

COSC363 Computer Graphics

Assignment 1: An Alien Space port

Description:

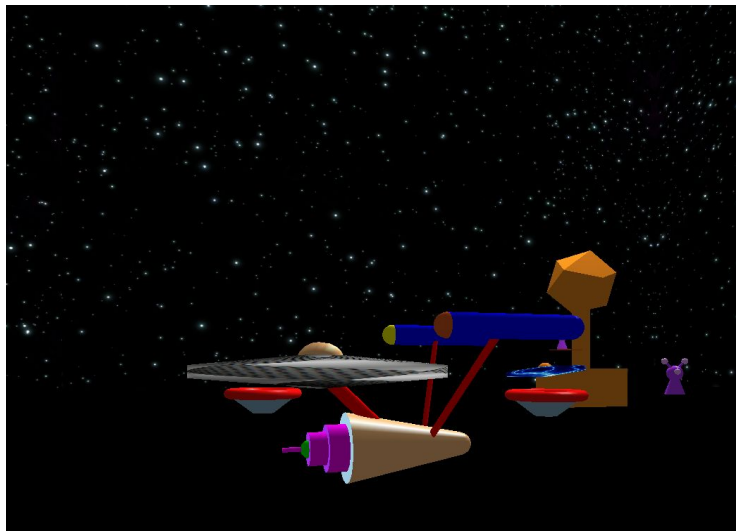
The alien space port that i have designed is in outer space with a starry night for the skybox.

The main spaceship (centre spaceship on initial load) was designed around the Enterprise spaceship from Star Trek and eight smaller generic UFO's hovering above pods.

In the far corner, I have created a control tower (yellow object) with an alien going up and down on the platform gazing into the distance. The two Aliens that are orbiting the Enterprise follow a physics model to allow them to appear as if they were hopping from place to place. The final alien in the far z direction has a view of the scene when the Enterprise takes off and crash lands.



The screenshot above shows the initial scene when the spaceport is rendered.



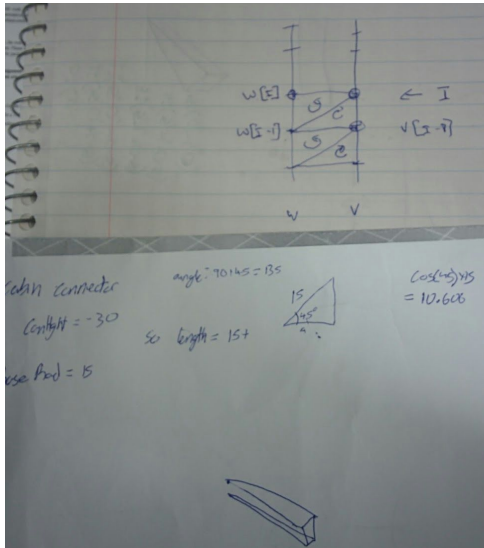
The two images above shows a ground view of the scene and a top down view (Birds- eye)

Extra Features:

- A greenish Spotlight was added on the the cannon of the Enterprise (Lower Section) so as the Enterprise takes off and rotates, the spotlight swings around illuminating the other objects in the scene
- Each smaller UFO is rotating about the Y-axis on its pods but also hovering up and down at different levels to each other.
- The two Aliens that are rotating around the Enterprise follow a simple physics displacement Parabolic Equation in both the X and Y Axes.

$$d = v_o t + \frac{1}{2} a t^2$$

- When the Enterprise takes off, the camera will change to the perspective of the 4th Alien in the far +Z wall and will pan up and down as the Enterprise gets closer to it.
- All the spaceships including the the main part of the enterprise was created using Sweep Surfaces. There is a total of 4 points that are swept using Triganle sweeps with a total of 180 segments with a degree of 2.0 separation (Degrees)



- A skybox was also implemented to give the appearance of a in-space spaceport. Camera movement has been bounded to certain points to prevent the camera moving and tilting outside the Skybox.

Controls:

- W: Move Camera Forward
- S: Move Camera Backwards
- A: Move Camera Left
- D: Move Camera Right
- E: Move Camera Up
- C: move Camera Down
- Z: Zoom out (When Camera is Tilted)
- X: Zoom out (When Camera is Tilted)
- Arrow Key UP: Pan Camera UP
- Arrow Key DOWN: Pan Camera DOWN
- Arrow Key LEFT: Pan Camera LEFT
- Arrow Key RIGHT: Pan Camera RIGHT
- KEY 1: Change to camera in front of the Enterprise
- KEY 2: Change to camera in initial scene overview
- KEY 3: Change to camera to 4th Alien

Resources And References:

- <http://stackoverflow.com/questions/327043/how-to-apply-texture-to-glutsolidcube>

- <https://s-media-cache-ak0.pinimg.com/736x/3d/a5/69/3da5698ffa66216dae10ee04d6556f6c.jpg>
- <http://www.physicsclassroom.com/class/1DKin/Lesson-6/Kinematic-Equations>
- <https://www.youtube.com/watch?v=PoxDDZmctnU>
- <http://in2gpu.com/2016/02/26/opengl-fps-camera/>
- <http://previews.123rf.com/images/drizzd/drizzd1210/drizzd121000203/15863215-simple-character-with-tie-and-green-alien-3d-illustration-Stock-Illustration.jpg>
- <https://ravehgonen.files.wordpress.com/2013/02/spaceship.jpg>