Assignment 1 – Custom Shaders

Matthew Siegenthaler

What was once the battlefield of a last stand, is now rests an overgrown shrine where the plant life feast on the unfortunate souls. This scene aimed to combine both the prompts of and growth, depicting life flourishing in a place of death and decay.

The project consisted of assets from the Quixel Megascans Library along with custom shaders. My effects primarily begun from the shader effects learnt from the studio and workshops from FIT3097 weeks 1-4. From the base effects, I extended upon these to achieve thematic effects for my scene primarily through personal experimenting with nodes.

My original attempts to create an edge mask for the moss in my scene examined attempts by *(Wonderscape Creations, 2023)* and (*Meyer, J. 2022).* This was used to primarily learn the setup and the effects of each node on the mask. Although I didn't use this effect in the end, my learnings resulted in me producing my surface mask material function which I used instead for my moss effects.

Other materials I referred to were forum posts on the Epic Developer forums describing usage of Unreal Engine's foliage tool as I was unfamiliar with how to use it.

The shader effect I am most proud of in the scene is my ocean material. This effect has several effects that depend on the nearby surfaces in the scene such as colour blending, a tidal effect, and ripples. I wanted to create the effect of blood draining from the island and leeching into the nearby water of the ocean. This uses the distance field like the ripple effect to alter the absorption coefficient.

Other effects of note include:

- Using shaders to adding emission to the metal lantern by creating a mask from the opacity channel and chroma keying the lantern albedo texture.
- Creating a material function to provide a mask for the top surface of an object (used for moss).
- Dynamic wind strengths based on object scale with added randomness from world position and noise.

In future work, I would like to further explore managing shader effects with level of detail (LOD). This could allow me to toggle on different shader effects for a material based upon the distance from the player and allow me to better manage the shader complexity in the scene. Particularly with the water effect, the shader complexity was significantly high due to the cost of transparency and refraction. I had tried to experiment using a higher vertex density plane to create larger waves using vertex displacement. However, since I had separated the low detail mesh, it would try to refract through the second liquid resulting in extremely bad shader complexity on the mesh borders as a result. As I was limited with time, I opted to drop this effect.

Additionally, I would also like to explore effects caused by the player position such as displaying ripple decals at the player's feet in water or wind/movement of foliage when the player intersects. This would add a sense of presence to the player in the scene as they influence the scene.

Google Drive Link:

https://drive.google.com/file/d/19TN7PAjc1io-Xr-aZf1VRH4tYDUNq7XJ/view?usp=drive_link

References

- *Quixel Megascans. (n.d.). Quixel. https://quixel.com/megascans*
- *Wonderscape Creations. (2023, October 27). World Building Auto Material PT 1 Slope Mask and Edge Mask. YouTube. https://www.youtube.com/watch?v=cdMgCwxW-nI*
- *Meyer, J. (2022, March 14). Real-time edge damage masking [Review of Real-time edge damage masking]. ArtStation. https://www.artstation.com/blogs/jjq/B2Dd/real-time-edge-damage-masking*
- *Vertex painting on Instanced Meshes. (2016, August 9). Epic Developer Community Forums. https://forums.unrealengine.com/t/vertex-painting-on-instanced-meshes/366661*
- *Vertex Transfer. (2014, March 11). Epic Developer Community Forums. https://forums.unrealengine.com/t/vertex-transfer/276313*