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THE CHINESE UNIVERSITY OF HONG KONG
Print Course Catalog Details

May 10, 2023
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 Academic Org: Div of Computer Science & Engg – Subject: Courses offered by Fac of Erg

Course: ENGG5104   **Course ID:** 011157   **Eff Date:** 2022-07-01   **Crse Status: Active**   **Apprv. Status:** Approved   【Course Rev】

Image Processing and Computer Vision 圖像處理及計算機視覺

This course will cover fundamental knowledge and advanced topics in image processing and computer vision, including feature detection, segmentation, motion estimation, panorama construction, 3D reconstruction, scene detection and classification, color image processing and restoration. Applications in computer graphics will also be introduced, including image transformation, and camera calibration. Basic concepts of related algorithms and mathematic background will be discussed.

本科將會介紹圖像處理和計算機視覺基礎知識和進階主題, 包括特徵檢測，圖像分割，運動估計，全景圖構建，三維重構，場景識別和分類，彩色圖像處理和恢復。本科也將會概觀介紹計算機視覺技術在圖形學的應用，包括圖像變換相機標定。本科會討論相關算法的基本概念和數學背景。

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+

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.

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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

MPhil-PhD Electronic Erg
MPhil-PhD Info Engineering
MPhil-PhD Mechan & Auto Erg
MPhil-PhD System Erg & Erg Mgt
MPhil-PhD Information Engineering
MPhil-PhD Biomedical Engineering

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to
1. Understand basic knowledge and algorithms in computer vision.
2. Use Matlab in computer vision programming.
3. Perform image transformation in the color and spatial domains.

Course Syllabus:

This course will cover fundamental knowledge and advanced topics in image processing and computer vision, including feature detection, segmentation, motion estimation, panorama construction, 3D reconstruction, scene detection and classification, color image processing and restoration. Applications in computer graphics will also be introduced, including image transformation, and camera calibration. Basic concepts of related algorithms and mathematic background will be discussed.

Assessment Type:

Essay test or exam	:	25%
Others	:	75%

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.

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Recommended Readings:

1. Computer Vision: A Modern Approach, 2nd Edition, Forsyth & Ponce, Pearson, 2011.
2. Digital Image Processing, 3rd Edition, Gonzalez and Woods, Prentice Hall, 2008.
3. Multiple View Geometry in Computer Vision, 2nd Edition, Richard Hartley and Andrew Zisserman, Cambridge University Press, March 2004.

OFFERINGS

1. ENGG5104   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. ENGG5104   **Enrollment Requirement Group:**
For students in MSc Computer Science or MPhil-PhD programmes under Faculty of Engineering or UG Computer Science or UG Computer Engineering;
Not for students who have taken CMSC5711 or CSCI5280

CAF

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