

# Project B: The Death Star and the Sith

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This report outlines the goals, usage and outcomes of my project and includes images and scene graphs of the created objects.

## Section 1: User's Guide

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 is based off the Star Wars universe and features the Death Star, a “fleet” of Tie Fighters, a Sith with retractable lightsaber, star clusters, and other objects.

Upon opening the html file in the browser, there will be a set of basic instructions on how to alter objects on the screen and move the camera around the world space. The user has complete freedom of movement around the world space and is able to interact with a few different objects on the screen: the lightsaber, the Sith, the fleet, and the platform's cylindrical base. The axes of the world are located and displayed at the origin, and part of the jointed platform-Sith object also has its own 3D axes, which rotates with the attached object. Before discussing the results of the project, we will discuss the interactions available to the user and classify the different objects.

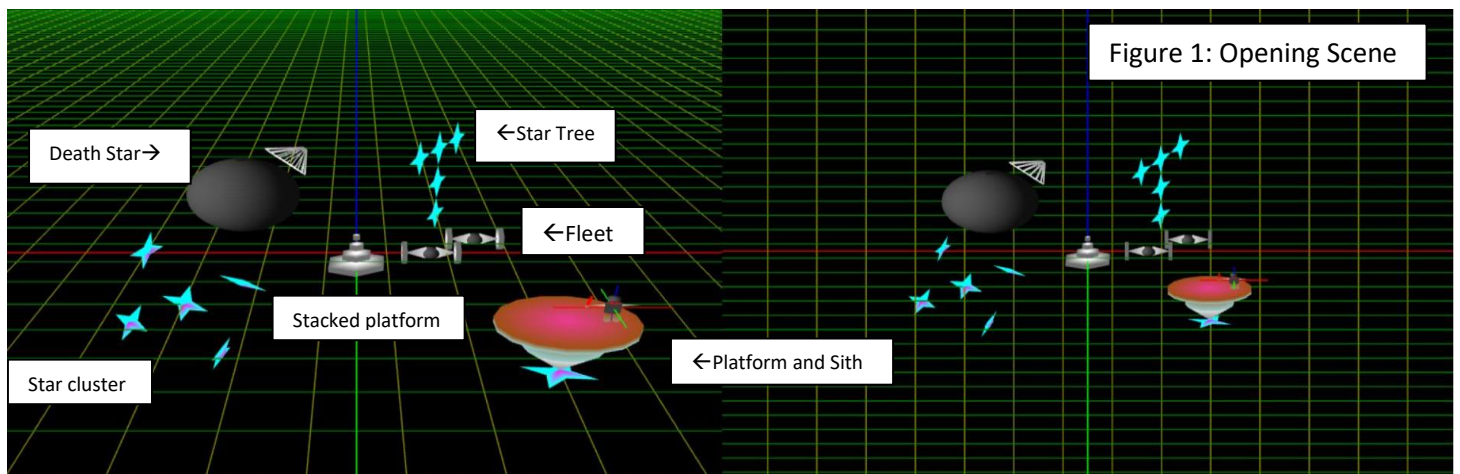
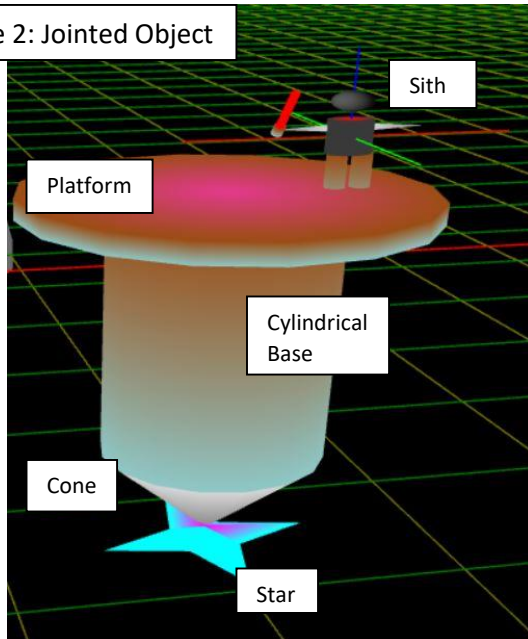


Figure 1 shows the scene as it opens. Each object is labeled with the classification that will be used throughout. Some objects will have joints with separate names which will be clarified when referenced. Let us now look at the controls and interactions available to users.

The following keyboard keys will move the camera up, left, down, and right respectively: w, a, s, d. The keys “i, j, k, l” will point the camera up, left, down, and right respectively, therefore orienting it in a new direction. Using these controls, the user can traverse the world space freely.

Figure 2: Jointed Object



The Sith, which is jointed to the platform and is jointed together, can move across the platform using the spacebar, pressing it again will stop the movement. Pressing “f” will also cause the Sith to rotate on its z axis. A second press will return the Sith to its original 0 rotation. 3D axes for the Sith are connected to the torso object. Pressing the “Saber” button on screen will cause the lightsaber in the Sith’s hand to extend/retract.

Another interaction with the large, jointed object is that typing in a number in the input box will scale the cylindrical base—the object after the second joint (see Figure 2). It will then grow or shrink gradually until reaching the scaled length. The length is limited to 0.5 and 4, anything smaller or greater will automatically adjust to the bound.

The fleet of Tie Fighters will move across the screen if the button “Release Fleet” is pressed. Pressing it again will freeze the movement. “Reset Fleet” button will return the fleet to its original position.

## Section 2: Results

The below pictures illustrate the program results. The top is a screenshot of the Instructions available when opening the html file. The others demonstrate different aspects of the program. Below the instructions, there are two images to illustrate the freedom of movement and the orthographic camera. The first of these two shows the world from a different viewpoint. The second shows perspective vs orthographic when the camera is on the ground plane. The line in the orthographic that is the ground plane is faint, but by looking at the Tie Fighters, the green line can be seen cutting through them (as their z-position is 0 but the spheres’ radi is 1). The final set of pictures are of the Death Star. The four images are screenshots of the object from different angles, showing the diffuse shading. A scene graph follows.

**In a galaxy far, far away...**

You got a glimpse of a Sith Lord and the Death Star!

To have the Sith sheathe/draw his lightsaber, click on the “Saber” button. Press the spacebar to have the Sith walk across the platform, press it again to stop. Press f to have him spin on the platform, press it again to reset.

To release the fleet of Tie Fighters, press the button “Release Fleet”. Press it again to stop their movement. Reset the fleet by pressing the “Reset Fleet” button.

To move the camera around the canvas, use w,a,s,d. To change the direction of the camera, use i,j,k,l.

Type in a number between 0.5 and 4, and watch the platform grow!

