②國玄東華大學

教學計劃表 Syllabus

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課程名稱(中文) Course Name in Chinese					學年/學期 Academic Year/Semester		114/1	
課程名稱(英文) Course Name in English	Advanced Compu	uter Vision				•		
科目代碼 Course Code	AI I A50160	系級 Department & Year		С	開課單位 Course-Offering Department			
修別 Type	El ecti ve	學分數/時間 Credit(s)/Hour(s)		•	3.0/3.0			
授課教師 Instructor	/							
先修課程 Prerequisite								
課程描述 Course Description								
2D		3D						

課程目標 Course Objectives

- 1. To understand the underlying principles of Computer Vision (CV).
- 2. To design CV algorithms on various applications.
- 3. To solve practical problems using CV methods.

	系專業能力 Basic Learning Outcomes	課程目標與系專業能 力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
А	Ability to integrate knowledge and technologies of computer science and information engineering.	
В	Ability to design and conduct science experiments and to validate hypotheses.	
С	Ability to design and develop computer software and hardware.	
D	Ability to design and develop team projects.	
E	Ability of analytical thinking, creative research planning, and innovative development.	

圖示說明Illustration : ● 高度相關 Highly correlated ○中度相關 Moderately correlated

授課進度表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	Introduction	Chapter 1
2	Image Formation, Light	Chapter 2
3	Image Projection, Camera	Chapter 2
4	Image Processing, Convolution, Filter	Chapter 3
5	Edge, Feature, Invariant, Matching	Chapter 7
6	Segmentati on	Chapter 7

7	Face Detection	Chapter 8				
8	Tracking, Motion Estimation	Chapter 9				
9	Midterm Exam					
10	Machi ne Learni ng	Chapter 4				
11	Deep Learning, Convolutional Neural Network (CNN)	Chapter 5				
12	Detection, You Only Look Once (YOLO)	Chapter 6				
13	Recognition, Transformer	Chapter 6				
14	Image Synthesis, Diffusion Model					
15	Matting, Quilting					
16	Augmented Reality (AR)					
17	Image-based Rendering (IBR)	Chapter 14				
18	Fi nal Exam					
	教學策略 Teaching Strategies					
Lecture Group Discussion Field Trip Miscellaneous: Project & Homework Implemented using OpenCV and Python						
	教學創新自評Teaching Self-Evaluation					
(I nnovati ve Teachi ng)					
	(PBL) (TBL) (SBL)					
	Flipped Classroom Moocs					
(Soci al Responsi bi l i ty)					
	Community Practice Industy-Academia Cooperation					
((Transdi sci pl i nary Proj ects)					
	Transdi sci pl i nary Teachi ng Inter-col l egi ate Teachi ng					
	Courses Co-taught with Industry Practitioners					
othe	r: 					

學期成績計算及多元評量方式 Grading & Assessments									
配分項目	配分比例	多元評量方式 Assessments							
Items	Percentage	測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
() General Performance (Attendance Record)	30%		~						Hands-On Practice
Midterm Exam	15%		~		~				Project/Implement ation
Fi nal Exam	15%		~		~				Project/Implement ation
Homework and/or Assignments	40%		~						Implementation
Miscel I aneous									

評量方式補充說明

Grading & Assessments Supplemental instructions

Coding is important because of programming homework and projects throughout the course.

教科書與參考書目(書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

Richard Szeliski. Computer Vision: Algorithms and Applications. Springer, 2nd Edition, 2023. (available online at https://szeliski.org/Book/)

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information.

Personal website can be listed here.)

https://elearn4.ndhu.edu.tw/moodle/

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