VIRTUAL AND AUGMENTED REALITY

Code: 20605

Main Scientific Area: Computer Graphics and Multimedia

Lecturer: Sérgio Rafael Tomé das Neves Eliseu

Language of Instruction: Portuguese

Regime: S1

Contact Hours: 30h Total Workload: 100h

ECTS: 5,0

Objectives

Although Virtual and Augmented Reality technologies are more than 30 years old, their use inentertainment and industry has massively expanded over the past decade, due to the increased performance of hardware systems and human-computer interface devices. Particularly in the case of video games, these technologies allow unique immersion experiences, thus enhancing the development and investigation of new solutions in this area.

The objectives of the Curricular Unit of Virtual and Augmented Reality are:

1. Acknowledge the history, the concepts and fundamental theories of virtual and augmentedreality;

2. Acknowledge the state of the art in relation to virtual and augmented reality systems,specifically applied to video games;

3. Introduce some tools and technologies for the development of virtual and augmented realitysystems.

Learning Outcomes

Development of techniques and prototyping in virtual and augmented reality;

Representation of space in a virtual and augmented reality environment;

Interaction techniques in virtual and augmented reality environments;

Identify associated problems in interaction in immersive environments in virtual andaugmented reality.

Course Contents

Human-Computer Interaction

Human Aspects (perception and representation)

Technological Aspects (inputs and outputs)

History of Virtual and Augmented Reality

Development of Virtual and Augmented Reality solutions

Usability and User Experience (UX) in Virtual and Augmented Reality

WebXRTechnology

Recommended Bibliography

Jason Jerald, The VR Book: Human-Centered Design for Virtual Reality, Association forComputing Machinery and Morgan Claypool Publishers, 2016

Tony Parisi, Learning Virtual Reality: Developing Immersive Experiences and Applications forDesktop, Web, and Mobile, O'Reilly Media, 2015,

Jonathan Linowes, Unity Virtual Reality Projects, Packt Publishing, 2015

Micheal Lanham, Augmented Reality Game Development, Packt Publishing LLC, 2017

Learning and Teaching Methods

Theoretical sessions will present the concepts and methodologies defined in the syllabus ofthe course. In practical sessions the students will apply the methodologies in the development of practical projects, solving problems and challenges posed by the teacher.

Assessment Methods

• Attendance and class participation: [25%]

• 1 practical work during the semester [75%]:

- Individual or group work;

- If group: The practical evaluation will be individual within the group. The defenses will be ingroup and will contemplate evaluation of each member individually;

- The practical project may contain assets already elaborated within other curricular units(models, textures,

music or sound design);

- Requires report delivery.

• or 1 theoretical work during the semester [75%]:

- Scientific paper on Virtual Reality and/or Augmented Reality