Tairan Gao

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EDUCATION

Carnegie Mellon University
Master of Entertainment Technology *Sep. 2021–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 *Sep. 2015–May. 2019*
Courses: Object-Oriented Programming, Game Design and Development, Database System, CVPR

TECHNICAL SKILLS & TOOLS

- **Programming Language**: C/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
- **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 extensive 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.