Gaoxiang Zhao

gxzhao4@seas.upenn.edu · (+1) 267-701-1663 · github.com/seerier

Education

University of Pennsylvania August 2025 – May 2027

MS in Scientific Computing Philadelphia, USA

- *Related Coursework*: Machine Learning, Linear Algebra and Optimization, Computer Animation

Wuhan University September 2021 – July 2025

BEng in Communication Engineering Wuhan, China

- *Related Coursework*: Electromagnetic Field Theory, Signal Processing, Computer Graphics

Experience

ZJU-Coohom Joint Lab of CG&AI August 2024 – November 2024

Research Algorithm Intern Hangzhou, China

- Explored and devised lignt transport algorithms for KooEngine, a commercial rendering engine dedicated to indoor scenes rendering.
- Optimized this Vulkan-based engine by reducing the CPU-GPU synchronization frequency.
- Proposed a photon mapping method for fast caustics rendering.

Projects

Xeno Renderer December 2023 – January 2025

Physically-based renderer implemented in C++

- Developed various shapes, materials, lights, textures and samplers.
- Designed several 3D scenes and customized a scene parser.
- Implemented several ray tracing algorithms including path tracing, bidirectional path tracing and stochastic progressive photon mapping.

Diffraction Simulation June 2024 – August 2024

- Reproduced SIGGRAPH paper *A Free Space Diffraction BSDF*.
- Solved Fraunhofer diffraction equation under ray-tracing framework.
- Rendered colorful diffraction patterns from various apertures.
- Compared the convergence rates between RGB rendering and spectral rendering.

Sampling in Real-time Rendering September 2023 – November 2023

- Analyzed aliasing artifacts using frequency domain analysis.
- Rendered scenes at different resolutions and constructed image pyramids.
- Observed the elimination of textures and preservation of structures during downsampling.

Technical Skills

- Programming: C++, Python, GLSL
- Tools: LaTeX, Git, PyTorch, NumPy, CMake, Unity, OpenGL
- Language: English (Proficient), Mandarin (Native)