



Deep Learning

深度學習

ECM9042 (5081)

李佳翰 副教授
Prof. Chia-Han Lee



Course information

- **Instructor**
 - Professor Chia-Han Lee 李佳翰副教授
 - Email: chiahan@nctu.edu.tw
- **Teaching assistants (TAs)**
 - 陳柏豪 (Po-Hao Chen)、張宇傑 (Yu-Chieh Chang)、鍾上佐 (Jordan Chung)、Payal Guleria (Office: ED716)
- **Course hours**
 - Tue. 15:30-16:20, Thur. 13:20-15:10
 - No classes on Dec. 10 (conference) and Dec. 12 (midterm). Makeup classes will be scheduled.
- **Room:** EDB26
- **Office hours:** ED808, by appointment



Course goal and prerequisite

- **Goal**
 - The goal of this course is to help students master the basic concepts and skills of deep learning that will be helpful for their study and research.
 - Students will learn how to implement deep learning.
 - Students will apply what they learn to the final project.
- **Prerequisite**
 - Linear algebra, Probability, Optimization (preferred), Machine learning (preferred)



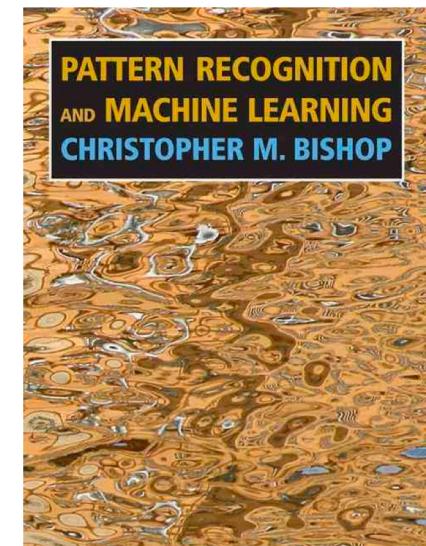
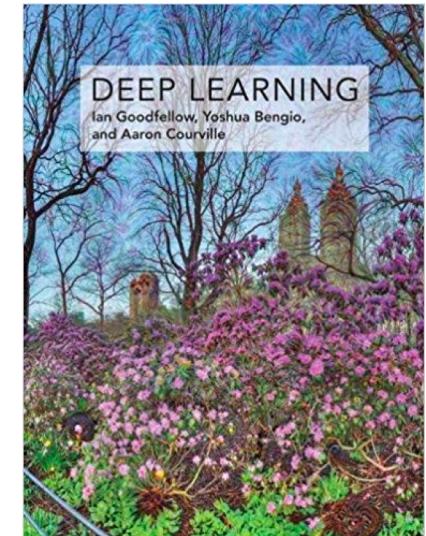
Course outline

- **Introduction to machine learning**
- **Deep forward networks**
- **Regularization for deep learning**
- **Optimization for training deep models**
- **Convolutional networks**
- **Recurrent and recursive networks**
- **Autoencoders**
- **Monte Carlo methods**
- **Deep generative models**
- **Reinforcement learning**
- **Theories for deep learning (if time permitted)**



Readings

- **Textbook**
 - I. Goodfellow and Y. Bengio and A. Courville, *Deep Learning*, The MIT Press, 2016 (also available online)
- **Reference**
 - C. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2007
- **Papers**
 - To be assigned





Grading

- **Homework (programming): 30%**
 - 3 to 4 programming homework
- **Paper presentation + debate: 15%**
 - Present deep learning papers (in teams)
 - Debate for topics about AI (if possible. Fun!)
- **Midterm exam: 30%**
 - Written
- **Final project: 25%**
 - Mini self-driving car
 - In teams





Policy

- **Asking and answering questions is encouraged.**
- **Grading is non-negotiable.**
- **Come to talk to me whenever you have doubts/questions/problems. Do not wait until the last minute!**



If you decide to take this course, please take it seriously, and don't give up!