JACOB S. HAYDEL
jcbhaydel@gmail.com

EDUCATION

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

B.S. / M.S. University of Utah Aug. 2017 – May. 2022
Major: Computer Science / Computing (Graphics and Visualization Track)
B.S. GPA: 3.96, M.S. GPA: 3.81

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.

Scientific Computing Imaging Institute (SCI) January 2019 – May 2020
Salt Lake City, UT

Graphics Developer Intern

- 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 RISCV 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
- University of Utah Magna Cum Laude
- University of Utah Dean's List 2017-2020
- Selected for the Pioneer Mentors program for SIGRAPH 2016

TECHNICAL EXPERIENCE

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