

Program 3 - Virtual World

You must work individually on this assignment. To receive credit, push all required materials to the master branch of your BitBucket repository by 11:59PM on May 1st.

Summary

Virtual worlds are an important part of graphics applications. Objects populate a world or scene and the user is able to navigate that world in some way. In this assignment, you will be creating a world that the user can move around in using first-person controls. You must scatter around the objects you generated in program 2, along with some other simpler pieces of geometry to create an interesting world to explore. Vary the customizable options you had in program 2 to keep the world more interesting. Assign different material properties to the different objects in your world. You may choose the lighting conditions of your world. Lighting plays an important role in how your world looks and feels. Is it mid day? Dusk? Dark with a flashlight attached to your virtual character?

Required Materials

Your program3 directory must include:

- All source code for the completed program
- A screenshot of your world from a viewpoint of your choice
- A readme text file with any necessary instructions for using your program, along with a description of what is in your world and what lighting condition you chose for your world

Detailed Requirements

Your program must

Be an original program written by you. You may use code from labs as a starting point. You may talk with other students about the program, but looking at their code is not allowed.

Implement a first person camera control. The user must be able to move left, right, forward and backward using 'a', 'd', 'w' and 's' respectively. The user must also be able to look around with the mouse which will change the direction the movement keys translate the camera. The user must be able to explore your world. Collision detection with your objects is not required.

Light and shade your world using the Phong reflection model. Your world must have objects that are assigned at least 3 different materials. A material consists of an ambient, diffuse and specular color. Create lights in your world to approximate the lighting condition of your choice. Feel free to apply textures to give more detail to your world.

Construct a virtual world. Your world must include at least a ground plane and 10 different configurations of your program 2 object. It must also include at least 10 different basic objects. A basic object could be as simple as a couple scaled cubes or could be models that you load in. The goal is to create a visually interesting world that the user wants to explore. Hide easter eggs if you like and let the user find them by pure exploration, or lead the user places with how you've laid out your objects. It's up to you.

A readme file. Write up what your program does, and how to use it, along with any extra information you want me to know about your program.

Demonstrate creativity and self expression. Put effort into your program, beyond the minimum requirements. Experiment, put extra features in, organize your code exquisitely, it's really up to you. Explain what you did in your readme file.

Point breakdown

20 - Correct first person controls

20 - Correct Phong shading

20 - 3 different materials assigned to objects

10 - Lighting that matches your choice of conditions

10 - 20 different objects (10 objects from program 2, 10 basic objects)

20 - General (code style, execution, creativity, self expression and readme)

100 total points

EXTRA CREDIT

up to 20 points - Add a particle system for the user to find. What the particle system does is up to you, but could be a sparks simulation, a fountain, a tornado or whatever else you come up with.