Universitat Autònoma de Barcelona

2022/2023

Augmented and Virtual Reality

Code: 104760
ECTS Credits: 6

Degree	Type	Year	Semester
2503873 Interactive Communication	OT	4	1

Contact

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Use of Languages

Principal working language: catalan (cat)
Some groups entirely in English: No
Some groups entirely in Catalan: Yes
Some groups entirely in Spanish: No

Prerequisites

No prerequisites

Objectives and Contextualisation

Know how to generate an augmented reality application.

Competences

- Act with ethical responsibility and respect for fundamental rights and duties, diversity and democratic values.
- Act within one's own area of knowledge, evaluating sex/gender-based inequalities.
- Apply and integrate knowledge in the fields of social sciences, humanities and engineering to generate complex products and services tailored to citizens' needs.
- Design and create aesthetically pleasing, usable interfaces based on users' needs.
- Determine and plan the technological infrastructure necessary for the creation, storage, analysis and distribution of interactive multimedia and social-networking products.
- Devise, create, activate and integrate virtual and augmented-reality spaces, characters and objects.
- Display the ability to lead, negotiate and work in a team.
- Introduce changes in the methods and processes of the field of knowledge to provide innovative responses to the needs and demands of society.
- Manage time efficiently and plan for short-, medium- and long-term tasks.
- Search for, select and rank any type of source and document that is useful for creating messages, academic papers, presentations, etc.
- Students must be capable of applying their knowledge to their work or vocation in a professional way and they should have building arguments and problem resolution skills within their area of study.
- Students must be capable of communicating information, ideas, problems and solutions to both specialised and non-specialised audiences.
- Students must develop the necessary learning skills to undertake further training with a high degree of autonomy.
- Students must have and understand knowledge of an area of study built on the basis of general secondary education, and while it relies on some advanced textbooks it also includes some aspects coming from the forefront of its field of study.

Learning Outcomes

1. Analyse a situation and identify its points for improvement.
2. Communicate using language that is not sexist or discriminatory.
3. Create augmented reality products by combining technical skills and mastery of specific software with aesthetic taste.
4. Create geographies or maps that act as interfaces and allow users to interact with games.
5. Create virtual spaces using suitable software and efficient visibility techniques.
6. Cross-check information to establish its veracity, using evaluation criteria.
7. Design objects that combine aesthetic norms with perfect technical functionality.
8. Develop augmented reality projects, integrating digital and real-world elements.
9. Distinguish the salient features in all types of documents within the subject.
10. Form part of groups working on virtual-production projects.
11. Interpret and discuss documents on the main theories on virtual environments.
12. Plan and conduct academic studies in the field of augmented and virtual reality.
13. Present a summary of the studies made, orally and in writing.
14. Propose new methods or well-founded alternative solutions.
15. Propose projects and actions that are in accordance with the principles of ethical responsibility and respect for fundamental rights and obligations, diversity and democratic values.
16. Propose projects and actions that incorporate the gender perspective.
17. Show expertise in operating the relevant computer programmes.
18. Submit course assignments on time, showing the individual and/or group planning involved.
19. Use the virtual spaces created as narrative contexts.
20. Weigh up the risks and opportunities of both one's own and other people's proposals for improvement.

Content

Conception and design of augmented and virtual reality projects.

Level design and complexity.

Applications.

Project document, project genres.

Integration of Unity and Vuforia.

Characteristics of the targets.

Creation of targets (photographic edition / composition).

Content generation by RA.

Configuration.

Publishing SDKs.

APK / IPA generation.

Publication.

Interactivity in RA.

Methodology

This subject has a certain balance between the theoretical part and the practical part, although the practical part has more weight. It is not a totally ABP subject as the theoretical concepts are important, and the practical part will be done with tutorial sessions, delivery sessions and evaluation of the planetary problems and autonomous work by the student.

Theory classes: Although they will be reduced as much as possible, they are master classes where the theoretical concepts of the subject are introduced. Despite being theory classes, a good part of the session (approximately half) will be devoted to solving simple problems posed by the teacher in groups.

Seminars: These are classes where practical cases will be presented that will require the application of the concepts explained in the theory classes.

Laboratories: These are sessions in which the teacher will carry out tutorials with the students in order to guide their work in developing the solution to practice a real problem of a certain complexity. Prior to these sessions, the student will be required to perform a series of tasks autonomously that will be sampled at the beginning of the lab session.

Annotation: Within the schedule set by the centre or degree programme, 15 minutes of one class will be reserved for students to evaluate their lecturers and their courses or modules through questionnaires.

Activities

Title	Hours	ECTS	Learning Outcomes
Type: Directed			
Study for evaluatiion	60	2.4	6, 9
Theory sessions	22	0.88	6, 9, 11
Type: Supervised			
Practicum	12	0.48	3, 5, 4, 9, 7, 17, 8, 13, 10, 11, 12, 18, 19
Seminar	12	0.48	11
Type: Autonomous			
Autonomous work practicum	38	1.52	10

Assessment

The final grade of the course will be

NF = w1 * NTeo + w2 * NLab

where w1 and w2 will be defined by the teacher responsible for the subject on the first day of the course.

The NTeo note is

NTeo = 0.5 * NTeo1 + 0.5 * NTeo2

where NTeo1 and NTeo2 are two evaluation activities that will be carried out throughout the course in theory session schedules.

The NLab grade will be a weighted average of the different NLab lab sessions (i).

NLab = w1 * NEntr1 + w2 * NEntr2

where NEntr (i) is the individual grade for each of the two internship deliveries (predictably in lab sessions 3 and 6 of the course, respectively), and w1 and w2 are the weights of each delivery (values will be announced at the beginning of the course). The calculation of these marks is specified in the statement of each practice (which will be published in the Moodle classrooms).

There is no second call for the NLab grade or for any of the NLab grades (i).

In the event that the student performs any irregularity that may lead to a significant variation of an evaluation act, this evaluation act will be graded with 0, regardless of the disciplinary process that could be instructed. In the event, that several irregularities occur in the evaluation acts of the same subject, the final grade for this subject will be 0.

Students will be entitled to the revaluation of the subject. They should present a minimum of activities that equals two-thirds of the total grading. To have access to revaluation, the previous grades should be 3.5 . The activities that are excluded from the revaluation process are the practicums.

Assessment Activities

Title	Weighting	Hours	ECTS	Learning Outcomes
Individual Continuous evaluation on theory 1	0.225	3	0.12	6, 9, 13
Individual Continuous evaluation on theory 2	0.225	3	0.12	6, 9, 13
Practicum evaluation	0.55	0	0	1, 3, 2, 6, 5, 4, 9, 7, 17, 8, 13, 10, 11, 12, 20, 18, 14, 15, 16, 19

Bibliography

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Software

Unity

Vuforia