SDF-Based DirectX Path Tracer

Milestone 1

Yiyang Chen, Hanlin Sun, Zhuohao Lin

Milestone 1 : Building Framework

- Problems we met

First we chose *Falcor* as our base code, but after wasting lots of time we found it too complicated to modify.

Because we want to implement software path tracing with SDF, the Microsoft DXR sample projects are also incompatible.

So we decided to build our own DirectX path trace framework.

Milestone 1 : Building Framework

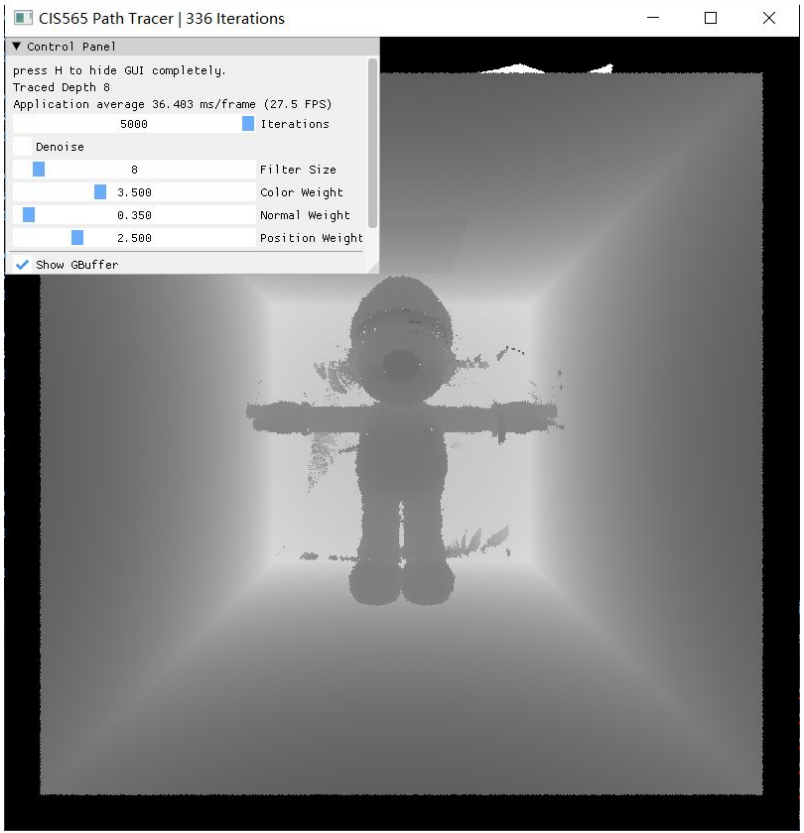
- Framework

We built a helper library of DX12 according to a tutorial and its' base code. And we successfully rendered images using the framework (forward rendering).

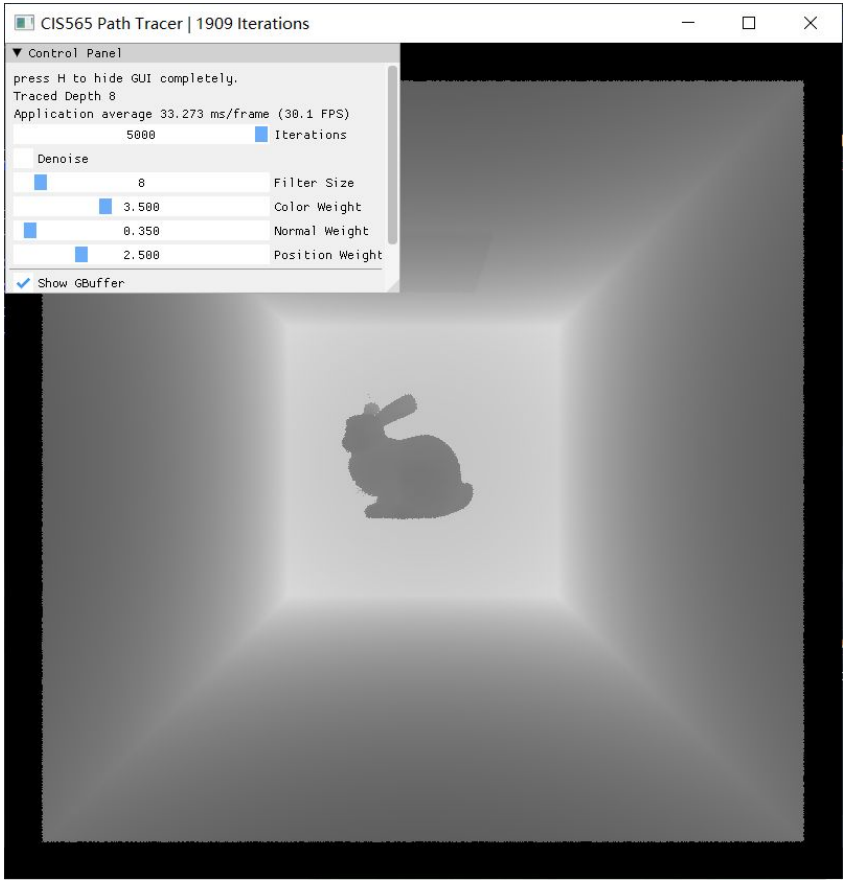
We plan to build our path tracing pipeline on it, by modifying and adding pass (etc. compute pass)

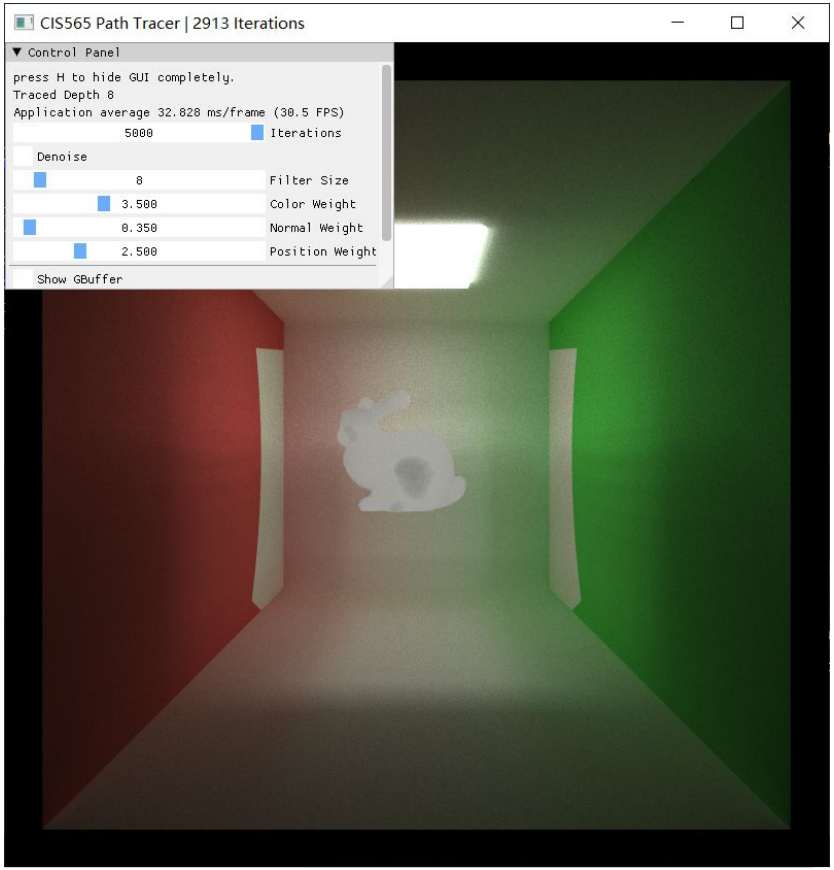
Milestone 1: Mesh SDF

- Progress
  - Brute-force algorithm for arbitrary mesh SDF generation.
  - Ray marching for SDF intersection test.
- Problems
  - SDF generation for non-watertight mesh is problematic.



Milestone 1: Mesh SDF





Goals for next Milestone

- Port code from Cuda to DirectX 12.
- Optimize SDF generation method from Brute-force to BVH method.
- Finishing DX12 ray marching Framework
- Implement screen space ray tracing