Virtual, Augmented and Mixed Reality

Rationale

Virtual reality (VR), Augmented Reality (AR) and Mixed Reality (MR) technology is currently being widely adopted. Applications cut across multiple disciplines that include, social interaction, entertainment, training, architecture, psychology, marketing and much more.

Course Description

This course introduces students to the development of 3D simulations in virtual, augmented and mixed reality (VR/AR/MR) environments. Students will be introduced to various topics which include immersion, presence, immersive visual displays, remote telepresence, motion tracking, interactive 3D graphics and immersive audio.

Topic List

Please note that this schedule is tentative and is meant to serve only as a guide:

- Introduction to VR, AR and MR
- Hardware and Software
- Immersive Visual and Interactive Displays
- Immersion, Presence and Reality
- 3D Tracking, Scanning and Animation
- Interaction and Input Devices
- Interactive 3D Graphics
- 3D Geometry
- Immersive Audio
- Perception
- VR Sickness and Latency
- Immersive Telepresence

Learning Outcomes

Students completing this course will be able to:

- Understand fundamental concepts of virtual, augmented and mixed reality.
- Use Unity3D game engine to develop VR, AR and MR projects.
- Choose the most effective VR/AR/MR display for showcasing your projects.

Textbooks and Materials

- Jason Jerald. 2015. The VR Book: Human-Centered Design for Virtual Reality. Association for Computing Machinery and Morgan & Claypool Publishers. ISBN 9781970001129.
- LaValle, Steven M. Virtual Reality. (Self-published), 2016, http://msl.cs.uiuc.edu/vr/.

Assessment

The following is subject to change:

Category	**Percentage**
Attendance/Participation	10%
Seminar – Paper Presentation	20%
Seminar – Unity Demos (Wiki)	10%
VR/AR/MR Project	40%
Exam	20%