Virtual Reality

2018/2019 - Fall Semester
MEIC-A / MEIC-T

Project 1 - Simple VR scene

Group #	13
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Indicate software versions
Unity 3D: Unity 2018.2.9f1
GVR SDK for Unity: GoogleVRForUnity_1.170.0.unitypackage
JDK: jdk 1.8.0_181 (when we tried to use Android)
Target API level: Target minimum iOS version -> 8.0

Describe the main goal of this project and how the assigned tasks were performed. Always refer to (i) GameObjects and assets that were used; (ii) the scene graph; (iii) computer graphic techniques required to complete the tasks; and, if any, (iv) mention each encountered issue. *(word count: between 350 to 450)*

The main goal of this project was to develop a simple VR application to get students acquainted with the Unity game engine.

The scene graph starts with a Sphere object which is used to project the 360º video.

Inside it we can find its children: Map and Terrain. Map is just an empty game object that acts as container for everything inside the play area. Terrain is the game object that contains the mountains created with Unity's terrain tool.

Map is composed by a Maze, a Floor, a WarFireDragon, several Torches and a Player. The Maze contains the walls that create the maze itself. The WarFireDragon is the animated creature at the entrance of the maze. The Torches are free assets which recreate real torches and we placed several of them throughout the map, hanging on walls. The Player holds the camera used to render the scene and the necessary controllers from GoogleVR SDK.

For task 1, we simply followed the tutorials and added the prepared camera setup from GoogleVR.

For task 2, we created a **GameObject** on the hierarchy containing a **Terrain component**. We extruded mountain shapes in a circle inside the plane created by the component. Since visual appeal is not really needed for this application, we decreased the map resolution to make editing faster and the app more lightweight.

For task 3, we imported the generated maze and added it to the middle of the terrain. Then we placed several walls on top of the generated maze. The walls were built by stretching a **Cube GameObject** and then replicate that to every wall of the maze. Finally we added some textures to the walls and floor.

For task 4, we tweaked the directional light that comes with each new scene, and for the flames, we used a free torch asset and replaced its flame particle system with a one of our own.

For task 5, we placed our maze inside a **Sphere GameObject**. Then, we downloaded a 360º video of a mountain and placed it on our sphere with a **VideoPlayer Component.** Since the normal vectors of the sphere were pointing out, we had to create a shader that inverted the normal vectors, we simply copied the code provided in the Project Assignment and pasted it in the **Shader Component**. Finally we added the shader to our sphere.

Given the simplicity of the project, the biggest challenge we had was build the app and running it on the phone. We managed to get it working on the iPhone. It took a while, quite more complicated then on Android, but it runs well. We tried to run it on Android, but apparently, we need to install the Google Cardboard App and it doesn't install on phones that don't have a gyroscope, which both Android phones in our group don't have.

Link for repository: https://github.com/rpsfonseca/VRCourse