Human-Computer Interaction

What is HCI Research?

Professor Bilge Mutlu

Today's Agenda

- Where we left off
- **What is HCI research?** – kinds of contribution
- **Project kickoff** – the speculative-design workshop
- How you get a team over the weekend
- Crit feedback etiquette

Where we left off

Three strands, decoupled by day – **Monday** seminar, **Friday** methods, the **project** across both.

Fundamentals are the medium, not the message.

You took home a card: **Technology × Context × Perspective**. Today it goes to work.

Two jobs today

This lone Friday does double duty.

First half

What is HCI research? – the kinds of contribution a project can make

Second half

Launch the project – put a topic on the board and recruit into it

Reading behind today[1]

Lazar, Feng & Hochheiser (2017), **Ch. 1** – *Introduction to HCI research.*

[1] Lazar, J., Feng, J. H., & Hochheiser, H. (2017). *Research Methods in Human-Computer Interaction* (2nd ed.). Morgan Kaufmann.

What is HCI research?

What counts as HCI research?

Mostly **empirical** or **design-based** – often both.

- **Empirical** – understand a phenomenon from observation or experience
- **Design-based** *(artifact / system)* – understand a design space by building in it
- Plus a handful of less common types

The formal version[2]

Wobbrock & Kientz name **seven** kinds of contribution:

1. Empirical
2. Artifact
3. Methodological
4. Theoretical

1. Dataset
2. Survey
3. Opinion

[2] Wobbrock, J. O., & Kientz, J. A. (2016). Research contributions in human-computer interaction. *interactions*, 23(3), 38–44.

The four you'll live in

Empirical

interview · diary · lab experiment · field study

Artifact

system · device · toolkit · technique · envisionment

Methodological

new method · new measure · new instrument

Theoretical

framework · design space · conceptual model

Empirical research, in four questions

Who?

Sample – random, purposive, snowball, convenience

Where?

Context – natural setting, field, or controlled lab

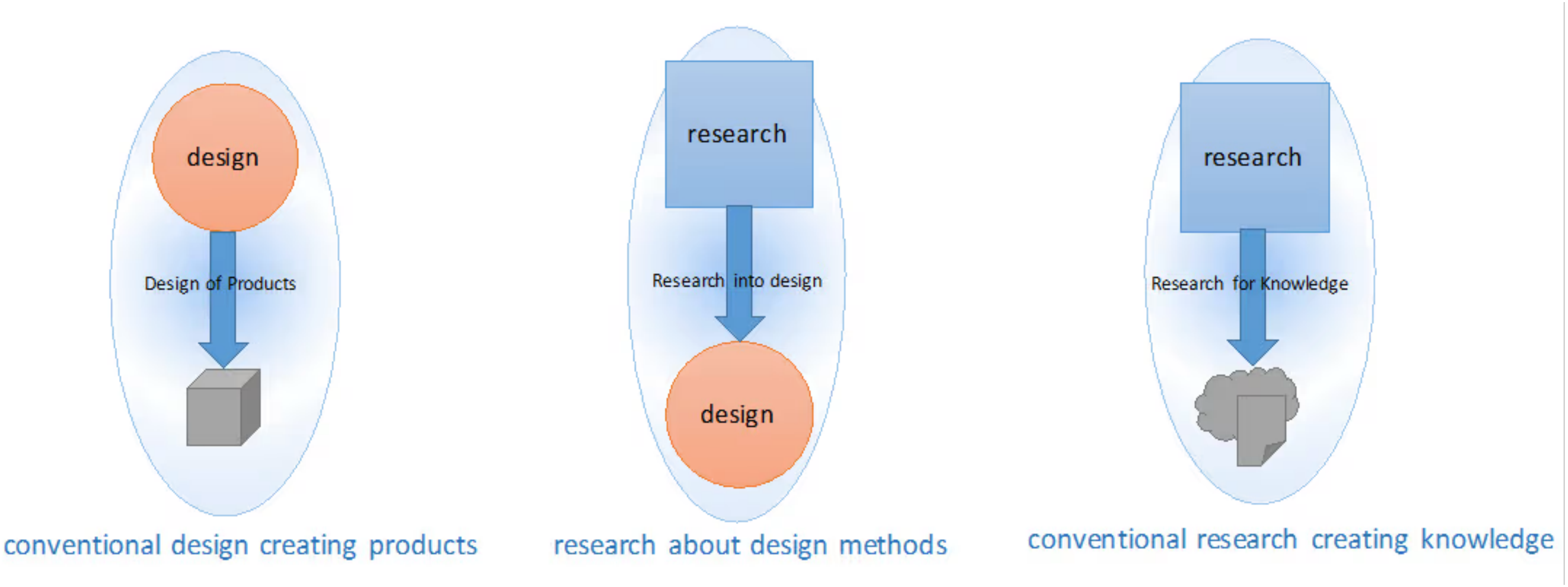
Why?

Goals – representation *(deep, small-n)* or generalization *(broad, large-n)*

What?

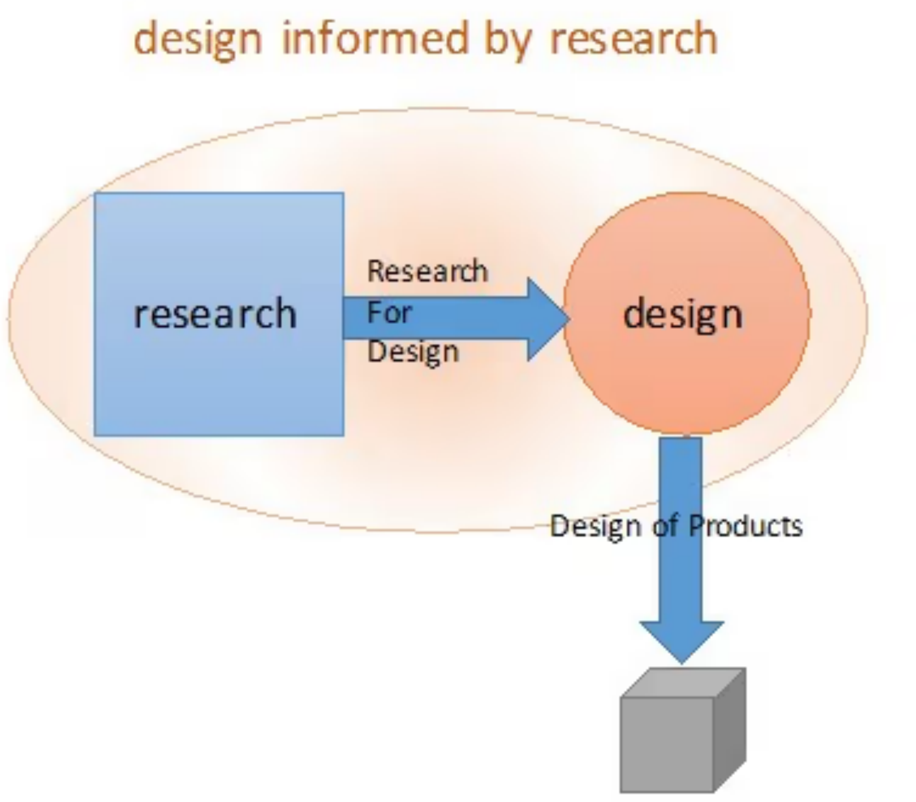
Data – qualitative, quantitative, or mixed

Design-based research



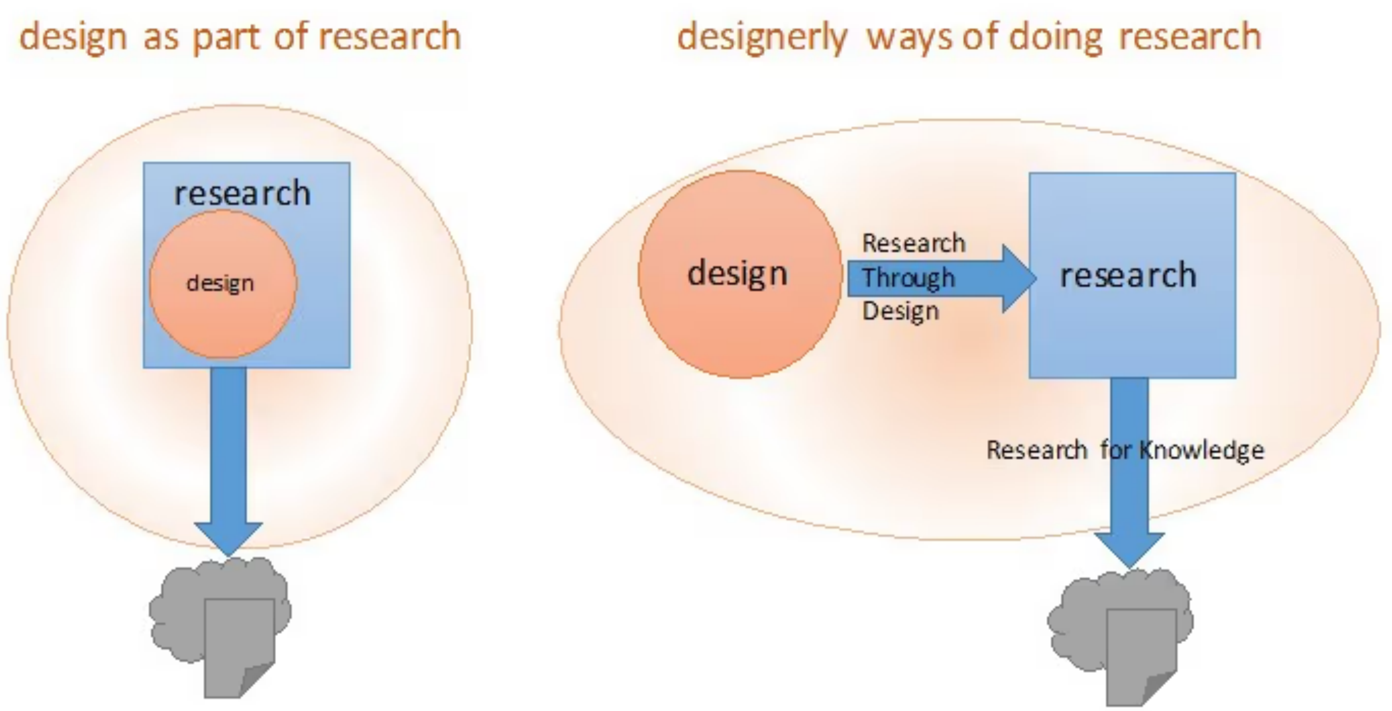
For design, or through design?

Research *for* design



Research that **informs** a design.

Research *through* design



Design that **creates** knowledge.

From contribution to question

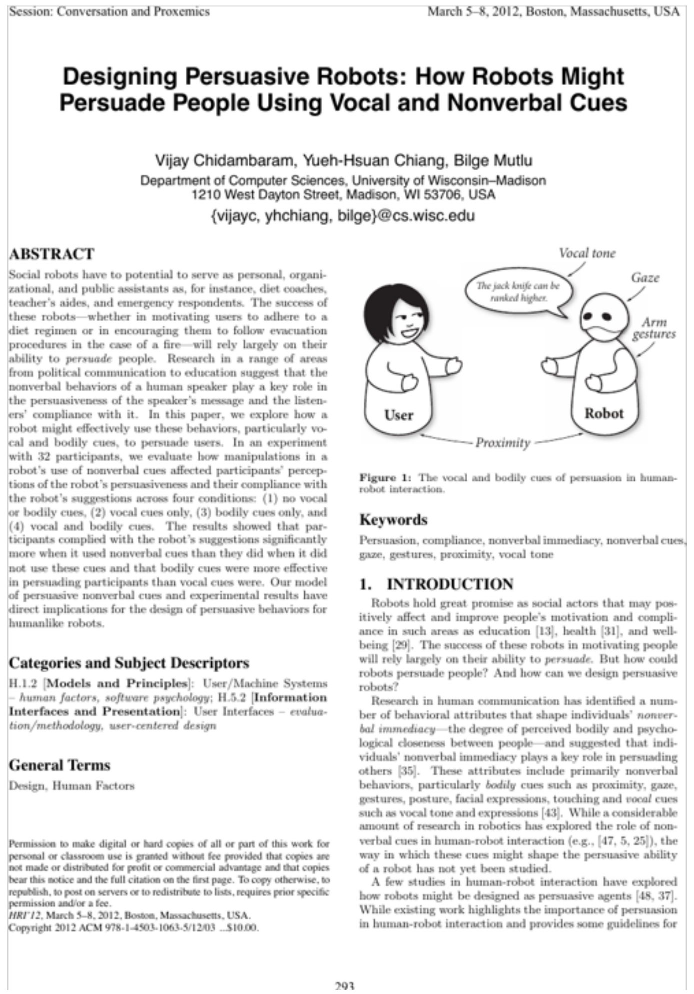
The contribution you're aiming at shapes:

- what a good **research question** looks like
- which **method** can answer it
- what counts as **evidence** that you succeeded

You don't have to name it today. It follows from the question, and the question comes first.

Project Kickoff

Where these have gone


Session: Conversation and Proxemics — March 5–8, 2012, Boston, Massachusetts, USA

Designing Persuasive Robots: How Robots Might Persuade People Using Vocal and Nonverbal Cues

Vijay Chidambaram, Yueh-Hsuan Chiang, Bilge Mutlu

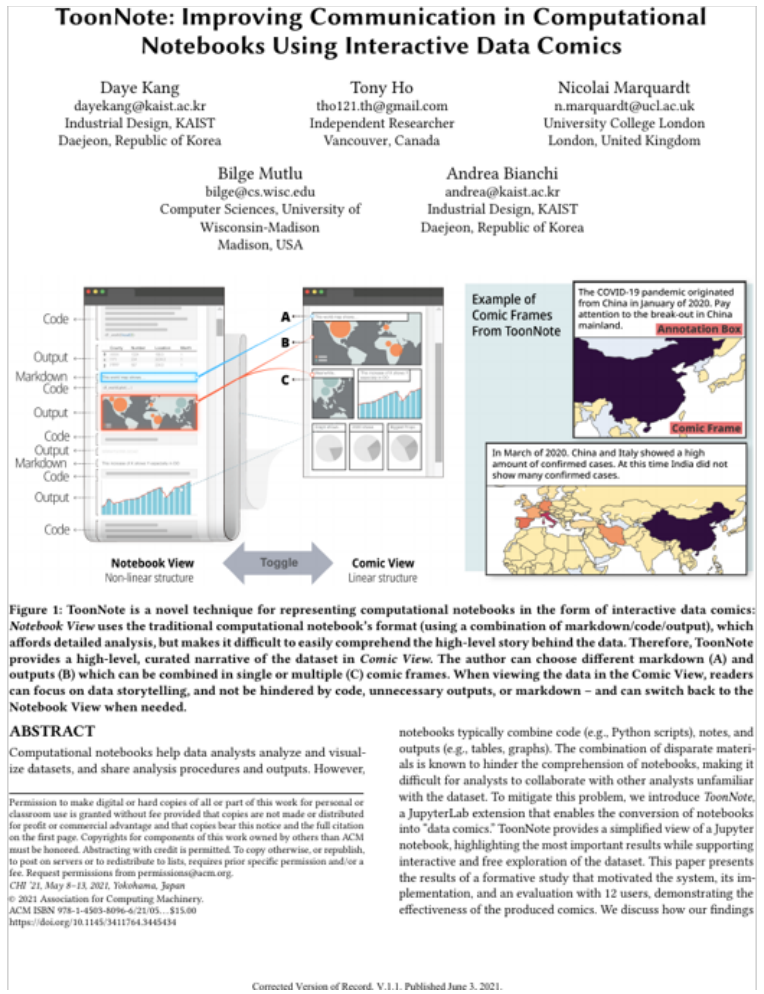

There's Just Something About Hands — CSCW 2015, March 14-18, 2015, Vancouver, BC, Canada

Handheld or Handsfree? Remote Collaboration via Lightweight Head-Mounted Displays and Handheld Devices

Steven Johnson, Madeleine Gibson, Bilge Mutlu


A Motion Retargeting Method for Effective Mimicry-based Teleoperation of Robot Arms

Daniel Rakita, Bilge Mutlu, Michael Gleicher


ToonNote: Improving Communication in Computational Notebooks Using Interactive Data Comics

Daye Kang, Tony Ho, Nicolai Marquardt, Bilge Mutlu, Andrea Bianchi

Four of the five. All started as a 770 project.

Five projects, five venues

	Team	Venue	Cited
2012	Chidambaram, Chiang	**HRI** – persuading with a robot's vocal and nonverbal cues	405
2012	De Simone, Verbruggen, Kuo	**Computers in Human Behavior** – cheating in an unfair game	17
2015	Johnson, Gibson	**CSCW** – head-mounted vs. handheld for remote collaboration	90
2017	Rakita	**HRI** – mimicry-based teleoperation of robot arms	152
2021	Kang, Ho	**CHI** – data comics for computational notebooks	61

The road ahead

- Topic *(today)*
- Literature survey + RQs
- Method
- Data
- Analysis, results
- Final paper + lightning talk

The paper is written **incrementally**, in Overleaf, in ACM format.

Assembled across the term – not started in December.

Six milestones, two crits

Topic	RQ + lit review	**Method design**	Data collection	**Analysis**	Paper + lightning talk
Sep 11	Oct 2	Oct 16	Oct–Nov	Nov 13	Dec 7/14
		pod crit		*pod crit*	

Speculative Design Workshop

Minutes	Who	What
0-5	me	How the marketplace works – you make **topics, not teams**
5-10	solo	Your card → **one research question** + a **≤10-word tagline**
10-20	your table	Round-robin, ~30 s each. The table picks the **2-3** it would most want to work on
20-28	table, then everyone	Post them to the shared sheet – **then get up and walk the room**
28-30	me	Five or six taglines read out at random

Posting and browsing

Post

- One laptop per table → the **shared sheet**
- Cast it to your pod monitor
- **Research question · tagline · your name**

Then move

- **Leave your table.** Read other tables' monitors
- Find a topic you'd spend a semester on
- Talk to the person who posted it

Brought your own idea? Post it

How you get a team

Topics go on the board. **You recruit into them over the weekend.**

- **Friday evening** – each topic becomes a **Canvas group, capacity 3**
- **Friday → Monday** – browse all, join one. **First come, first served**
- **Monday Sep 14** – teams are final

The tagline is doing real work. It's how someone decides to spend a semester with your question.

Two rules for the weekend

The fork rule

- A topic fills at **3** and closes
- More demand? **Fork**: 7A / 7B
- The two teams must **differentiate** – population, context, method, or measure
- The B team says how in its

Sit with your team

- **Mon Sep 14** – first time you're all in a room together
- **Standing pods** – two teams, one table – announced before **Sep 21**
- That seat is yours for the term

The weekend, end to end

Fri 9:30–10:45
In class
Topics go on the board

→

Fri afternoon
We curate
Each topic becomes a Canvas group, cap 3

→

Fri → Mon
You recruit
Browse, join one.
First come, first served

→

Mon Sep 14
Locked
Teams final
(3 per team)

Full at 3?
It forks — 7A / 7B.
The two teams must differentiate.

The three card decks

Technology

LLMs & agents · XR & sensing · robotics & IoT · wearables · ubiquitous systems

Context / population

health · learning · accessibility · work · everyday life · vulnerable groups

Perspective

usability · experience · ethics · adoption · creativity · repair & sustainability

Picking a topic worth studying

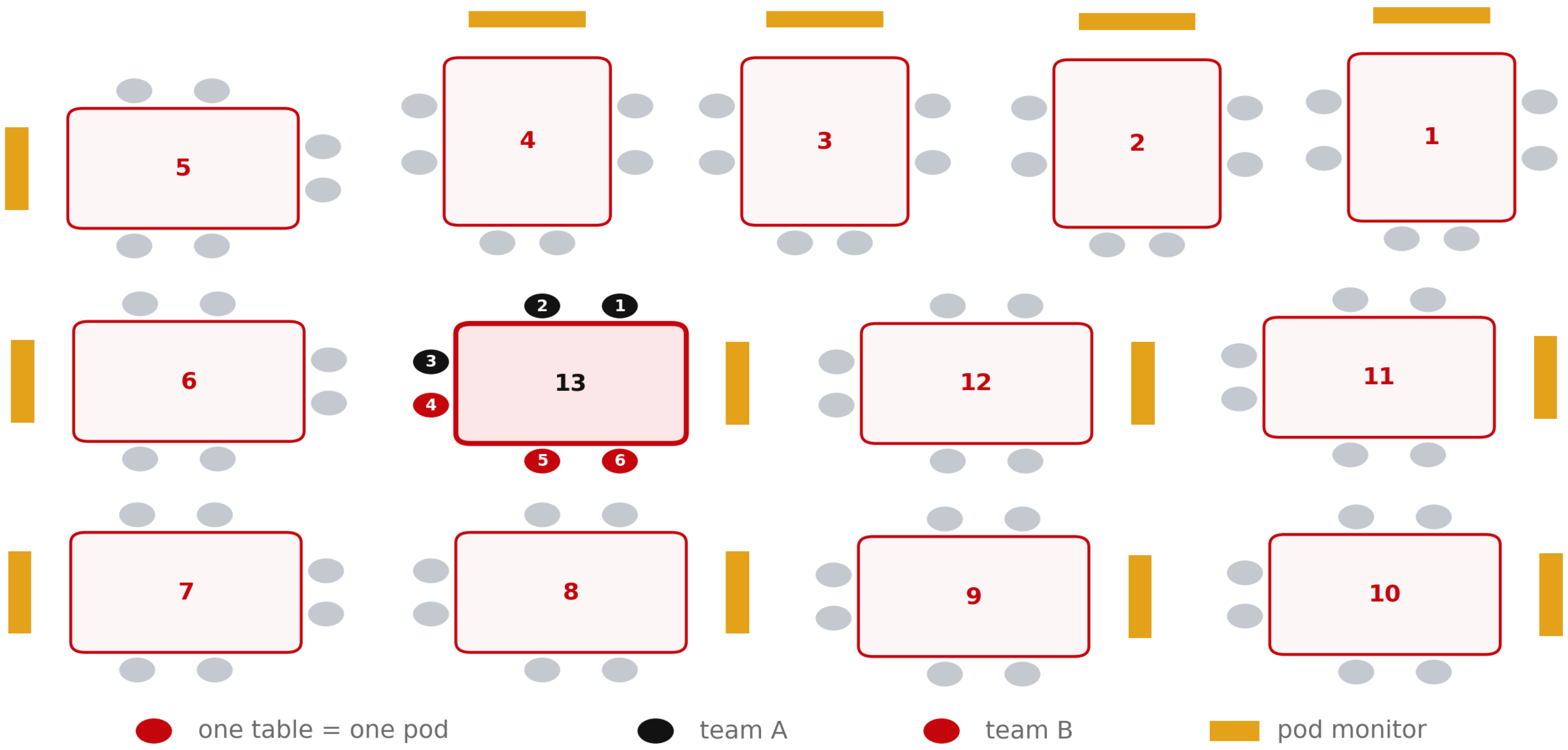
A problem worth a term is **understudied · significant · pervasive · persistent.**

- Odd card combinations are fine – they spark ideas even when they don't survive
- Choose a perspective you're actually drawn to
- Most of all: find teammates you click with

Teams and standing pods

- **Teams of 3** – fewer or more only as exceptions *(≈25 teams)*
- Teams are grouped into **standing pods – two teams at one table, six seats**
- The pod is your fixed unit all term: Monday discussion **and** Friday crits
- It's also the **backbone of attendance** – your seat is the check

The room



Pod 13 shown. Seats 1 and 6 flank the monitor; 3 and 4 sit across from it.

Crit etiquette – giving

- **Describe, don't judge** – "this is hard to interpret because…"
- **Ask questions** – "what made you choose that design?"
- **Build on ideas** – add, don't just react
- Be **kind, specific, and honest** – all three, or it isn't useful
- Focus on the **research goal**, not personal preference

Crit etiquette – receiving

- **Listen without defending** – you'll get your turn
- **Ask follow-ups** – get the note behind the note
- **Don't take it personally** – it's about the work, not about you

The first crit is modeled live before you run one yourselves.

Assignment – Project Framing Brief

(team; 1 page) · **Due Fri Sep 18, 9:30 am**

1. **Research question** – refined from your recruitment RQ
2. **Why it matters** – two or three sentences
3. **Rough direction** – what you'd build, study, or observe
4. **Likely contribution type** – your best guess, and why *(it can change)*
5. **Differentiation** – B-copy teams only: how you differ from the A team

What's Next?

- **Mon Sep 14 – Seminar: Foundations & Visions of HCI**
  - Read Bush, Licklider, Suchman; skim Shneiderman's 2×2
  - **Post one provocation slide** before class
- **Fri Sep 18 – M2: Choosing Methods + Research Ethics & IRB**
  - **Framing Brief due 9:30 am**
  - Each team posts a **3-line status** – done / blocker / next