

Qirui Fu

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EDUCATION

University of Pennsylvania

MSE in Computer Graphics and Game Technology

Philadelphia, USA

August 2024 - Present

- **GPA: 3.95/4.0**

- Courses: Computer Animation, Interactive Computer Graphics, 3D Computer Modeling, Applied Machine Learning, Feedback Control

Nanjing University

B.Sc. in Computer Science and Technology

Nanjing, China

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

Carnegie Mellon University, USA

Research Intern, Advisor : Prof. Minchen Li

May - August 2025

PROJECT EXPERIENCE

Taichi Simulation Gallery

Individual Project | [Github Link](#)

August 2023 - Present

- Implemented a range of algorithms of physical simulation 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)*.
- Developed a simulator based on the MLS-MPM framework to simulate snow effects and reproduced some results from the paper *A Material Point Method for Snow Simulation (Stomakhin et al., 2013)*.
- Developed a simulator based on paper *Phase-change Modeling Based on a Novel Conservative Phase-field Method (Reza Haghani-Hassan-Abadi et al., 2021)* to simulate the phase change of water and evaporation (both CUDA and Taichi versions).

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.

HONORS & AWARDS

2nd Prize, Award on Renmin Scholarship (Top 30%)

October 2021, 2022

Honorable Mention, Mathematical Contest In Modeling (Top 21%)

January 2022