南台科技大學 98 學年度第 2 期課程資訊

課程名稱	數位影像處理概論
課程編碼	36D02302
系所代碼	03
開課班級	四技網通四乙
開課教師	王立洋
學分	3.0
時數	3
上課節次地點	四 2 3 4 教室 I104
必選修	選修
課程概述	The purpose of this course is to give the students an overview of digital image processing, so that the students can realize what is digital image process? What kinds of applications are there for DIP? And, most of all, the students can learn many basic but important operations to serve different image processing purpose.
課程目標	After finishing the course, the student is expected to 1. under what human visual system is and how it works. 2. learn some basic spatial domain image enhancement techniques. 3. learn some basic frequency domain image enhancement techniques 4. understand several color models and learn basic color image processing techniques. 5. learn some basic morphological image processing operations and algorithms.
課程大綱	1. 簡介 a. 何謂影像處理 b. 影像處理起源 c. 應用領域 d. 影像處理之基本步驟 2. 數位影像基礎 a. 視覺感知元素 b. 電磁波之頻譜 c. 影像感知與擷取 d. 影影取樣與量化 e. 一些像素之基本關係 3. 空間域之影像強化方法 a. 灰階轉換 b. 直方圖之處理 c. 使用算術與邏輯運算 d. 基本之空間域濾波器 e. 平滑化空間域濾波器

	f. 銳化空間域濾波器 g. 組合應用 4. 頻率域之影像強化方法 a. 傅立葉轉換與頻率域 b. 平滑化頻率域濾波器 c. 銳化頻率域濾波器 d. 同態濾波器 e. 實作 5. 彩色影像處理 a. 色彩模式 b. 假色處理 c. 全彩影像處理基礎 d. 色彩轉換 e. 平滑化與銳化 f. 色彩分割 g. 雜訊處理與影像壓縮 6. 形態學 a. 膨脹與侵蝕 b. 開啟與關閉 c. 比對轉換 d. 基本形態運算演算法 e. 灰階影像之形態運算處理
英文大綱	1. Introduction a. What is digital image processing b. Origins of DIP c. Examples of fields that use DIP d. Fundamental steps in DIP 2. Digital image fundamentals a. Elements of visual perception b. Light and the electromagnetic spectrum c. Image sampling and quantization d. Some basic relationships between pixels e. Spatial domain image enhancement methods 3. Spatial domain image enhancement methods a. Some basic gray level transformations b. Histogram processing c. Enhancement using arithmetic/logic operations d. Basics of spatial filtering e. Smoothing spatial filters

	f. Sharpening spatial filters g. Combining spatial enhancement methods 4. Frequency domain image enhancement methods a. Fourier transform and the frequency domain b. Smoothing frequency-domain filters c. Sharpening frequency domain filters d. Homomorphic filtering e. Implementation 5. Color system and color image enhancement a. Color models b. Pseudo-color image processing c. Basics of full-color image processing d. Color transformations e. Smoothing and sharpening f. Color segmentation g. Noise and image compression 6. Morphology a. Preliminaries b. Dilation and erosion c. Opening and closing d. The hit-or-miss transformation e. Some basic morphological algorithms f. Extensions to gray-scale images
教學方式	課堂教授,
評量方法	課堂討論,課程參與度(出席率),
指定用書	Digital Image Processing, 2nd Ed.
參考書籍	
先修科目	
教學資源	投影機、教學網頁
注意事項	
全程外語授課	0
授課語言 1	華語
授課語言 2	英語
輔導考照 1	
輔導考照 2	