It is an emerging new field created by the convergence of computer graphics, computer vision and machine learning. Its main purpose is to overcome the limitations of the traditional camera by using computational techniques to produce a richer, more vivid, perhaps more perceptually meaningful representation of our visual world. The content of this course is to study ways in which samples from the real world (images and video) can be used to generate compelling computer imagery. We will learn how to acquire, represent, and render scenes from digitized photographs. The following topics will be covered: cameras, image formation and models; image manipulation (warping, morphing, mosaicing, matting, compositing); data-driven synthesis; visual perception; high dynamic range imaging and tone mapping; image-based lighting; non-photorealistic rendering; and other applications in machine vision.

**Grade Descriptor:**

**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。

**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。

**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.

有关等級說明的資料，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:

Topics:

COURSE OUTCOMES

Learning Outcomes:

At the end of the course of studies, students will have acquired the ability to
1. understand the problem and emerging techniques of computational photography.
2. know the methods for generating compelling pictures and understanding images in computer vision.
3. use software packages, such as Python, C++, or Matlab.

Course Syllabus:

It is an emerging new field created by the convergence of computer graphics, computer vision and machine learning. Its main purpose is to overcome the limitations of the traditional camera by using computational techniques to produce a richer, more vivid, perhaps more perceptually meaningful representation of our visual world. The content of this course is to study ways in which samples from the real world (images and video) can be used to generate compelling computer imagery. We will learn how to acquire, represent, and render scenes from digitized photographs. The following topics will be covered: cameras, image formation and models; image manipulation (warping, morphing, mosaicing, matting, compositing); data-driven
synthesis; visual perception; high dynamic range imaging and tone mapping; image-based lighting; non-photorealistic rendering; and other applications in machine vision.

Assessment Type:

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<td>Essay test or exam</td>
<td>30%</td>
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<td>Others</td>
<td>70%</td>
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Feedback for Evaluation:

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

Required Readings:

- 

Recommended Readings:


OFFERINGS

1. CSCI3290 Acad Organization=CSD; Acad Career=UG

COMPONENTS

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ENROLMENT REQUIREMENTS

1. CSCI3290

Enrollment Requirement Group:

Prerequisite: CSCI2100 or ESTR2102.

New Enrollment Requirement(s):

Pre-requisite = no change
CAF

- eLearning hrs for blended cls: 0
- No. of micro-modules: 0
- Research components (UG): 50%-74%

<END OF REPORT>