國立東華大學

課　綱　Course Outline

資訊工程學系人工智慧與創新應用碩士班

中文課程名稱 Course Name in Chinese	高等電腦視覺				
英文課程名稱 Course Name in English	Advanced Computer Vision				
科目代碼 Course Code	AIIA50160	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					

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.

系教育目標 Dept.'s Education Objectives

1	探究學科知識，善用專業技能 Explore academic knowledge, utilize professional skills.
2	訓練評析思考，創新解決問題 Exercise analytical thinking, enhance creative problem solving skills.
3	學習團隊分工，強化溝通表達 Participate in teamwork, strengthen communication skills.

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
A 統合資工知識技術之能力 Ability to integrate knowledge and technologies of computer science and information engineering.	●
B 設計技術理論驗證實驗之能力 Ability to design and conduct science experiments and to validate hypotheses.	●
C 資訊軟硬體設計開發之能力 Ability to design and develop computer software and hardware.	●
D 團隊專案開發之能力 Ability to design and develop team projects.	●

E	批判性思考與創新研發之能力 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

課程大綱
Course Outline

－CV Introduction
－Image Formation/Processing/Segmentation
－Feature Detection and Matching
－Image Alignment and Stitching
－Motion Estimation, Tracking, & Structure from Motion
－Detection & Recognition
－Computational Photography
－Stereo Correspondence, Depth Estimation, & 3D Reconstruction
－Image-based Rendering (IBR)
－Augmented Reality (AR)
－Deep Learning & YOLO
－OpenCV & MediaPipe
－CV Zone

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.)

Existing suitable full-time teachers

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

Coding is required in all homework and projects. Students should be able to implement CV algorithms using Webcam, OpenCV and Python.

其他
Miscellaneous