Project

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 9-5 Projet
> **Course language:** English
> **Duration (hours):** 100
> **ECTS:** 5
> **Teacher(s):** Paul Richard

> **Assessment:**
- ☒ Continuous assessment
- ☐ Final exam

> **Teaching methods:**
- ☐ Lecture course ___ hours
- ☐ Tutorial course ___ hours
- ☒ Practical work 20 hours
- ☐ Case study
- ☐ Project

COURSE DESCRIPTION

- Concepts and characteristics of multimodal interaction
- Concepts and theoretical approaches to multimodality
- Multimodality in input (fusion) and output (fission)
- Integration of haptics for multimodal feedback
- Sensory substitution and informational redundancy
- Design and integration of force feedback interfaces
- Mechanical architectures of force feedback interfaces
- Classification of tactile and force feedback interfaces
- Optimal integration of force feedback interfaces
- Development of an application with haptic feedback

OBJECTIVES

- In-depth knowledge of multimodal interaction (entry and exit)
- General knowledge of haptic interfaces (tactile and kinesthetic)
- Knowledge of the characteristics of haptic perception and rendering
- Be able to propose and develop a multimodal haptic application

PREREQUISITES

Human-Computer Interaction and Virtual Reality 1 (3A), Virtual Reality (4A)

SELECTİVE BİBLİOGRAPHY

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 -