

Project C: Swamp Scene with Lighting

By: Vittorio Iocco & Michael Huyler
NetID: vji1208 & msh1851

User Guide

Introduction

Upon loading the scene, the user will see a lit, perspective view of a swamp scene consisting of logs, rocks, lily pads, swaying cattails, and a flying dragonfly. If the user does not interact with the scene, the cattails will continue to sway and the dragonfly will fly around the screen at random. There are two user menus -- “Show Help” and “Open Controls” -- located to the top left and top right of the screen respectively. The user can click on these to interact with the scene.

Open Controls Menu

Upon opening the drop-down menu, the user will see five subsections as shown in Figure 1. The functionalities of each of the menus varies.

Shading

The user has the option to choose between Gouraud and Phong shading as well as a non-linear shader as shown in Figure 1.

Lighting

The user has the option to choose between Blinn-Phong and Phong Lighting. When the user has Phong Shading selected under the “Shading” tab, they can also choose between several sphere materials.

Lamps

There are two lamps, the head lamp which follows the camera and the free lamp. Both lamps can be toggled on and off using the “Head Lamp Toggle” and “Free Lamp Toggle,” and the free lamp location and color can be changed using the rest of the controls as shown in Figure 1.

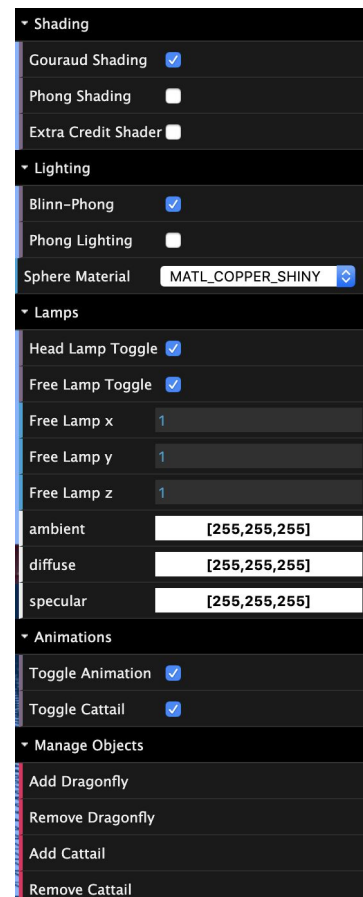


Figure 1 -- Controls Menu

Manage Objects

This menu allows the user to add and remove objects. The user can click on the “Add Dragonfly” and “Add Cattail” descriptors to add dragonflies and cattails to the scene respectively. The user can click on the “Remove Dragonfly” and “Remove Cattail” descriptors to remove dragonflies and cattails from the scene respectively.

Animations

This menu allows the user to toggle animation (pause and unpause the scene) and to toggle cattail sway. Both options can be modified by clicking the box to the left of the toggle descriptors “Toggle Animation” and “Toggle Cattail” as shown in Figure 1.

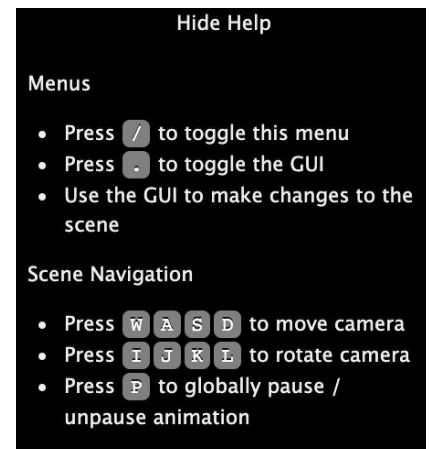
Show Help Menu

This drop-down menu (Figure 2) describes the keyboard and mouse interactions.

Keyboard Interactions

The user has several options for keyboard interactions:

1. The “\” key will toggle the Show Help Menu.
2. The “.” key will toggle the Open Controls Menu.
3. WASD to move up, down, left, and right from the user’s (camera’s) current point of view.
4. IJKL to rotate view up,down,left, and right from the user’s (camera’s) current point of view.
5. The “P” key to pause.



Results

Upon loading the page, the user will be met with a scene of cattails, rocks, logs, and dragonflies. If the user does not interact with the scene, the cattails will continue to sway and the dragonfly will fly around the screen at random. The scene is complete with lighting and defaults to Gouraud shading and Blinn-Phong lighting. This initial set-up can be seen in Figure 3. Changing the lighting to Phong lighting, we get the scene in Figure 4. This change is most notable on the cattail heads. Changing the lighting-shading combination again, Figure 5 shows the scene with Phong shading and Blinn-Phong lighting. Figure 6, shows the scene with Phong shading and

Phong lighting. Notice, that with Phong shading materials are introduced for objects. Also, as shown in Figure 7, it is possible to change the free light's color and position. In Figure 7, the light is green and placed to the left of the reader's left. Another important feature to take note of is that it is possible to toggle the lights on and off, as shown in Figure 8.

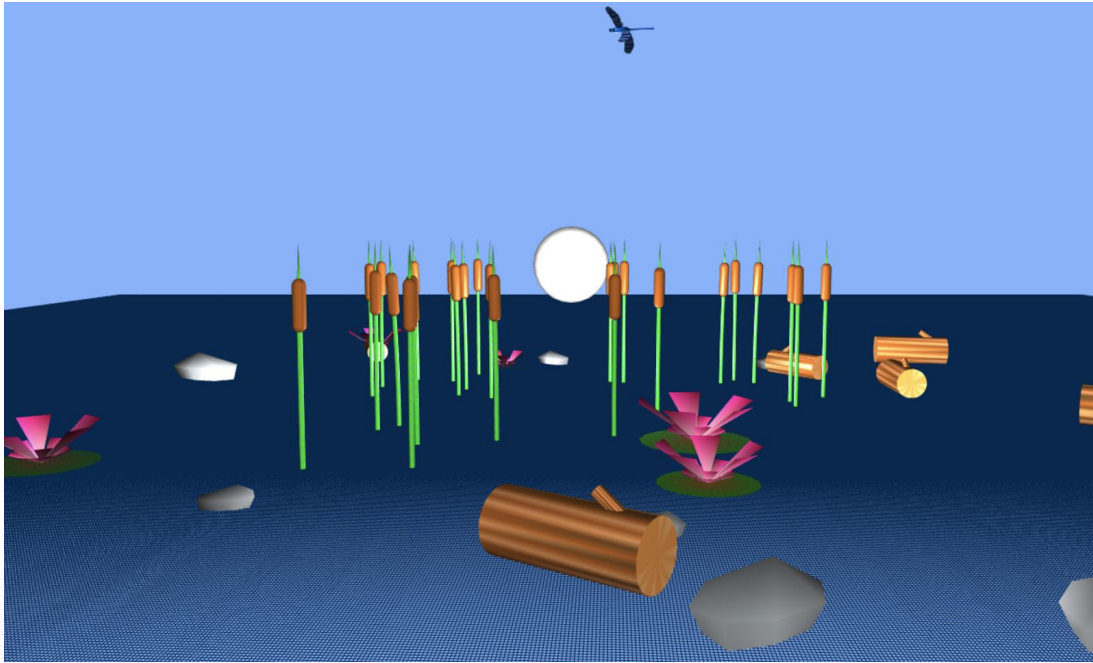


Figure 3 -- Gouraud shading and Blinn-Phong Lighting

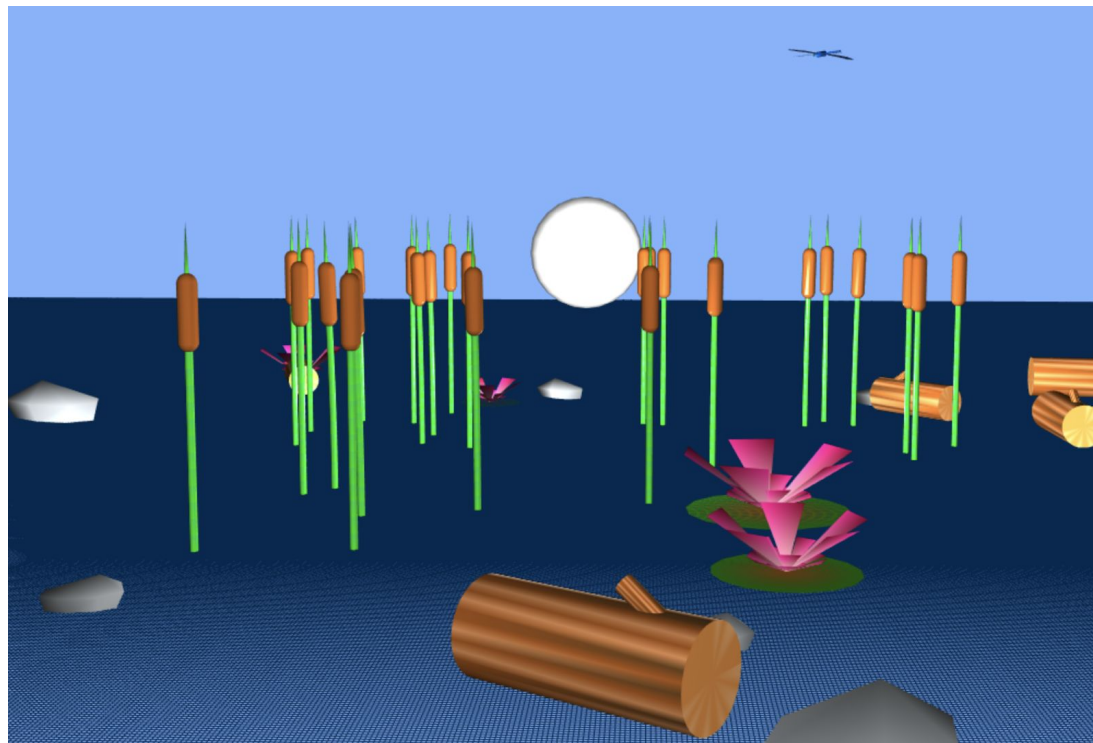


Figure 4 -- Gouraud shading and Phong Lighting

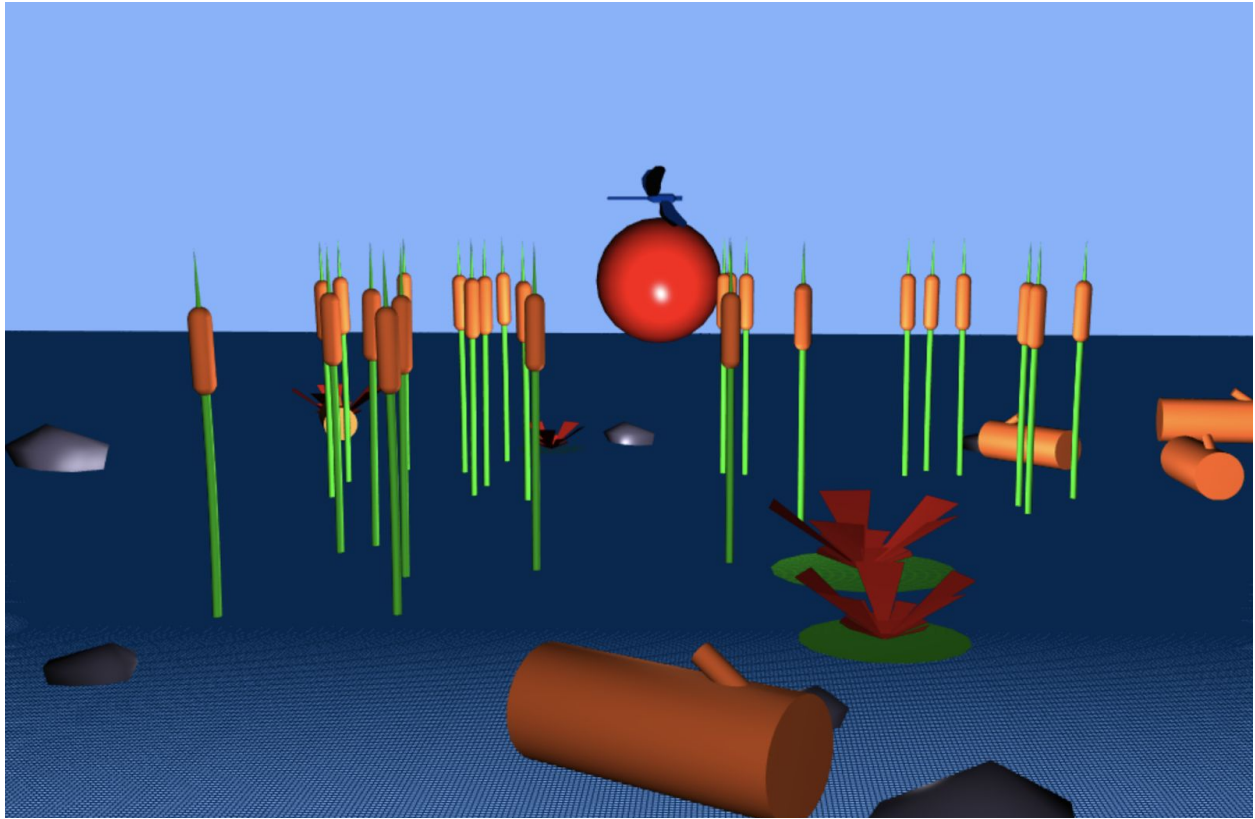


Figure 5 -- Phong shading and Phong Lighting

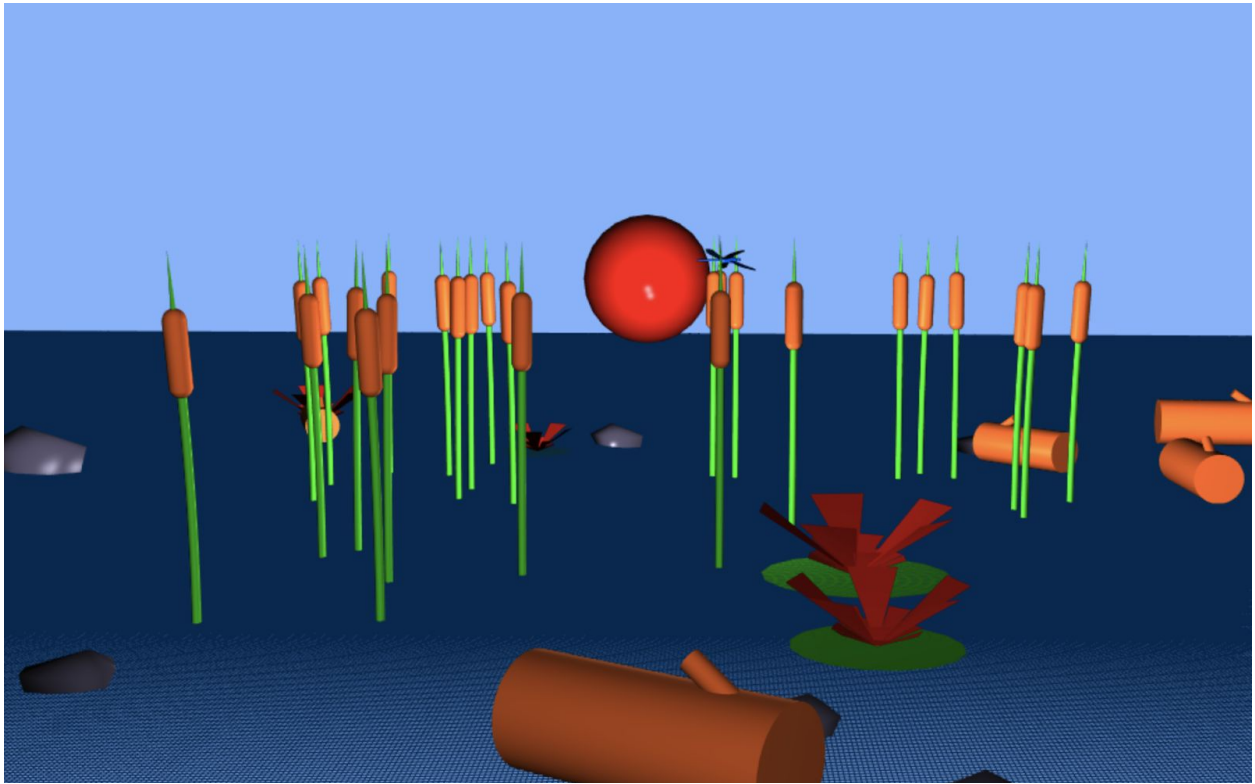


Figure 6 -- Phong shading and Blinn-Phong Lighting

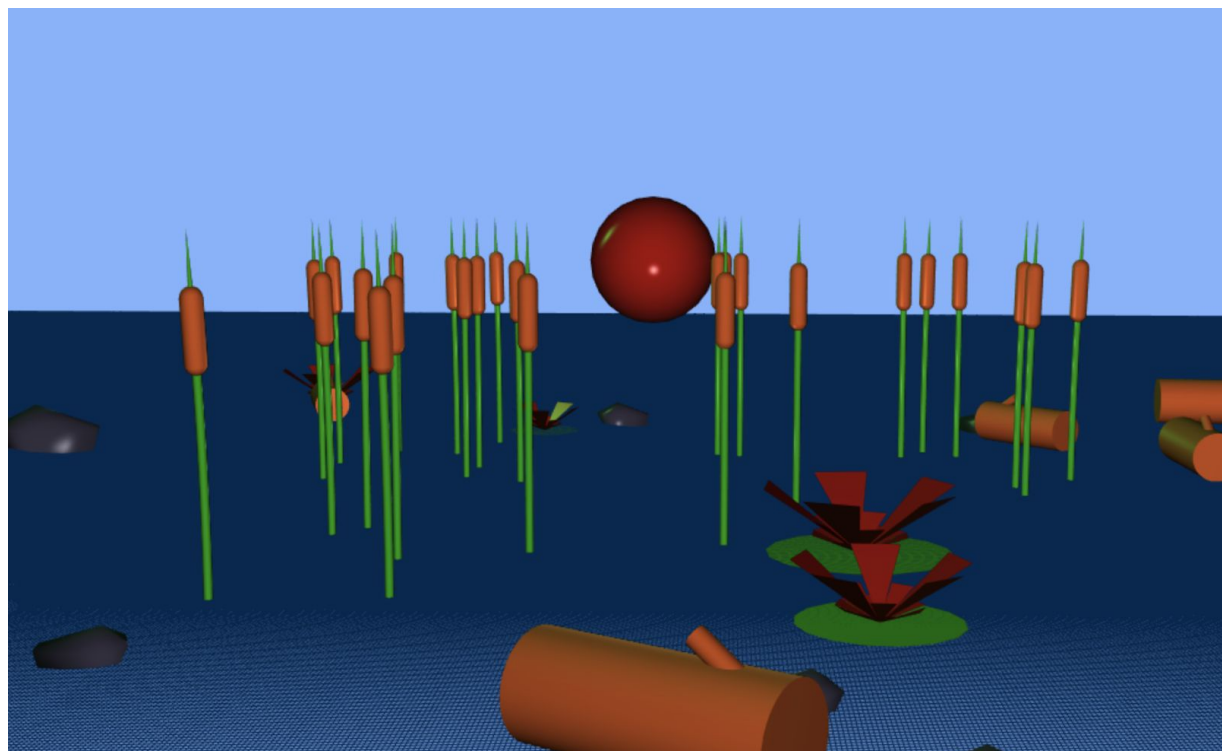


Figure 7 -- Free Light Position and Color Change

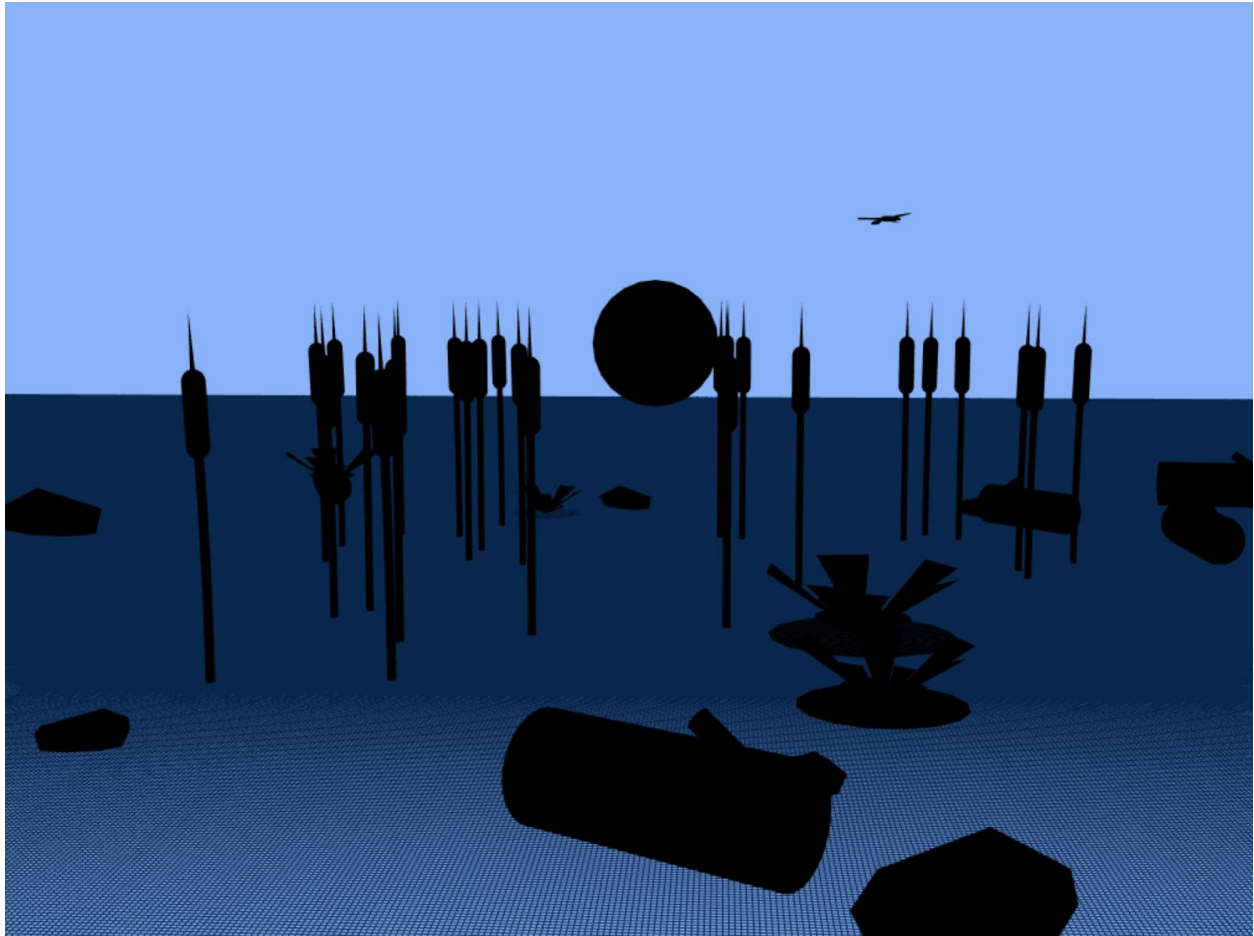


Figure 8 -- Lights Toggled Off

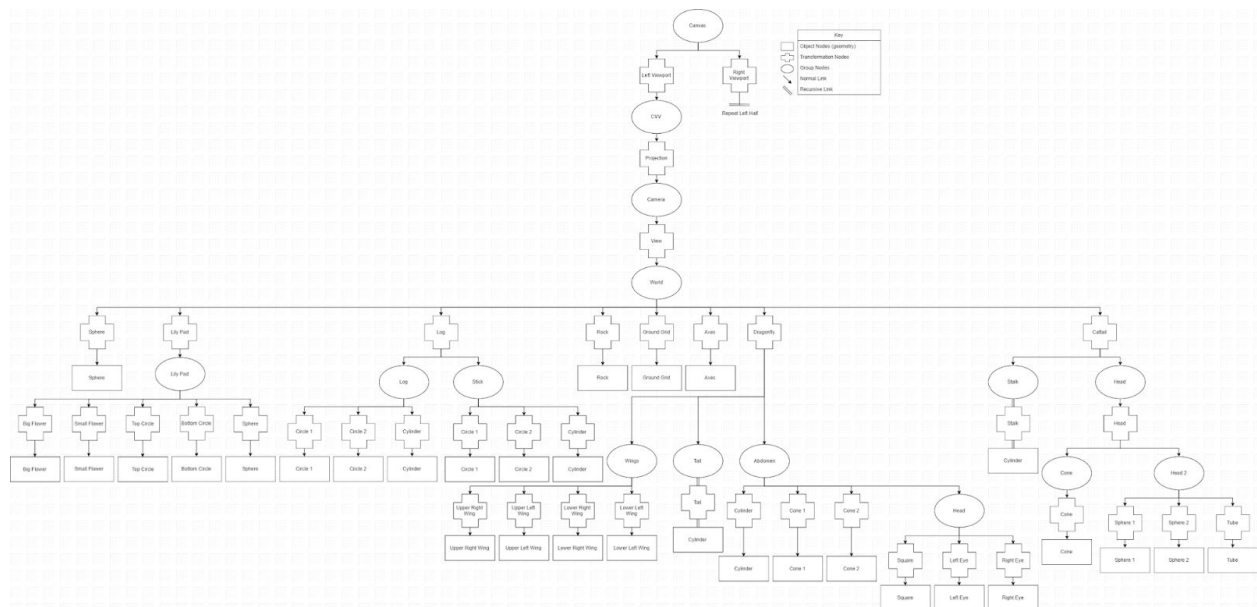


Figure 9-- Scene Graph Sketch