Module Proforma

Approved, 2022.02

Summary Information

Module Code	6106COMP
Formal Module Title	Mixed Reality Technologies
Owning School	Computer Science and Mathematics
Career	Undergraduate
Credits	20
Academic level	FHEQ Level 6
Grading Schema	40

Module Contacts

Module Leader

Contact Name	Applies to all offerings	Offerings
Christopher Baker	Yes	N/A

Module Team Member

Contact Name	Applies to all offerings	Offerings
Abdennour El Rhalibi	Yes	N/A

Partner Module Team

Contact Name	Applies to all offerings	Offerings

Teaching Responsibility

LJMU Schools involved in Delivery
Computer Science and Mathematics

Learning Methods

Learning Method Type	Hours
Lecture	22
Workshop	33

Module Offering(s)

Offering Code	Location	Start Month	Duration
SEP-CTY	CTY	September	12 Weeks

Aims and Outcomes

Aims	To describe the concepts and technologies for mixed reality.To explain the principles and techniques of modelling and rendering virtual reality using appropriate tools and technology.To provide opportunity for students to design, develop and evaluate mixed reality solution.

Learning Outcomes

After completing the module the student should be able to:

Code	Description
MLO1	Elaborate the concepts, technologies and application of mixed reality.
MLO2	Critically evaluate the issues associated to mixed reality and technical issues related to mixed reality technology.
MLO3	Apply principles and techniques to design a mixed reality solution.
MLO4	Evaluate the use of appropriate tools and technology to develop a mixed reality application

Module Content

Outline Syllabus
Mixed Reality: Definition, Augmented Telexistance, Taxonomy, Issues associated to Mixed Reality, Applications of Mixed Reality Technology.Sensory Augmentation: Sound, Stereoscopic display, Force Feedback Simulation, haptic devices.User input: Viewer and object tracking, Pose and gesture recognition, Motion Capture, Accelerometers, Fiducial markers, User interface issues.Physical modelling and rendering: Physical simulation(collision detection & response), Animation, Visibility computation, Time-critical rendering, Multiple levels of details (LOD).System Architectures: Game Engines, Mobile Augmented Reality, Flight simulators, CAVEs, Medical Imaging.Application to Game Console.Networking: Collaborative Mixed Reality, peer to peer, Client-Server, Dead Reckoning, Encryption, Synchronization, Distributed Collaboration.

Module Overview

Additional Information
The module will focus on the novel input and output technologies that enables blended experience between the physical reality and virtual reality. It will also cover design of virtual world and development of mixed reality applications as well as the proposal of mixed reality solutions for a specific application. Students will be working in team taking different roles in the coursework to achieve the task provided.

Assessments

Assignment Category	Assessment Name	Weight	Exam/Test Length (hours)	Learning Outcome Mapping
Artefacts	Mixed Reality Application	50	0	MLO1, MLO2
Centralised Exam	Examination	50	2	MLO3, MLO4