Deep Learning
深度學習
ECM9042 (5084)

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)
  - 林佳葳 Fiona、謝孟彤 Meng-Tung、陳立杰 Lie-Chieh (Office: ED716)
- Course hours
  - Tue. 15:30-16:20, Thur. 13:20-15:10
  - No classes on Sept. 20 (Python), Nov. 6, Nov. 8, Dec. 11, and Dec. 13 (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 (using Python).**
  - **Students will apply what they learn to the final project.**

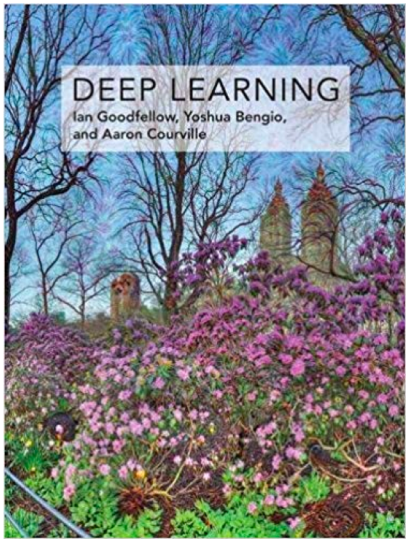
- **Prerequisite**
  - **Linear algebra, Probability, Optimization, Machine learning**

Course outline

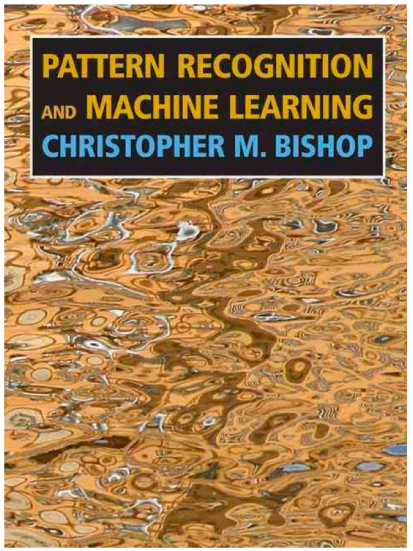
- Introduction to machine learning
- Deep forward networks
- Regularization for deep learning
- Optimization for training deep models
- Convolutional networks
- Recurrent and recursive networks
- Autoencoders
- Monte Carlo methods
- Deep generative models
- Reinforcement learning
- Theories for deep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

Readings

- **Textbooks**
  - **I. Goodfellow and Y. Bengio and A. Courville, *Deep Learning*, The MIT Press, 2016 (also available online)**



  - **(For machine learning basics) C. Bishop, *Pattern Recognition and Machine Learning*, Springer, 2007**



- **Papers**
  - **To be assigned**

Grading

- **Homework (programming using Python): 30%**
  - **3 to 4 programming homeworks (using Python)**
- **Paper presentation + debate: 15%**
  - **Present deep learning papers (in teams)**
  - **Debate for topics about AI (fun!)**
- **Midterm exam: 25%**
  - **Written or programming or both**
- **Final project: 30%**
  - **Programming or theoretical study**
  - **Topic should be approved by me.**
  - **3 to 4 students form a team.**

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 unit the last minute!

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