Course: ENGG5104  Course ID: 011157  Eff Date: 2024-07-01  Crse Status: Active  Apprv. Status: Approved  [New Course]

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及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,三維重建,場景識別和分類,彩色圖像處理和恢復。本科也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.
有关等級說明的資料，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。

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<th>Equivalent Offering:</th>
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<tr>
<td>Units:</td>
<td>3 (Min) / 3 (Max) / 3 (Acad Progress)</td>
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<td>Repeat for Credit:</td>
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<td>Multiple Enroll:</td>
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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.

Recommended Readings: