CU_CURR501
Page 1 of 4

THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

July 25, 2024
9:40:30 AM

Academic Org: Div of Computer Science & Engg – Subject: Computer Science

Course: CSCI5460   **Course ID:** 002645   **Eff Date:** 2024-07-01   **Crse Status: Active**   **Apprv. Status:** Approved   **[New Course]**
Virtual Reality 虛擬現實

This course introduces the fundamental and advanced research topics in virtual reality (VR), including VR tools & metaphors, multi-sensory interactions, geometric and behavior modelling, touch-enabled interfaces, real-time immersive navigation, human factor in VR, augmented reality systems, internet-based VR applications. The web-based virtual reality interfaces plus 3D graphics engines build up the developing tools for testing the innovative ideas/solutions for the advanced VR research and real-time applications.

本科旨在介紹虛擬現實（VR）研究中的基礎及進階課題，包括VR工具及模擬，多感知交互，幾何與行爲建模，可觸摸式介面，實時空間漫遊，沉浸感的人工因素，增強現實系統，基於互聯網的VR應用等。基於網上的虛擬現實交互介面連同3D圖形引擎，為進階的VR研究及實時應用中的創新提供了有力的開發工具。

Grade Descriptor:

A

EXCELLENT – exceptionally good performance and far exceeding expectation in all or most of the course learning outcomes; demonstration of superior understanding of the subject matter, the ability to analyze problems and apply extensive knowledge, and skillful use of concepts and materials to derive proper solutions.

有關等級說明的資料，請參閱英文版本。

B

GOOD – good performance in all course learning outcomes and exceeding expectation in some of them; demonstration of good understanding of the subject matter and the ability to use proper concepts and materials to solve most of the problems encountered.

有關等級說明的資料，請參閱英文版本。

C

FAIR – adequate performance and meeting expectation in all course learning outcomes; demonstration of adequate understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

D

MARGINAL – performance barely meets the expectation in the essential course learning outcomes; demonstration of partial understanding of the subject matter and the ability to solve simple problems.

有關等級說明的資料，請參閱英文版本。

F

FAILURE – performance does not meet the expectation in the essential course learning outcomes; demonstration of serious deficiencies and the need to retake the course.

有關等級說明的資料，請參閱英文版本。

Equivalent Offering:

Units:	3 (Min) / 3 (Max) / 3 (Acad Progress)
Grading Basis:	Graded
Repeat for Credit:	N
Multiple Enroll:	N
Course Attributes:	MSc Computer Science
	MPhil-PhD Computer Sci & Erg

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to
1. learn fundamental methodology in VR projects/systems.
2. build VR environments and web-based virtual effects.
3. realize the virtual immersion and interactions in VR.
4. apply VR techniques to the application via 3D graphics tools.

Course Syllabus:

This course introduces the fundamental and advanced research topics in virtual reality (VR), including VR tools & metaphors, multi-sensory interactions, geometric and behavior modelling, touch-enabled interfaces, real-time immersive navigation, human factor in VR, augmented reality systems, internet-based VR applications. The web-based virtual reality interfaces plus 3D graphics engines build up the developing tools for testing the innovative ideas/solutions for the advanced VR research and real-time applications.

Assessment Type:

Essay test or exam	: 40%
Others	: 50%
Presentation	: 10%

Feedback for Evaluation:

1. Quiz and examinations
2. Course evaluation and questionnaire
3. Reflection of teachers
4. Question-and-answer sessions during class
5. Student consultation during office hours or online

Required Readings:

To be provided by course teacher.

Recommended Readings:

1. Virtual Reality Technology – 2nd Edition by Grigore Burdea and Philippe Coiffet, John Wiley, New York, 2003.
2. Touch in Virtual Environments, Haptics and the Design of Interactive Systems, by M. McLaughlin, J. Hespanha, G. Sukhatme, Pretice Hall, 2002.

CU_CURR501
Page 4 of 4

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3. Online WebGL homepage: http://www.khronos.org/webgl/

4. Learning WebGL tutorials: http://learningwebgl.com/blog/

5. Selected research papers in VR journals and conferences (e.g MIT PRESENCE, ACM VRST).

ARToolKit homepage: http://www.hitl.washington.edu/artoolkit/

OFFERINGS

1. CSCI5460   Acad Organization=CSEGV; Acad Career=RPG

COMPONENTS

LEC : Size=30; Final Exam=Y; Contact=3
TUT : Size=30; Final Exam=N; Contact=1

ENROLMENT REQUIREMENTS

1. CSCI5460   **Enrollment Requirement Group:**
                               For students in MSc Computer Science; or
                               For students in MPhil-PhD Computer Science & Engineering; or
                               For students in UG Computer Science; or
                               For students in UG Computer Engineering;
                               Prerequisite: CSCI3260 or its equivalent;
                               Exclusion: CMSC5716

Additional Information

VTL-Onsite face-to-face hrs   0
VTL-Online synch. hrs   0
VTL-Online asynch. hrs   0

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