

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation!

Lecture 17: Course Recap and Exam Prep

Instructor: Amy Zhang, 12/2/2021

Today's Topics

- Plan for Poster Session next Thursday
 - Roster of judges!
- Course recap!
 - What is HCI and why study it?
 - History and impact of HCI
- Exam details
 - Logistics
 - Practice:
 - User research
 - Task analysis
 - Design critique

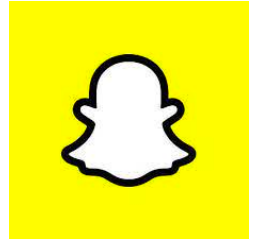
Poster Session next Thursday

Poster Session Prep and Logistics

- Poster session will be in this room during class time (Thurs 11:30-12:50)
- Open to anyone you'd like to invite!
- It is your responsibility to print a poster in time for class. Many places will require some amount of time (a few hours to up to a day) to get your poster printed and will cost a fee.
 - As mentioned in the Assignment 4 instructions on Canvas, Chris has offered to print your poster for you for free (!) via the CSE printer but you have to get it to them by **next Tuesday at 1PM** and in the correct format that the printer requires. See the assignment spec for details. (Thanks Chris!)
- You're welcome to bring your own poster board or easel to class if you like. We will be bringing tape to tape your posters to the wall.
- If you created an interactive digital mockup using a tool like Figma or Marvel, feel free to bring that on Thursday too as a demo to show off (totally optional)!
- **Please bring a draft of your poster on your computer to class next Tuesday** to get feedback from classmates. We will also be working on your pitches in class on Tuesday.

Poster Session External Judges!

Snap Inc.



Sven Kratz

Senior Research Engineer, Snap

Ph.D. in Computer Science from Ludwig-Maximilians-Universität München



I am passionate about inventing new interactive technologies that improve the users' experience and empowers them with new and exciting capabilities. I am a full-stack interactive systems engineer and who invents interactive artifacts from electronics up to the UI software. I have a keen interest in applying AI and machine learning to create new interactive applications and experiences, by allowing machines to understand human gestures, activities, mental and physical states. As a Human-Computer Interaction researcher, I value the importance improving the usability and UX of new technologies through studying actual users. My work has resulted in multiple patents and has been published at top venues in the field.

<https://www.linkedin.com/in/mobilehci/>

Microsoft



Cyn Liu

HCI Design Researcher, Microsoft

Ph.D. in HCI from Indiana University

My research lies at the intersection of computer science, social science, and interaction design, with a particular focus on democratizing technology to support social and environmental justice. My work critically examines the concept of "user" in user-centered design by engaging with underserved stakeholders who are often excluded in the process of technological intervention, including stakeholders who are nonhumans (e.g., animals, plants, microorganisms).

With a hybrid background in HCI and product design, I take an interdisciplinary approach combining methods from social science, arts-and-design, and the humanities to turn large-scale and ambiguous questions into implications that drive change in products, methodologies, and theories to pursue more inclusive and resilient futures.

<https://www.szuyuliu.com/>



Allen Institute for AI



Joseph Chee Chang

Research Scientist, Semantic Scholar

Ph.D. in HCI from CMU

Joseph's research focuses on developing information systems to support users and crowdworkers to explore and make sense of large amounts of information and make better decisions. For example, using crowds to synthesize search results into coherent articles or empowering consumers to navigate and explore thousands of reviews and online sources and gain deep insights and make confident decisions.

<https://joe.cat/>

Kelsey MacMillan

AI Features Product Manager, Semantic Scholar

Kelsey is a Product Manager for Semantic Scholar focused on leveraging AI technology to accelerate the scientific process. She has previously worked at Truveta, Microsoft, OfferUp, and Apple.

<https://www.linkedin.com/in/kelsey-macmillan-851a017a/>



Matt Latzke

Senior Product Designer, Semantic Scholar

Matt is a Product Designer that creates usable, accessible experiences. He aims to solve problems through design and make people's lives better with technology.

<http://www.mlatzke.com/>

[Stealth Startup]



Justin Cranshaw

HCI Researcher and Entrepreneur, [Stealth Startup]

[Left his] Ph.D. in HCI at CMU

He is a Human-Computer Interaction researcher with multiple award-winning publications at top academic conferences. He is an expert in building intelligent computing systems to help organizations communicate and collaborate more efficiently and effectively.

Previously, he was an Entrepreneur in Residence at AI2 and a Senior Researcher at Microsoft Research.

<https://www.linkedin.com/in/justin-cranshaw-81153357/>

Brian Fling

Product Designer, [Stealth Startup]

I am a designer with 20+ years of experience in building world-class consumer and business-facing apps.

My experience has been trusted by the world's most respected companies, like Apple, Amazon, Disney, Google, IBM, Microsoft and The New York Times. I wrote Mobile Design & Development for O'Reilly—the first "animal" book on mobile design. I also teach design at the University of Washington.

I have spoken at 50+ tech and design events around the world, including chairing multiple conferences and doing keynote at SXSW Interactive. And have led dozens of digital transformation workshops and design sprints for Fortune 500 companies.

Lastly, I have founded multiple product design studios and built them up to multimillion dollar businesses.

<https://www.linkedin.com/in/fling/>



Polis



Colin Megill

Nonprofit startup founder and CEO, Polis

I create products for the web. I am deeply interested in problems of collective behavior and future models of open scientific collaboration. My work since 2011 has focused on designing and building open source platforms which enable people to visualize and interactively explore high dimensional spaces.

Polis is a real-time system for gathering, analyzing and understanding what large groups of people think in their own words, enabled by advanced statistics and machine learning. Polis has been used all over the world by governments, academics, independent media and citizens, and is completely open source.

<https://colinmegill.com/>

University of Washington

Katharina Reinecke

Associate Professor, UW Allen School



My research in Human-Computer Interaction aims at developing technology that is equally usable and useful for everyone. My lab explores how technology can be biased against people around the globe who are unlike the small groups of people that created it. My lab's work has shown that commonly used technology, from online communities to scheduling software and MOOCs is often less usable, understandable, trustworthy, visually appealing, and engaging for people from non-Western countries and for people who deviate in their values, language, age, education level, or abilities from the average developer in Western technology hubs.

<https://homes.cs.washington.edu/~reinecke/>

Manaswi Saha

Ph.D. researcher, UW Allen School

My research interests are at the intersection of HCI, data visualization, urban informatics, and computational social science, and their application in domains such as accessibility and sustainability. In my PhD, my main focus is on urban accessibility. I am building interactive computational tools that can improve understanding of urban accessibility and can serve as a tool for advocacy, urban planning, and policymaking. To do this, I am reappropriating online street-view imagery to assess sidewalks (Project Sidewalk) and utilizing data visualization techniques to communicate about urban accessibility.

<https://homes.cs.washington.edu/~manaswi/>

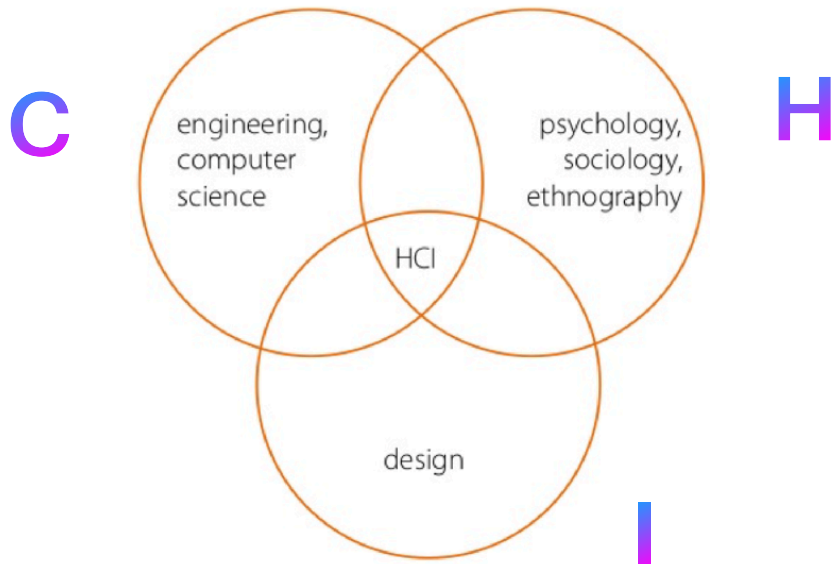


Course Recap

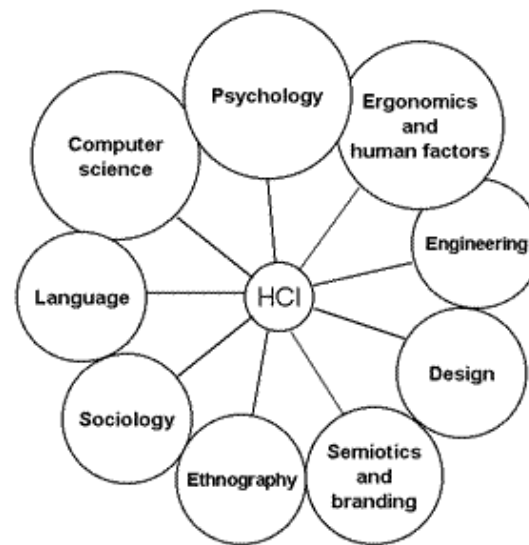
What is HCI?

After having spent many weeks on this, how would you describe HCI to someone else?

What is HCI?



HCI (human-computer interaction) is the study of how **people interact with computers** and to what extent computers are or are not developed for successful interaction with human beings.



Is HCI just usability?

HCI != Usability!

- A usable system is easy to learn, easy to remember how to use, effective, efficient, and safe.
- Usability is only one part of HCI, but it has been one of the main goals historically.
- What other goals do we have for interfaces?
 - Agency - interfaces that do not violate human rights and that put humans in control
 - Societal impact - interfaces that are positive for society
 - Accessibility and diversity - interfaces that work for people of different abilities, cultures, and backgrounds
 - Aesthetics, environmental impact, ergonomics, etc.

What has HCI contributed?

- HCI has contributed to the **development of guidelines and standards** as well as **design patterns and toolkits** that support designers (C.R.A.P., Nielsen's 10, Tarot Cards of Tech...)
- HCI has also developed **methods of evaluation** that help us to evaluate the usability of a given product/system (and other aspects of the user experience), as well as **methods of ideation and iteration** to progressively arrive at a design.
- HCI uses **mathematical models** to predict users' performance with a system (e.g., Fitt's law to predict mouse movement time, or models that predict search time or mental effort), as well as **theoretical models** to describe user behavior with a system (e.g., Model Human Processor).
- HCI also investigates **new interaction paradigms** or new ways of integrating technology in our daily lives (think IoT, chatbots, voice assistants, Microsoft Kinect, Hololens, or touch displays...)

Why do we study HCI in CSE?

- Every engineering discipline includes the **study of breakdowns** and the **design of improved solutions** that address those breakdowns

Why do we study HCl in CSE?

- Tacoma Narrows (nicknamed “Galloping Gertie”)

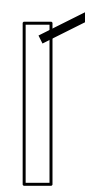
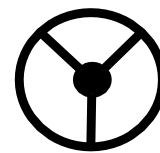


Why do we study HCI in CSE?

- Tacoma Narrows (nicknamed “Galloping Gertie”)



Why do we study HCI in CSE?



Autopilot

Manual

Disconnected

“just the user’s fault”

- Remember, technology *shapes* user behavior (and vice versa)
- In this class, we’ve discussed many examples of technology where its design has shaped behavior or, in aggregate, society as a whole.
 - Think of some technologies that you use regularly
 - or that have been introduced/changed drastically some time in your life (so you remember the “before times”)
 - or some new technology that was introduced but then wasn’t adopted/ didn’t have the intended impact for some reason

Why do we study HCI in CSE?

- Understanding how and why human interaction breaks down is fundamental to designing better computing systems
- **This study must include computer scientists, as we are the ones who...**
 - **understand the technology**
 - **create the technology**
 - **know what technology is capable of**
- We have a responsibility to use our powers for the benefit of people and society!

HCI is an extension of “traditional” CS disciplines

- For example, computer systems research:
 - They design, scale, and evaluate computing systems for particular tasks (e.g., parallel programming, network routing)
 - HCI additionally incorporates humans into the computing system -> it adds an additional constraint
 - Any computer system must be designed taking into account both the physical constraints of the machine (e.g., processor speed, networking capabilities) and the constraints of the human brain (e.g., attention, memory)
- You can do this with lots of other CS disciplines - security and privacy, programming languages and software engineering, AI and machine learning, graphics and visualization, databases, computer networks, ...

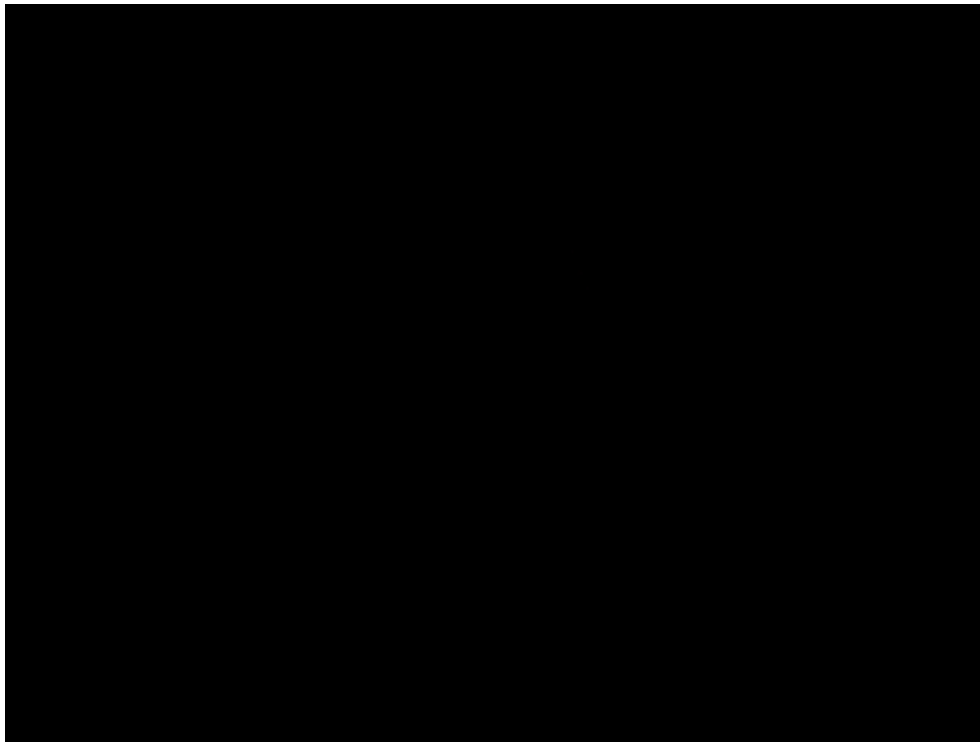
History and Impact of HCI

HCI has had a huge impact on society!

- Computers are way more usable!
- Little training required for most applications and devices compared to decades ago
- Examples of innovations:
 - command line -> graphical user interface
 - keyboard -> mouse -> touch screens
 - A lot of these ideas were imagined and prototyped years ago, before the vision behind them became reality!

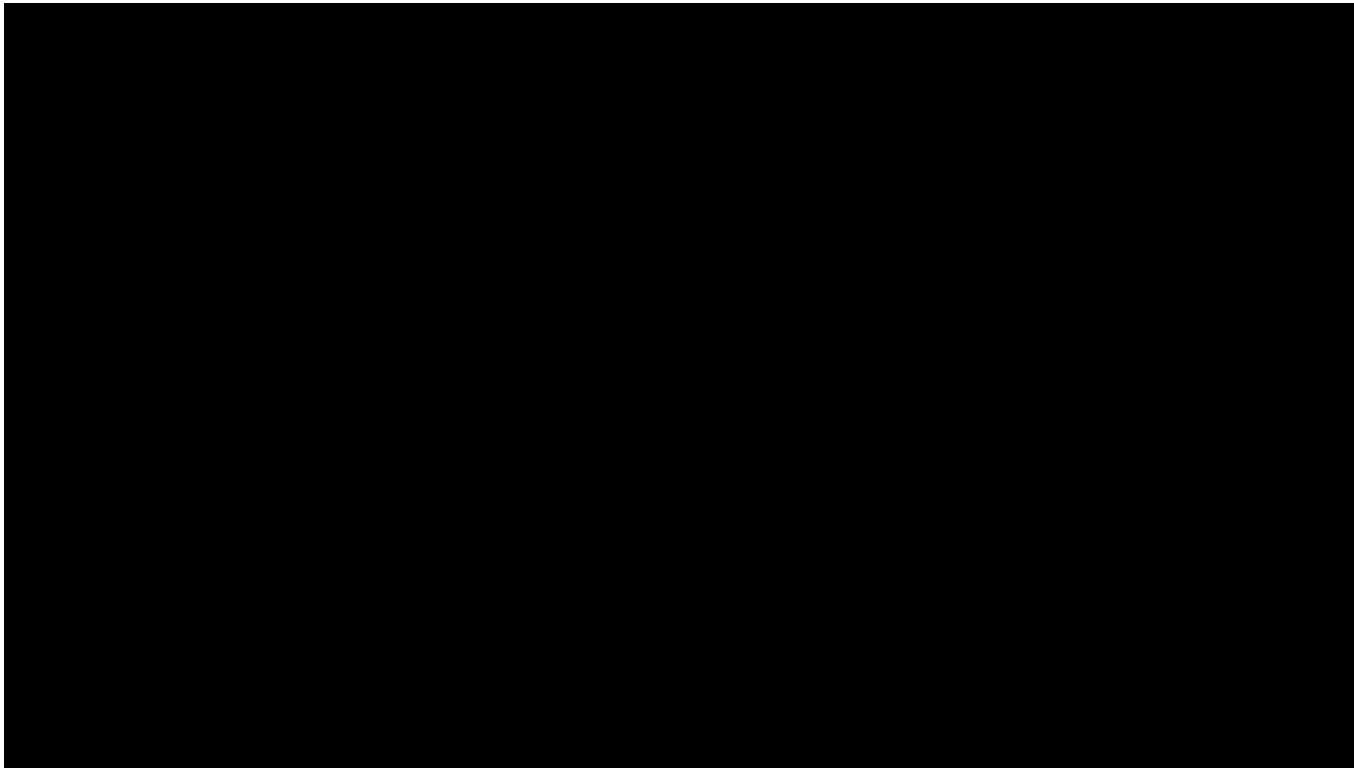


1963 - Sketchpad



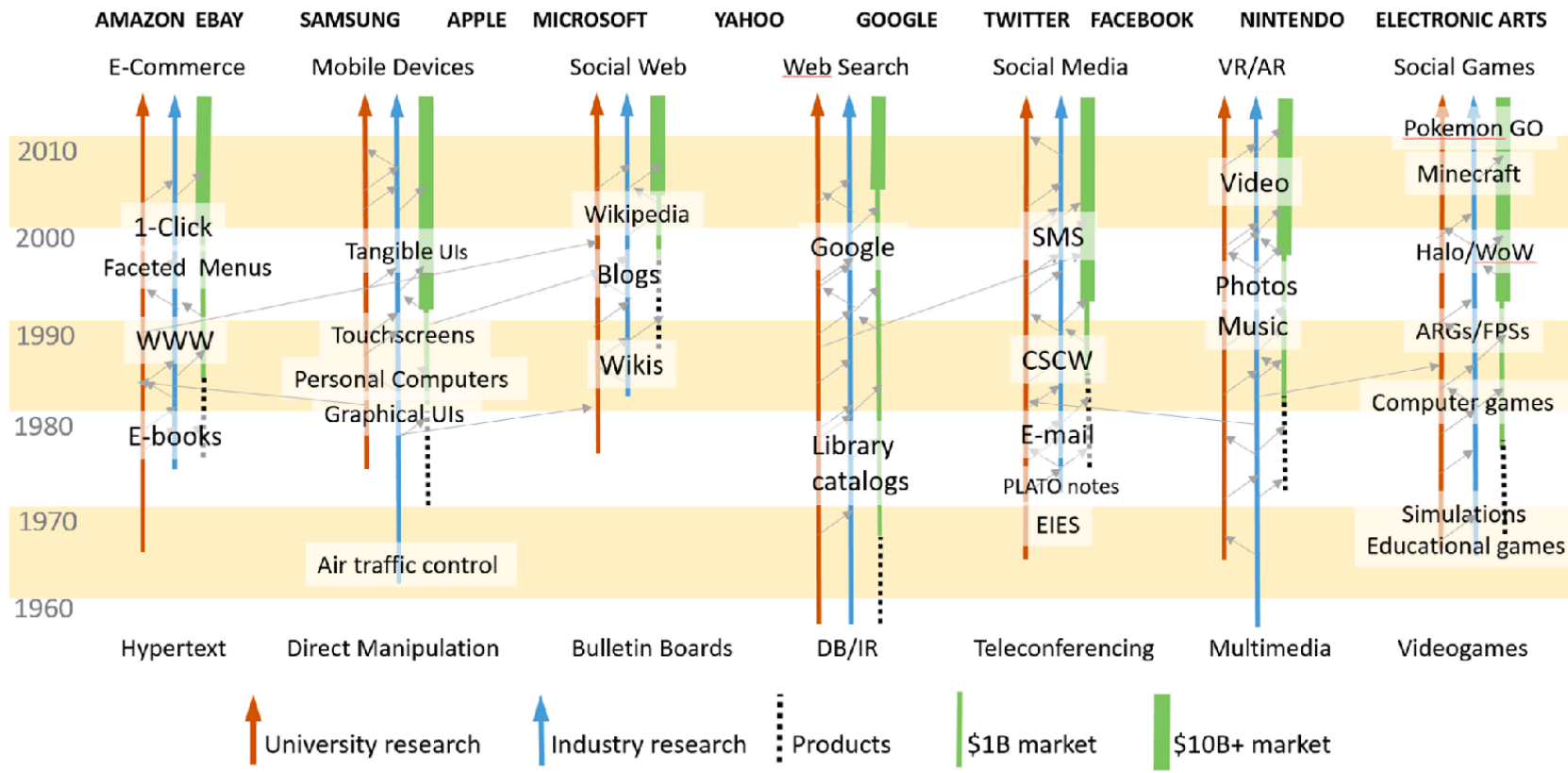
<https://www.youtube.com/watch?v=5RyU50qbvzQ&t=5s>

1968 - “The mother of all demos”



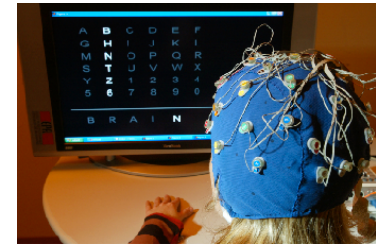
<https://www.youtube.com/watch?v=B6rKUf9DWRI&t=90s>

HCI/UXD: Large Economic Impact



SO many subfields within HCI!

- Accessibility
- ICT4Development
- Human-Robot interaction
- Human-AI interaction
- AR/VR, tangible UIs
- Social and collaborative computing
- Ubiquitous computing, mobile computing, sensing
- ...
- And SO many classes, research labs, centers, and groups at UW if you want to explore more!



~3 minute break!

Exam details

Exam Logistics

- Open book
 - Fine to use any resources from this class (slides, notes, recordings).
 - Not ok to communicate to someone else in any way (in the class or outside).
 - Do not use the Internet as a resource except for where we ask you to go a particular website. But more specifically, we do not want you to look up concepts online - you don't need it, and it might even hurt you by adding confusion with new concepts/different definitions than what we describe in class).
 - Use your **own words** for any answer and do not plagiarize.
- Link to the exam questions will be posted to Canvas and Ed a couple minutes after the end of class (once I walk back to my office).
 - This will be a web link. Do not download or copy the questions into a private file.
 - Choose a word processor and open a blank document to write your answers (Word, Google Docs).
 - Write down each question number along with your answer to that question (e.g. Scenario A, Question 1)
- By 10AM tomorrow, you need to submit the exam to GradeScope.
 - When done, convert your document to PDF via File -> Print -> Save as PDF and then upload the PDF to GradeScope.

Exam Tips

- Questions can have several correct answers. Just like in design, **justification** of your answers is key.
- If you're unsure about how to interpret a question, you should state your assumptions in your answer and the way you've chosen to interpret the question before answering according to those assumptions.
- Do not spend tons of time writing really long answers. We provide an indication for each question about how long we expect an answer to be. Please be concise and stay within the suggested length.
 - On the exam, there will be 7 main scenarios, each with a subset of questions.
 - Each main scenario should take about the same amount of time (we estimate about 20 minutes) and is worth roughly the same number of points (14-15 points to get to 100 total).
- Label your answers, and stay organized. This will make your life easier. When you turn in the exam, you'll be marking in GradeScope which answers correspond to which questions.
- Relax! Only 25% of your grade. Historically, students do well! If you've been paying attention in lecture and doing the in-class activities, you should be prepared.