



課 綱 Course Outline
理工學院學士班

中文課程名稱 Course Name in Chinese	電腦視覺實務與深度學習				
英文課程名稱 Course Name in English	Computer Vision Practice with Deep Learning				
科目代碼 Course Code	TCAI50090	班 別 Degree	碩士班 Master' s		
修別 Type	學程 Program	學分數 Credit(s)	3.0	時 數 Hour(s)	3.0
先修課程 Prerequisite	建議學生修讀過機器學習與深度學習。				
課程目標 Course Objectives					
This course will provide a pragmatic introduction to computer vision, with an aim to walk through milestone models and research papers in the literature. This course will explore practical solutions from the latest literature for solving computer vision tasks with various data, label, and deployment constrains.					
院教育目標 College.' s Education Objectives					
1	培育專業知能，提升學習能力 Acquisition of professional competence and enhancement of learning abilities.				
院基本素養與核心能力 College Basic Learning Outcomes				課程目標與院基本素養與核心能力 Correlation between Course Objectives and Basic Learning Outcomes	
A	具備數理基本知識、邏輯推理、分析解決問題之能力。 Basic math knowledge, logical reasoning, analytical and problem-solving skills.				
B	具備中外語言表達溝通技巧，以養成團隊合作的能力。 Ability to express ideas and communicate in Chinese and foreign languages and teamwork skills.				
C	具備終身學習的能力。 Lifelong learning ability.				
圖示說明Illustration：● 高度相關 Highly correlated ○ 中度相關 Moderately correlated					
課程大綱 Course Outline					
1. Generic Object Detection 2. Convolutional Neural Networks (CNN)					

3. Transformer Networks
4. Diffusion Models
5. State Space Models
6. Generic Object Detection (cont.)
7. Practical Issues
8. Lightweight Computer Vision
9. Data Imbalance
10. Domain Adaptation
11. Weakly-/ Semi-supervised Learning in Computer Vision
12. Self-supervised Learning in Computer Vision
13. Computer Vision Security
14. Practical Issues (cont.)
15. Generative Computer Vision:
16. Unconditional Generative Models
17. Vision-Language Models

資源需求評估 (師資專長之聘任、儀器設備的配合 . . . 等)
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

課程要求和教學方式之建議
Course Requirements and Suggested Teaching Methods

評量方式
Evaluation methods

- 平時報告:
- 期末考成績:
- 作業成績:
- 其他:

其他
Miscellaneous