

Digital Systems Design and Laboratory

[Supplementary Material]

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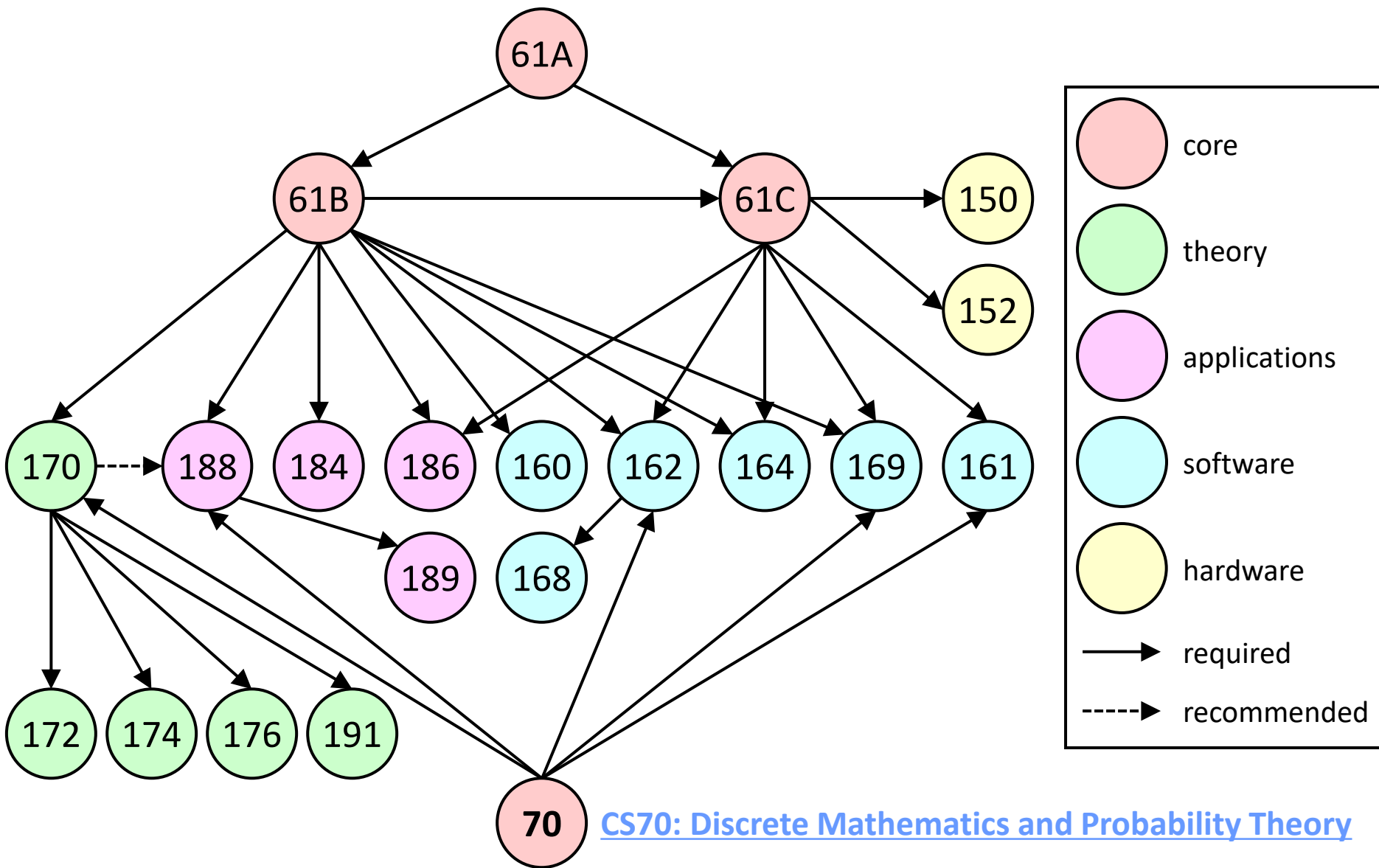
CSIE Department

National Taiwan University

Outline

- ❑ Teaching Experience at Berkeley
- ❑ Career Path

Course Roadmap of UC Berkeley CS



Topics in CS70

- ☐ Propositions and Quantifiers
- ☐ Proofs
- ☐ Induction
- ☐ Stable Marriage
- ☐ Modular Arithmetic
- ☐ Bijections and RSA
- ☐ Polynomials
- ☐ Error Correcting Codes
- ☐ Counting
- ☐ Introduction to Discrete Probability
- ☐ Conditional Probability
- ☐ Random Variables
- ☐ Variance
- ☐ Two Killer Applications
- ☐ Chebyshev's Inequality
- ☐ Some Important Distributions
- ☐ Continuous Probability
- ☐ Graph Theory
- ☐ Infinity and Uncountability
- ☐ Self-Reference and Uncomputability

Teaching Experience at Berkeley

❑ CS70: Discrete Mathematics and Probability Theory

- Spring 2013, Spring 2014: teaching assistant
- Summer 2015: instructor (<http://www-inst.eecs.berkeley.edu/~cs70/su15/>)
 - 300+ students on the first day
 - The total tuition is about \$450,000
 - 11 teaching assistants --- all undergraduates
 - 14 readers (to grade homework) --- all undergraduates

❑ Background

- Some students want to meet the GPA requirement to "declare" (i.e., major) CS
- The class GPA is (was) expected to be 2.5--2.9 (3 is B and 2.7 is B-)

❑ Instructor's evaluation from students will be posted publicly

Weekly Schedule (8-Week Long)

	Monday	Tuesday	Wednesday	Thursday	Friday
10am		DIS 9 Caroline 405 Soda	DIS 9 Caroline 405 Soda	DIS 9 Caroline 405 Soda	DIS 9 Caroline 405 Soda
11am		DIS 2 Favian 102 Latimer	DIS 2 Favian 102 Latimer	DIS 2 Favian 102 Latimer	DIS 2 Favian 102 Latimer
12pm	Homework Due	DIS 3 Nathan Zhang 3107 Etcheverry	DIS 3 Nathan Zhang 3107 Etcheverry	DIS 3 Nathan Zhang 3107 Etcheverry	DIS 3 Nathan Zhang 3107 Etcheverry
1pm	Homework Posted	DIS 10 Diana 405 Soda	DIS 10 Diana 405 Soda	DIS 10 Diana 405 Soda	DIS 10 Diana 405 Soda
2pm	Lecture Chung-Wei 155 Dwinelle	Lecture Chung-Wei 155 Dwinelle	Lecture Chung-Wei 155 Dwinelle	Lecture Chung-Wei 155 Dwinelle	Homework Party Weeks 1, 4, 7 540 Cory (ASV Room) Weeks 2, 3, 5, 6 430-438 Soda (Woz Lounge)
3pm					
4pm					
5pm	DIS 4, 5, 7 Jerry, B56 Hildebrand Kunal, B51 Hildebrand Nathan Mandi, 310 Soda	DIS 4, 5, 7 Jerry, B56 Hildebrand Kunal, B51 Hildebrand Nathan Mandi, 310 Soda	DIS 4, 5, 7 Jerry, B56 Hildebrand Kunal, B51 Hildebrand Nathan Mandi, 310 Soda	DIS 4, 5, 7 Jerry, B56 Hildebrand Kunal, B51 Hildebrand Nathan Mandi, 310 Soda	
6pm	DIS 1, 6, 8 Lexing, 3107 Etcheverry Akshay, 102 Latimer Anna, 310 Soda	DIS 1, 6, 8 Lexing, 3107 Etcheverry Akshay, 102 Latimer Anna, 310 Soda	DIS 1, 6, 8 Lexing, 3107 Etcheverry Akshay, 102 Latimer Anna, 310 Soda	DIS 1, 6, 8 Lexing, 3107 Etcheverry Akshay, 102 Latimer Anna, 310 Soda	
7pm					
8pm					

How-To

❑ Answer students' questions

- Homework parties
- Online forum
 - Participation score

❑ Synchronize TAs and readers

- Two additional forums

❑ Grade homework and exams

- Gradescope

❑ Proctor exams (3 in 8 weeks)

- Separated rooms
- Timing conflicts
- Special cases

Observations

☐ Are/do students at Berkeley...

➤ Very smart?

- Pick 3 cards from 52 cards
 - Sampling without replacement, order does matter
 - Sampling without replacement, order does not matter
 - Sampling with replacement, order does matter
 - Sampling with replacement, order does not matter

➤ Study very hard?

➤ Love to ask questions?

➤ Care about grade?

- Regrading policy

➤ Have a lot of pressure?

- Special office hour

☐ How about TAs?

☐ And ...

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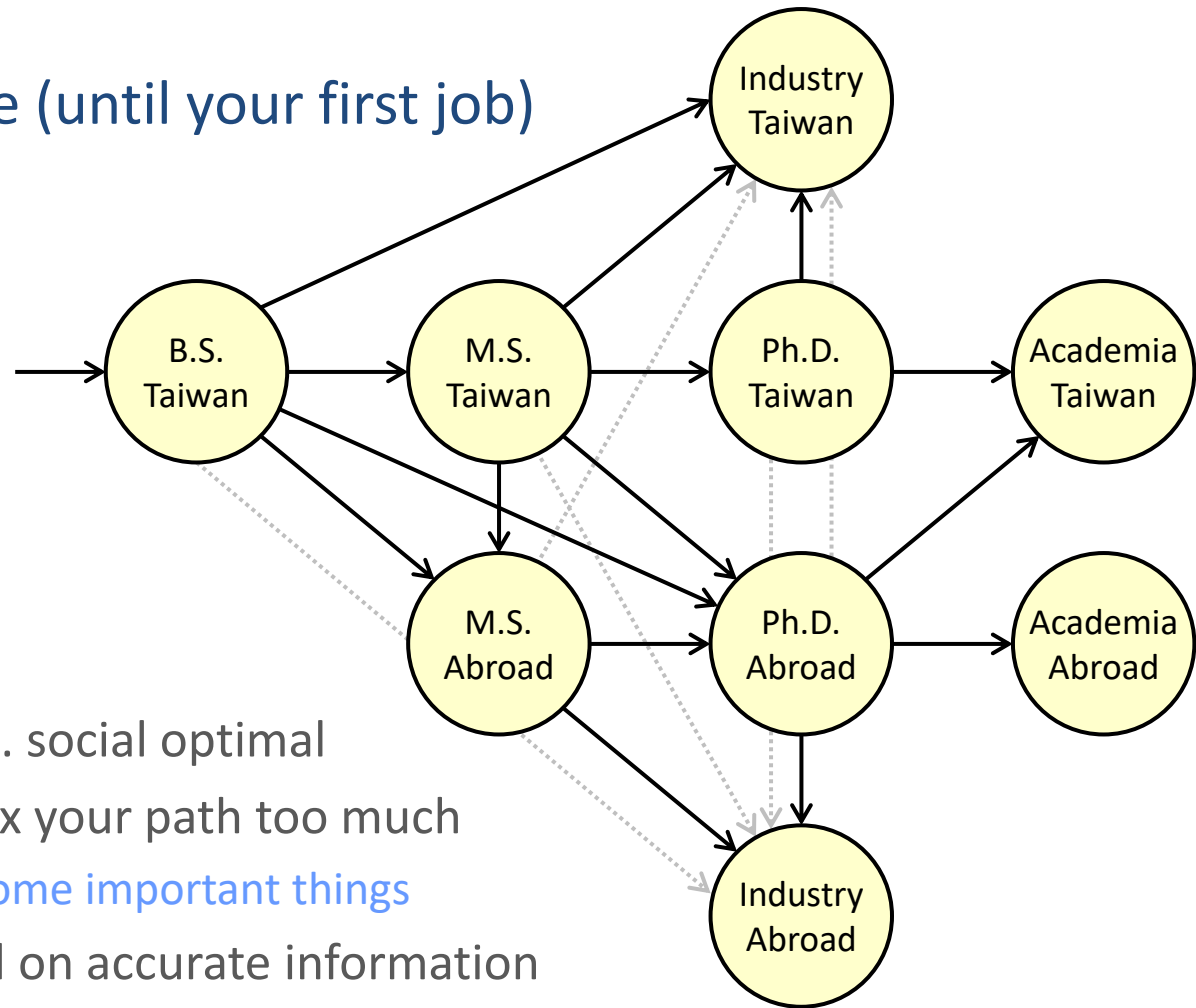
Disclaimer

❑ Everyone has a very different story

➤ The following is just my experience

Common Questions: Career Path

❑ Finite state machine (until your first job)



❑ Personal opinions

- Individual optimal vs. social optimal
- Do not optimize or fix your path too much
 - You cannot control some important things
- Make decision based on accurate information
 - Ask!

US Graduate Education: Capitalism!

❑ Wrong Information

- A student need to prepare a lot of money to study Ph.D. abroad
- Fellowships only go to Chinese or Indian students

❑ Ph.D. study: professors are really like the bosses of companies

- Get start-up funding
- Hire employees (Ph.D. students)
- Develop products (papers)
- Sell products and get funding
 - Freedom of research? Teaching?
- Go to Step 2

❑ M.S. study

- Universities need the tuitions
- Students need the tickets of the job market

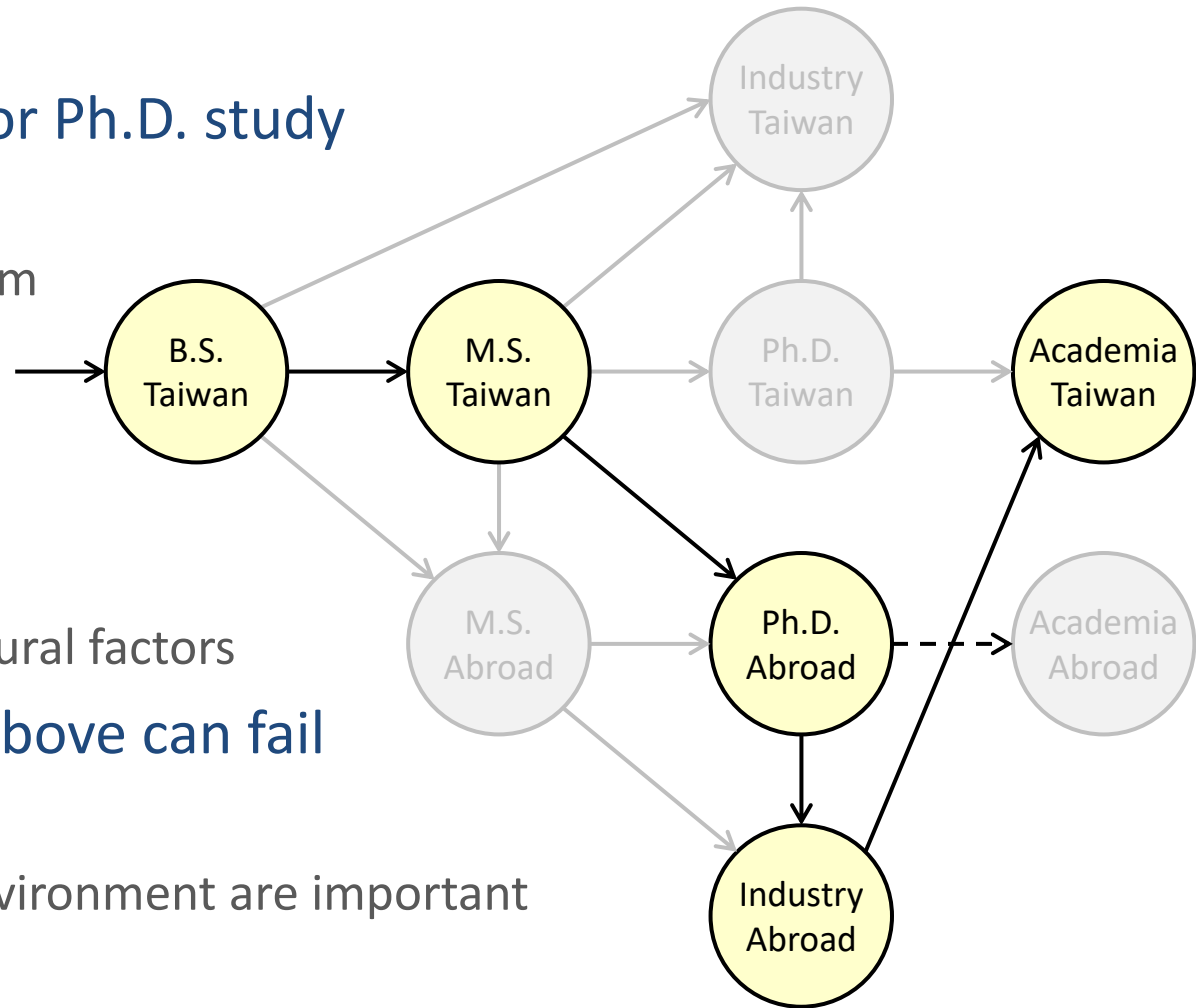
Personal Experience

❑ Important factors for Ph.D. study

- Advisor
- Prelim or qualify exam
 - English speaking
- Funding support
- Publication
 - English writing
- Other living and cultural factors

❑ Any of the factors above can fail the Ph.D. study

- Good people and environment are important
- Is it worthy?



Personal Suggestion

❑ Preparation

- English speaking and writing
- M.S. or Ph.D.?
 - Special research (專題研究) or M.S. first
- M.S. in Taiwan
 - Special research (專題研究) is a good testing for topics and people
- M.S. abroad
 - Grades, targeted program, money
- Ph.D. abroad
 - Big research direction, paper(s), grades, connection(s), TOEFL?, GRE?
- Ask people!
 - It is not a rule-based system

Q&A