

CS445/545 – Project 3: Interactive Camera

1. Due Date

Project 3 is due on **11/17 11:59pm**.

2. Introduction

Write a program using OpenGL to create a 3D interactive camera. As shown in the lecture note L10, there are two modes of camera implementation: First-person mode (e.g., used in first-person shooter games or VR) and focus mode (e.g., used in 3D modeling or CAD model visualization). Make sure you run the example executable to see what you are expected to finish.

First-person mode is required. Focus mode is optional for bonus credits. Note that if you don't implement the first-person mode in your submission, though you may implement the focus mode, you won't earn the bonus credits.

3. Requirements

- 3.1. (10pts) **3D Grid**: create a 5x5 grid in 3D environment.
- 3.2. (10pts) **Perspective View**: show a correct perspective perception in your program.
- 3.3. (40pts) **Camera rotation**: use mouse buttons and/or keyboard to rotate the camera about the eye position.
- 3.4. (40pts) **Camera movement**: use “W, A, S, D” keys to move the camera.

4. Bonus Credits

You can earn a total of 20 bonus credits if you implement the focus mode camera.

- 4.1.(5pts) **Camera mode switch**: implement a method to allow users to switch between first person mode and focus mode.
- 4.2. (5pts) **Camera rotation**: use mouse buttons and/or keyboard to rotate the camera about the *lookAt*.
- 4.3. (5pts) **Camera zoom**: use mouse buttons and/or keyboard to zoom in and out along the viewing direction.
- 4.4. (5pts) **Camera panning**: use mouse buttons and/or keyboard to pan the camera.

4. What to Turn In

Zip the following files and submit to Canvas:

- (1) A description that explains how to control the camera and how to switch between the modes if you implement both.
- (2) The source files of the program, which should include only *.h* and *.cpp* files.