

CHUYAN ZHANG

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RESEARCH INTERESTS

Real-time ray tracing is still relatively limited in modern-day games due to its high-performance cost. From my perspective, two approaches can be taken to address this problem:

- reducing the complexity of the scene (*LoD and prefiltering techniques*),
- improving the efficiency of *sampling* (ReSTIR, path guiding, etc.).

While these are the two particular areas I am most interested in, my interests are also broadly distributed across various aspects of rendering, like *neural networks* as an effective method of compression and function fitting, and *3D Gaussians* as a potential unified geometry primitive to unify both surface and volume representations.

EDUCATION

University of California, Santa Barbara

Master of Science in Computer Science
advised by *Prof. Lingqi Yan*

Santa Barbara, U.S.

Sept. 2023 - Jun. 2025 (estimated)

Tsinghua University

Bachelor of Engineering in Computer Science and Technology
advised by *Prof. Kun Xu*

Beijing, China

Sept. 2019 - Jun. 2023

PUBLICATIONS

LuisaRender: A High-Performance Rendering Framework with Layered and Unified Interfaces on Stream Architectures

SIGGRAPH Asia 2022

In this work, we proposed a multi-backend, high-performance programming framework for general-purpose computing and rendering. We unified device-side and host-side code by embedding a domain-specific language (DSL) into modern C++ and provided multiple language bindings including Python and Rust.

PROFESSIONAL EXPERIENCES

Research Intern

Visual Computing and Graphics Group
worked with *Anton Sochenov* and *Gabor Liktov*

Intel Labs

June 2024 - September 2024

During this internship, I worked on an efficient level-of-detail (LoD) and culling algorithm with ray-tracing acceleration structure. With an efficient cluster hierarchy for LoD selection and lazy, on-demand build for visible clusters, the algorithm can lower the geometry bandwidth of each frame on real-time ray tracers.

PROFESSIONAL SKILLS

- Programming

I'm familiar with C/C++, Python, CUDA, Rust, and GLSL (with Vulkan).

I have worked on graphics toolchains and APIs like Vulkan and CUDA + OptiX, and I also have knowledge and experience with Machine Learning toolkits like PyTorch.

- Languages

I am a native Mandarin speaker, and I speak fluent (112/120 in TOEFL iBT) English.