

## Section1: Goals

The goal of this project was to create a three-dimensional world with interesting shapes that the viewer can explore. The world would have a ground plane that shapes would rest on, and the viewer could look at this world from two different viewports. At least one moving object would have diffuse shading. The world itself includes the moving tank, rotating ball, colorful pyramid and other objects. The motivation for such idea is due to personal affection upon fitness. The next section will explain how to manipulate these objects and use the program.

Upon opening the html file in the Google browser, there will be a set of basic instructions on top about how to alter objects on the screen and move the camera around the world space. There are two different scenes on the canvas that the user can interact with: a perspective one and an orthogonal one, which are shown as Figure 1. There are several different types of controls and interactions the user can choose: button interaction, mouse-drag and keyboard inputs.

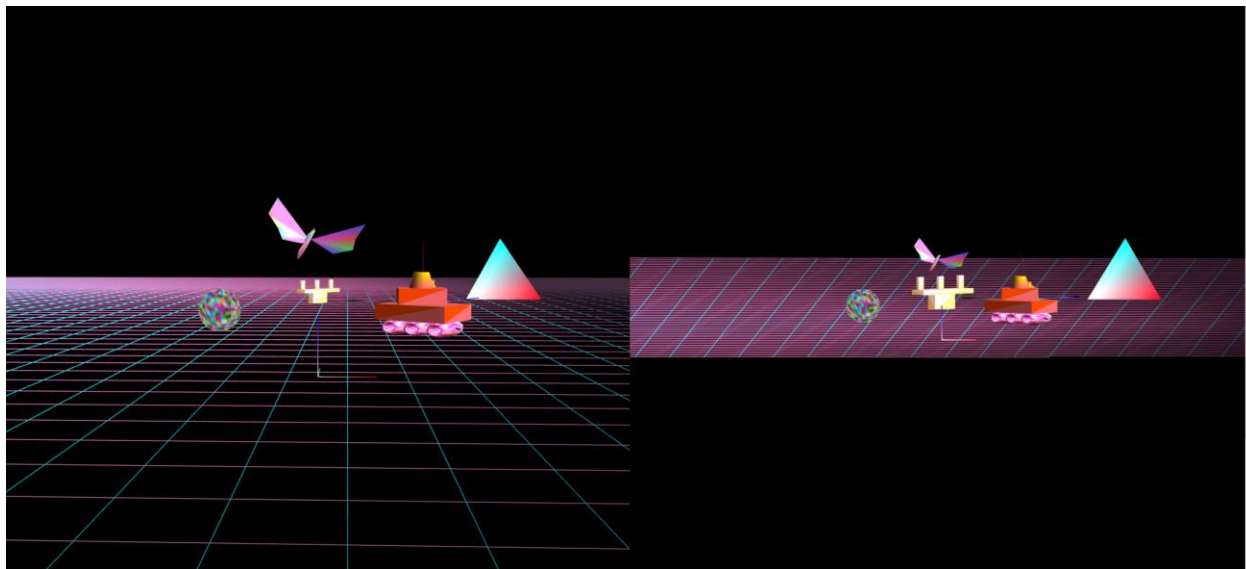


Figure 1 Two different scenes

## Section2: User-guide

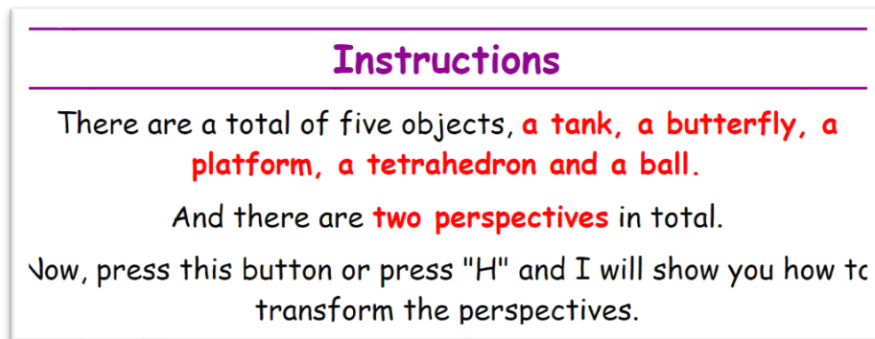


Figure 2.1 Instructions

Press J or F1 for help.

Press W(up), S(down), A(left), D(right) to turn the camera up down left and right.

Press T(up), G(down), F(left), H(right) to move the view.

Press L: flying-airplane yaw.

Press P: flying-airplane pitch.

Press O: The camera will move as segment moving.

Press space: Run/Stop the moving.

Press 1/ 2: Re-size the window width/height (asymmetric camera).

Mouse drag for Rotating the pyramid with Quaternion.

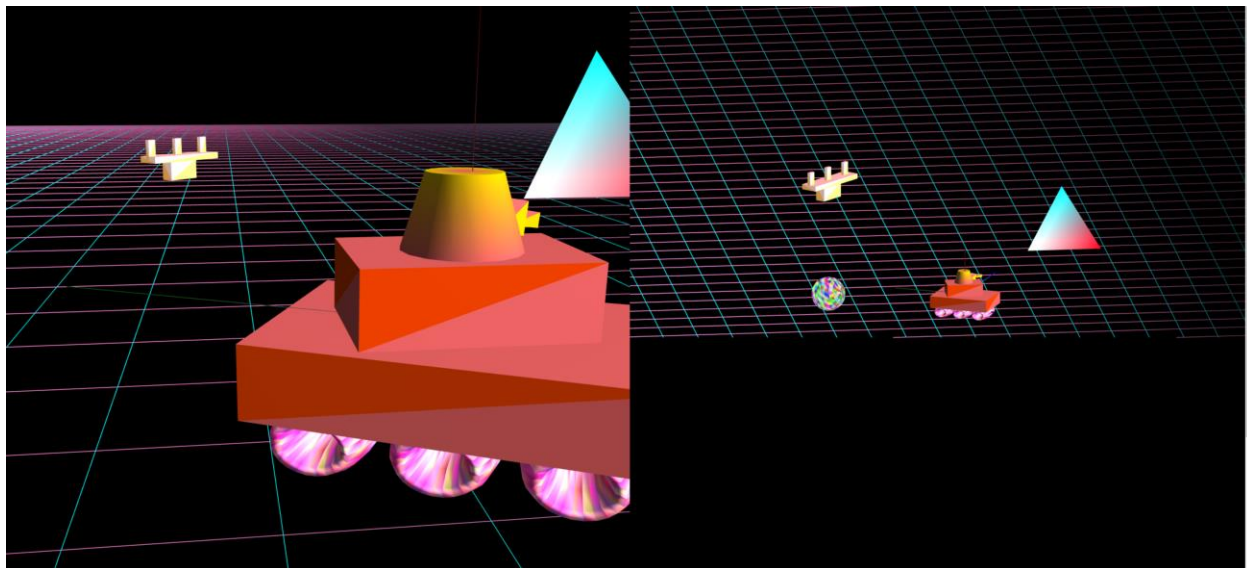


Figure 2.3 The transformation of camera

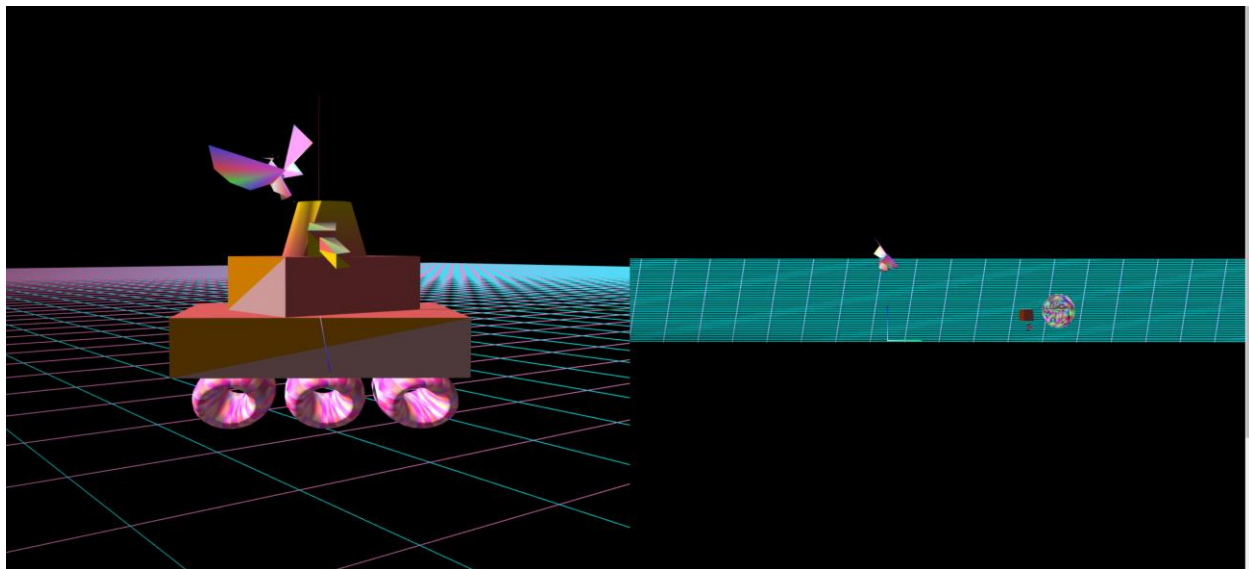


Figure 2.4 camera moves as segment moving

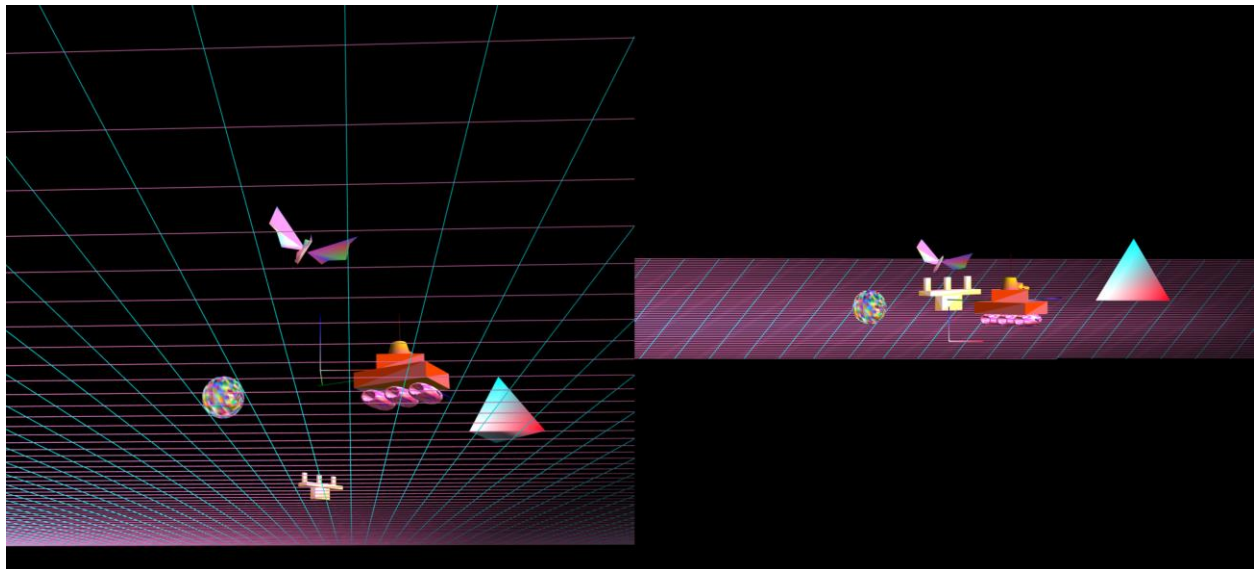


Figure 2.5 flying-airplane pitch

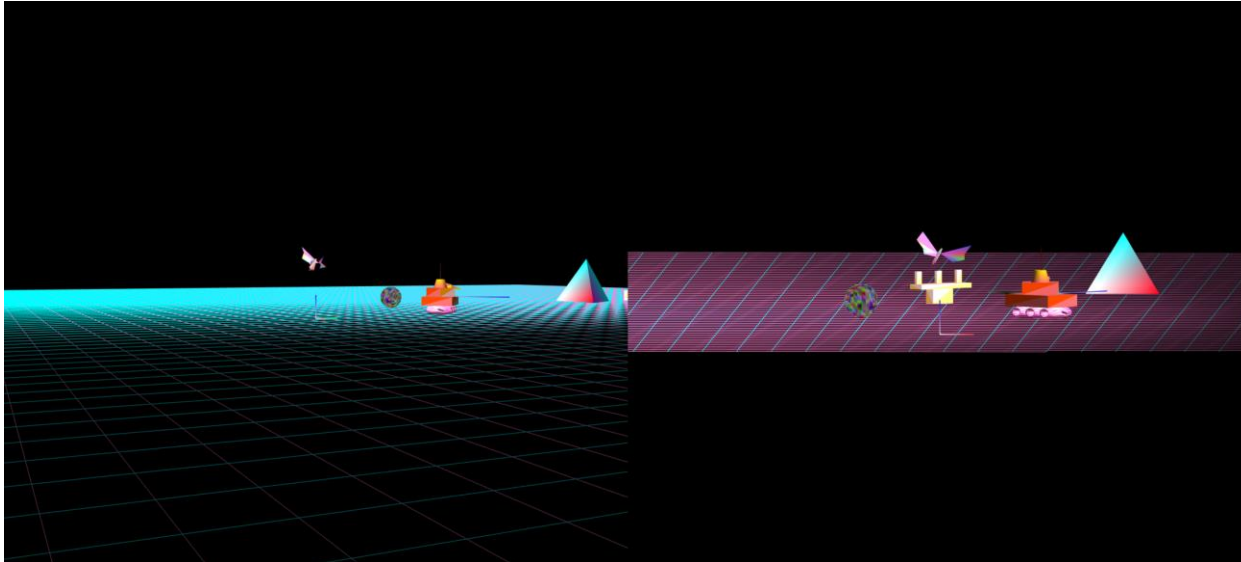


Figure 2.6 flying-airplane yaw

## Section 3: Scene-graph

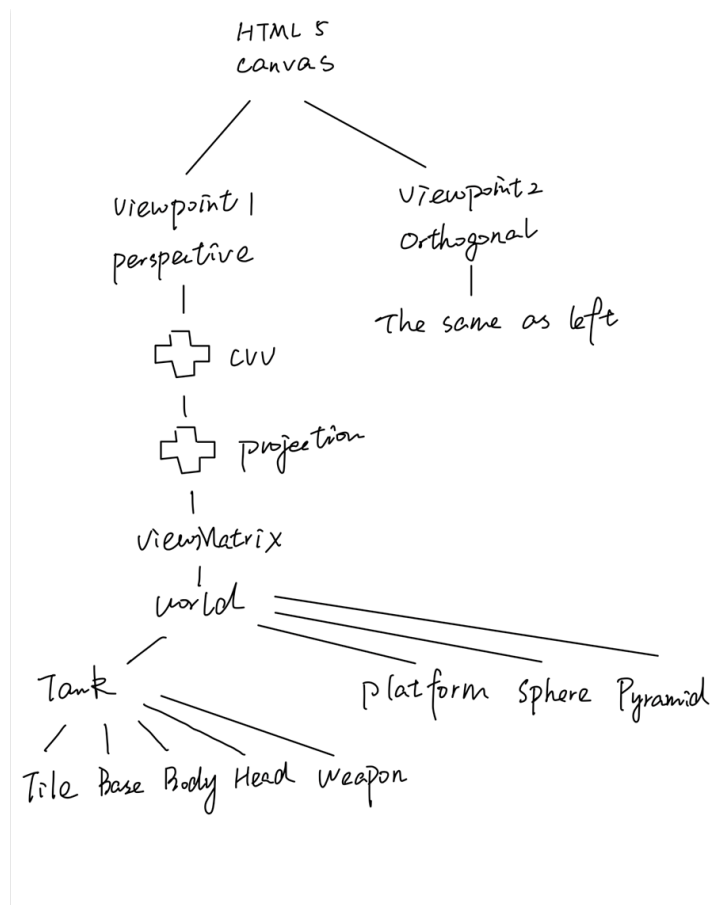


Figure 3.1 The scene-graph