Individual Write-Up

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I’m in charge of the pipeline design and SSAO of our project.

There are challenges that I foresaw when we were making plans, and difficulties that I met when implementing the features.

First, designing a flexible pipeline is really hard, which I knew that before starting. At first the pipeline only features shadow pre-processing and forward rendering. Then we have the need of using multiple materials, and after that comes the post-processing effects. And eventually we decided to add real-time refraction, which needs the screen texture before the object is rendered. Every time I need to adjust the pipeline a little, and eventually it gets less efficient and elegant.

For SSAO, its concept is very easy to understand, but changing it to shader codes did take a long time. Unlike PBR, there are not many formulas there. All we need to do is to randomly sample around the pixel and calculate the occlusion contribution. However, that sampling stage struggled me. Either my output buffer is not correct, or it’s too noisy. So, I take the implementation of the book *Introduction to 3D Game Programming with DirectX 12* as a reference. Even so the performance is buggy.

There are things went pretty well too. The pipeline, even its not good enough, was functional at the very beginning of the project, which makes the members much easier to implement their part. And like I said, the concept of SSAO is very easy so I don’t need to take several hours before I start to implement it.

If possible, I’d like to re-design the pipeline we had this semester, and that’s part of the reason I applied for an independent study. Also, with this project, I understand the post-processing effects much better than I did before. I might try to do some other stuff like motion blurring for our capstone project.