UNIVERSIDADE D COIMBRA

Project

Interactive Virtual Reality Environments 2025-2026

Introduction

The project for the Interactive Virtual Reality Environments course allows students to

1. Demonstrate technical expertise in implementing a VR experience (using A-Frame or Unity).
2. Demonstrate knowledge about different interaction techniques and how to apply them.
3. Demonstrate knowledge about evaluating interactions in VR.
4. Show ability to communicate project development and implementation (both orally and in writing).

This year's project focuses on Training & Serious Games in VR.

Training & Serious Games in VR

Serious Games are more than just games, they are interactive experiences with a purpose. They use the power of play and immersion not only to entertain, but also to teach, train, raise awareness, and inspire change. Whether in health, education, or social challenges, serious games show how virtual worlds can have real impact.
Your challenge will be to create a small VR serious game experience that demonstrates how immersion can truly make a difference and support learning, training, or awareness.

Some possible directions to explore:

- Social and environmental awareness: step into the shoes of someone facing the effects of climate change, or make decisions about resources to understand sustainability challenges.

- Health and wellbeing: a VR space for stress reduction, mindfulness, or basic rehabilitation exercises that motivate positive routines.

- Skill and safety training: practice evacuating a building in an emergency, handling tools safely, or learning first aid in a safe, controlled environment.

- Education & exploration: discover history by interacting with objects from the past, explore scientific phenomena hands-on, or experience scenarios that spark curiosity and learning.

These are just examples. Your project can take another direction, as long as it is purpose-driven and shows how VR can be a tool for real-world impact.

By default, the project should:

1. Be related to a serious game scenario
2. Be implemented in A-Frame or Unity
3. Ideally run on a standalone VR device (Quest 2, Quest 3, Pico 4) or smartphone

Students are advised to discuss ideas with the professor as early as possible.

Groups

The project should be developed in groups of 2–3 people. Whenever possible, groups should include a mix of Informatics Engineering and Data Science students with Multimedia students.

Milestones/Deliverables

The development of the project is distributed through several milestones. Most of these offer sharing and formative evaluation opportunities so that the ideas can be improved before the final submission. The following table shows these milestones and deliverables:

Milestone	**Deliverable**	**Date**	**Description**
Present initial project idea	Discussion in class	4th week	Initial idea, where the main object should be identified and the main purpose of the VR experience also sketched. Students will present the idea during class.
Project demonstration	Demonstration	10th week	Students should prepare a presentation where the motivation, purpose, functionality, etc. are clearly presented. Students should prepare these presentations for an outside audience.
Project is presented and demoed	Formal presentation	Last week of classes	Students may still make changes to the project after this point, given the feedback from the Project presentation.
Report	Project report	January	The final project report should document the motivation, purpose, functionality, design process and implementation process. **(See report template below)**

The exact dates for each milestone should be checked on InforEstudante.

Evaluation

The main evaluation item will be the Project Report, but the grade will also consider the overall process and participation in the various project milestones.

Evaluation will address the following aspects:
- Quality of the development process
- Quality of the communication (report, presentations) of the project
- Demonstration of knowledge over the various aspects related to VR (interaction techniques, evaluation, etc.)
- Technical quality of the implementation
- Innovative aspects of the prototype, completeness of the prototype

Project Report Template

The report should explain the motivation for the VR experience, its main purpose, functionality (how it works and what you can do with it), design process and implementation process. It should also reflect on what was effectively achieved and what could be improved in future work.

The report should feature, at least, the following sections:

1. Introduction
2. <VR Experience>
3. Design and implementation process
4. Conclusions

Introduction

The Introduction should present the theme of the project, its motivation, objectives and approach.
Explain the intended usage context for your VR serious game. Provide the link to your VR experience, and any specific instructions.

<VR Experience>

Replace the name of this section by the title of your project.

Here you should detail the system's functionality: how it works and what the player can do. **This section should be supported by screenshots and/or links to videos (preferably) that demonstrate the system[1].**
You should also explain your decisions and demonstrate that the interaction techniques used are suited to the use context and purpose of the VR system.

Design and implementation process

Explain how your idea evolved (sketches, prototypes, diagrams).
Describe the main implementation details, with code snippets where relevant.
Provide a link to your project's code and instructions to run it.

Conclusions

Reflect back on the initial purpose of your project.
Does the current implementation state meet the original goals? Why or why not.
What would be the next steps?

[1] Some examples: https://www.instagram.com/p/C91flWiMCva/, https://www.instagram.com/p/C6gK2vFsDPS/

Fraude e Plágio

De acordo com o Regulamento Pedagógico da UC (https://www.uc.pt/regulamentos/ga/vigentes/regulamento_pedagogico_da_uc.pdf), no seu artigo 28º:
“1 — A fraude ou tentativa de fraude cometida em sede de avaliação de uma unidade curricular, ao violar o princípio base da honestidade académica, inviabiliza essa mesma avaliação e leva à reprovação liminar do estudante nessa inscrição na unidade curricular em causa.“