In future years,
add Katharina Reinecke's
LabInTheWild aesthetics paper
"Quantifying Visual Preferences Around the World "
(they're reading it this year)

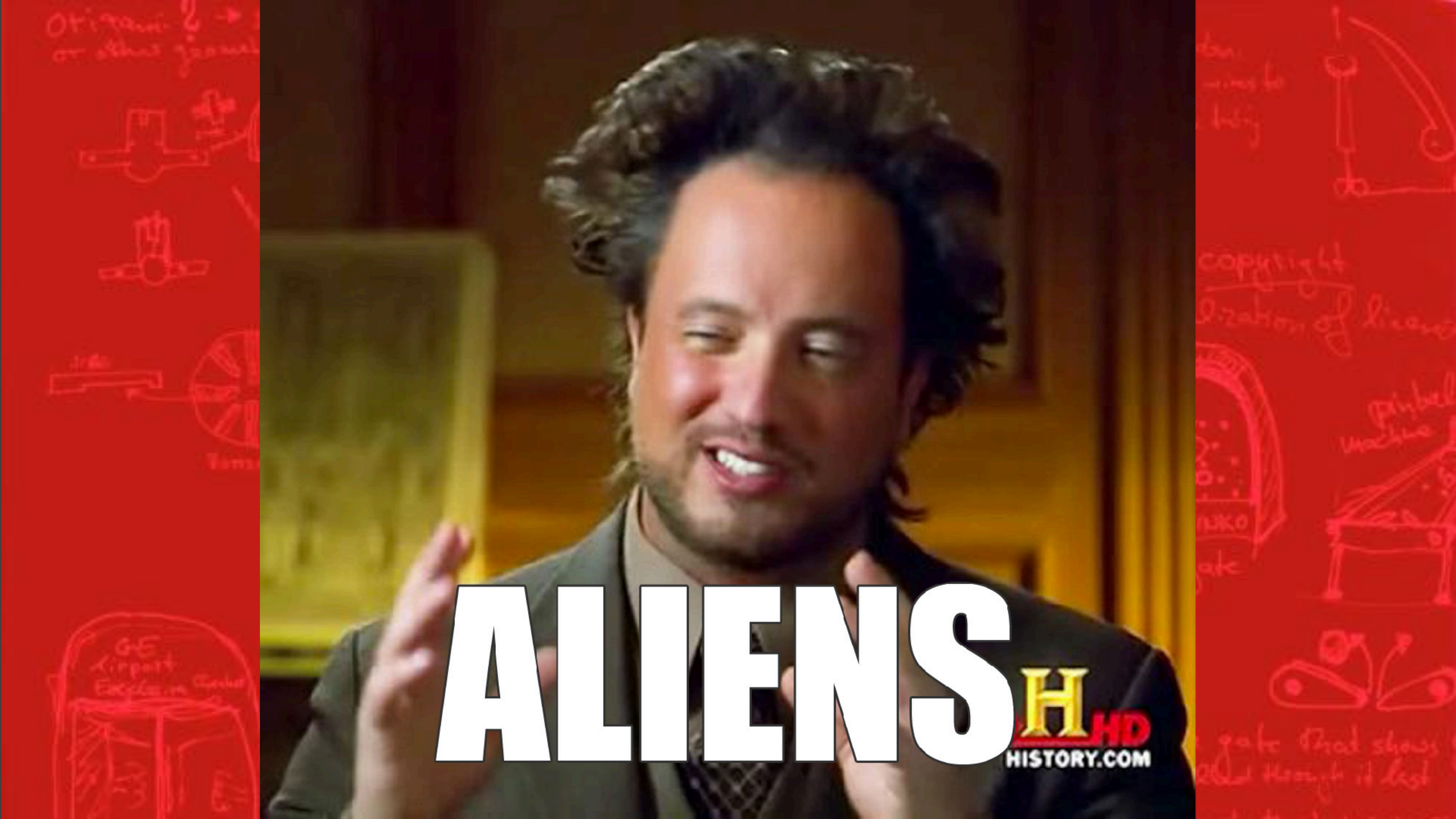# Design Process

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# Wednesday: Project Faire

Design and creation are not static processes.

They can be studied, supported and improved.

**Design**
Brainstorming process
Early-stage design tools

**Implement**
Programming tools
WYSIWYG design tools
Rapid prototyping tools

**Evaluate**
Study strategies
Cognitive modeling

Recall: process improvements to design

# Wizard-of-Oz Prototypes

- An iterative design methodology for user-friendly natural language office information applications [Kelley, TOIS '84]

  - *"Central to the methodology is an experimental simulation which I call the OZ paradigm, in which experimental participants are given the impression that they are interacting with a program that understands English as well as another human would."*

Recall: Wizard of Oz prototyping as an example

# Design as research

# Design-oriented HCI

- HCI is distinct from natural or social sciences: its methodology is based in design

- Design is a context-dependent dialogue with the problem

- Perspectives on design

  - Conservative: as a scientific or engineering endeavor
  - Romantic: "imaginative masterminds equipped with almost magical abilities of creation"
  - Pragmatic: design is a reaction to a context

# Research through design

[Zimmerman, Forlizzi, and Evenson, CHI '07]

- How can designers make contributions to HCI research?
- Interaction designers wrestle with **wicked problems**
  [Rittel and Webber, Policy Sciences '73]
  - Wicked problems: problems whose requirements are contradictory or unknown — no global optimum
- To solve wicked problems: integrate known facts, engineering opportunities, and user research to create a new perspective

# The Power of Representation

- "The powers of cognition come from abstraction and representation: the ability to represent perceptions, experiences, and thoughts in some medium other than that in which they have occurred, abstracted away from irrelevant details."

# Example: Number scrabble

- Take turns picking numbers in 1,2,3,4,5,6,7,8,9 without replacement. Win if three of your numbers add up to 15.

# Ready, set, go!

- A takes 8.
- B takes 2.
- A takes 4.
- B takes 3.
- A takes 5.

- What should B do?

# Re-encoding number scrabble

| 4 | 9 | 2 |
|---|---|---|
| 3 | 5 | 7 |
| 8 | 1 | 6 |

# Ready, set, go!

|   |   |   |
|---|---|---|
| A | B | A |
|   | A |   |
| B |   |   |

# Design process

# Iterate on a design, or create parallel alternatives?

[Dow et al., TOCHI '10]

- Feedback on five iterations or five parallel alternatives
- Quality measured via ad clickthrough
- Designs generated in parallel condition had ~1/3 more clicks

# Prototyping dynamics:
# share one, or share multiple?

[Dow et al., CHI '11]

- When getting feedback from a partner, designers would...
  - Share multiple: design and show three ads
  - Share best: design three and show one ad
  - Share one: design and show one ad
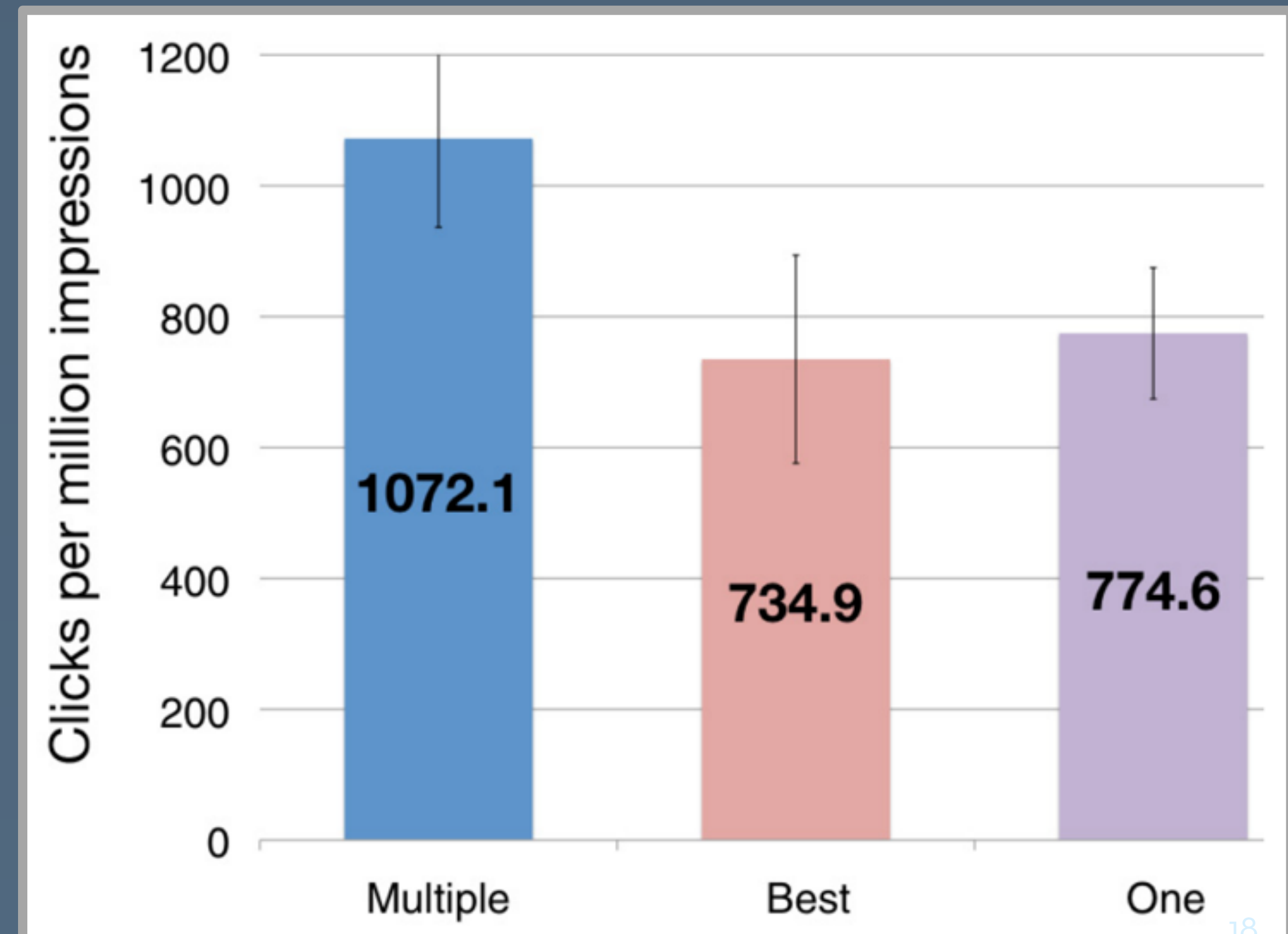
# Ethnographic approach to design

[Blomberg and Burrell, HCI Handbook '03]

- Qualitative research methods have matured into a core part of the HCI research toolkit
- A caution from Blomberg and Burrell:
  - "Insights from ethnographic studies do not map directly onto design specifications."
- Instead, ethnographies provide deep insight into the user population and practice

# Implications for design?

[Dourish, CHI '06]

- If viewed as part of a design process, ethnography must produce actionable requirements for design and development
- "Scenic fieldwork" in HCI ignores the analytic contribution of an ethnographer
  - It is (wrongly) viewed as a method rather than a perspective

# Implications for design?

- "Ethnography provides insight into the organization of social settings, but its goal is not simply to save the reader a trip; rather, it provides models for thinking about those settings and the work that goes on there."

- "The value of ethnography, then, is in the models it provides and the ways of thinking that it supports."

# Crowds in the classroom
[Dow, Gerber and Wong, CHI '13]

- Reach beyond the class population for design project classes
  - Needfinding: read and mine social media
  - Ideation: brainstorming with Mechanical Turk
  - Testing: MindSwarms video feedback on ideas
  - Pitching: Kickstarter & IndieGoGo

# Scaling the design studio

[Kulkarni et al., TOCHI '14]

- How can we teach design to millions?
- Klemmer's HCI class on Coursera: thousands of submissions, thousands of students
- Peer assessment: training students to give calibrated feedback on each others' design assignments
- Now deployed to many other classes, including network science, science fiction, english...

# Design resources

# Design patterns

[van Duyne, Landay and Hong, '06]

- Web design, much like web software, can be characterized by successful design patterns
- Examples...
  - News mosaics
  - Distinctive HTML titles
  - Quick-flow checkout
  - Floating windows
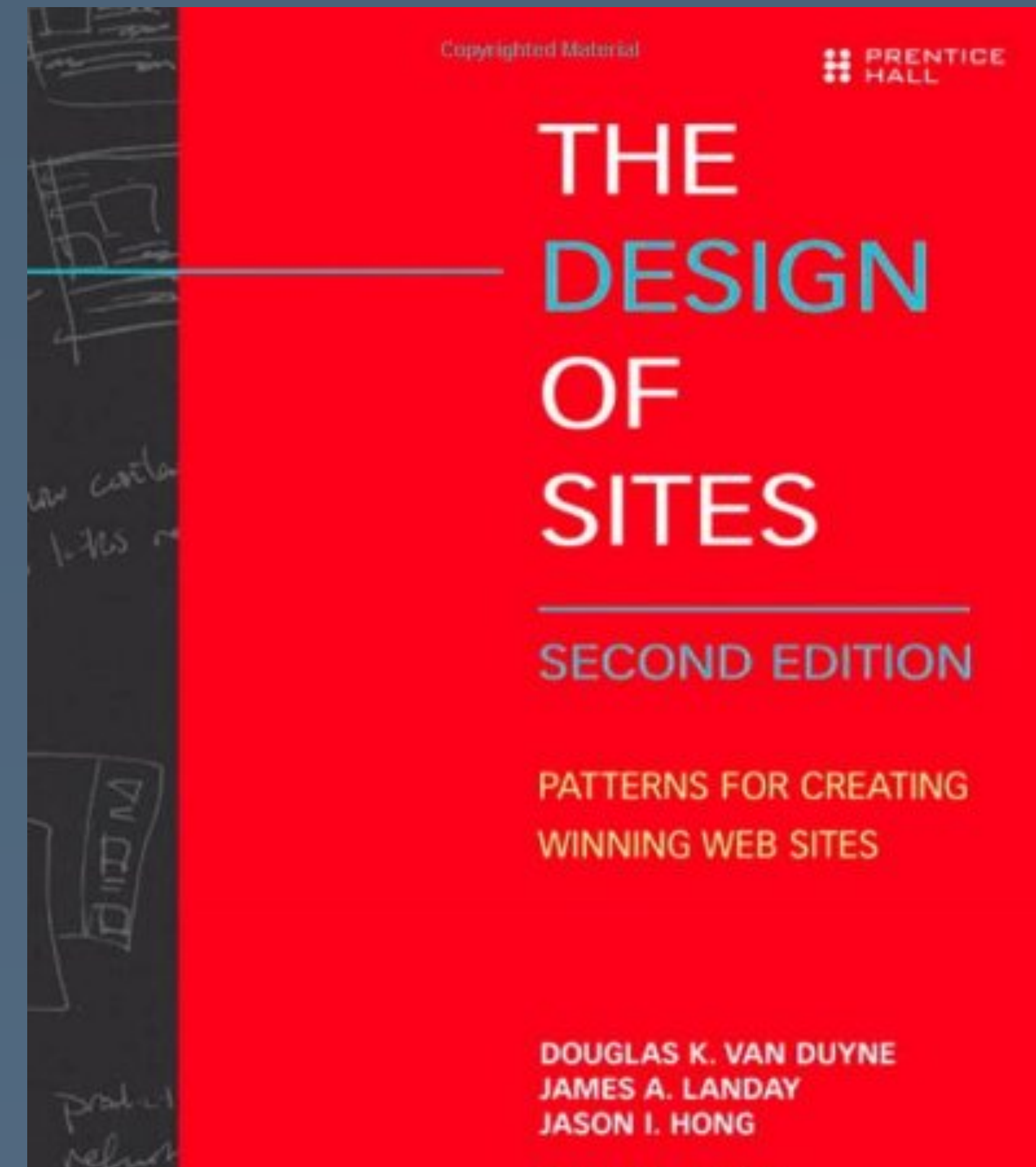
# Discussion rooms

| Rotation | Littlefield 107 | Littlefield 104 |
|----------|-----------------|-----------------|
| a | 12 | 34 |
| b | 24 | 13 |
| c | 14 | 23 |
| d | 34 | 12 |
| e | 13 | 24 |
| f | 23 | 14 |