

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation!

Lecture 01: What is HCI?

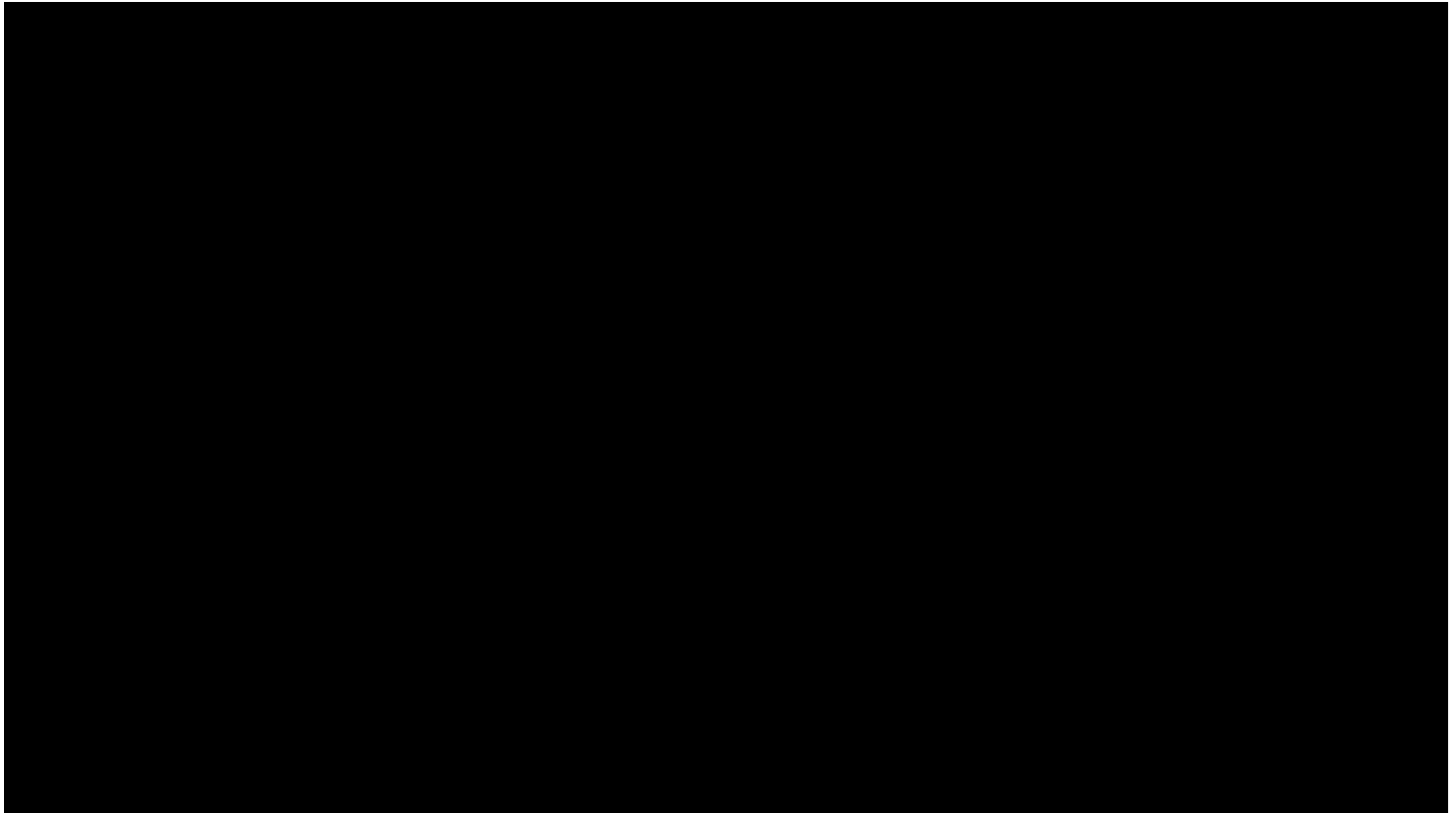
Instructor: Amy Zhang, 1/5/2021

Today's Topics

- UI Hall of Fame and Shame
- Introductions!
- What is HCI?
- Why is interaction design hard?
- Activity
- Course Overview

UI Hall of Shame

What are examples of truly terrible UIs you've seen in the wild?
[type in the chat]

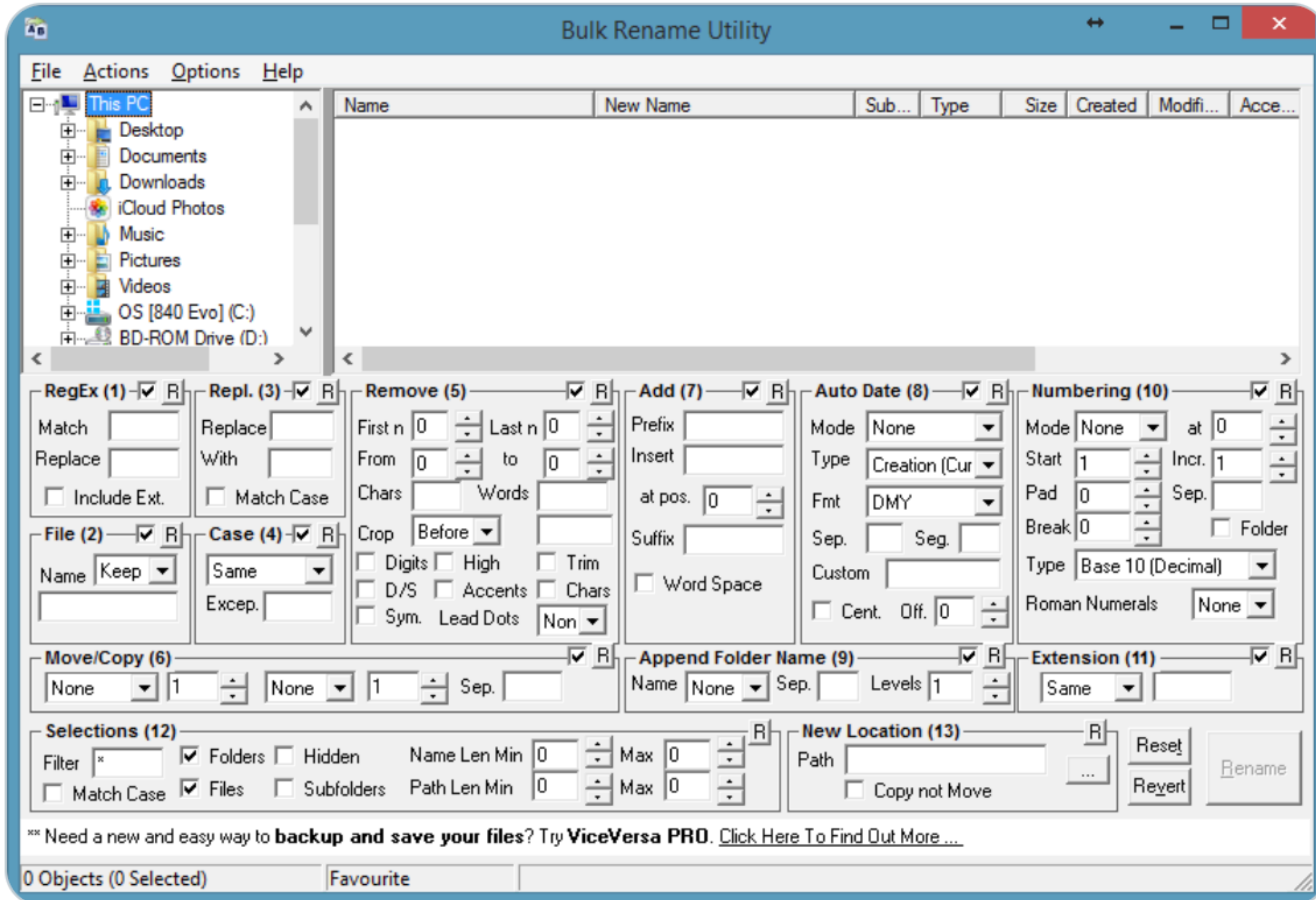




John Bellomy
@cowbs

...

Engineers don't let engineers design user interfaces.



What's wrong with
this UI?
[type in the chat]

UI Hall of Fame

Nothing for today, but think about UIs that you really like for future classes!

Introductions!



Instructor: Amy Zhang (she/her)

- I'm a new professor in UW CSE! I grew up all over the place - China, LA/Irvine, and Dallas, and then got my undergrad degree in CS at Rutgers. MPhil Cambridge, PhD MIT, Postdoc Stanford.
- I love hiking and travel (visited 11 national parks this year!). I am a foodie - I love eating Asian food and drinking boba, though I cannot cook.
- I am a former competitive tennis player! I played tennis since the age of 5 and played NCAA Division I for Rutgers and also in the UK for Cambridge.



- My research is in an area of HCI called **social computing**.
- I work on how to better design and build all the software you use for social activity - from collaborative tools like Slack to social media like Instagram - and also look at all the cool and terrible things we do together online, from building Wikipedia to spreading misinformation.

Social Futures Lab RESEARCH TEAM RESOURCES NEWS

The Social Futures Lab is based out of the [Allen School of Computer Science & Engineering](#) at University of Washington. We are reimagining social and collaborative systems to empower people and improve society.

People

Amy Zhang
Assistant Professor

Shagun Jhaver
Postdoctoral Researcher

Ja
Quan Ze (Jim) Chen
PhD Student

Ruotong Wang
PhD Student

Ge Zhang
Visiting Researcher

News

Sept 2020: The Social Futures Lab is started, with Shagun joining as a postdoc and Jim and Ruotong joining as grad students.

Aug 2020: Amy named a Belfer Fellow by the Anti-Defamation League to work on tools to fight harassment. →

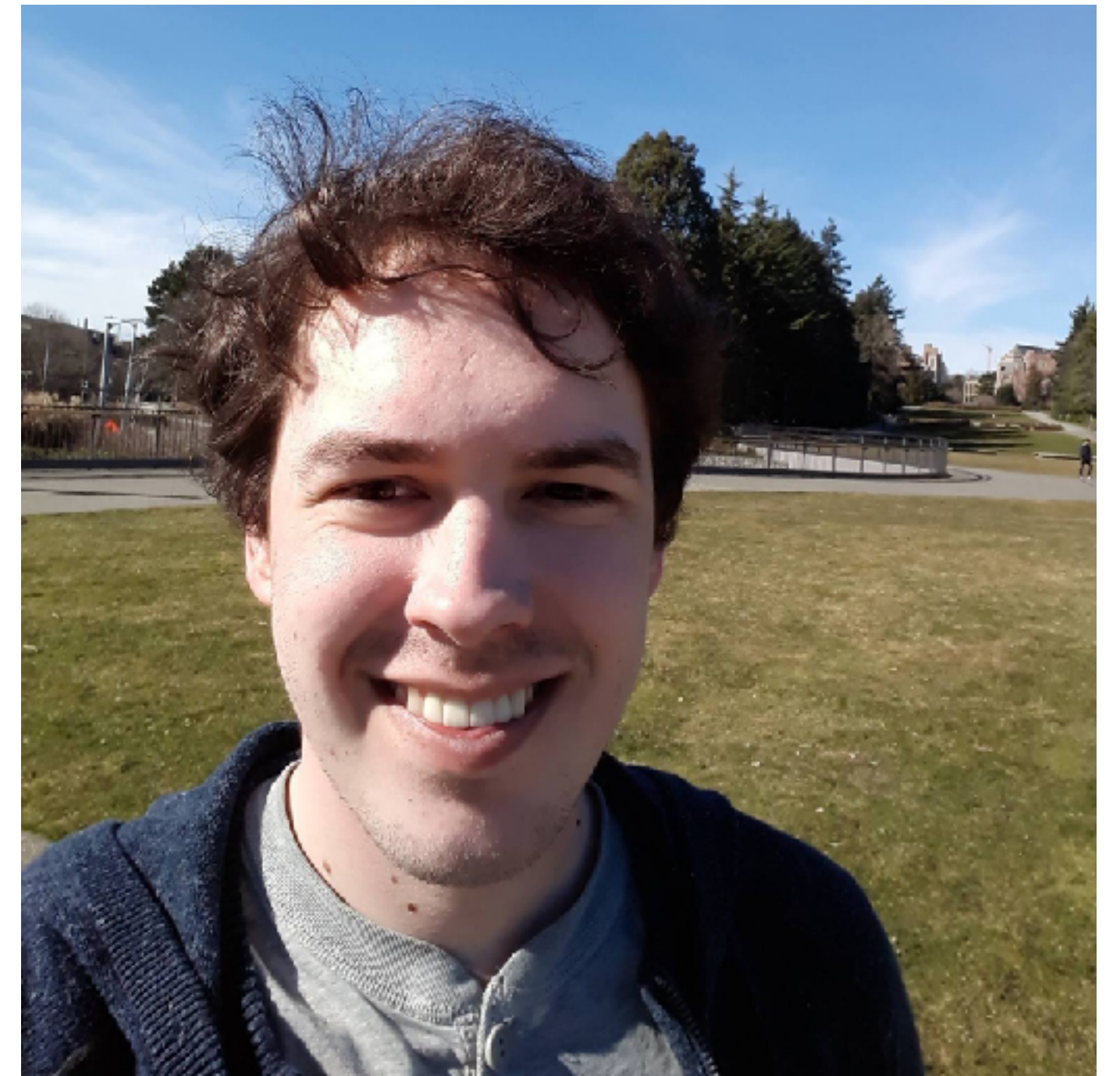
July 2020: Amy's PhD thesis wins the MIT EECS George Sprowls Award for best PhD thesis in computer science. →

July 2020: We won a micro-grant from WikiCred to work on the UX of credibility on Wikipedia. →

social.cs.washington.edu

TA: Spencer Williams (he/him)

- I'm a 3rd-year PhD candidate in HCDE, co-advised by Gary Hsieh (HCDE) and Katharina Reinecke (CSE).
- I love to play and write music, read, hike, play video games, play chess, and watch TV.
- I started playing chess a couple months before Queen's Gambit came out, so I have a head start.



TA: Lior Levy (she/her)

- I was born in Israel and moved to Seattle when I was 11. I received my Computer Science Bachelor's degree Fall 2019 from UW, and am currently pursuing a Masters in Computer Science also from UW!
- I love to travel (Europe especially!), drawing with colored pencils, and listening to music.
- I have a 4 year old rescued lab named Moose



TA: Ciana Yi (she/her) 🙌



Portland → Vancouver → Seattle

Completing my last year in the Interaction Design program.



I enjoy thrifting, creating playlists, watching films, and have recently been exploring hand embroidery.

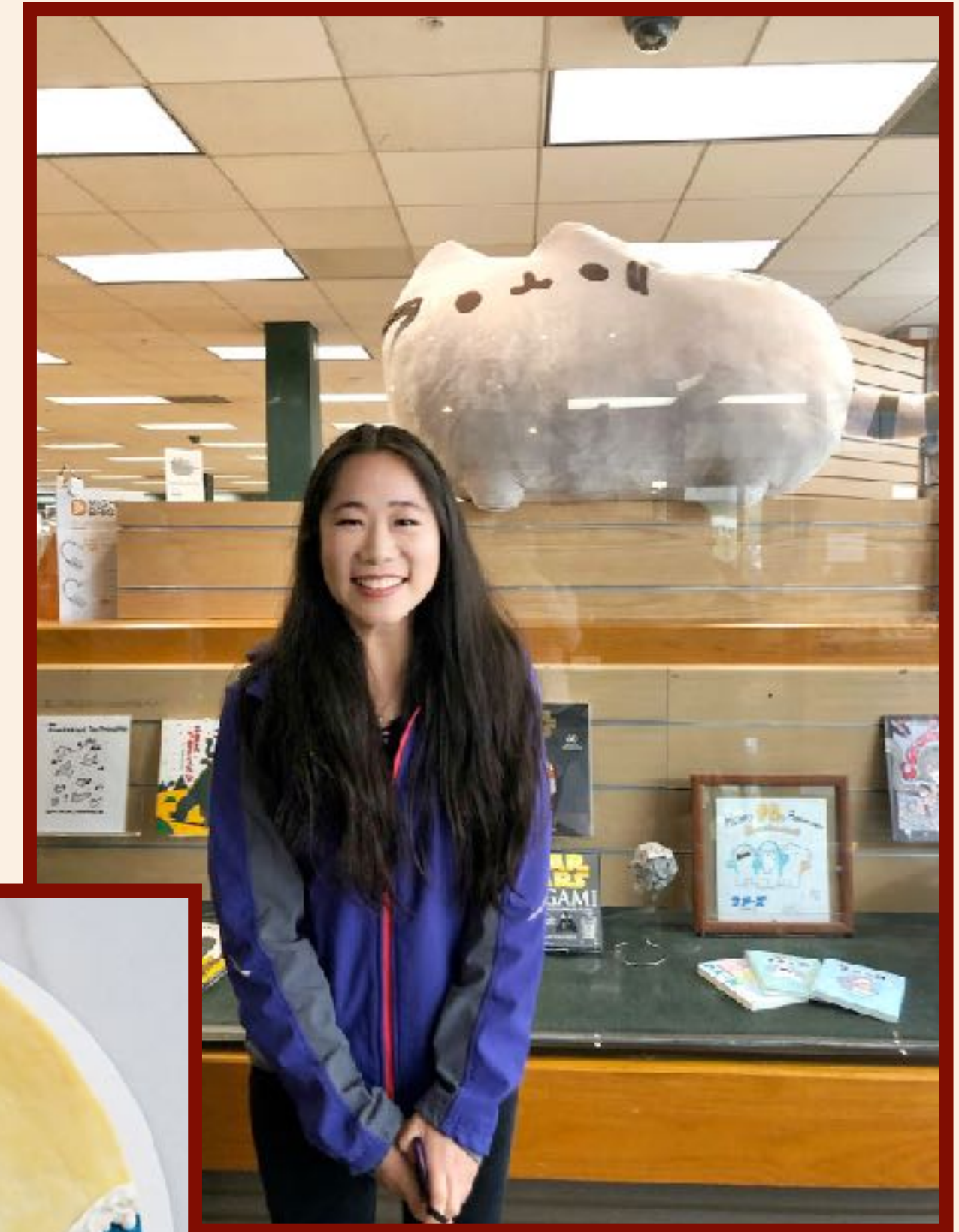


I spent my freshman year pursuing a pre-med track!



TA: Lucy Jiang (she/her)

- I was born and raised in the greater Seattle area! I'm currently a junior studying Computer Science at UW.
- I love baking and decorating sweet treats (and eating them!) In my free time, I also enjoy skating, hiking, cooking, and exploring the city!
- I've been inline skating since I was 5, and I've been a Certified Skating Instructor for the past 8 years!



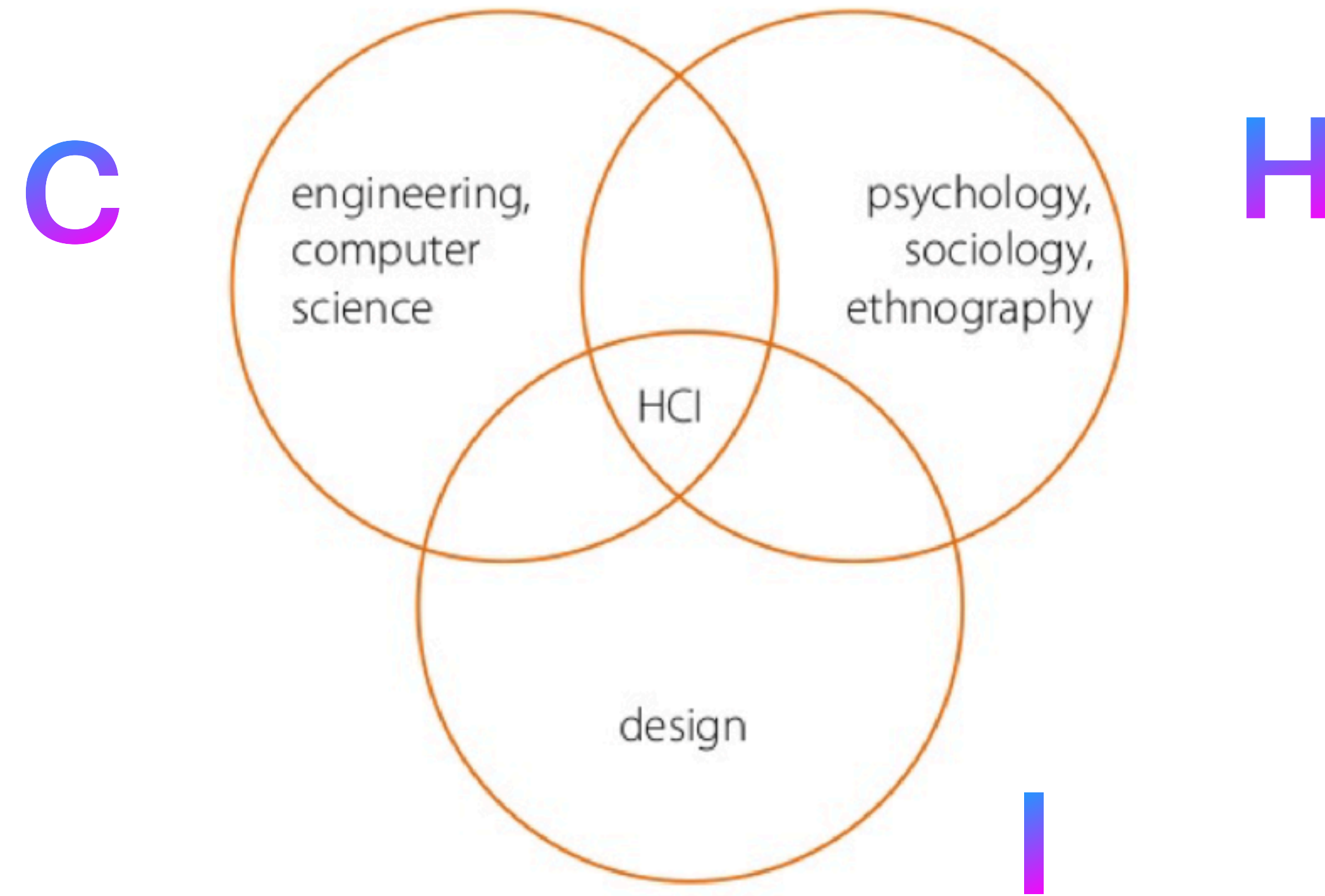
Your turn!

Go to: yellkey.com/from

Spend ~3 min to add your slide, then we'll add you to breakout rooms to introduce yourself to a random subset of students!

What is HCI?

Human-Computer Interaction



HCI is about the design and use of computer technology

What is **design**?

- Design is about **making** things
- “[Design is] a plan for arranging elements in such a way as to best accomplish a particular **purpose**.” - Charles Eames (*designer of that Eames chair by Herman Miller*)

What is an **interface**?

- “the place at which independent and often unrelated systems meet and act on or communicate with each other” - Merriam Webster dictionary
- This is the **interaction** part of human-computer interaction
- The interface is what we design!

Why is interaction design hard?

You are not the user!

- User interfaces are about communicating with users. Users are NOT like you!
- As the builder, you know a lot more about your application than any user will, and it's difficult to un-learn it.
- What do we mean when we say “the user is always right”?

BUT don't expect users to be designers either

1) Telephone handset weight

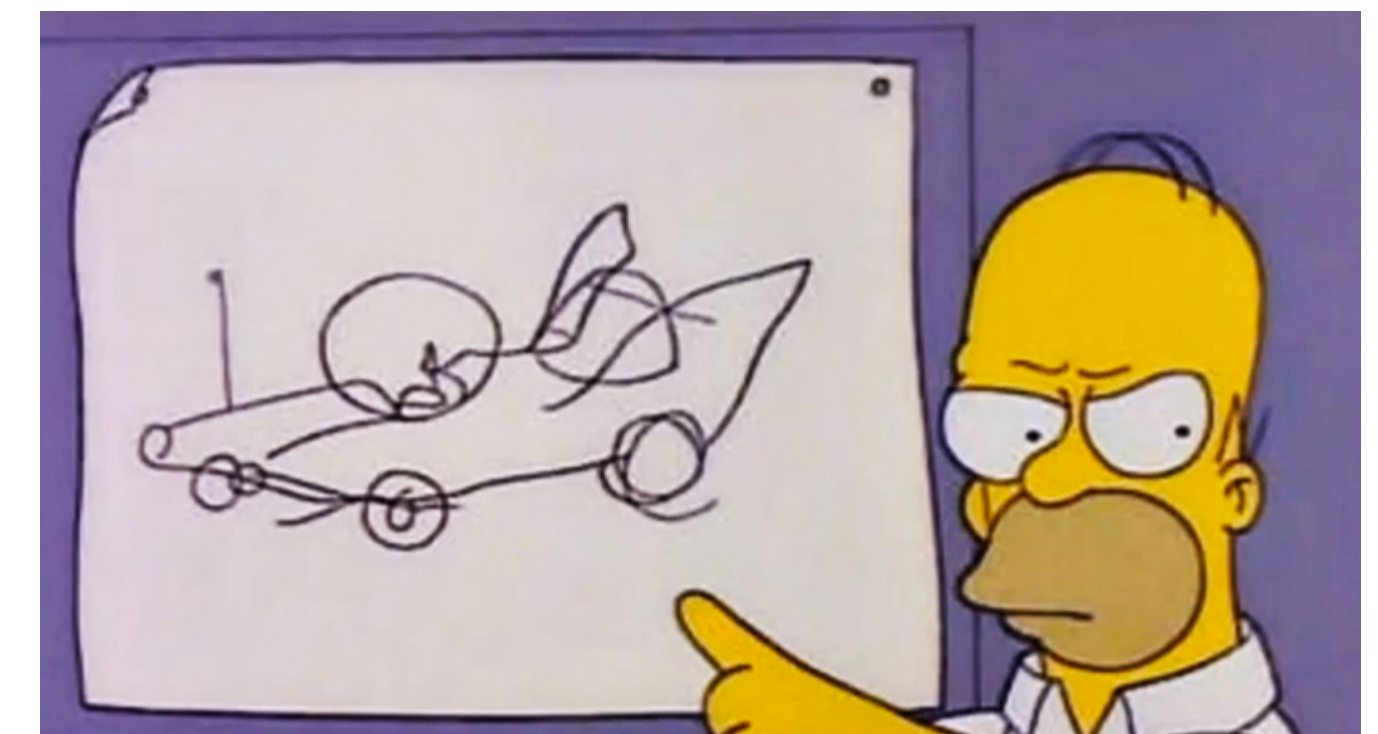
- users said: it's fine! — but they wanted lighter

2) # of Google search results

- users said: 30 results — but they really wanted 10

3) Command abbreviations

- Users made 2x more errors with their own custom abbreviations



“I want a horn here, here, here, and here. You can never find a horn when you're angry.”

1) Klemmer, Ergonomics, Ablex, 1989, pp 197-201

2) <http://perspectives.mvdirona.com/2009/10/31/TheCostOfLatency.aspx>

3) Grudin & Barnard, “When does an abbreviation become a word?”, CHI '85

So how do you know what to design?

- Design as a **process**:
 - To synthesize a solution from all the relevant constraints
 - To frame, or reframe, the problem and objective
 - To create and envision alternatives
 - To select from those alternatives
 - To visualize and prototype the intended solution

- Bill Moggridge (co-founder of IDEO)

Design as a **process**

- Design process as **iterative** and **explorative**, constantly involving **users** and investigating **use**, since we can't just trust our instincts
- Group project - propose and carry out an end-to-end design process

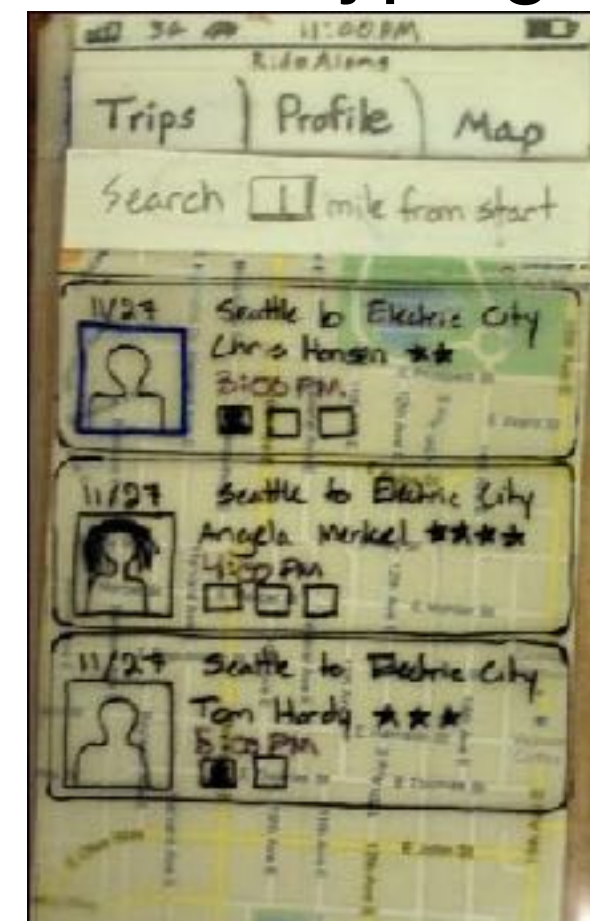
Talk to people,
investigate
problems



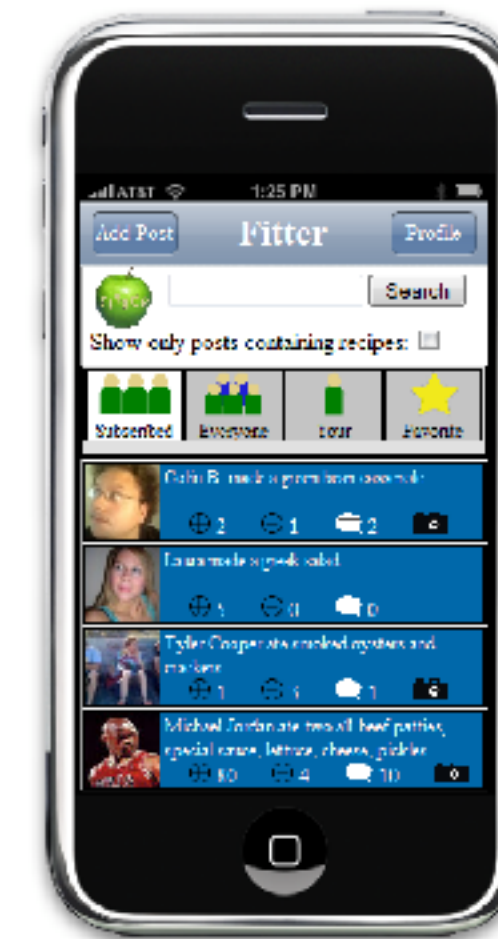
Sketching and
Storyboarding



Low-fidelity
Prototyping



Digital
Mockup



Presentation &
Communication

So how do you know what to design?

- Design as an open-ended **series of principles**:
 - Usability: how well users can use the system's functionality
 - Learnability: how easy is it to learn?
 - Efficiency: once learned, how quickly can it be used?
 - Safety: are errors few and recoverable?
 - Accessibility
 - Aesthetics, minimalism
 - Ergonomics
 - Expressivity, flexibility
 - Malleability, control

Which principles to emphasize depends on context

- There are **trade-offs** between different design principles, so you can't just apply them mindlessly
- Emphasis depends on the **user**
 - Novice users need greater learnability
 - Expert users need efficiency
 - But everyone can be a novice or an expert at different points in time
- Emphasis depends on the **task**
 - Highly critical tasks should emphasize safety (amber alert system)
 - Less critical, repetitive tasks need efficiency (unlocking your smartphone)

There are also other trade-offs

- Software builders have a lot to worry about!
 - functionality
 - performance
 - cost
 - security
 - maintainability
 - reliability
- Some of your other CSE courses focus on these other attributes
- But we'll mostly ignore these trade-offs in this class in favor of how well the interface addresses a **problem that people have** and how successful is the interface for people to **achieve their goals and tasks**
- Just like with these other attributes, we have to think about constraints —but now, we add humans' physical, mental, and social constraints in addition to physical constraints of machines

Objectives of this Course

- **Process**-focused perspective on interaction design
- Learn **design principles** and **heuristics**
- Learn **design methods** such as **user** research methods, **task** analysis
- Create **design artifacts** for communicating and thinking through your intermediate design: scenarios, sketches, storyboards, prototypes
- Rapid prototyping and **iteration** of design, coupled with user testing and other evaluation methods
- **Critical** perspective on design solutions
- Learning communication skills and design **critique**

Activity! (10 min)



- Here are three different kinds of locks.
- Consider the different design decisions made in these different locks to address different principles (learnability, efficiency, safety)
- Since we don't have them in front of us, think back to a time where you used a lock, and remember problems you may have encountered when trying to use it.
- What aspect of the design of the lock related to the problem?
- Design and then sketch a new lock that addresses the problem.
- Fill out and upload your sketch to: www.yellkey.com/down

Course Overview

Course Structure

- **Tuesdays** and **Thursdays** we have lecture and in-class activities, along with group work or group presentations with feedback sometimes.
- **Fridays** we have section. Section is primarily studio time led by TAs, where you will participate in group presentations and give feedback.
- As you can see - **active participation** is a huge component of the course! Every group is counting on everyone else for rapid feedback.

Communication

- Check **Canvas** for syllabus, assignments, calendar, Zoom links, slides, recordings.
 - Canvas has a handy calendar feed for importing into your personal calendar (see my announcement). Zoom links are different for each lecture!!
- Turn in group assignments in **Gradescope**.
- Post questions to **Ed** or to cse440-staff@cs.washington.edu (always reply-all!)
- Office Hours posted in Canvas
- **Do not message or email any of the TAs individually!** It's not their job to respond to you outside of work, also other students and staff may benefit from hearing your question.

Submissions and Deadlines

- Many group assignments are due at **5PM on Fridays**. The expectation here is that you already have the assignment done, along with a presentation prepared, prior to section on Friday. Then you have time to take feedback from section and iterate on your assignment by the deadline.
- We do not have a systematic late policy. **Please get your assignments in on time**. If there is an emergency impacting your group's ability to turn in an assignment, the sooner you tell us (especially BEFORE the deadline), the better.

Forming Groups

- Fill out the following form by **end-of-day today!** www.yellkey.com/north
- We will take this information into consideration and announce teams on Thursday.
- **The teams we create are FINAL, no exceptions!** We will try our best to accommodate your needs when creating teams but no guarantees, as we're trying to juggle many considerations.
- If you are considering dropping the course, please let us know in the form, and do so ASAP. (If you are still trying to add this course, write me an email.)

Upcoming schedule this week

- Thursday lecture topic: the **Design Process**
- You'll also meet your team on Thursday and start brainstorming for **Assignment 1a** (on Canvas).
- In Section on Friday, your team will continue working on 1a. 1a is then due at **5PM Friday**.
- You'll receive feedback on the 3 ideas from TAs after Friday. You'll also prepare a presentation of your 3 ideas next Tuesday after lecture with other group for more feedback. For the rest of next week, you'll focus on narrowing and developing one main project idea.

That's all!

- Questions?
- My office hours are tomorrow - feel free to just come by to chat!
- Remember to fill out the form: www.yellkey.com/north