

EDUCATION

Ph.D. University of Utah Aug. 2022 – Present
Major: Computing (Graphics and Visualization Track)

B.S. / M.S. University of Utah Aug. 2017 – May. 2022
Major: Computer Science / Computing (Graphics and Visualization Track)

RESEARCH PAPERS

- Jacob Haydel, Cem Yuksel, Larry Seiler, “Locally-Adaptive Level-of-Detail for Hardware-Accelerated Ray Tracing,” ACM Transactions on Graphics (Proceedings of SIGGRAPH Asia 2023), 42, 6, 2023.

WORK EXPERIENCE

University of Utah Hardware Ray Tracing Research Group (HWRT) April 2018 – Present
Salt Lake City, UT
Research Assistant

- Developed a cycle accurate hardware simulator called arches.
- Researched adaptive tessellation for hardware accelerated raytracing.
- Currently researching novel raytracing architectures.

Advanced Micro Devices (AMD) May 2023 – August 2023
Austin, TX
Raytracing Architecture Intern

- Worked on shader execution reordering for hardware ray tracing.

Reality Labs Research (Meta) May 2022 – August 2022
Redmond, WA
Research Scientist Intern

- Worked on researching methods for anit-aliasing in the context of hardware ray casting.

Qualcomm May 2021 – August 2021
Salt Lake City, UT
Graphics Research Intern

- Worked on developing and testing a ray tracing architecture.

Advanced Micro Devices (AMD) May 2020 – August 2020
Salt Lake City, UT
RTG Intern

- Analyzed ray tracing workloads in modern video games and benchmarks.

- Fixed and extended the in-house OpenGL renderer.

PROJECTS

- Cycle level hardware simulator written in C++ called arches. Implements both the TRaX and Dual-Streaming architectures. Uses a modified version of GCC to compile RISC-V binaries targeting each architecture.
- Spectral path tracer written in C++. Implements BVH build/traversal, multiple importance sampling, next event estimation, mesh lights, image-based lighting, microfacet BRDFs, dispersion, spectral reconstruction, and texture mapping.



AWARDS

- Utah Teapot Rendering Competition Winner 2019. The Teapot Rendering Competition invites students at the University of Utah to submit images of teapots rendered with their own custom path tracers.
- Graduated Magna Cum Laude from the University of Utah (Top 3.5% of students).
- Selected for the SIGGRAPH 2016 Pioneer mentor program. This program funds high school students to attend SIGGRAPH.

TECHNICAL EXPERIENCE

C/C++, Python, OpenGL, GLSL, x86, and RISC-V