香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

Division of Integrative Systems and Design

ISDN 4000Q (Spring, 2022-23)
Designing the Metaverse with Immersive Technologies

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Hong Kong University of Science and Technology
Division of Integrative Systems and Design

ISDN 400Q – interaction Design

Course Description:

The metaverse is generally understood as a large-scale collection of virtual experiences that users can visit through their digital avatars. This special topic aims to cover the emerging field of the metaverse from technology to applications. The course will first introduce the technologies supporting the metaverse, with a specific focus on immersive technologies such as augmented and virtual reality, before discussing content creation and ownership. Topics covered will include digital twins, 3D scanning, 3D scene design, blockchain and NFTs, AR/VR, and avatars. The course will also include hands-on practice through labs, as well as a final project for students to apply their knowledge.

Course Learning Outcomes:

By the end of the course, students will be able to:

1. Develop a broad understanding of the metaverse as an emerging field from a dual technology/design perspective
2. Develop capability to design digital experiences driven by an understanding of the underlying technology
3. Acquire practical skills to design new experiences in current and future metaverse platforms

Grading:

30% Assignments and Labs	30%
Project	55%
Presence and participation	15%
	100%

Topics:

1. Introduction to the Metaverse
2. The Human Perceptual System
3. Virtual Reality
4. Augmented Reality
5. Designing immersive experiences

6.3D scanning and digital twins
7.3D modelling
8.Blockchain and NFTs
9.Avatars – Creation and Interaction

Recommended Reading

[1] Lee, Lik-Hang, Tristan Braud, Pengyuan Zhou, Lin Wang, Dianlei Xu, Zijun Lin, Abhishek Kumar, Carlos Bermejo, and Pan Hui. "All one needs to know about metaverse: A complete survey on technological singularity, virtual ecosystem, and research agenda." arXiv preprint arXiv:2110.05352 (2021).
[2] Aukstakalnis, Steve. Practical augmented reality: A guide to the technologies, applications, and human factors for AR and VR. Addison-Wesley Professional, 2016.
[3] Jerald, Jason. The VR book: Human-centered design for virtual reality. Morgan & Claypool, 2015.
[4] Hillmann, Cornel. UX for XR: User Experience Design and Strategies for Immersive Technologies. Apress, 2021.
[5] Boardman, Clive, and Paul Bryan. 3D laser scanning for heritage: Advice and guidance on the use of laser scanning in archaeology and architecture. Historic England, 2018.
[6] Real, Nathan. The NFT Handbook: The 2022 Crash Course on How to Create, Sell and Buy Non-Fungible Tokens with Every Secret Revealed.