Project Idea

Due: November 25th, 2019

3D Mandelbulb Visualizer and Raymarching Demo

Using ray marching, a volume rendering technique similar to raytracing, draw a 3D fractal onto the screen. The program will be able to orbit the volume with a camera and change the color and power (complexity) of the fractal. The fractal drawn will be a mandelbulb and it will be drawn by taking advantage of modern graphics hardware using a compute shader. The program will also act as a learning opportunity for shaders in general and will have interactive demos to better understand how they work. Finally, the program will utilize Unity3D, a popular game engine, to handle the compilation of compute shaders to different platforms and provide some low-level matrix transformations of the camera. Instructions on using the project files will be provided.

Project Participants:

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Additional links:

The Unity game engine:

<https://unity.com>

An explanation and introduction to ray marching:

<http://jamie-wong.com/2016/07/15/ray-marching-signed-distance-functions/>

Mandelbulb:

<https://en.wikipedia.org/wiki/Mandelbulb>