CSE 566 Virtual Reality Spring 2020

Assignment 1

https://drive.google.com/open?id=1k5zb07dOfQBBLDGaitAOpWWIMY9ERobu

- **Your name and Stony Brook ID:** Yao Li 112715069
- **Unity version:** Unity 2019.3.0f6 (64-bit)
- **Hardware used:**

  PC: Windows 10; Inter(R)Core(TM)i7-9750H @2.60GHz

  Device: Oculus Quest

- **Directory hierarchy**

From the global perspective, there is a point light in the center of the Sun bringing the whole space light; then there is an OVRCameraRig set as the third-person camera.

For the solar system, the sun has one child-object, the Earth, while the Earth is the parent of the moon and the spaceship. Inside the spaceship, there are a billiard ball, a beam of directional light, a first-person camera, and six colliders forming the inner space. Other stars like the Mercury and the Mars are set to be separated from this bound system for future convenience. Lastly, the sun has its own effects to look warm and bright.

- **Details on implementation:**
  - **Programming language:**
    I used C# scripts to implement the rotation, trigger event and all the switch operations.
  - **Orbits and Rotations:**
    Four planets and a spaceship can revolve around the Sun at a certain speed. There are two types of rotation. Planets and satellites revolve at different speed around the sun while rotating on their own axis.
    Also, the spaceship moves around the earth at a relatively close distance. Here I set different speed to make the whole system run naturally, also used different rotation angle values to simulate their own track.
  - **Gravity Mode:**
    Gravity mode is implemented by a trigger. The billiard ball, as a rigid body in the spaceship, can obtain gravity if the trigger is turned on, finally falling on the desk or floor. When the player turns off the trigger again, the ball will lose gravity and start to float in the spaceship.
  - **Scenes Transitions:**
    Two cameras are set to switch from different views. The outer view can see the whole space running, while the inner view offers the perspective from the inside spaceship to feel being part of this simulated solar system.
  - **Lighting Conditions:**
    Two kinds of light are used to simulate the real situation. First, the point light is set in the center of the Sun, which is the one gives the whole solar system heat and light. Then there is a directional light put inside of the spaceship. When it cannot get light from the Sun at certain position, I wrote scripts to detect the distance and make the inside light automatically turned blue.
  - **References:**
    Texture of Planets: https://assetstore.unity.com/packages/3d/environments/planets-of-the-solar- system-3d-90219
    Spaceship: https://assetstore.unity.com/packages/3d/vehicles/space/hi-rez-spaceships-creator-free-sample-153363
    Billiard Balls: https://assetstore.unity.com/packages/2d/textures-materials/billiard-balls-6353