

Gaoxiang Zhao

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Education

University of Pennsylvania

August 2025 – May 2027

MS in Scientific Computing

Philadelphia, USA

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

Wuhan University

September 2021 – July 2025

BEng in Communication Engineering

Wuhan, China

Experience

ZJU-Coohom Joint Lab of CG&AI

August 2024 – November 2024

Research Intern

Hangzhou, China

- Explored and devised shading 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 rendering 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, CUDA, MATLAB
- Tools: \LaTeX , Git, PyTorch, NumPy, Unity, OpenGL, Vulkan
- Language: English (Proficient), Mandarin (Native)