ICG 2024 Spring HW1 Specification

Due to 2024/4/18 11:59 PM

March 12, 2024

1 Introduction

Before diving into the homework, you can first refer to the demo links [1] [2] in references below to understand what the final result may look like. However, we also encourage more creative ideas to complete this homework. The sample code can be found at the following GitHub Classroom link: https://classroom.github.com/a/5X0-umxz. Please join the GitHub Classroom to accept the homework and fill out the form: https://forms.gle/4MMwucV7wk3EJEAQ9 within the deadline to confirm that your GitHub account corresponds to your student ID.

2 Requirements

In this homework, the following four requirements need to be fulfilled: shading, fundamental transforms, 3D clipping, multiple objects and lights.

a. Shading

Implement Flat, Gouraud, and Phong shading in shaders. Note that for Gouraud shading, TAs have already written part of the Gouraud shading in the sample code. You can either complete the remaining parts to finish Gouraud shading or write your own.

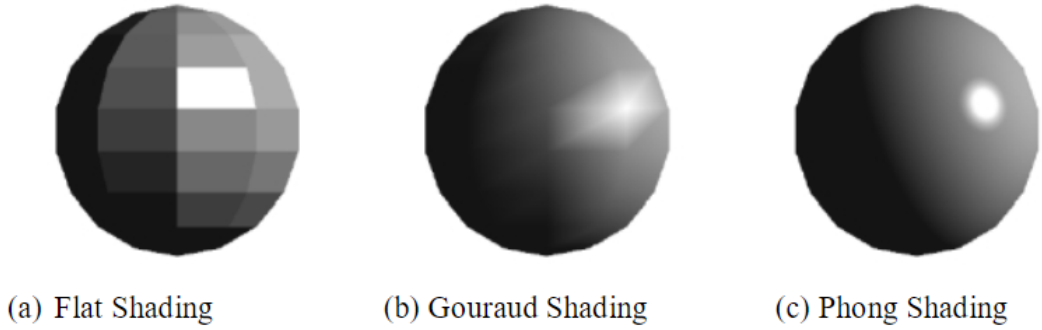

Figure 1: Flat, Gouraud, and Phong shading.

b. Fundamental Transforms

Enable four fundamental transforms (translate, rotate, scale and shear) on objects in a scene. You are free to use those provided model files and arrange them to form the scene on your own style.

c. 3D Clipping

Implement 3D clipping, at least in one direction(x or y or z).

d. Multiple Objects and Lights

The scene should include at least three lights and three objects. Among the types of objects, there should be at least two objects from different models. Additionally, the scene must include three lights at different positions. You can verify the presence of the three lights through the specular highlights in Phong shading.

3 Bonus

We welcome bonus features, extra points will be granted. For bonus, include but not limited to implementing different shading (ex: Toon shading), special lighting effects, interesting animations, importing or modeling custom models, etc. The creative effects designed can be considered for bonus points.

4 Submission & Demo

TAs will grade your homework through physical demo. TAs will invite everyone to Room 104 to demo their homework on 4/18. Detailed demo instructions will be announced before the demo date. Additionally, code and related resources must be submitted to your own repository in GitHub Classroom before **11:59 PM on April 18, 2024**. Remember to fill out the form mentioned earlier https://forms.gle/4MMwucV7wk3EJEAQ9 before submission and ensure that the information is correct.

5 Policies

You have to write your own codes. Copying code from others is not allowed. We encourage you to discuss with your classmates, but remember to mention their names and contributions in the code or in the README file.

References

[1] Demo 1. https://www.csie.ntu.edu.tw/~ming/courses/icg/HW/DEMO2/.

[2] Demo 2, best demo. https://www.csie.ntu.edu.tw/~ming/courses/icg/HW/DEMO3/.