

Project 2

Cave

Abigail Love

February 25, 2019

Houdini Version 17.0.352

The Project



The picture above is a severely revised version of my original project. The challenge I faced before this iteration was creating an image complex enough to be considered a “complex scene.” However, as my project appears now, it contains about **1,750 point lights** and **over 20,000 packed primitives**.

Layers and Issues

Since my tests had told me that this project would take an enormous amount of time to render, I decided to split it up into layers that I would then composite into the final result. The layers and the challenges I faced with each one are listed below.

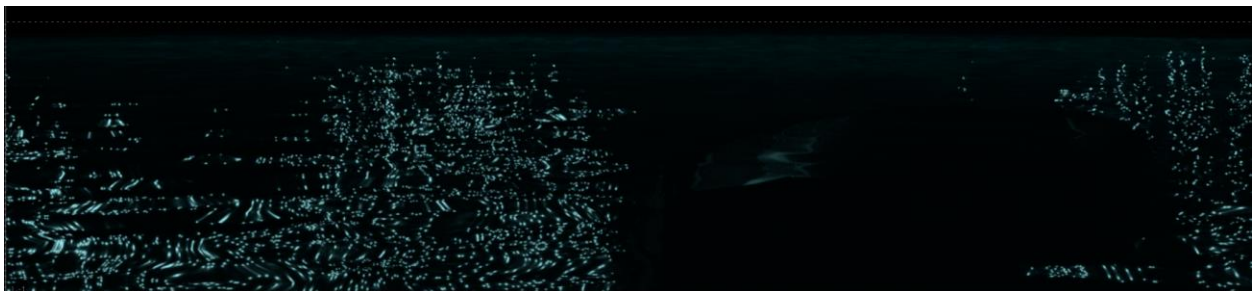
Extra information: I rendered the scene in two ways- in many individual layers affected by the point light instance, and all at once with one diffuse light. I limited the number of

image planes I was rendering to **diffuse, reflect, refract,** and **depth**. My final render settings included setting the diffuse limit to 2, pixel samples to 5x5, and max ray samples to 32.



1. The Cave Ceiling

The cave ceiling was the heaviest object that I rendered because it was the largest object, was textured with an image, and interacted with the point lights the most directly. During render tests, I estimated that rendering it would take over 8 hours, which was unsuitable. In order to make it manageable, I lowered my pixel samples by one in comparison to the rest of the scene (4x4 instead of 5x5), and I used the camera settings to split the layer into thirds, rendering one at a time locally. Each piece came in at about 2 hours for a total of 6 hours in rendering time.



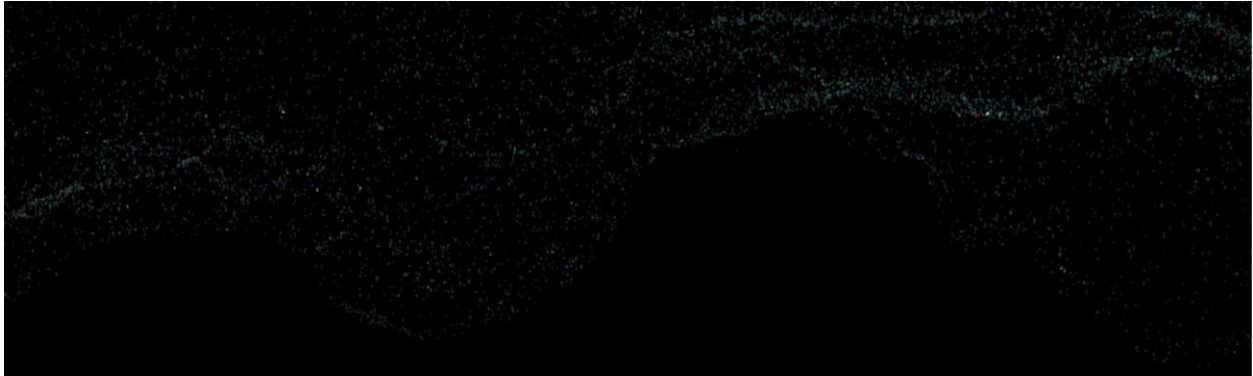
2. The Water

The water was the second heaviest object to render, but I didn't split it up or have any issues rendering it. It rendered locally in 4 hours and 20 minutes.



3. The Boat

The boat was rendered three times: once by itself under the point lights, once by itself under the diffuse light, and once more with the rest of the scene under the diffuse light again. Only the passes where it was rendered solo were used, and they were extremely useful when combined. The two passes created an effect that places it within the cave space well. The boat in diffuse light rendered in 3 minutes, and the boat with the instanced lights rendered in 1 hour and 14 minutes.



4. The Web

Although a little hard to see in the final render, the webs in the scene are the source of most of my geo. There are over 20,000 packed webs that are placed on the cave ceiling, with a slightly transparent, shiny, light-colored material on each of them to make them look accurate. They were incredibly easy to render at 17 minutes.



5. The Diffuse Light Scene

Last to render was the diffuse light scene, which contained everything in my scene except for the instanced point lights, replacing them with a single diffuse light. I mixed this image with the instanced version of the scene in order to bring some of the textures lost to the darkness of the point lights into the final image. It rendered in 4 minutes.