

Gaoxiang Zhao

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Education

Wuhan University

September 2021 – June 2025

B.Eng. in Communication Engineering

Wuhan, China

- GPA: 3.67/4.00

Experience

ZJU-Kujiale Joint Lab of CG&AI

August 2024 – November 2024

Research Intern

Hangzhou, China

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

Projects

Xeno Renderer

December 2023 – Present

Physically based renderer implemented in C++

- Implemented several light transport algorithms including path tracing, bidirectional path tracing and stochastic progressive photon mapping.
- Implemented BVH and Kd-Tree to accelerate the ray-scene intersection.
- Developed various shapes, materials, lights, integrators and textures.
- Described several scenes in JSON format and customized a scene parser.

Diffraction Simulation

June 2024 – August 2024

- Implemented the SIGGRAPH paper *A Free Space Diffraction BSDF*
- Solved Fraunhofer diffraction analytically under ray-tracing framework.
- Rendered various diffraction patterns from apertures of different shapes.
- Compared the convergence rates between RGB rendering and spectral rendering for wavelength-dependent phenomena.

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/C++, GLSL, MATLAB
- Graphics: OpenGL, Vulkan, pbrt, Mitsuba, Tungsten, Falcor
- Language: English (TOEFL 103), Mandarin (Native)