

Gaoxiang Zhao

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Education

University of Pennsylvania	August 2025 – May 2027
<i>MS in Scientific Computing</i>	Philadelphia, USA
• Related Courses: Machine Learning, Computer Animation, Linear Algebra and Optimization	
Wuhan University	September 2021 – July 2025
<i>BEng in Communication Engineering</i>	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 <i>A Free Space Diffraction BSDF</i> .	
• 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)