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Tumblin

EECS 351

Project C: Episode 3: The Final Mission

Goals:

After your swift defection to the Rebellion in Project B, it is now time to take your expert knowledge of the inner workings of the empire to infiltrate the outpost and launch a new surveillance operation. Your time with the Rebellion has taught you valuable information regarding lights and materials, and now you are to use your knowledge to examine the materials of the Imperial outpost.

In the meanwhile, the Rebellion has sent you another ZIP package. It is stated on the box that this package features yet another simulation program that, in addition to the camera movement features of the last program, gives you special visors that allow you to change your current shading and lighting mode. The visors come with a built in headlight that you can turn on and off.

To assist in your mission, we've also deployed the latest cube-type light droid which you can control remotely and turn its light on and off.

On your return, be on the lookout for jointed objects made out of different materials. It is said that the legendary golden imperial shuttle has recently arrived at the outpost. There is also a Red-plastic Imperial probe with brass legs roaming about, among other objects.

Mission Objectives (User's Guide):

1. Initiate the Conquest. (Opening the Program)

To begin your mission, simply **click** on the HTML file labeled "ZhaoLuoLeiprojC.html". You will see a single screen with a Perspective viewport. This is a resizable window, just like last time, and it maintains its proportions when you drag and resize the window (Figure 1), making it perfect for portable ops.

2. Conducting convert operations (moving around)

All movement functionalities are made with the keyboard and are identical to how they were in Project C. To move around the base, simply use the **W,A,S** and **D** keys. The **W** and **S** keys will make you walk forwards and backwards, while the S and D keys will make you strafe. To survey your surroundings by looking around. You can use the **arrow keys**. In addition, we have sent you a jetpack that allows you to float with the **R** button and descend with the **F** button. It can

even go underground with its stealthy giga-drill. All instructions are written underneath the Canvas screen, in case you forget.

3. Move and adjust your light-cube droid (movable world light)

We supplied the latest models of our light droids to provide an alternate light source. This droid has the appearance of a teal cube and can be controlled remotely. You can use the I, J, K, and L keys to move the light around in a similar manner to the W, A, S and D keys.

Our light droid is very advanced and has the ability to phase through any surface. But even more exciting is the ability to change the colors of the light it outputs! In the HTML canvas, you can alter the RGB values of the ambient, diffuse and specular components of the light cube. Values range from 0.0 to 1.0. If the input is invalid or empty, the value will count as 0. If the value is higher than 1.0, it will count as 1.0. You can submit the values by pressing the corresponding submit button. You can also turn off the light altogether using the Toggle light button.

4. Changing your optical specs (Changing shading/lighting mode)

To see the world from different shading modes and lighting modes, simply press the corresponding button.

To swap between Phong lighting and Phong-Blinn lighting, simply press the "G" key to switch between the two. The program starts with Phong-Blinn lighting as the default. You can refer to (Figure 2) for a comparison of the results.

To swap between Phong shading and Gourand lighting, simply press the "G" key to switch between the two. The program starts with Phong shading as the default. You can refer to (Figure 2) for a comparison of the results.

Results:

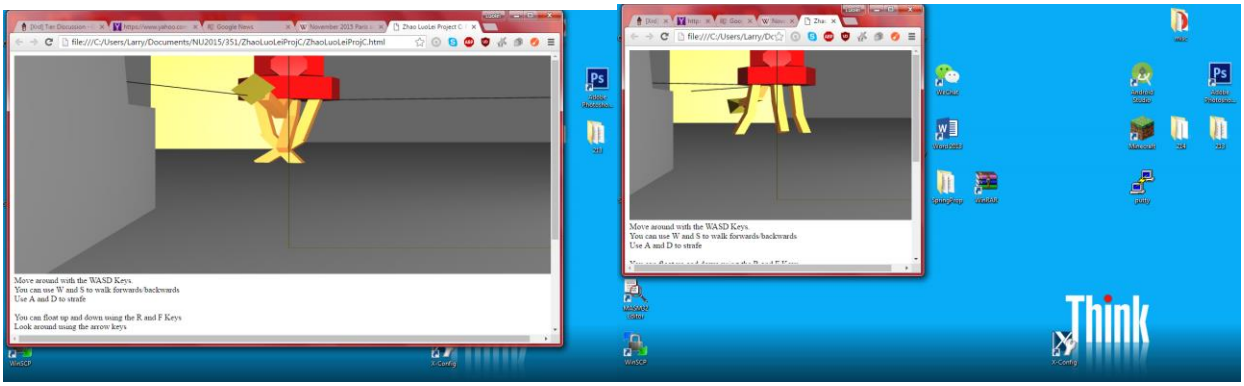

Figure 1: Example of using the screen resize functionality to enlarge and decrease the image by readjusting the browser window.

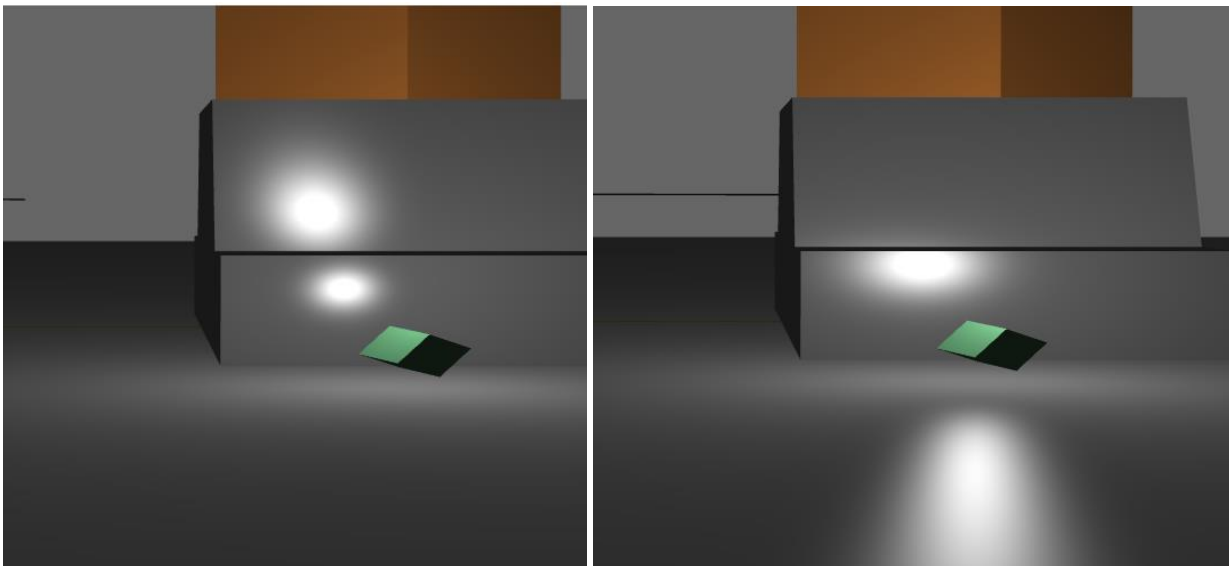

Figure 2: Comparison between Phong Lighting (left) and Blinn-Phong Lighting (right) on the same object. The cube acts as an origin point for the light. In both pictures, Phong shading is used.

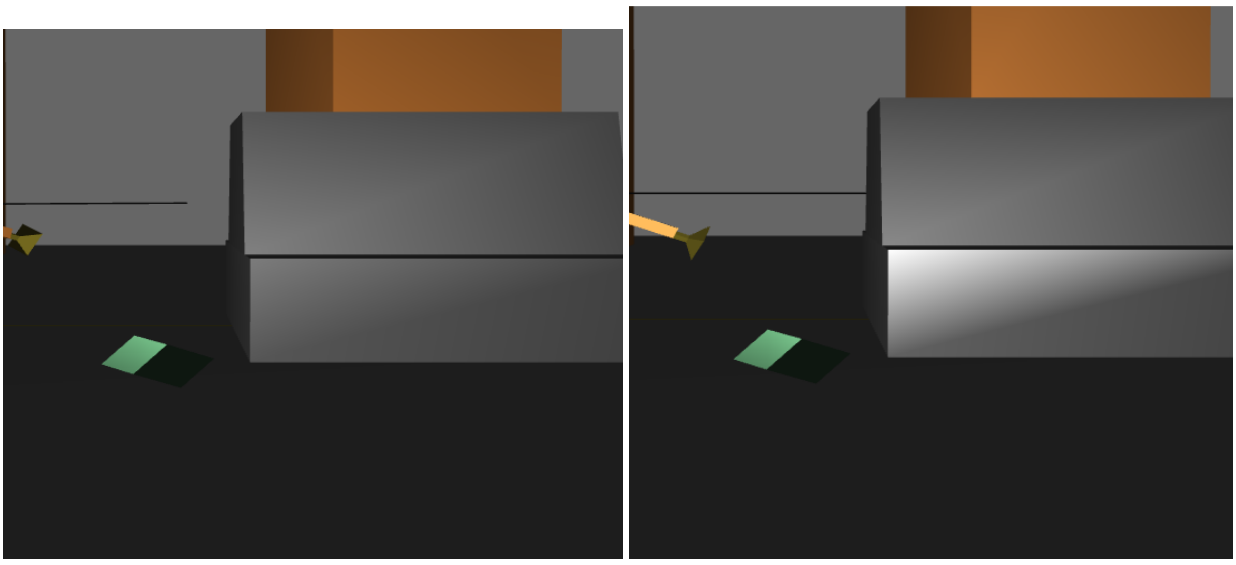

Figure 3: Comparison between Phong Lighting (left) and Blinn-Phong Lighting (right) on the same object. The cube acts as an origin point for the light. In both pictures, Gourand shading is used.

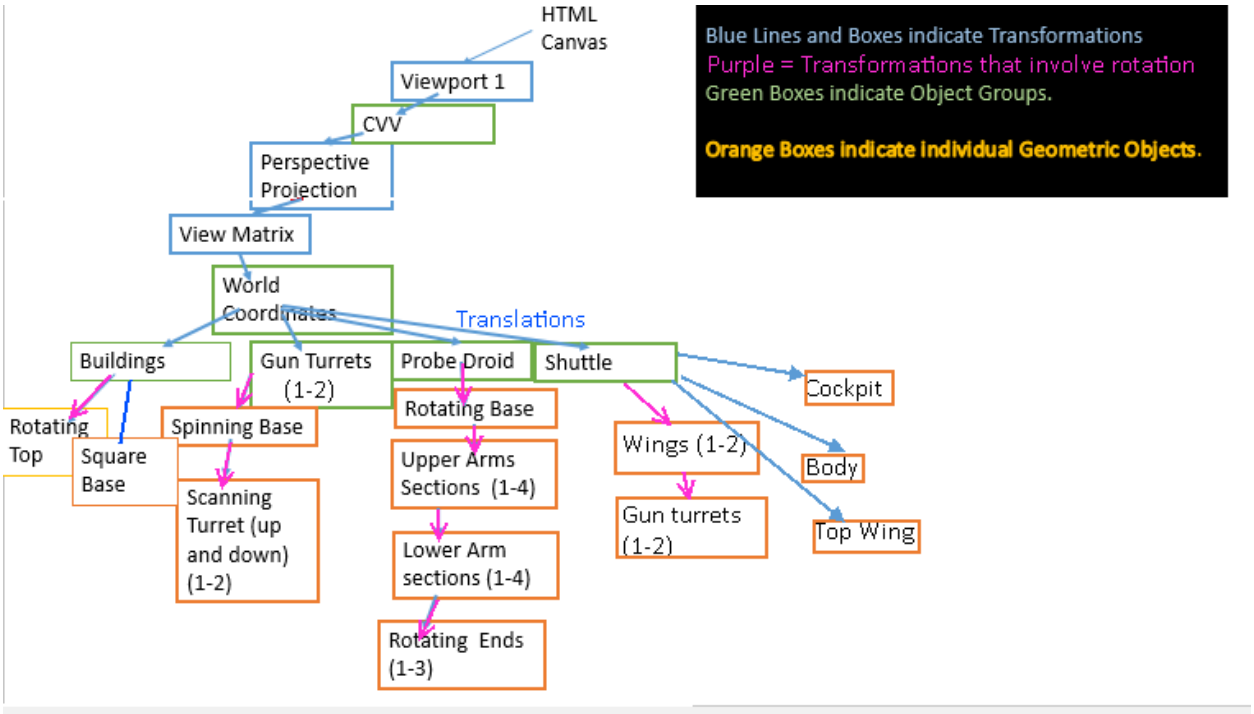

Figure 4: Scene graph of the project. Note, there are many duplicate objects that are virtually identical. Redundant objects are excluded, but the number of them is noted in the format (1-#).