assembly code for execution on the SPIM Simulator.
- Executed the project in five distinct stages: lexical and syntax analysis using Flex and Bison, semantic analysis and type checking, intermediate code generation and optimization, and final assembly code translation.
- Implemented advanced compiler techniques, including syntax tree analysis and flow graph-based intra-block optimization, enhancing the compiler's efficiency and optimization capabilities.
- Successfully produced a functional compiler that can translates C - - code accurately and optimize execution processes.

Digital Logic and Computer Organization Experiments
Team leader, Verilog Developer | Video Link   *February – June 2022*
- Led and managed the development of an interactive computer system on an FPGA development board, focusing on creating a basic computer architecture capable of executing machine instructions.
- Utilized Verilog for the development of critical hardware components including CPU, memory manager, VGA display, and keyboard input, integrating these elements to build a functional computer hardware system.
- Successfully delivered an FPGA-based interactive computer system, enabling command line control for simple computational tasks such as managing time, controlling digital tube and LED displays, and calculating expressions and Fibonacci sequences.

Gomoku AI
Course Project   *November 2021*
- Implemented a Gomoku AI using Monte-Carlo Tree Search (MCTS) as a homework project for the course *Practice of Fundamental Programming*.
- Achieved a top 4 ranking in the class competition and received a full score on this project.

HONORS & AWARDS

2nd Prize, Award on Renmin Scholarship (Top 30%)   *October 2021, 2022*
Honorable Mention, Mathematical Contest In Modeling (Top 21%)   *January 2022*