朝陽科技大學 097學年度第2學期教學大綱
Neural Networks and Its Applications 類神經網路

當期課號	7461	Course Number	7461
授課教師	許志宇	Instructor	HSU,CHIH YU
中文課名	類神經網路	Course Name	Neural Networks and Its Applications
開課單位	資訊科技研究所博士班一A	Department	
修習別	選修	Required/Elective	Elective
學分數	3	Credits	3
課程目標	The course objective is to let graduate students understand the concept of artificial neural network(ANN) and its models. Graduate tudents will learn how to construct and apply ANN to their interested research area. Paper study and project implementation of one or more neural network models are required to fulfill this class.	Objectives	The course objective is to let graduate students understand the concept of artificial neural network(ANN) and its models. Graduate tudents will learn how to construct and apply ANN to their interested research area. Paper study and project implementation of one or more neural network models are required to fulfill this class.
教材	1.Neural Network Computing (Paperback) by Ramachandran Bharath (Author), James Drosen (Author) 2.類神經網路設計 作者：Hagan Demuth Beale 審校：汪惠健 高立圖書公司	Teaching Materials	1.Neural Network Computing (Paperback) by Ramachandran Bharath (Author), James Drosen (Author) 2.Neural Network Design Hagan Demuth Beale
成績評量方式	計畫報告1 20% 計畫報告2 20% 期末考 30% 期中考 30%	Grading	Project 1 20% Project 2 20% Midterm Exam 30% Final Exam 30%
教師網頁			
教學內容	本課程介紹神經網路的基本結構和學習規則。 學習神經網路的數學分析和神經網路的訓練方法後可將此技術應用在樣本識別、信號處理以及控制系統等工程領域。 週次 教學內容 1 基本的類神經網路 2 多層回授網路 3 多層回授網路範例 4 Hopfield 類神經網路 5 Hopfield 類神經網路 5 倒傳遞演算法 5 倒傳遞演算法範例 5 感知機學習規則 6 感知機學習規則範例 6 監督式學習 9 期中考 10 監督式的Hebb學習範例 11 Widrow-Hoff 學習演算法 12 Widrow-Hoff 學習演算法範例一 13 Widrow-Hoff 學習演算法範例二 14 倒傳遞演算法 15 倒傳遞演算法範例一 16 倒傳遞演算法範例二 17 總複習 18 期末考	Syllabus	This course offers an introduction to artificial neural networks (NN). The successes in practical applications and substantive theoretical progress in NN research have aroused great interests among various disciplines and made it one of the most active research areas in computer science, mathematics, and engineering in the present days. Instead of trying to cover too many aspects of such a vast subject, we have tried to firmly focus on what is generally regards as the core of the subject-a good understanding of the key models in artificial neural networks, namely multilayer feedforward networks and Hopfield networks This course will cover both theoretical and practical aspects of NN. Topics to be covered by this course include •Basics of an artificial neural networks •feedforward networks •Hopfield networks •Boltzmann machines. •unsupervised learning The emphasis will be on the fundamentals of the models and related techniques. Analysis of mathematical properties of some network models will be given, and their limitations discussed.

			Applications and practical considerations of these techniques will be discussed. Students will gain hands-on experience through a sequence of computer projects. This course primarily deals with the computational aspects of NN, therefore, familiarity of data structures, algorithm analysis, linear algebra and differential equations are of great help, but no prior knowledge of cognitive/biological/neurological/psychological sciences is presumed. This course is open to Information and Communication and Computer Science graduate students.

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