

Virtual Reality

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

Project 1

Simple VR scene

Important dates

24/Set Project 1 assignment released

9/Out Project 1 assignment submission (via moodle)

10/Out Project 1 class demonstration

Grade: Project 1 corresponds to 15% of the laboratorial component: **1.8 / 20**

Work effort: The work effort of Project 1 has an estimate of 15 hours per group member, distributed by two weeks.

Requirements

- VR glasses
- Smartphone running Android 4.1 / iOS 8 or higher
- Smartphone compatible with VR glasses (gyroscope commonly required).
- PC or Mac capable of running Unity.

What you are expected to learn

By the end of Project 1, each group member is expected to understand basic VR elements and to explore the basics of 3D modeling. Furthermore, Project 1 has the following additional goals:

- to understand basic concepts related to Virtual Reality and Google VR
- to write basic C# code, even with no prior experience

- to create a simple VR application in Unity from scratch for your mobile device using the Google VR plugin for Unity (previously Google Cardboard)
- to build a VR application that will run on Windows or Mac Machine

NOTE: The VR application can be built to run on Android or IOS phones as long as they are compatible with Google VR

Tasks + Evaluation grid

Several tasks are required to complete Project 1:

Task 1 [0.2 valores]: Create a virtual camera with stereo output. This object will allow controlling the virtual camera with your head.

Task 2 [0.4 valores]: Starting with a plane (e.g., 240x240 grid), build a terrain with mountain tops surrounding the plane limits. Leave the middle are of the plane flat and untouched. The terrain should be modeled with sculpt tools. Optionally, procedural methods can be used to add more texture. However, generating a terrain solely with procedural methods is not allowed.

Task 3 [0.2 + 0.2 + 0.2 valores]: Model a labyrinth using an image as reference. The Maze Generator (<http://www.mazegenerator.net/>) creates a floor plan as the reference image. This image needs to be applied as a texture and walls are built taking scaled cubes as geometric primitive. Use the following Maze Generator parameters: Shape → rectangular, Width → 4, Height → 5. Leave the remaining parameters with their default values. Bear in mind that Maze Generator creates a different floor plan every time you hit the “Generate” button. Make sure to seal one of the entrances with a solid wall and that all walls are tall enough that the user’s point of view is below the wall’s highest point. Also, import a 3D model of a creature (why not a Minotaur?) and place it outside the labyrinth at the other entrance. Scale it to be 1.5x taller that the labyrinth’s walls. Note that Unity has a 65535 vertices limit.

Task 4 [0.2 + 0.2 valores]: Add a directional light for the outdoor lighting and several flames inside the labyrinth. Use particle system game objects to simulate the flames.

Task 5 [0.2 valores]: Finally, add a spherical skybox and import a 360° video of a mountain range. For this task you need to invert the normal vectors of the sphere using the following shader <http://www.vrtiginous.com/flippingnormals>

Suggestions of 3D repositories:

<https://www.yobi3d.com/>

<https://3dwarehouse.sketchup.com/?hl=en>

<https://sketchfab.com/tags/free>

<https://grabcad.com/library>
<https://free3d.com/3d-models/>
<https://www.turbosquid.com/Search/3D-Models/free>
<https://clara.io/library>
<https://www.cgtrader.com/free-3d-models>
<https://archive3d.net/>
<http://www.free-3d-models.com/>

Suggestions of 360 Photos and Videos

<http://vimeo.inmp4.com/>
<http://people.csail.mit.edu/jxiao/SUN360/>
<https://www.mettle.com/360vr-master-series-360-post-production-tutorial-series/>
<https://join.vimeo.com/360/>