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Project B Report
CS 351-1

Project B: Frogs in a pond

Introduction:

The following report describes the 3D scene of a pond, a display of five assemblies in two viewports: one with a perspective camera, and the one on the right with an orthographic camera. The main user interactions are through the keys W/A/S/D and the arrow keys to control the movement and aim of the camera. The other main user interaction is through the cursor to control the rotation of the fly, and buttons on the screen to control the rotations of the main frog assembly. There are also multiple axes displayed on screen. One for the world coordinates, one for the coordinates of the frog in the main assembly, and a final axis for the coordinates of the tongue on the frog.

User Guide:

To interact with the scene, there are four major methods of interaction. The first is by using the W/A/S/D keys to move the camera forwards, backwards, or side to side. The key W will move the camera towards the aim point, the key S to move it away, the key A to move the camera to the left, and the key D to key the camera to the right. The second interaction is through the arrow keys, will which shift the aim point of the camera in a similar way as was described with the camera movement. The third interaction is through the cursor – dragging the large fly in the screen will rotate it accordingly. The user may view this rotation in both viewpoints. Finally, at the bottom of the screen, there are buttons to reset the rotation of the fly and to stop/start or change the rotation of the lily pad, the frog, and the tongue in the main assembly.

Results:

Upon loading the HTML file, the user will see two viewports at the top of the browser. The viewport on the left displays the scene with a perspective camera using a field of view of 35 degrees. The viewport on the right displays the scene with an orthographic camera, whose frustrum is calculated from the z near, z far, and the field of view from the perspective camera.

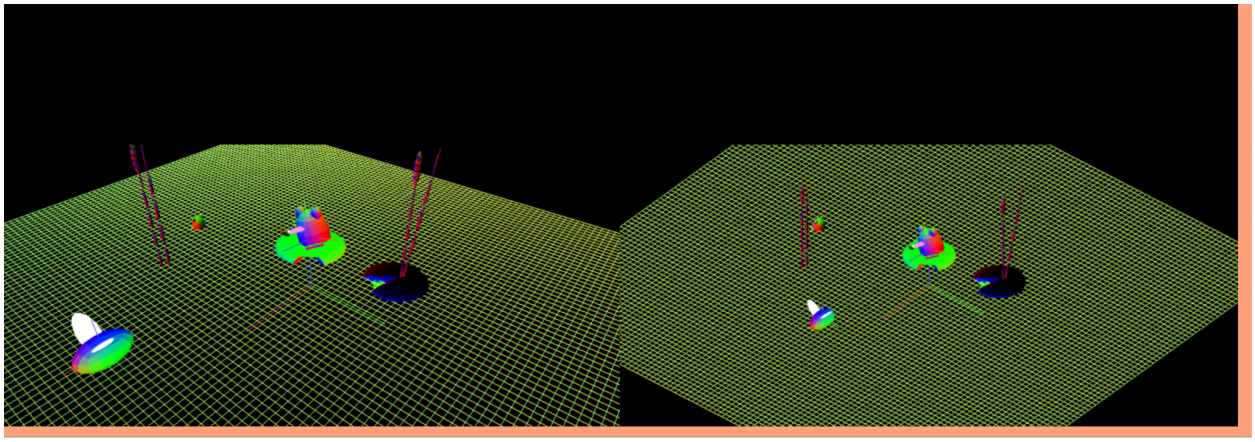

Figure 1: Initial display of the scene with a perspective and orthographic camera.

There are also clear user instructions below the view points explaining each of the four major user interactions. There are also buttons displayed which will affect the rotation of each 3D element in the main assembly of the lily pad, frog, tongue, and fly. Though there are only three buttons displayed, the main assembly consists for four 3D parts with three joints.

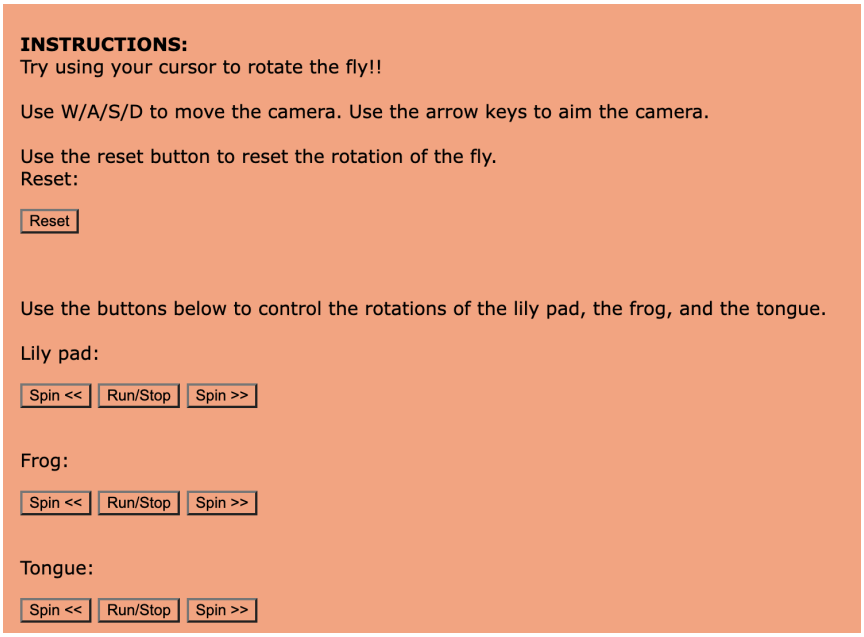

Figure 2: User instructions to interact with the scene.

The canvas will also resize itself according to the size of the browser and to user resizing, as shown below.

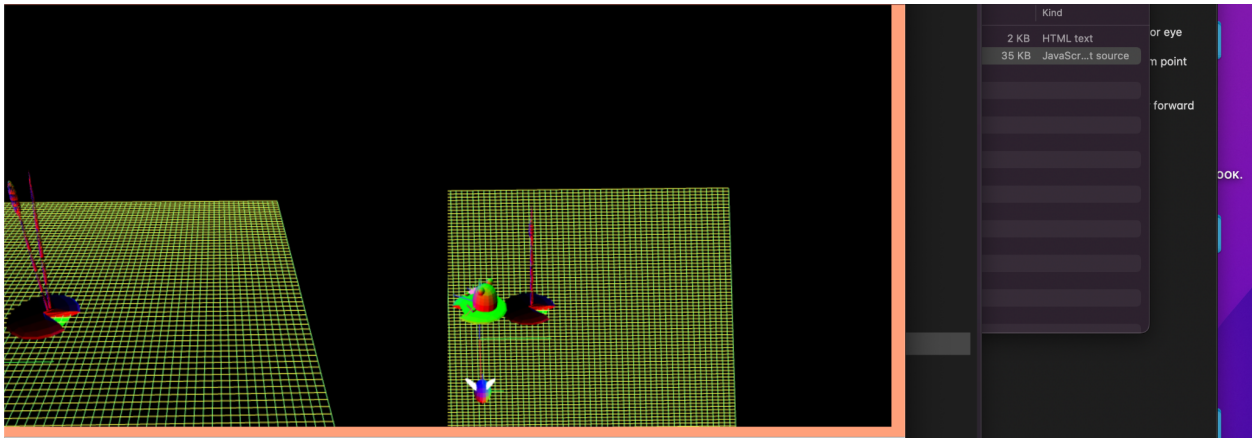

Figure 3: Canvas resizing with browser size

The user may also choose to use the W/A/S/D keys to shift the camera from forwards to backwards, or from side to side. Below is a demonstration of the view when the user shifts the camera to the left, using the A key. Note that camera shifting will be displayed in both viewports, as well as any other user interaction, such as interacting with the rotation angles of the main assembly, or dragging the fly.

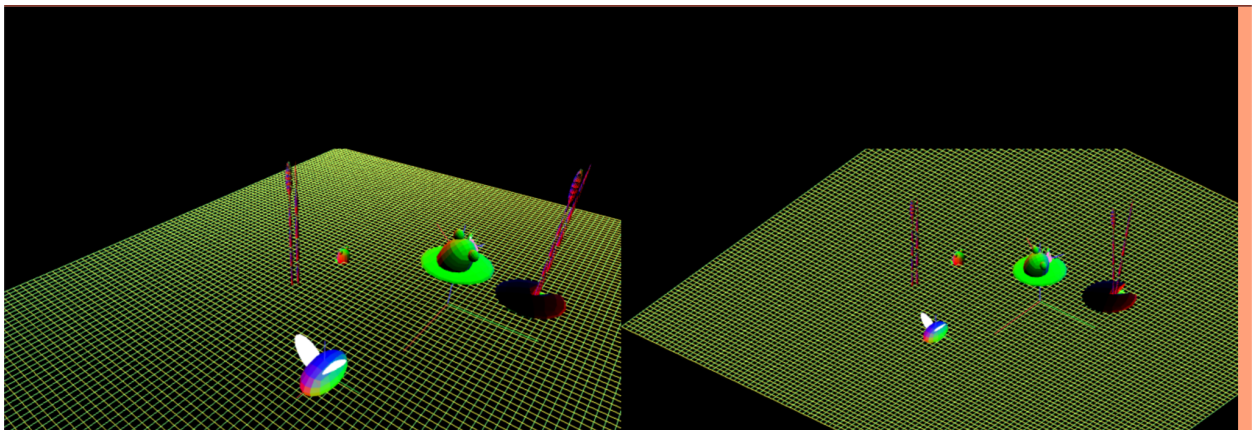

Figure 4: Demonstration of both viewpoints after user shifting the camera to the left.

The user may also use the arrow keys to change the aim point of the camera. Shown below is the resulting viewpoint after the user holds down the up arrow to move the aim upwards.

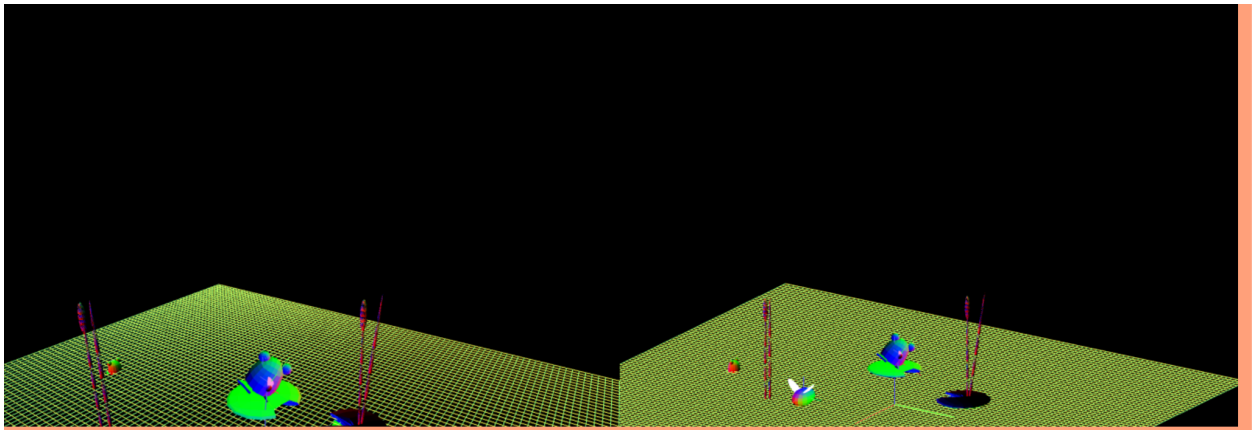

Figure 5: Shifting aim point upwards after holding down the up arrow key.