


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@nycu.edu.tw
助教	謝宏笙 高宗霖 林廷翰 廖唯辰 陳昱丞 劉子齊 張哲源		hongsheng.cs10g@nctu.edu.tw zxc1679876.cs11@nycu.edu.tw freefrit.en11@nycu.edu.tw xaviliaoweichen@gmail.com yucheng.cs11@nycu.edu.tw jonathan.tzuchi.liu@gmail.com five90204@gmail.com
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
3人/組(Paper and Final) 1人/組(Lab)		指導教師 <u>3</u> 人 助教 <u>7</u> 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 math of deep learning techniques (2) To familiarize with deep learning tools, such as PyTorch, Tensor Flow, 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(請註明所佔比重)
	上課		自行編寫 現有出版品
		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, <i>Reinforcement Learning: An Introduction</i> , Nov. 2017	50% 50%
課程內容及上課方式			
課程內容大綱	date	搭配實驗/實習項目	date
A. Introduction	Feb.16 (Peng)	Warm-up (Python + PyTorch)	Feb.21
B. Machine Learning Basics ■ Linear Algebra ■ Probability and Information Theory ■ Numerical Computation	Feb.23 (Peng)	No class	Feb.28
C. Deep Networks ■ Deep Feedforward Networks ■ Convolutional Networks	Mar.2 (Chen)	D. Deep Reinforcement Learning ■ Introduction to Reinforcement Learning	Mar.7 (Wu)
■ Convolutional Networks	Mar.9 (Chen)	Back-Propagation (Lab 1)	Mar.14

■ Convolutional Networks & Transformers	Mar.16 (Chen)	■ Reinforcement Learning for Lightweight Model	Mar.21 (Wu)
■ Recurrent and Recursive Nets ■ Regularization for Deep Learning	Mar.23 (Peng)	■ Valued Based Reinforcement Learning	Mar.28 (Wu)
E. Deep Learning Research ■ Linear Factor Models ■ Autoencoders	Mar.30 (Peng)	2048 TD (Lab 2)	Apr.4
No class	Apr.6	Convolutional Nets (Lab 3)	Apr.11
■ Autoencoders ■ Generative Adversarial Networks	Apr.13 (Peng)	Convolutional Nets (Lab 4)	Apr.18
■ Generative Adversarial Networks	Apr.20 (Peng)	Recurrent Nets and Variational autoencoders (Lab 5)	Apr.25
■ Normalizing Flows 	Apr.27 (Peng)	■ Policy-based Reinforcement Learning	May.2 (Wu)
■ Diffusion Models	May.4 (Peng)	Deep Reinforcement Learning (Lab 6)	May.9
■ Monte Carlo Method	May.11 (Peng)	Generative Adversarial Networks (Lab 7)	May.16
■ Graph Convolutional Neural Networks	May.18 (Peng)	Paper Presentation	May.23
Paper Presentation	May.25	Paper Presentation	May.30
Paper Presentation	Jun.1	Paper Presentation	Jun.6
Final Exam	Jun.8		Jun.13
Final Project Presentation	TBD		