Algorithm Design and Analysis

R102, R103, 104 都可以坐 （不分單雙班）

請戴口罩，或保持社交距離

線上發問：slido.com #71428 or

Algorithm Design and Analysis
Course Logistics

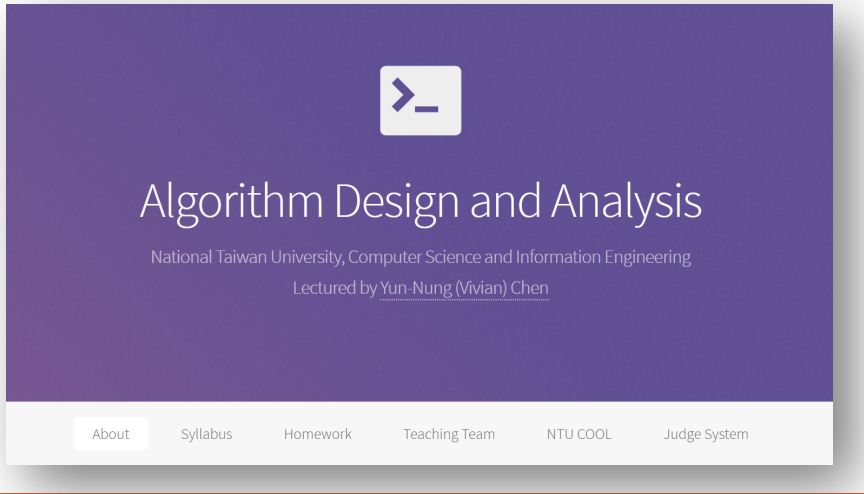
http://ada.miulab.tw

Hsu-Chun Hsiao & Yun-Nung (Vivian) Chen

國立臺灣大學
National Taiwan University

Algorithm Design & Analysis

- Instructors
  - 陳縕儂 Yun-Nung (Vivian) Chen (before midterm)
  - 蕭旭君 Hsu-Chun Hsiao (after midterm)
- Time: Thursday 789, 14:20-17:20
- Location: R103 (livestreaming @ R102 & R104)
- Required: data structure, programming



Let’s try something new this year!

- Problems
  - 每年想修 ADA 的同學越來越多，單一班級的教室已不敷使用
  - 助教人力有限，改 200 份手寫題和考卷已經相當吃力
  - 不確定 ADA 的題目是否適合全面自動化

- Opportunities
  - 同學對於直播和錄影的課程形式越來越熟悉
  - 過去兩年的 ADA 課程皆有錄影

Let’s try something new this year!

- What’s new in 2020?
  - 單雙班合併授課
  - 現場授課 (R103) + 直播 (R102 & 104) + 錄影
  - 線上即時發問
  - 增加能自動批改的作業的比例

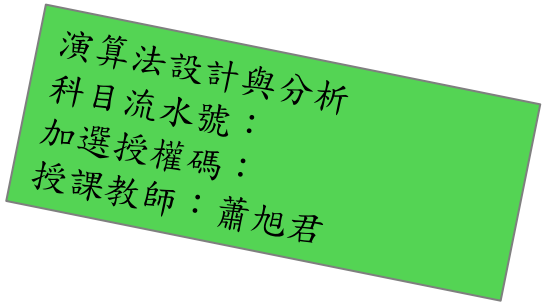
- 希望能摸索出適合 ADA 的授課模式
- 請大家一起參與並提供 feedback ☺

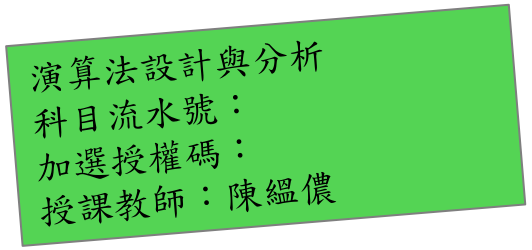
Algorithm Design & Analysis

- NTU COOL: https://cool.ntu.edu.tw/courses/3364
  - Slides uploaded before each lecture
  - Lecture recordings, homework submission, mini-HW submission
  - Discussion forum
- Email: ada-ta@csie.ntu.edu.tw
  - To ensure timely response, email title should contain “[ADA2020]”
  - Do NOT send to our personal emails
- Knowledge required
  - Programming
  - Data structure

加簽規則

- Pre-requisites
  - Programming
  - Data structure
- Order
  - CSIE (大二 = 研究所應修 > 大四+ > 大三 > 大一)
  - Others
- Registration Form
  - The deadline is 17:20 today!!
  - Registration code will be sent out via email
- 上限＝R102 + R103 教室容量 (~250人)
- 可旁聽，但請讓有選課的同學先入座





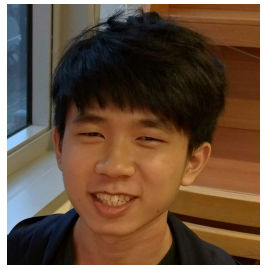
加簽表單：

Powerful Teaching Team

劉俊緯
(Lead TA)

林首志

林庭風



林楷恩

張道然

張鈰瀚

許耀文

陳玉恆

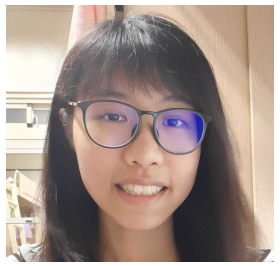
陳威翰

彭道耘

黃于軒

黃柏諭

塗大為

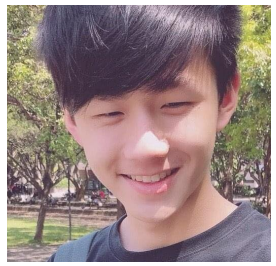


塗季芸

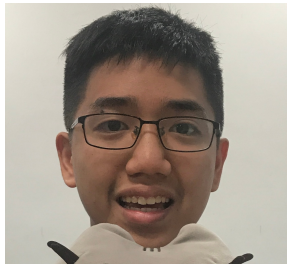
熊育霆

蔡銘軒

鄭豫澤



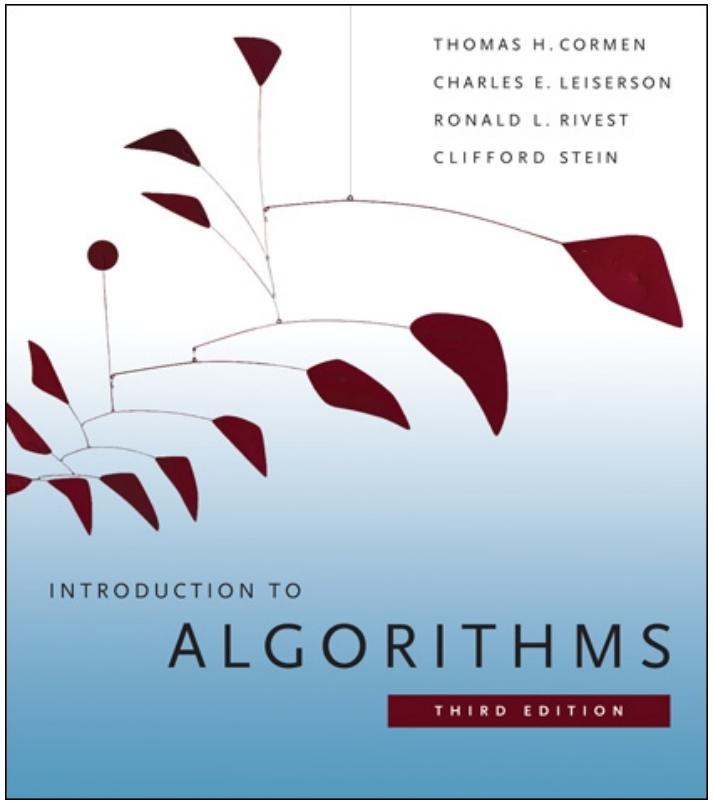
羅啟帆



蘇柏瑄

Textbook

- Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest and Clifford Stein. Introduction to Algorithms. 3rd edition, MIT Press, 2009



Slides credited from hil

Course Objective

- After taking this course, you should be able to
  - ***Design*** correct and efficient algorithms
  - ***Implement*** the designed algorithms
  - ***Prove*** the correctness of algorithms
  - ***Analyze*** the complexity of algorithms

Course Overview

Algorithmic Fundamentals

- Introduction
- Asymptotic Analysis

Algorithm Design Strategy

- Divide-and-Conquer
- Dynamic Programming
- Greedy Algorithms

Algorithm Analysis

- Amortized Analysis
- NP Completeness

Graph & Selected Topics

- Graph Algorithms
- Others

Course Syllabus

	Week	Topic	Note
1	2020/09/17	Course Logistics & Introduction	
2	2020/09/24	Divide-and-Conquer	
3	2020/10/01	Break	HW1
4	2020/10/08	Divide-and-Conquer	
5	2020/10/15	Dynamic Programming	
6	2020/10/22	Dynamic Programming	HW2
7	2020/10/29	Greedy Algorithms	
8	2020/11/05	Greedy Algorithms	
9	2020/11/12	Midterm Exam	
10	2020/11/19	Graph Algorithms	
11	2020/11/26	Graph Algorithms	HW3
12	2020/12/03	Graph Algorithms	
13	2020/12/10	Amortized Analysis	
14	2020/12/17	NP Completeness	HW4
15	2020/12/24	NP Completeness	
16	2020/12/31	Approximation Algorithms	
17	2021/01/07	Final Review	
18	2021/01/14	Final Exam	

Grading Components

- Homework Assignments (40%) NTU COOL online submission
  - 4 in total; once per 2-3 weeks
  - Programming and non-programming problems
- Mini-homework (10%) NTU COOL online submission
  - Once every week
  - Best 10 scores
  - Due before the next week class
- Midterm (20%)
  - Course content before midterm
- Final Exam (20%)
  - All course content
- ADA Challenge (5%)
  - About 5 people each group
- Class Participation (5%)
  - Default = 3%, additional bonus if you 1) ask questions during the class / in the discussion forum @NTU COOL, 2) provide opinions during discussion, or 3) help your peers

Grading Rules

- Non-programming problems
  - 可以與人討論及上網查資料，但必須理解後以自己的話來寫
  - 註明該次作業為
    1) 完全獨立完成
    2) 列出參考資料 (網址、課本頁數)
    3) 致謝共同討論同學
  - 須以線上上傳
  - 盡量用電腦寫，若用手寫看不懂字體時一律不算分
- Programming problems
  - 以測資分數計算，作業結束後會公布測資
  - 上傳規定會在每次作業說明中，請務必仔細閱讀
- **作業抄襲，考試舞弊，抄襲者與被抄襲者學期成績零分**

因應疫情之措施

- 目前規畫維持在教室上課，上課形式會隨著疫情變化調整
- 進入系館請確實主動刷卡或登錄
- 上課請戴口罩或保持社交距離
- 身體不適的同學請自主在家休息

Question?

Important announcement will be sent to @ntu.edu.tw mailbox & post to the course website

Course Website: http://ada.miulab.tw
Email: ada-ta@csie.ntu.edu.tw