Class: CS-330-R4848 Comp Graphic and Visualization

Assignment: 7-1 Final Project Design Decisions

Student: Margarita Kiseleva

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***Design Decisions - Reflection***

***Justify development choices for your 3D scene. Think about why you chose your selected objects. Also consider how you were able to program for the required functionality.***

To begin my reflection, I would like to express my appreciation of the way this course was structured. To be honest, I was rather nervous about this subject, and I was not sure how I would be able to grasp and digest such a considerable amount of information in eight weeks. However, because of the course structure and the nature of assignments, I was well-equipped and prepared for the final project. Moreover, each milestone brought me closer to the completion of the project, and all I needed to do in the week seven was to polish and perfect the work that had already been accomplished.

When selecting the objects for my scene, I was trying to be realistic. I wanted the project to be challenging enough yet achievable. I also wanted to ensure that the object I chose could be replicated with the basic 3D shapes. The shapes I ended up using for replicating all the objects in my scene are planes, boxes, cylinders, tapered cylinders, toruses, and spheres. These primitive shapes were used to create both simple and complex objects.

Once I created all the intended objects, I needed to make my scene more realistic by implementing textures, materials, and lighting, including ambient, diffuse, and specular light. The materials I set up were drywall, wood, plastic, ceramics, and glass. I was able to specify properties for each type of material making sure its shininess and reflectiveness were as close to realistic expectations as possible.

***Explain how a user can navigate your 3D scene. Explain how you set up to control the virtual camera for your 3D scene using different input devices.***

Making my scene interactive was definitely a highlight of the project. It was awesome to see how you can travel around objects and see them from different angles. To navigate the scene, we use keyboard and mouse. Keys W, S, A, and D are used to move forward, backward, left, and right respectively. With the keys Q and E, we can move up and down. Additionally, there is an option to change view projection from perspective to orthographic and back with the keys O and P. As for the mouse, its cursor is used to change the orientation of the camera the way it can look up and down or right and left. Another nice feature implemented is the use of mouse scroll to adjust the speed at which camera travels around the scene.

***Explain the custom functions in your program that you are using to make your code more modular and organized. Ask yourself, what does the function you developed do and how is it reusable?***

This project contains the most amount of code I think I have ever worked with in terms of a single application. Thus, from the very start, I decided to make sure my code was well organized and modular. This way, I would avoid the need to scroll through a massive number of code lines to find what I was looking for. The most important part of making the program modular probably was separating the portions of the code responsible for building shapes from the ones used for rendering scene. I also used extensive comments that were concise yet descriptive, and I separated each shape, texture, material, and light source so that each item could be modified individually without the need to change the rest of the code. As a result, I developed a code that could be easily modified, and whose parts could be reused in other projects.