課　　綱　Course　Outline

理工學院 碩士班

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	選修 Elective	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.

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

18. Conditional Generative Models
19. Multimodal Large Models
20. Generative Computer Vision (cont.)

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: 0%
●期末考成績: 0%
●作業成績: 0%
●其他: 0%

其他
Miscellaneous