

Tairan Gao

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EDUCATION

Carnegie Mellon University

Master of Entertainment Technology

May 2023

Courses: Computer Graphics, Principles of Software Constructions and Design Patterns

The Hong Kong Polytechnic University

Bachelor of Science in Internet and Multimedia Technology

June 2019

Courses: Object-Oriented Programming, Game Design and Development, Database System, CVPR

TECHNICAL SKILLS & TOOLS

- **Programming Language:** C#, C++, Java, TypeScript, React, Python
- **Tools:** Unity, Git, Perforce, Unix, Jest, Junit, Apache Maven
- **Skills:** 3D Math, system design, game design, testing, fast-prototyping, game design
- **Hardware:** HoloLens(AR), Oculus Quest(VR), Tilt Five(AR), Tobbi Eye Tracker
- **Languages:** English (Fluent), Mandarin (Native)

ACADEMIC PROJECTS

Santorini digital board game

CMU

Programmer

2022 fall

- Developed a scalable and robust back-end for a strategy-based board game for two players using **Java** and **Apache Maven**.
- Implemented the **Model-View-Controller** design pattern to enhance the game's extensibility and stability.
- Created a user-friendly interface utilizing **React** and **TypeScript**, as well as a **RESTful API** for seamless server-client data exchange.
- Conducted comprehensive structural and functional testing, achieving over 90% test coverage using **JUnit** and **Jest**.

Scotty 3D, 3D graphics software

CMU

Programmer

2022 spring

- Implemented a high-performance, robust ray-tracing renderer using **C++**.
- Utilized the **half-edge** data structure to develop various geometry processing operations.
- Enhanced the renderer's efficiency through the integration of **Monte Carlo ray tracing** method, **Bounded Volume Hierarchy** data structure, and **importance sampling** techniques.
- Developed a physically-based animation component using **forward and inverse kinematics**.

Shapetopia, Unity 3D project ([Web Link](#) | [Game Link](#))

CMU

Programmer / Game designer

2022 spring

- Contributed to a collaborative project with a team of six members, resulting in the creation of an educational game that educated college students on sustainable development concepts.
- Utilized **domain models** and system **sequence diagrams** to design the game's system architecture.
- Developed a city generator and implemented character AI with customizable paths and traffic systems using **C#** and **Unity**.
- Conceptualized and designed the core gameplay mechanics, incorporating elements of both a card game and light simulation.

WORK EXPERIENCE

PingAn Corporation

Shenzhen, China

Product R&D Intern

Jul. 2020– Dec. 2020

- Utilized the **Python Pandas** library to conduct data mining and implement regular expressions for data - scrubbing.
- Established standards for data structure and took ownership of data quality assurance.
- Designed an algorithm for data graph generation, which served as the key component of the "Policies - Knowledge Graph" data visualization product.