

國立陽明交通大學資訊工程學系		課程名稱: Deep Learning (深度學習)		
授課/指導教師	彭文孝(Peng)、吳毅成(Wu)、陳永昇(Chen)		連絡方式	wpeng@cs.nctu.edu.tw icwu@cs.nctu.edu.tw yschen@cs.nctu.edu.tw
助教	謝宏笙 李政毅 李頤 賴佑家 葉宥麟			hongsheng.cs10g@nctu.edu.tw franklp97531@gmail.com sciencethebird@gmail.com yoga.cs09g@nctu.edu.tw volin.cs09@nycu.edu.tw
先修課程	Linear Algebra, Probability Theory, Machine Learning (suggested)		授課對象	大四及研究生
分組方式		師資人力	其他規劃	
2人/組(Paper and Final) 1人/組(Lab)	指導教師 3人 助教 5人		(1) To submit final projects as academic papers (2) To hold exhibition to showcase final projects (3) To encourage students to participate in various challenges in the fields of computer vision, gaming, data analytics, etc.	
課程目標 (objectives)			(1) To understand the maths of deep learning techniques (2) To familiarize with deep learning tools, such as PyTorch, TensorFlow, etc. (3) To understand the latest developments and applications of deep learning techniques (4) To develop practical working systems	
評分方式	Labs (done individually) 40%, Paper presentation (done in groups of 2 members) 20% Final project (done in groups of 2 members) 20% Final exam 20%			
預定使用教材	用途	教材名稱		教材來源(請註明所占比重)
	上課	1. I. Goodfellow, Y. Bengio, and A. Courville, <i>Deep Learning</i> , 1st Ed., MIT Press, Dec. 2016 2. R. S. Sutton and A. G. Barto, Reinforcement Learning: An Introduction, Nov. 2017	自行編寫	現有出版品
課程內容及上課方式				
課程內容大綱		date	搭配實驗/實習項目	
A. Introduction		Jul.5 (Peng)	Warm-up: Python + PyTorch	
B. Machine Learning Basics ■ Linear Algebra ■ Probability and Information Theory ■ Numerical Computation		Jul.7 (Peng)	Back-Propagation (Lab 1)	
C. Deep Networks ■ Deep Feedforward Networks ■ Convolutional Networks		Jul.12 (Chen)	D. Deep Reinforcement Learning ■ Introduction to Reinforcement Learning	

■ Convolutional Networks	Jul.14 (Chen)	Convolutional Nets (Lab 2)	Jul.14
■ Convolutional Networks & Transfromers	Jul.19 (Chen)	Convolutional Nets (Lab 2)	Jul.19
■ Recurrent and Recursive Nets & Regularization for Deep Learning	Jul.21 (Peng)	Convolutional Nets (Lab 3)	Jul.21
Convolutional Nets (Lab 3)	Jul.26	■ Reinforcement Learning for Lightweight Model	Jul.26 (Wu)
E. Deep Learning Research			
■ Linear Factor Models	Jul.28 (Peng)	Recurrent Nets and Variational Autoencoders (Lab 4)	Jul.28
■ Autoencoders			
■ Generative Adversarial Networks	Aug.2 (Peng)	Generative Adversarial Networks (Lab 5)	Aug.2
■ Generative Adversarial Networks	Aug.4 (Peng)	■ Value-based Reinforcement Learning	Aug.4 (Wu)
■ Structured Probabilistic Models for Deep Learning	Aug.9 (Peng)	Deep Reinforcement Learning (Lab 6)	Aug.9
■ Monte Carlo Method & Approximate Inference	Aug.11 (Peng)	■ Policy-based Reinforcement Learning	Aug.11 (Wu)
■ Normalizing Flow Models	Aug.16 (Peng)	Deep Reinforcement Learning (Lab 6)	Aug.16
■ Graph Convolutional Neural Networks	Aug.18 (Peng)	Paper Presentation & Project Proposal	Aug.18
Paper Presentation & Project Proposal	Aug.23	Paper Presentation & Project Proposal	Aug.23
Paper Presentation & Project Proposal	Aug.30	Paper Presentation & Project Proposal	Aug.30
F. Final Exam	Sep.1		
G. Final Project Presentation	TBD	G. Final Project Presentation	TBD