15-400 Milestone 6
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https://thenumbat.github.io/15400-s21/

Changes

No changes this time.

Accomplished

1. Built Vulkan framework (surprising amount of work)

2. Implemented GPU BVH construction and various traversals, including stack based, stackless, threaded, and RT core accelerated.

3. Added various optimizations and benchmarking features.

Milestone

I have made good progress since last milestone, as the bulk of the GPU implementation is now complete. All that remains is to experiment with better bounding volumes and work on my poster/report. Hence, I have mostly caught up with my milestone, other than working on a novel way of using RT cores for closest point queries. I would like to work on this topic if I have time before the final report is due, but I do not have time to focus on it at the moment. Instead, this point, as well as polishing the library to a broadly consumable package, can come this summer.

Surprises

Not much has changed since last milestone, but the amount of setup and support work needed was surprisingly high.

Looking Ahead

By the next milestone, I plan to have the last part of implementation (bounding volumes) completed, and be done with performance testing/comparisons for the poster/report along the following axes:

1. parallel CPU vs custom GPU vs RTX GPU

2. rays vs closest points

3. max box dist optimization

4. 2,4,8,16 wide bvh

5. leaf size 1,2,4,8,16,32,64

6. traversal: threaded, stack (+-sorting), stackless, brute force

7. bounding volumes: aabb, obb, rss

8. coherent vs incoherent queries

Revisions

It looks like I will hit the 100% goals, but I won't have time for 125%.

Resources

No changes.