CS 362, Administrative Lecture

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Outline

- About Class
- Prereq Material

About Me

- Grew up in Georgia, USA; Lived in Palo Alto, Kyoto, and Seattle.
- Work in theoretical computer science: provable security for distributed algorithms
- Graduated dozens of PhD students, many recruited from this class. They have found industry positions at Amazon, Facebook, Google, and postdocs/academic positions at Yale, U. Virginia, Drexel, MSU, Loughborough.
- **Hearing: I am completely deaf in high frequency ranges**
  - If I mishear you, please **rephrase** your question/comment.
  - I often depend on lip-reading so may have a hard time with masks, I will ask you to write your question on paper. I definitely want to respond to your questions!
  - I will not hear a high-pitched alarm.

About Class

- Topics covered: Randomized Algorithms and Data Structures; Induction and Recurrences; Dynamic Programming and Greedy Algorithms; Graph Algorithms; NP-Hardness and Approximation Algorithms
- This class assume knowledge of proofs (direct proof, proof by induction, contradiction, case analysis), asymptotic notation and recurrence relations, basic algorithms (such as sorting and search) and data structures (such as binary trees).
- If you have not taken a class covering this, you should first take CS 261 and 361.
- You are **wasting your time here** if you haven't had the prereq material. Like sitting in on a Japanese III class if you haven't taken Japanese I and II.

Math and Proofs

- Class uses a mathematical methodology (theorems and proofs)
- This class is challenging, especially if you haven't done proofs before.
- Best way to study is to **solve problems, and re-derive proofs**
- This mathematical methodology is an **extremely** important tool in computer science
- We'll mostly be covering material that has only been discovered in the last several decades - and near the end of the class, in the last decade. I'm an expert in this area, and even I get stuck and make mistakes.

Administrivia

- Web page
- Syllabus
- Piazza (todo: sign up)
- There will be a 30 minute quiz on Tuesday. It will cover pre-req material including the material in the first 2 lecture slides: "Asymptotic Notation" and "Recurrences/Induction", and Appendices of our textbook. Studying for it will help you recall pre-req material and determine if you're ready to take this class.
- This quiz (and all tests) will be closed book, closed notes, and no electronic devices. You will be able to use 2 pieces of hand-written standard size notebook paper.

Homeworks

- You may work with others on hw problems, but **must write up solutions individually**. Wait at least 30 minutes after group discussions before writing up your solutions
- I will **not be** handing out solutions to problems. I am happy to help you if you are stuck via Piazza, office hours or lecture.
- *"The point of homework is not to solve that particular homework problem, but to practice solving a type of problem and get honest feedback on your progress. I've found that when solutions are available, my own students are much more likely to rely on them, rather than trying to figure out the problems themselves, which means they get both less practice and less honest feedback, which means they do worse on exams and in the course overall. And while I firmly believe that each student is ultimately responsible for their own learning, I also believe that it's my responsibility as an instructor to help them. Putting dessert on the table does not help anyone eat their vegetables. - Jeff Erickson"*

Homework and Pedagogy

- For every 5 hours of work you do, you must ping me or the TA via Piazza, office hours, lecture.
- Ping should be **a question, comment, or your partial solution to a problem.** Please do not struggle fruitlessly for hours and hours on homework without reaching out for feedback.
- I rely heavily on pedagogical techniques of *(faded) worked examples* and *productive failure* in lectures and office hours. For math-based and physics classes, evidence shows these are the most effective teaching techniques.
- You will need to balance working hard on homework/exercises yourself, with asking for help when stuck.

Pings

- Your 5 hour ping should be **a question, comment, or your partial solution to a problem.** Please do not struggle fruitlessly for hours and hours on homework without reaching out for feedback.
- **Bad Ping:** "I just worked for 5 hours. It was tough!".
- **Good Ping:** "I'm having trouble formulating a recurrence relation in Problem 2 of the hw. Does the following seem like the right idea for the homogeneous part?"

How to Succeed in Algorithms

- Work with a group! But remember the Star Trek rule.
- Learn to use Latex
- Overleaf, free via your CS email, can be used to write up homeworks in latex.
- Piazza can be used with latex to write up math in your online questions and posts.
- Ping early, ping often

Todo

- Sign up for Piazza; review syllabus
- Study for quiz: Review Pre-req slides and Appendices carefully, solve problems.

Upcoming Topics

- Pre-Req Material Review
- Randomized Algorithms and Data Structures