

CS 432 – Interactive Computer Graphics

Assignment 4

The goals of this assignment are

1. Rendering Spheres
2. Object Picking
3. Multiple Views

Requirements

For each programming assignment you should submit a **zip file** containing the code (and MSVS/Xcode project/solution files) and a **report** stating: what you did; how you did it; any particular features you want to draw attention to; any problems with the program that you know about.

In addition:

1. Your code must be original. You may discuss approaches with your colleagues but not how to code it.
2. You must use GLSL (shaders) and vertex buffer objects (VBOs)
 - a. Therefore you **may not** use glVertex*, etc..
3. Make sure your program complies and runs on either a Windows 7/8 machine with VC++, freeglut and glew or on a Mac with OSX and Xcode

What to Submit

For your submission, zip together the following.

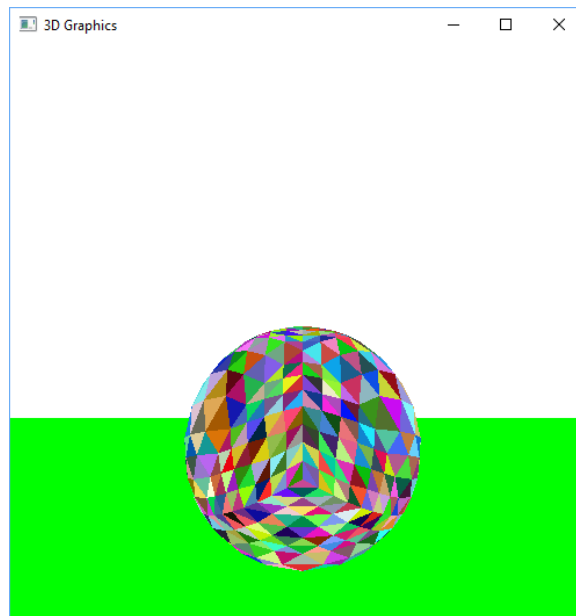
- A README file with instructions on how to compile and run your program(s). This should also include the environment in which you are developing and running (OS version, Developing Environment version, Shader Version) and any issues/features you want to draw attention to.
- Your source files
- Your file(s) containing rules for compiling and running your program(s) (i.e. project files, make files, etc...)
- **A short screencast video that you talk over (5 minutes max)**

Overview

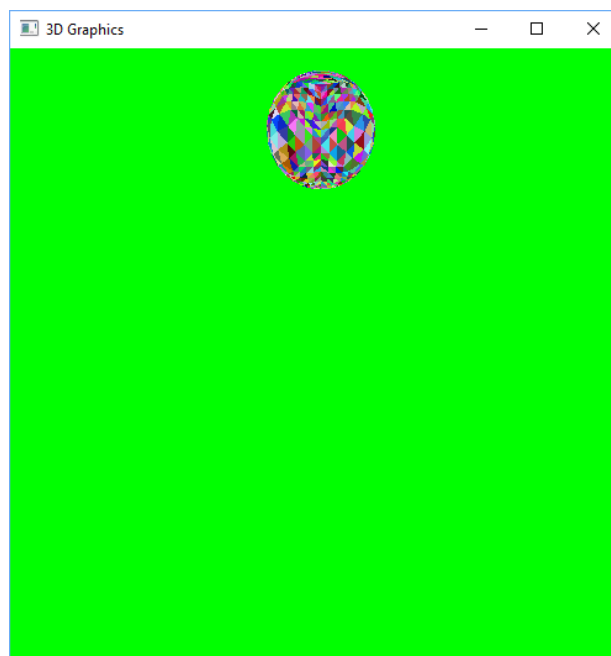
In this assignment you will have two objects:

1. A recursively built sphere. See Angle Appendix A, Problems 6 and 7
2. A “ground plane”

Your scene should be as below.



You will have two cameras that you can toggle between using the spacebar. When in “camera one” mode, if you click on a triangle of the sphere it should turn black.



Details

- The sphere should be built using recursive division as discussed in class and in your textbook.
 - Place the sphere at (0,1,-4)
- Each triangle should be a random color.
- The ground plane should be green.
 - This should be a in the xz-plane
- Both cameras should use perspective projection
 - The perspective parameters should be `fov=65, aspect=width/height, near=1, far=100`
- Place the first camera at (0,2,0), looking down the negative z-axis with the up direction the y-axis;
- Place the second camera at (0,10,0), looking down the negative y-axis with the up direction the negative z-axis;
- Camera one can be moved via your “flying camera” interface from Assignment 3.
- Camera two never move.

Extra Credit

Add collision detection to your program so that if you try to move inside of the sphere when in camera one mode you will not be able to.

Grading:

- | | |
|---------------------------|---------|
| • Draw Sphere | (25pts) |
| • Draw ground plane | (10pts) |
| • Toggle Cameras | (20pts) |
| • Flying Camera Interface | (25pts) |
| • Picking | (20pts) |
| • EC | (10pts) |