CST8236 – Computer Graphics

Project 3 – Due December 14, 2016 at Midnight

The purpose of this assignment is to demonstrate your knowledge of the Unity game engine.

This goal of this project is to produce a model of the solar system. There should be at least 9 spheres (the sun + 8 planets, Pluto is no longer considered a planet, but I'll give you bonus marks if you add it and its appropriate tilt and orbit) that move in a circular orbit around the sun. The planets themselves should spin as well on different axes. On the page http://en.wikipedia.org/wiki/Axial_tilt, there is a table listing the tilts of all planets. All spheres will have a unique material.

The user should be able to move around within the world using keyboard inputs, and go up close to the planets and sun, or zoom out and see the planets orbiting. The user should also be able to speed up time to see the planets orbit faster or slower. You don't need to use accurate physics to model the orbit, it is good enough that they orbit at a pre-determined radius.

This page http://en.wikipedia.org/wiki/Orbital_period lists the times for each planet to orbit the sun, so the planets should orbit proportional to the earth. For instance, if the earth in your simulation takes 1 minute to do a full orbit, then Mars should take 1.881 minutes, Jupiter should take 11.86 minutes, etc.

The program should also play some form of background audio (such as the audio from the introduction to Star Trek: http://www.youtube.com/watch?v=HnDtvZXYHgE) and the player should fly some form of spaceship (such as a model of the USS Enterprise around the solar system: https://3dwarehouse.sketchup.com/search.html?q=uss+enterprise&backendClass=entity)

These requirements will receive a grade of A. For extra marks, add **two** creative elements such as:

- comets that have a tail as they approach the sun (particle emitter),
- implement rings around Saturn,
- add a skybox showing pictures of other stars or galaxies
- add moons to one of the planets (Earth, Jupiter, Saturn…)

Grading:

Solar system contains at least 9 spheres	/ 9
Each sphere has a unique material	/ 9
All planets rotate locally around an axis (axial tilt)	/ 8
All planets orbit the sun at an appropriate period relative to Earth, and at a pre-defined distance	/ 16
Player represented in the scene by a ship	/ 10
Player can move in four directions based on keyboard input	/ 4
Player can zoom in/out based on keyboard input	/ 4
Player can speed up/slow down time based on keyboard input	/ 6
Background audio present in the scene	/ 4
Two creative elements from list above	/ 17
Total	/ 87

Value:

- This project is worth 15% of your final grade.

Submission:

- GitHub repository named 'CST8236-Project3' (or if another name is used, an email providing a link to the repository).