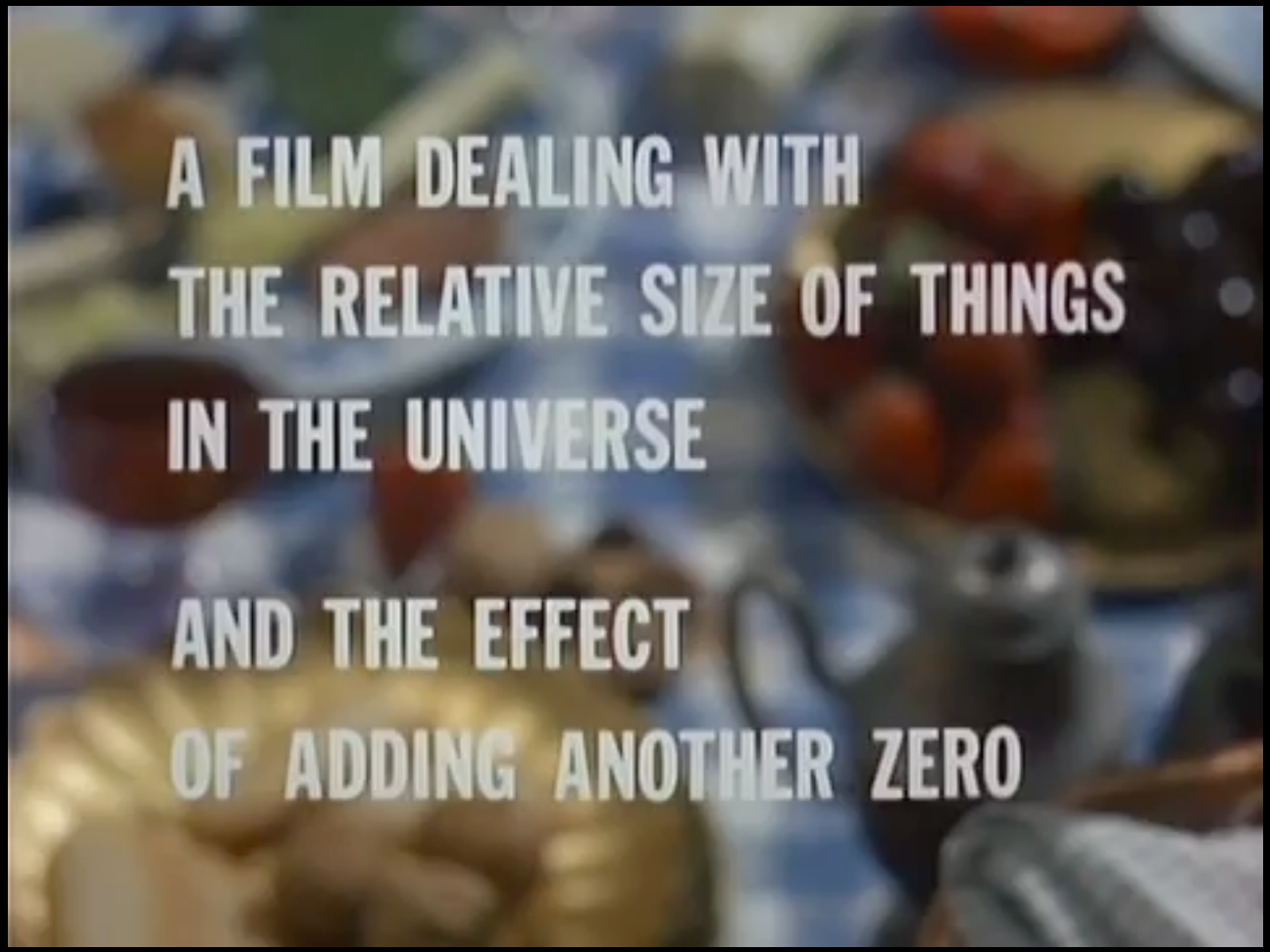
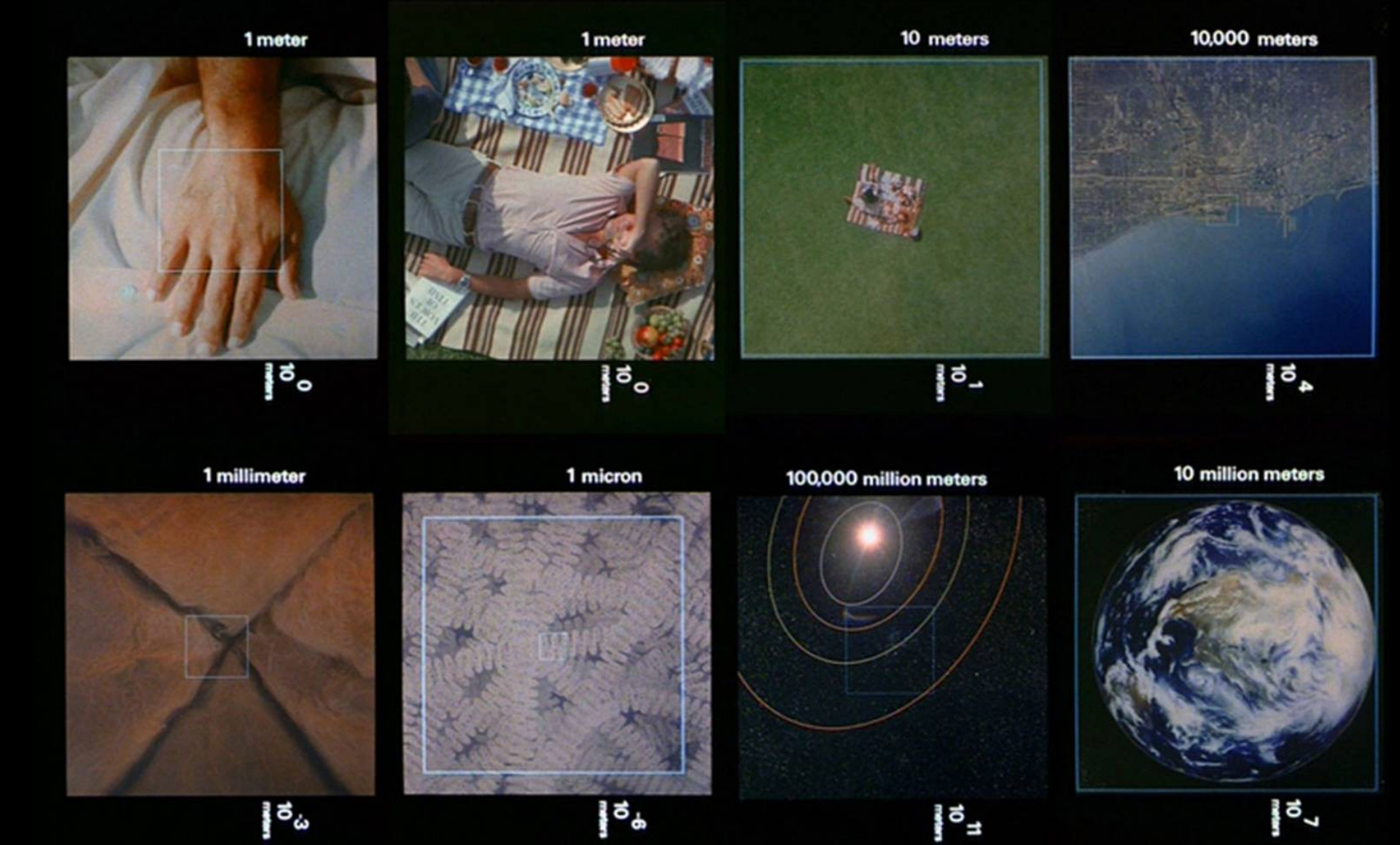


Powers of Ten (1977)



Perspectives on Design

Cosmic Eye (2011)

Today

- Checking in
- Perspectives on HCI and Design

Checking in

- Any questions after last class?
- Canvas, syllabus, clickers?

🚨 Clicker test 🚨

Best treat?

So… what is design?! 🤔

Talking about design

- Why is this useful?
  - Help identify where we want to practice and get better in this course
  - Identify your own opinions and stylistic preferences
- For now, we'll talk about the **process** of design rather than the output

Defining design

- There probably isn't one definition that we could agree on - but what elements do we think go into it?
- **Talk with your neighbor:** what are your thoughts on what design is (in a CS course on HCI)?

Definitions of design

- Information organization
  - Spatial, organization
- Understanding and designing for users
  - Kids, business people
- Customizability / user preferences
- Directing the user's attention & behavior
  - "design is mind control"
- Deliberate practice / decision making
- Balancing appearance & function
  - Usability, usefulness, desirability

Some important points

(personal opinion)

- Understanding humans and their interactions with technology → **people are really different**
- Identifying needs (even when people do not know themselves)
- Demonstrating the value of design – we need to be able to show that the work we did was useful (and why)
- Inclusion in design – understanding who is included/excluded by technology

How we'll address these issues

- Understanding user needs
- Designing for some user/goal
- Science: what do we know about people, how to reach our goals
- Iterating
- Learning about user experiences – empathy, understanding groups/populations

Understanding design

- Definitions from influential people

- **Skills view:** What do good designers do?

- **Process view:** Is there a process for doing design?

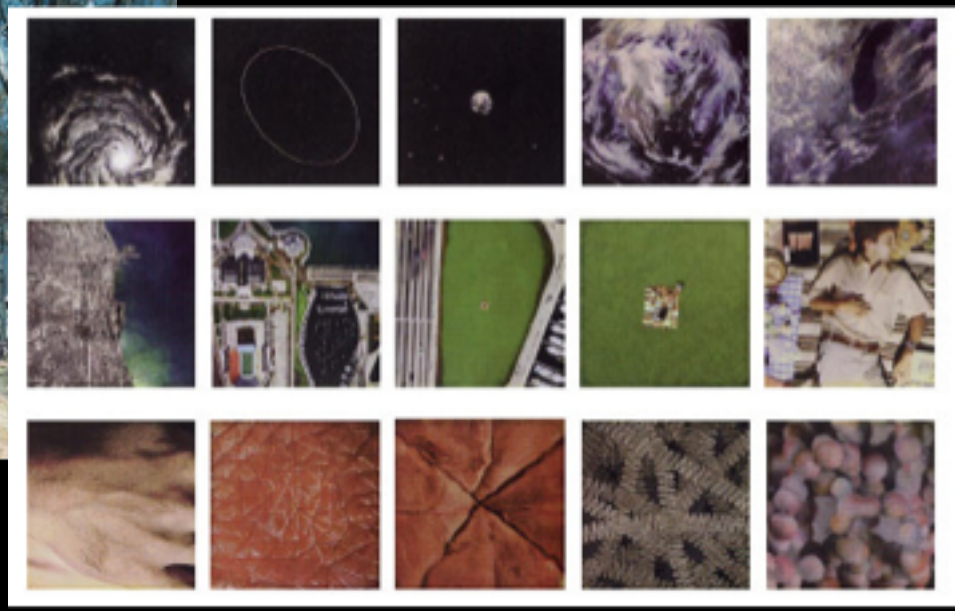
Perspectives on design

- “Design is not just what it looks like and feels like. Design is how it works.”

- Steve Jobs

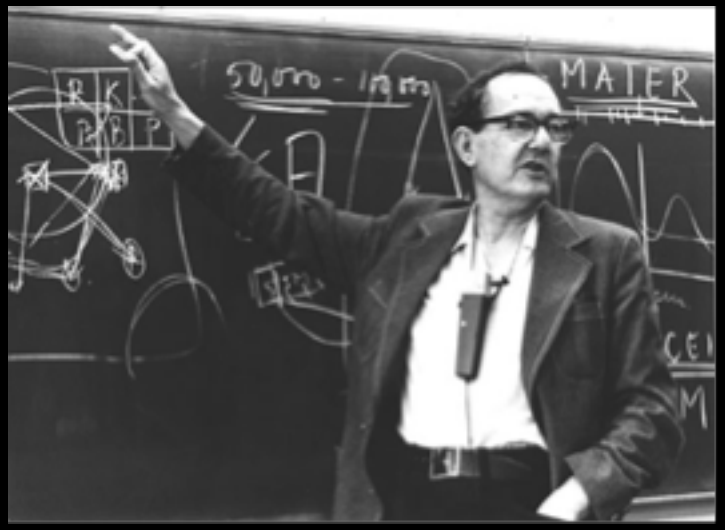
Perspectives on design

- “Design is a plan for arranging elements in such a way as best to accomplish a particular purpose.” – Charles Eames



Perspectives on design

- “Engineering, medicine, business, architecture and painting are concerned not with the necessary but with the contingent - **not with how things are but with how they might be** - in short, with design.” – Herb Simon



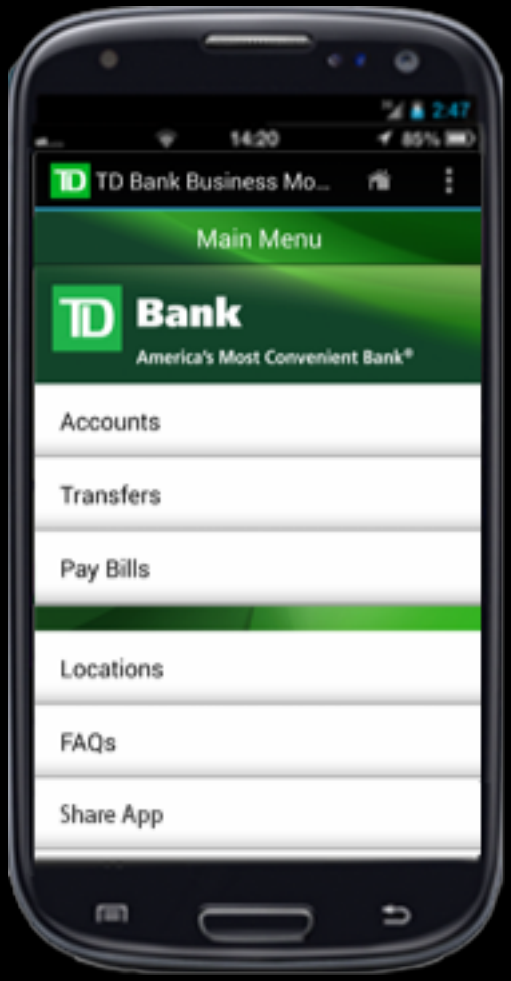
Perspective on design

“I’ve been amazed at how often those outside the discipline of design assume that what designers do is decoration—likely because so much bad design simply is decoration. Good design isn’t. **Good design is problem solving.**”

- Jeffrey Veen, *The Art and Science of Web Design*

UCD ≠ UI layout

- This is not a course on user interface layout (but we will do some)
- We need to understand the deeper questions
  - Why is it this way?
  - Is this good? How do we know?
  - What would happen if we changed <x>?
  - How could we change this to, e.g., encourage saving?



What skills does a (good) designer have?

- Empathy
- Listening / observing
- Flexibility / agility
- Putting the user first
- Prototyping / technical skill
- Variations / trying multiple approaches
- Communicating to others

Shaun's stages of design awareness

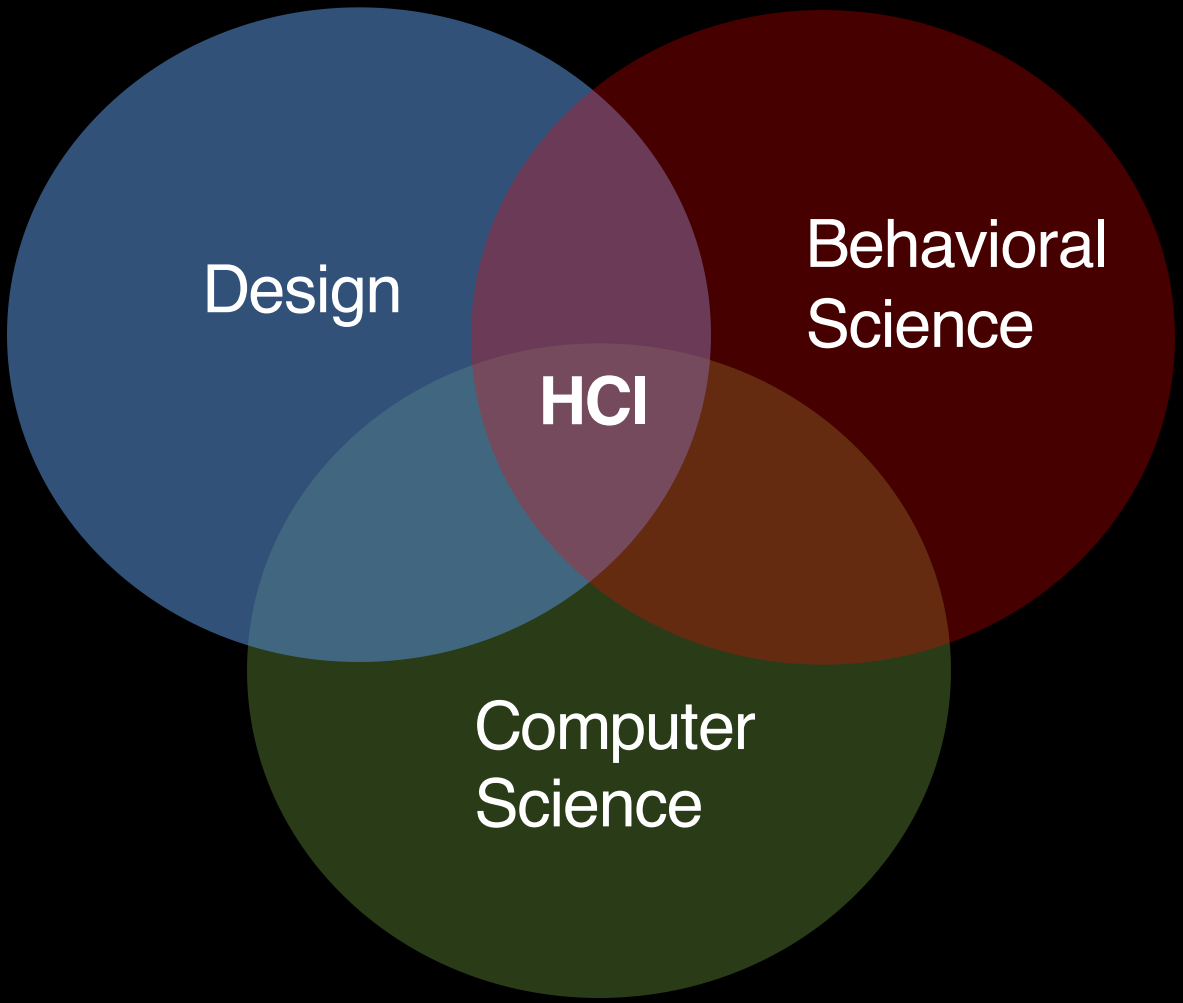
1. "This sucks and I don't know why."
2. "This sucks and I know why it sucks, but I don't know what to do about it."
3. "I know why this sucks and I have came up with some ideas about how to fix it, but I don't know whether any of them will work."
4. "I have ideas on how to fix this and I know how to test whether they will work."

Some core skills

- Understanding what the (real) problem is
  - Not always what people say
- Understanding the opportunities and constraints
  - Knowing your tools
- Generating a lot of solutions (most of them bad)
- “Failing fast” and eliminating unworkable ideas
- Iterating and learning from feedback

HCI is interdisciplinary

(Amy Hurst)



HCI is interdisciplinary

- Computer Science
  - Implementation of website or other interface
- Engineering
  - Faster, cheaper equipment
- Ergonomics
  - Design for human factors
- Graphic design
  - Visual communication
- Technical writing
  - Textual communication
- Linguistics, artificial intelligence
  - Speech recognition, natural language processing
- Cognitive psychology
  - Perception, memory, mental models
- Sociology
  - How people interact in groups
- Anthropology
  - Study of people in their work settings

What does successful design look like in this class?

- Examine existing, inefficient UI and optimize it
- Identify confusing aspects of a UI and make it easier to use (remember: users don't read manuals)
- Learn what features of a product are most important to real users and make them easier to find
- Identify unmet technology needs and explore solutions
- Use rules from psychology, human factors, design theory to critique UIs and identify improvements
- Design UIs that work well in the **context of use**

Failure in design

- Not understanding the underlying problem
- Getting stuck on your first idea (“In writing, you must kill all your darlings.” – William Faulkner)
- Not brainstorming enough
- Not knowing how to evaluate solutions – get stuck, or make a bad choice
- Not understanding constraints/tradeoffs – can lead to regression errors

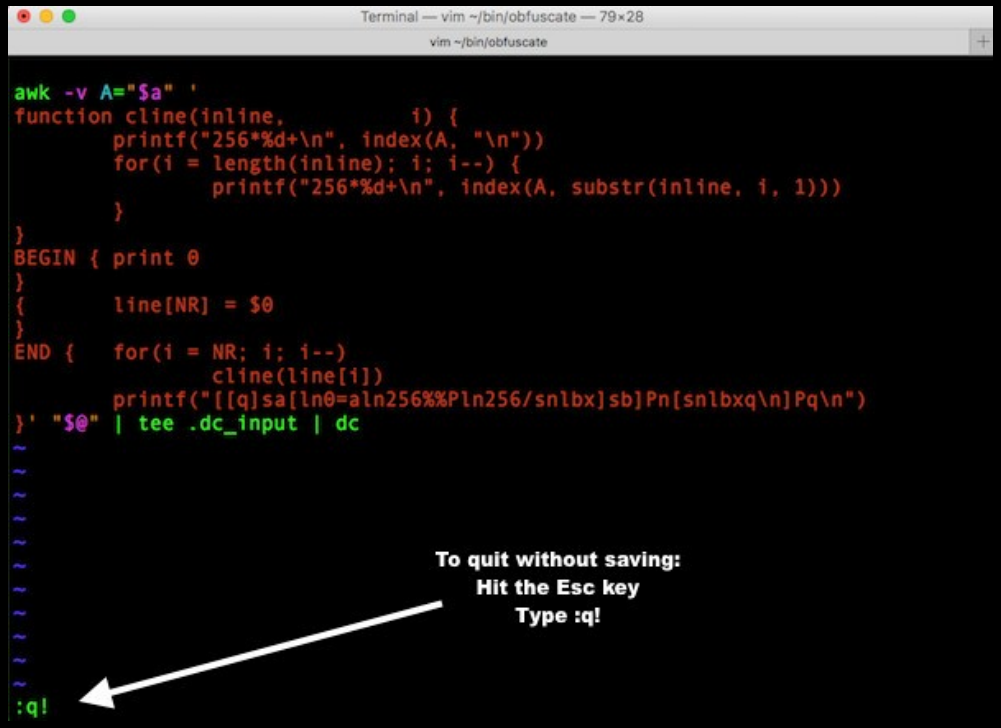
Key elements of HCI design

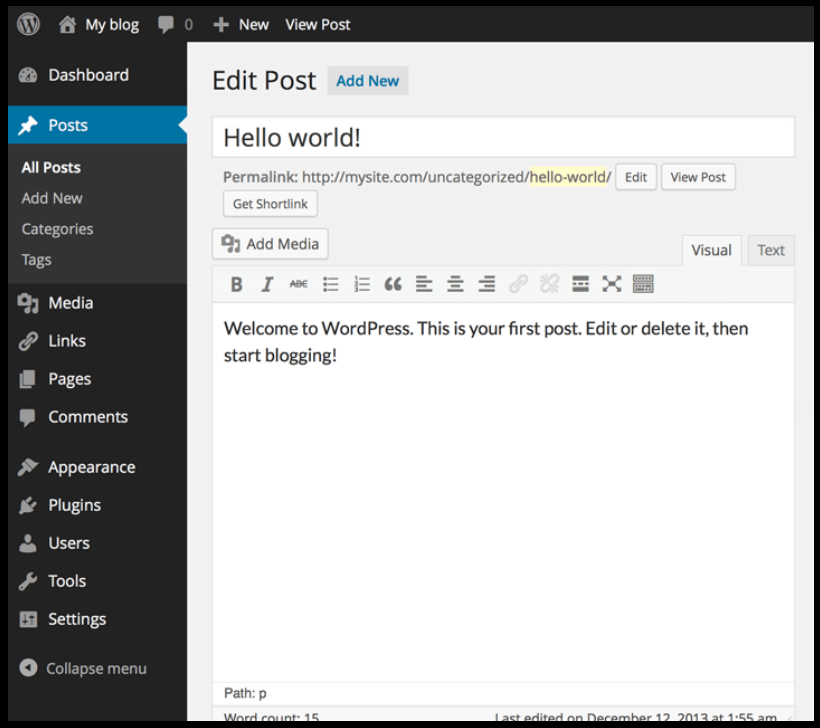
- Understanding context of use
- Understanding (and working with) trade-offs
- Learning from workarounds

Understanding use in context

- One of these Apple TV UIs was very unpopular. Why?

Understanding trade-offs





Understanding trade-offs (round 2)

Some points about trade-offs

- Sometimes you can't "win" on all fronts
  - But we still need to figure out the best solution(s)
  - Best outcome may be a set of multiple solutions
- People use tools in unexpected ways, for unexpected reasons
  - Kid's musical instruments are different from traditional instruments. One isn't a superset of the other.
- Draw from diverse solutions
  - If we are designing a new text editor for smartphones, draw ideas from vim, wordpress, maybe even musical instuments
  - Don't get stuck in a silo when looking for inspiration

Some classic design trade-offs

- Flexibility vs. simplicity
- Usability vs. security
- Speed vs. accuracy
- Simplicity vs. functionality
- Targeted vs. general
- Cost vs. efficiency/quality
- Display size vs. portability
- Thinness vs. battery life

Learning from workarounds

- In 2015 Apple released an Apple TV with a new remote
- Shortly thereafter, lots of images and posts like this one appeared:

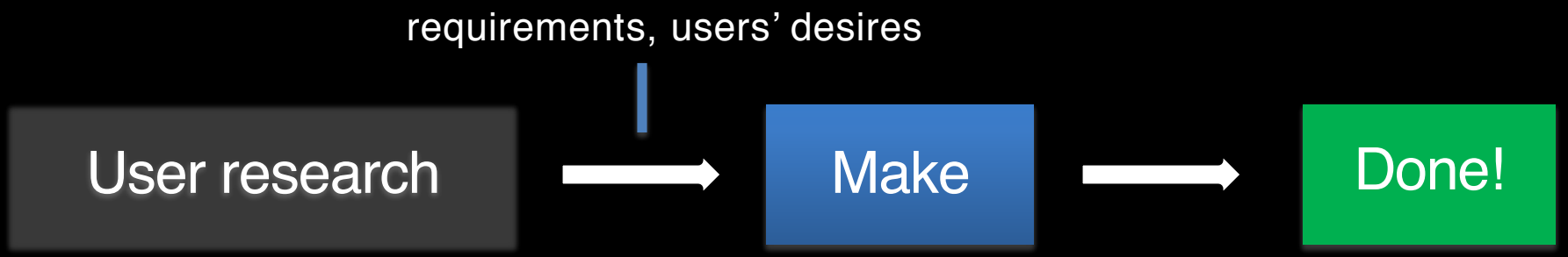
- What is the problem?
  - And why did it happen?

Design as a process

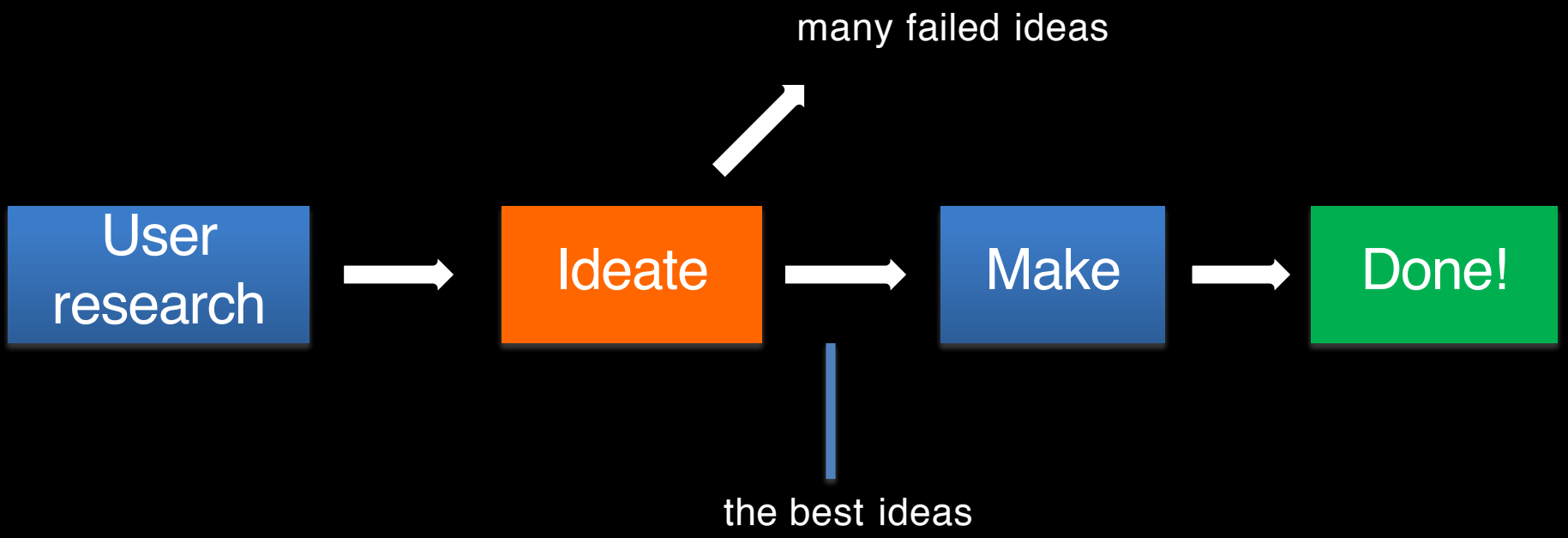
- We can think about design as a sequence of steps that get us to a good solution

(One) Design process

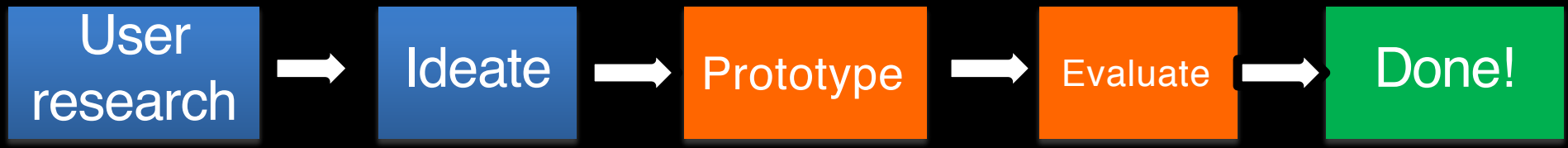
How do we know what to build?



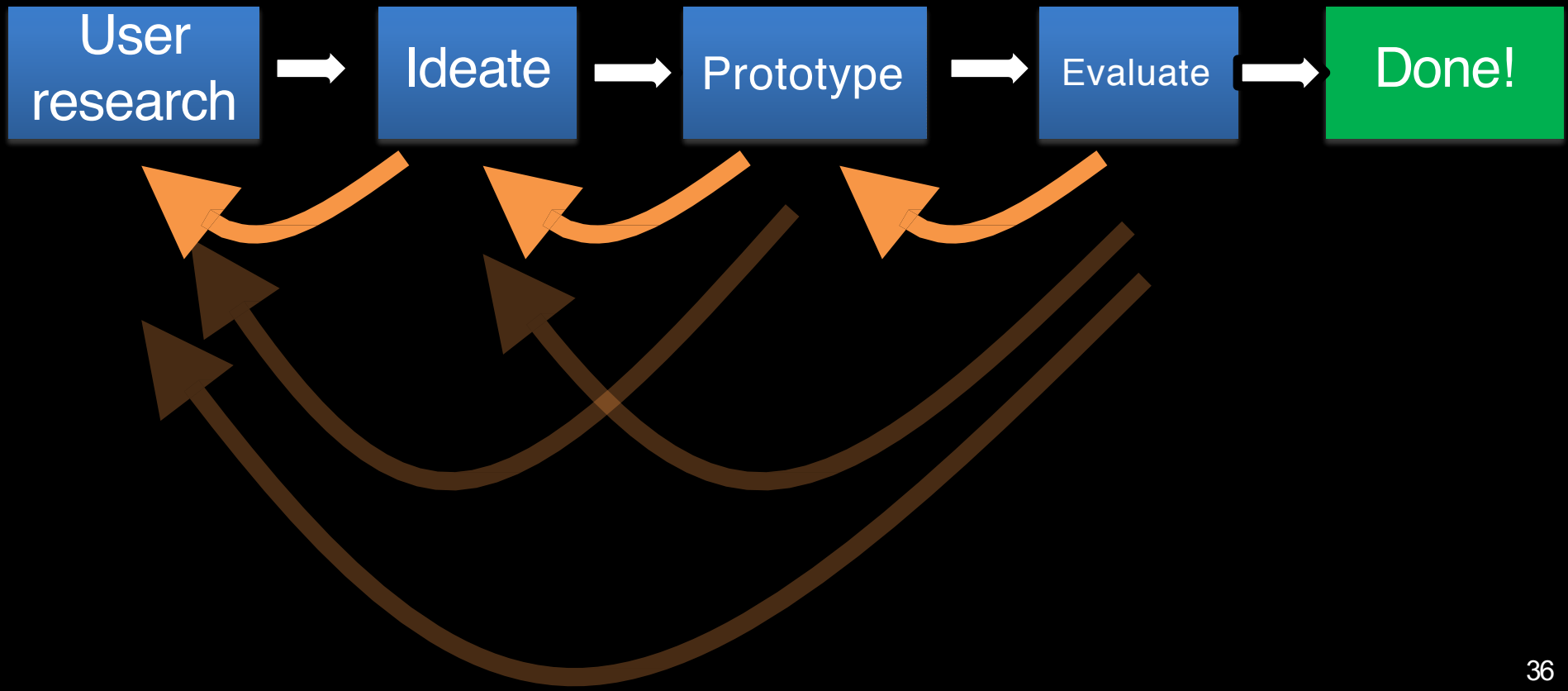
How do we come up with ideas?



How do we know if we're right?



Closing the loop



Documenting the design process

- The Deep Dive
- 1999 video from the TV show *Nightline*
- Shows entire design process from IDEO

Watching the Deep Dive

- Some things to watch for:
  - Interesting quotes?
  - What were the steps of their process?
  - What parts of their process were surprising?
  - Did you disagree with anything they said or did?
  - Any other noteworthy items?

Finally, interesting HCI design

- A sobering fact: in 2018, it is sometimes difficult to design a **bad** user interface
  - UI development tools are pretty good
  - Good examples to follow
    (Making an online store? Copying Amazon will get you pretty far)

- So, how can we make a living doing UI design?
  - And how do we keep from being bored while we do it?

Finding inspiration

- What pieces of computer hardware or software are interesting or inspirational?
- Where are people doing things that are new and exciting?

Your inspirations

Some of Shaun's picks

- Nintendo Switch: reminds us that hardware design matters; new interactions; modular design acknowledges different contexts of use
- Tinder: UI design was new and different, very well suited to smartphones, "Tinder for X" interaction model has become very popular
- Thingiverse Customizer: tool to customize 3D printed objects. Make your own phone case, prosthetic hand, etc

Coming up

Friday

- Design in miniature: performing your first design activity

Next week

- Brainstorming and generating project ideas