CS475/CS675
Computer Graphics

Assignment 3

Souraj Dewalia (183010004)
R. Sudarsanan (160050067)

Indian Institute of Technology Bombay

Introduction

Aim of the assignment is to design a spacecraft launch mission animation based on a real mission that has been carried out by any country. The mission chosen by us for this is **The Falcon Heavy test flight**. It was the first attempt by *SpaceX* to launch a Falcon Heavy rocket on February 6, 2018. Payload of the mission was a Tesla Roadster car. We have modified the payload as a satellite for the sake of simplicity. We'll try to model the car and incorporate it in the next phase. The main components of the assembly are

1. Main Booster
2. Auxiliary Boosters
3. Payload Bay
4. Payload - Satellite

Code Structure

For moving the camera the arrow keys and the brackets - '[' , ']' are used and for changing the view direction the key: F, G, H, R, T and Y are used. The executables have to executed from the source folder.

Model of Earth

Model of the earth is created by texture mapping the world map on a sphere. The sphere was modelled using the code of `Tutorial 05`.

Launch Site

The launch site was created by using the *skybox* technique. In this a box is modelled around the viewer on which texture for a particluar scene is mapped on all surfaces. A suitable scene was selected and modelled.

Launch Vehicle

Launch vehicle is modelled using simple geometrical surfaces. The main booster is a cylinder. The payload bay is a parabolic shell. Texture from the original image of Falcon heavy is mapped to get a realistic effect.

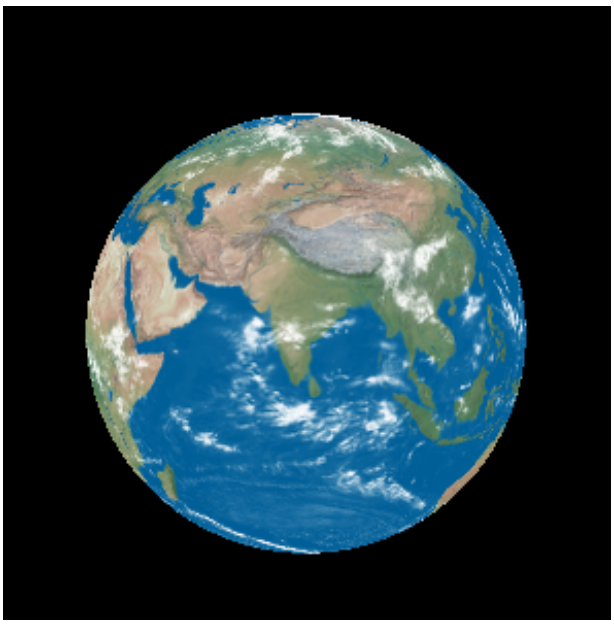

Figure 1: Model of earth

Payload

For the payload we have added a satellite with the solar panels opening up. With the keys 'u' and 'j' the first solar plate opens/closes and similarly with the keys 'i', 'k', 'o', 'l' the other two plates open and close. The camera point can be moved by using the keys A, S, D and W.

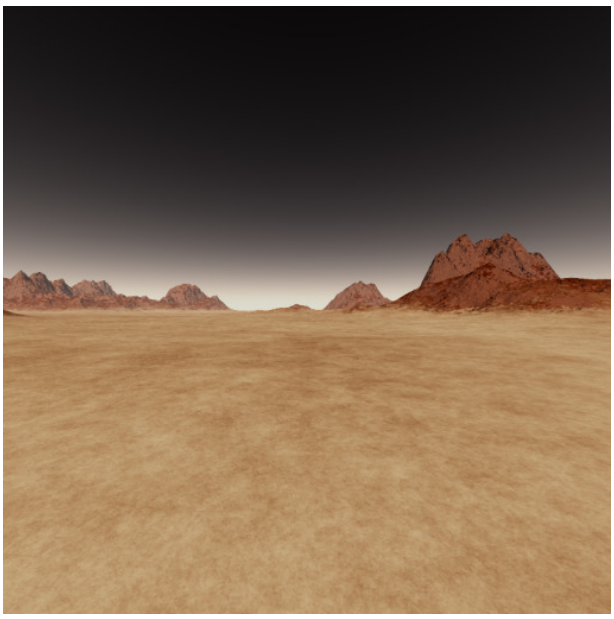

Figure 2: Launch site skybox

References

1. Format/Boilerplate codes taken from the tutorials of course CS675/475 by Prof. Parag Chaudhuri.

2. Skybox image downloaded from `http://www.custommapmakers.org`

3. Texture image for Falcon heavy taken from `https://www.teslarati.com/`

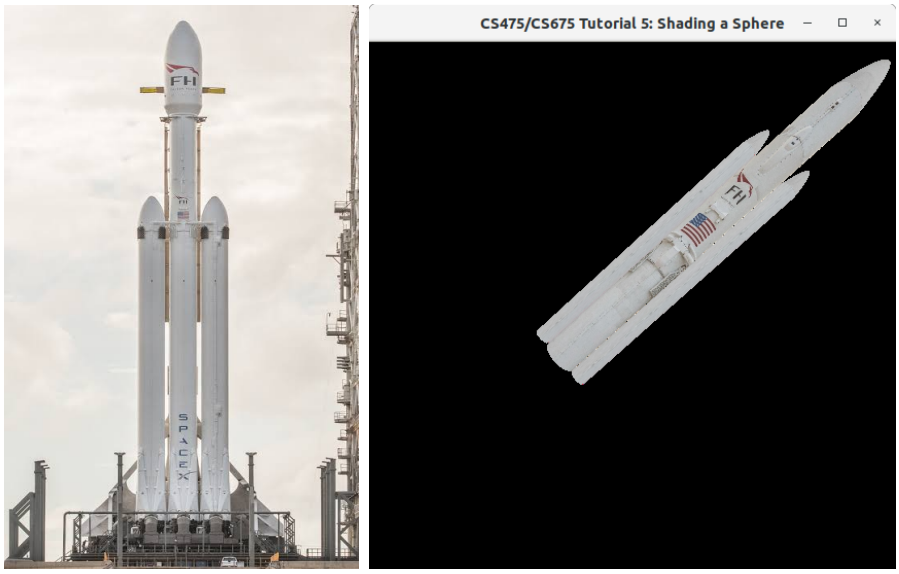

Figure 3: Launch Vehicle

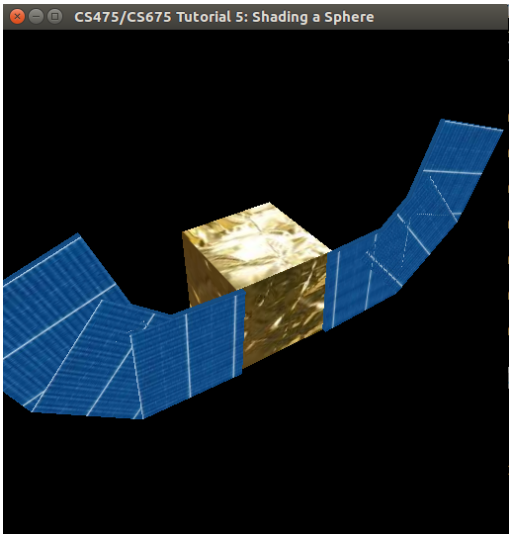

Figure 4: Payload: satellite