ANNIE QIU

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Portfolio: https://qiuannie.com/

EDUCATION

University of Pennsylvania   May 2025

Master of Science in Engineering, Computer Graphics & Game Technology   Philadelphia, PA

Cumulative GPA: 3.93/ 4.0

University of Rochester   May 2023

Bachelor of Science in Computer Science   Rochester, NY

Overall GPA: 3.81/ 4.0

CORE COURSES

Interactive Computer Graphics, Advanced Rendering, Computer Animation, Production Pipeline, 3D Modeling, GPU Programming And Architecture, Game Design Practicum, Language Design and Implementation, Computer Organization, Mobile App Development, Computation & Formal Systems

PUBLICATIONS

- "Bee and I need diversity!" Break Filter Bubbles in Recommendation Systems through Embodied AI Learning. In Interaction Design and Children, June 17--20, 2024, Delft, Netherlands. ACM, New York, NY, USA 18 Pages. https://doi.org/10.1145/3628516.3655802

COURSE PROJECTS

EndlessNeon *- Houdini/ Unreal Engine/ Substance Designer*

- Created a procedural city blending traditional Eastern architecture with cyberpunk aesthetics
- Utilized Houdini procedural workflows and PDG to create building generation and automated layouts in Unreal Engine 5

Stylization Shader *- Unity*

- Created a stylized 3D scene with non-photorealistic rendering techniques like custom shaders for glowing edges, rim highlights, brush-like outlines, and paper texture post-process effects in Unity

CUDA Path Tracer *- C++/ CUDA*

- Created a high-performance CUDA-based path tracer using path segment sorting and stream compaction

WebGPU Deferred Rendering *- C++/ WEBGPU*

- Implemented Naive, Forward+, and Clustered Deferred Shading techniques using WebGPU

Vulkan Grass *- C++/Vulkan*

- Implemented a grass simulator and rendering system based on the Responsive Real-Time Grass Rendering technique for 3D scenes
- Used compute shaders for physics on Bézier curves and blade culling for optimized rendering

USD Asset Library *- Universal Scene Description (USD), Python, Qt*

- Collaborated with a team of 15 to develop a USD-based 3D asset library that aligned with production pipelines
- Integrated asset browsing, import/export, storage, and real-time collaborative workflows into the library

Mini Minecraft *- C++/ GLSL/ OpenGL/ Qt Creator*

- Collaborated with a team of three to build a Minecraft-like sandbox game, with a focus on procedural terrain generation, post shader, user interface, and player mechanics
- Developed a procedural cave system using noise functions and optimized diverse biomes by mapping moisture and temperature, and procedurally placed assets to enhance realism

Floating Bubble - *C++/ Houdini/ Maya/ MEL*

- Collaborated with a team of two to create a Houdini plugin based on a SIGGRAPH paper to generate realistic dispersed bubble simulations within fluid systems
- Developed an efficient tool with customized variables that users can generate realistic fluid and bubble interactions with real-time feedback

Signed Distance Fields and Subsurface Scattering - *C++/ Qt Creator/ OpenGL/ GLSL*

- Developed a real-time shader using Signed Distance Fields and implemented subsurface scattering for 3D models
- Implemented raymarching techniques to create complex, procedurally generated shapes, with materials featuring varied roughness, metallic properties, and approximated subsurface scattering

Houdini Solaris Integration - *Python/ Houdini/ MongoDB*

- Collaborated with a team to develop a Houdini Solaris pipeline for efficient asset creation and integration into the MongoDB Database
- Contributed to the asset creation and update workflows, set up LOD generation using PolyReduce, managed materials, and automated the export of assets to the database through USD ROP nodes

L-System Plugin - *C++/ Python/ Houdini/ Maya/ MEL*

- Created an L-System plugin in Maya for the procedural generation of tree branches and flowers, with a friendly UI

Behavior Animation Simulator - *C++/ Unity*

- Implemented behavior-based controllers for characters used in games and animation, with six individual behaviors, three group behaviors, and two combined behaviors

Forward Kinematics- Inverse Kinematics plugin - *C++/ Unity*

- Build a comprehensive forward and inverse kinematics framework and implemented limb-based and Cyclic Coordinate Descent approaches to calculate realistic limb positions and angles for complex animation

EXPERIENCES

Advanced Topics In Computer Graphics And Animation
Jan 2025 - Present

Teaching Assistant
Philadelphia, PA

- Assisted students with coding assignments and provided guidance on advanced graphics and animation techniques
- Reviewed and updated homework structures to improve the effectiveness of course materials

VR Space - *C#/ Unity/ Oculus*
Aug 2022 - June 2024

Developer Group Leader
Rochester, NY

- Collaborated with a Ph.D. student in an education program to heighten students' interest in space exploration
- Developed VR Game to educate K-12 students about Robert Arm concepts

BeeTrap - *C#/ Unity*
April 2022 - March 2024

Developer
Rochester, NY

- Designed and developed an AR application to teach K-12 students Artificial intelligence concepts
- Conducted user study and analysis data from users to generate AR for Machine Learning discovery

Machine Learning for Stem - *Python*
April 2022 - June 2022

Researcher
Rochester, NY

- Processed and coded qualitative interview data
- Conducted a 2-week co-design research with 18 K-12 teachers

SKILLS

- Programming/Scripting Languages: C++, GLSL, mel, OpenUSD, C#, Java, Python, HTML/CSS, Mysql, Swift
- Tools: Qtcreator, OpenGL, Houdini, Unity, Maya, MongoDB, Photoshop