

Lecture 0: Introduction

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EE210: Probability and Introductory Random Processes
KAIST EE

August 23, 2022

- Course logistics
- Why this course?

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Instructor

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- Homepage: <https://yung-web.github.io/home/>
- E-mail: yiyung@kaist.edu
- Computer Division
- In KAIST EE since 2008

- non-real-time online ($\leq 50\%$) + real-time offline/online ($\geq 50\%$)
- All lecture videos have already been pre-recorded. Available in [YouTube](#).
- **non-real-time online:** Just watch anytime and anywhere you like.
- **realtime offline/online:** Watch lecture videos in the classroom or in the zoom, with [asking and answering questions](#).
- No attendance check!

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- Method 1:
<https://yung-web.github.io/home/courses/probability.html>
- Method 2: (a) Type Yung Yi in the google, (b) visit his [GitHub homepage](#), (c) find the links on [Course](#).

Google Search Results for 'yung yi':

- <https://yung-web.github.io/home/courses/probability.html>
- <https://github.com/yungyi>
- https://scholar.google.com/citations?view_op=view_citation&hl=en&user=09000000000000000000
- <https://orcid.org/0000-0002-1723-6228>
- <https://yungyi.koala.scholar>
- [Yung Yi, Professor of Electrical Engineering, KAIST Verified email at kaist.ac.kr · Homepage · Applied machine learning, computer networking, machine learning-based computer networking and communication systems, modeling, analysis, and developing ..](https://yungyi.koala.scholar)
- <https://yung-web.github.io/>
- [Yung Yi - KAIST - GitHub Pages](https://yungyi.koala.scholar)
- [2021-11 - Show Dr. Yung Yi received his B.S. and the M.S. in the School of Computer Science and Engineering from Seoul National University... · KAIST · Korea Advanced Institute of Science and Technology · Names · Emails · Personal Links · Education & Career History · Advisors, Relations & Conflicts · Expertise.](https://yungyi.koala.scholar)
- <https://dblp.uni-trier.de/>
- [Yung.Yi - Home - DBLP Digital Library](https://dblp.uni-trier.de/pid/134/Yung.Yi)
- [Mobile networks: Wireless access networks Machine learning Network protocols Sequential decision making Design and analysis of algorithms Local area networks](https://dblp.uni-trier.de/pid/134/Yung.Yi)

Yung Yi's GitHub Profile:

Courses

- Probability and Random Processes (undergraduate)
- Mathematics for Electrical Engineers (undergraduate)
- Computer Networks (undergraduate)
- Computer Network (graduate)

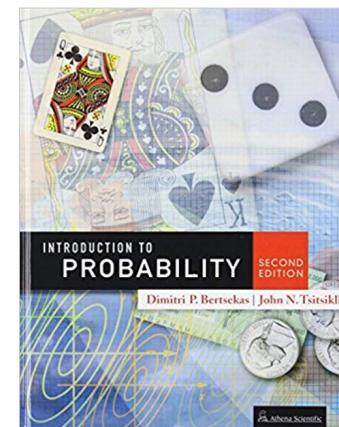
- All notifications and announcements (also sent to you via email)
- Questions about course contents
 - Only through posting in KLMS (so should be in English)
 - NOT individual emails to the lecturer or the TAs
- Homework upload
- Score upload and all the grade-related things

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Textbook

- Introduction to Probability (2nd edition)
 - MIT course textbook
 - Dimitri P. Bertsekas and John N. Tsitsiklis
- You can order it from Yes24, Aladin, Kyobo
 - Yes24: <http://www.yes24.com/Product/Goods/3995311>
 - Aladin: <https://www.aladin.co.kr/shop/wproduct.aspx?ItemId=12945615>
 - Kyobo: <http://www.kyobobook.co.kr/product/detailViewEng.laf?ejkGb=ENG&mallGb=ENG&barcode=9781886529380&orderClick=LAG&Kc=>



- <http://athenasc.com/probbook.html>
- Solutions for all problems (so you have all solutions for your homework)
- Links to the old MIT courses
- You can find the urls (2006, 2010, 2013) for the MIT lectures based on the same textbook, where there are many useful resources (recitation problems, homework problems, old exam problems, etc)
- Some of my lecture slides are based on theirs, but my slides are largely modified/reorganized/edited in many places for our purpose.

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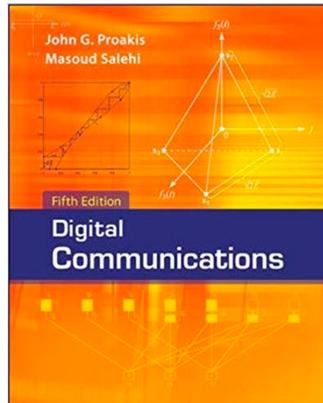
1. Probabilistic model (0.5 week)
2. Conditioning and Independence (0.5 week)
3. Random Variable, Part I (Discrete Random Variable) (1.5 week)
4. Random Variable, Part II (Continuous Random Variable) (1.5 week)
5. Random Variable, Part III (Advanced Topic on Random Variable) (1.5 week)
6. Limit of Scaled Sum of Random Variables: Central Limit Theorem and Weak Law of Large Numbers (1.5 week)
7. Random Process: Bernoulli and Poisson Processes (2 week)
8. Random Process: Markov Chain (2 week)
9. Introduction to Statistical Inference (2 week)

- 2 Exams (mid-term and final)
- Homeworks
 - All problems are from exercise problems in the textbook.
 - We do NOT check whether you copy your solution from the problem solutions or not.
- 9 Homeworks for each of 9 chapters.

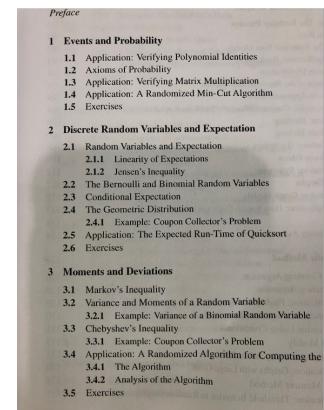
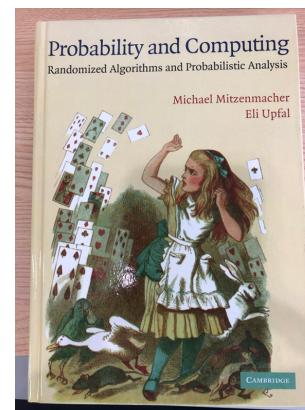
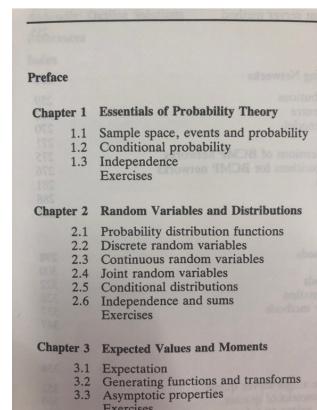
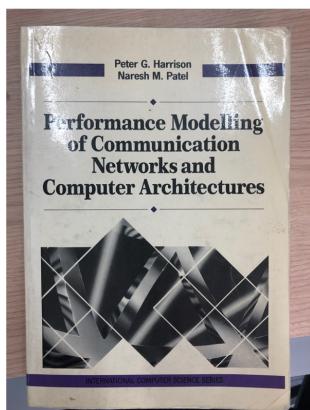
- Read **ALL** the emails and sms from KLMS.
- Try to read **ALL** of the textbook contents covered in the class.
- OK not to be present in the classroom? Yes
- OK that my homework solutions is same as those in the solutions book? Yes
- Can I ask for a personal meeting to ask questions or get other general advices? Yes.
Send me an email.

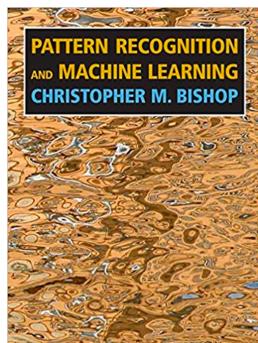
Questions?

- Many things are "probabilistic"
- Assume that you are a designer of the following engineering systems. Good design?
 - a web server
 - a communication device like mobile phones
 - an AI-based image classifier
- From an engineering point of view,
 - System input
 - Algorithms in systems
 - Analysis of systems



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- Designer's perspective?
- In the year of 2022, suppose that unfortunately there is no theory of mathematically studying the *uncertainty* of some phenomena, events, etc.
- You have to design such a theory called "probability". How are you going to do it? Where are you going to start?
- You just have other basic mathematical theories such as set theory.
- You need to get used to the *English terms* on probability (e.g., sample space = 표본공간, probability density function = 확률밀도함수).
- We will take this exciting journey from the next lecture!

These days, every area in CS and EE is directly or indirectly related to machine learning!

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Questions?



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