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Immersion and 3D interaction techniques

SCHOOL
Polytech Graduate School of Engineering

CAMPUS
Belle-Beille

LEVEL
Engineering 5th year

OPEN TO EXCHANGE STUDENTS
Yes

SEMESTER
Fall (S1)

> **Degree course:** Graduate School of Engineering - Automation and Computer Engineering
> **Teaching unit:** UE 9.4.2 IHM and RV
> **Course language:** English
> **Duration (hours):** 24
> **ECTS:** 2
> **Teacher(s):** Paul Richard

> **Assessment:**
> **Teaching methods:**

- [x] Continuous assessment
- [ ] Final exam

- [ ] Lecture course   hours
- [ ] Tutorial course   hours
- [x] Practical work   24   hours

- [ ] Case study
- [ ] Project

COURSE DESCRIPTION

Analysis of interaction and immersive devices
1. Systems based on virtual reality headsets (HMD)
2. Projection-based systems (CAVE)

Analysis, modeling and implementation of 3D interaction techniques
1. Techniques for selecting and manipulating virtual objects
2. Navigation / locomotion techniques in virtual environment -

OBJECTIVES

Students will:
Learn to implement 3D interaction techniques (selection, manipulation, navigation) and develop immersive applications under the Unity3D environment
Be able to design and implement basic 3D interaction techniques
Know how to develop immersive applications based on virtual reality headsets

PREREQUISITES

Human-Computer Interaction and Virtual Reality (3A), Virtual Reality (4A)

SELECTIVE BIBLIOGRAPHY

Learning C# Programming with Unity 3D, Alex Okita, Taylors and Francis (2015)

- Getting Started with 3D Animation in Unity: Animate and Control your 3D Characters in Unity, Patrick Félicia (2018).
- Human-Computer Interaction (second edition) par Alan Dix, Janet Finlay, Gregory Abowd and Russell Beale. London, UK : Prentice Hall Europe, 1998, 638 p.
- 3D User Interfaces: Theory and Practice, By Doug Bowman, Ernst Kruijff, Joe LaViola, and Ivan Poupyrev, 512 p. Addison Wesley (2004)
- Enhancing Interaction in Mixed Reality: The Impact of Modalities and Interaction Techniques on the User Experience in Augmented and Virtual Reality
- Augmented Reality with Unity AR Foundation: A practical guide to cross-platform AR development with Unity 2020 and later versions
- Hands-On Unity 2021 Game Development: Create, customize, and optimize your own professional games from scratch with Unity 2021, 2nd Edition, Nicolas Alejandro Borromeo Packt Publishing
- Learning C# by Developing Games with Unity 2021: Kickstart your C# programming and Unity journey by building 3D games from scratch, 6th Edition, Harrison Ferrone
- C# Game Programming Cookbook for Unity 3D (English Edition), Jeff W. Murray, 2e Édition