Huizhe Su

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Education

ShanghaiTech University, Shanghai, China 2020 – Present

B.E. in Computer Science and Technology (CS), expected July 2024

University of Wisconsin-Madison, Wisconsin, USA Sept. 2023 – Present

Visiting International Student Program (VISP)

University of California, Berkeley, California, USA June. 2023 – Aug. 2023

Summer Session C

Teaching Assistant Experience

CS110 Computer Architechture Feb. 2023 – Jun. 2023

Teaching assistant Course Lecturers: Chundong Wang, Siting Liu

Main works:

- Hold labs for students weekly.
- Give presentation on *Control Logic and FSM*.
- Create midterm questions on *control logic*.

CS101 Algorithms and Data Structures Sep. 2022 – Jan. 2023

Teaching assistant Course Lecturers: Dengji Zhao, Hao Geng

Main works:

- Create homework and examination problems on *Hash Table* and *NPC problem*
- Grade student assignments.
- Hold recitations for students weekly.

GEHA1149 Mathematical Logic Sep. 2022 – Jan. 2023

Teaching assistant Course Lecturer: Xudong Hao

Main works:

- Grade student assignments.

CS100 Introduction to Programming Feb. 2021 – Jun. 2022

Outstanding Teaching Assistant Course Lecturers: Lan Xu, Laurent Kneip

Main works:

- Carry out tutorials and review sessions on *C and C++*.

Course Projects

Athernet Sep. 2022 – Jan. 2023

Co-developer Course: CS120 Computer Networks. Grade: A+

Brief description: Athernet is a user-space TCP/IP stack with full functionality and handy utilities built on the acoustic channel. This project was developed purely in the Rust language. I worked on this project with my dearly beloved, Cheng Peng.
In this project:

- Two different modulation schemes(BPSK and OFDM, 4B5B and NRZI) was implemented.
- An IP server was implemented for the user-level IP protocol.
- An Athernet NAT server was also implemented.
- We have implemented three main protocols: UDP, TCP, and ICMP.

- On the application layer, an FTP client and an Athernet proxy were implemented.
- The network stack is compatible with the existing world wide web.

PintOS Sep. 2022 – Jan. 2023

Co-developer Course: CS130 Operating Systems I. Grade A+

Brief description: PintOS is a toy operating system designed by Stanford University. Students are required to implement additional functionality for PintOS and enhance the existing ones. Cheng Peng and I successfully together finished all the tasks in PintOS.

A new VR Locomotion Method: Ninja Run Sep. 2022 – Dec. 2023

Main developer and designer Course: ARTS1423 Interactive Product Design. Grade: A+

Brief description: A new locomotion method that simulates the running movements of a Japanese Ninja in an attempt to reduce motion sickness. This project was designed together with NT^3.
In this project, I was responsible for

- Unity and OpenXR development.
- Main UI design (using Figma).
- Deployment on Oculus Quest.
- User experience test design.

Gaussian Blur Optimization Feb. 2022 – Jun. 2022

Co-developer and analyzer Course: CS110 Computer Architecture I. Grade: A+

Brief description: We have optimized an existing Gaussian Blur implementation. Our version was ranked second by speed among all the students in the final competition. I worked on this project with my dearly beloved, Cheng Peng.
In this project, I was responsible for

- Analyzing the program performance using VTune.
- Implementing thread-level parallelism using OpenMP.
- Implementing data level parallelism using AVX Intrinsics.
- Optimizing cache access by blocking and loop unwinding.

Alzheimer: A third-person puzzle game Sep. 2021 – Jan. 2022

Main developer Course: ARTS1303 Unity Game Development. Grade: A

Brief description: Alzheimer's is an artistic puzzle game about a woman who was diagnosed with Alzheimer struggled to find a cure. The game uses metaphoric techniques to demonstrate her fighting against the fear, strangeness, and confusion in her mind. This game was powered by Unity Engine. I made this game with Yutao Ming, the art designer, and Kaitian Chao, the level designer.
In this project, I was responsible for

- Main game programming, including game mechanics programming, UI programming, character control, and camera control.
- Creating design tools for the level designer.
- Game version control.
- Game testing.

In addition to this project, three other individual games were completed in the course:

- A third-person shooting game where the player has to plant trees while fighting off dangerous ghosts.
- A third-person puzzle game that mimics the mechanics of the famous game FEZ and uses perspective shifting to solve puzzles.
- *Thieves by the Sea*, a third-person stealth game used to demonstrate Unity's animation and blend features.

Honors and Awards

Outstanding Teaching Assistant - ShanghaiTech University Jun. 2022

Skills

Programming Language

- C/C++, familiar with modern c++.
- Rust, intermediate.
- Python, intermediate.
- C# in Unity Engine.
- JavaScript.
- HTML/CSS.
- Matlab
- Haskell
- GLSL

Natural Language

- Chinese(native speaker).
- English(TOEFL 103).
- Japanese.
- German (ein bisschen).

Other skills

- Git.
- LaTeX
- z3Py
- UML
- WebGL

Reasearch Interests

While I am actively exploring different research areas, I have a particular interest in **formal verification** and **programming language theory**. Simultaneously, I have a long-standing interest in **game engine development**. Driven by its high demand for verification, I am actively seeking to **leverage formal verification methods in game engine development**.

Other Interests

- Playing zachlike games and other challenging puzzle games.
- Philosophy(logics, epistemology and metaphysics).
- Psychoanalysis

Relevant Courses

- Algorithms and Data Structures
- Algorithmic Game Theory
- Cryptography (in progress)
- Computer Architecture I
- Computer Graphics (in progress)
- Computer Networks
- Computer Security
- Interactive Product Design
- Mathematical Logic
- Operating Systems I
- Software Engineering

- Theory and Design of Programming Language (in progress)
- Theory of Computation
- Unity Game Development