User Interface Design

UI Design: Monday Aug 29 (Day 4)

- Dr. Jillian Aurisano

- Plan for today:
  - Reminders, course logistics
  - Review last week
  - Let’s think about the user’s goals, tasks, and concept of the system
  - Activity about the first project

Course logistics

- Homework:
  - Still open- turn it in!
- Syllabus:
  - Questions?
- This week:
  - Building our 1st project requirements together
  - Bring a sketchbook or sketching device
- Next week:
  - Let’s get technical- html, css, javascript

Let’s start with learnability

- https://www.youtube.com/watch?v=pQHX-SjgQvQ&list=PPSV

- Why is this funny?
- Is it hard to learn to use a physical book?

- Let’s bracket this and we can return to it…
- Let’s think about digital interfaces and how we learn to use it

How do you learn to use a new interface?

- Any thoughts- think about something you learned to use recently…

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  - Learn to use by just trying to accomplish your task
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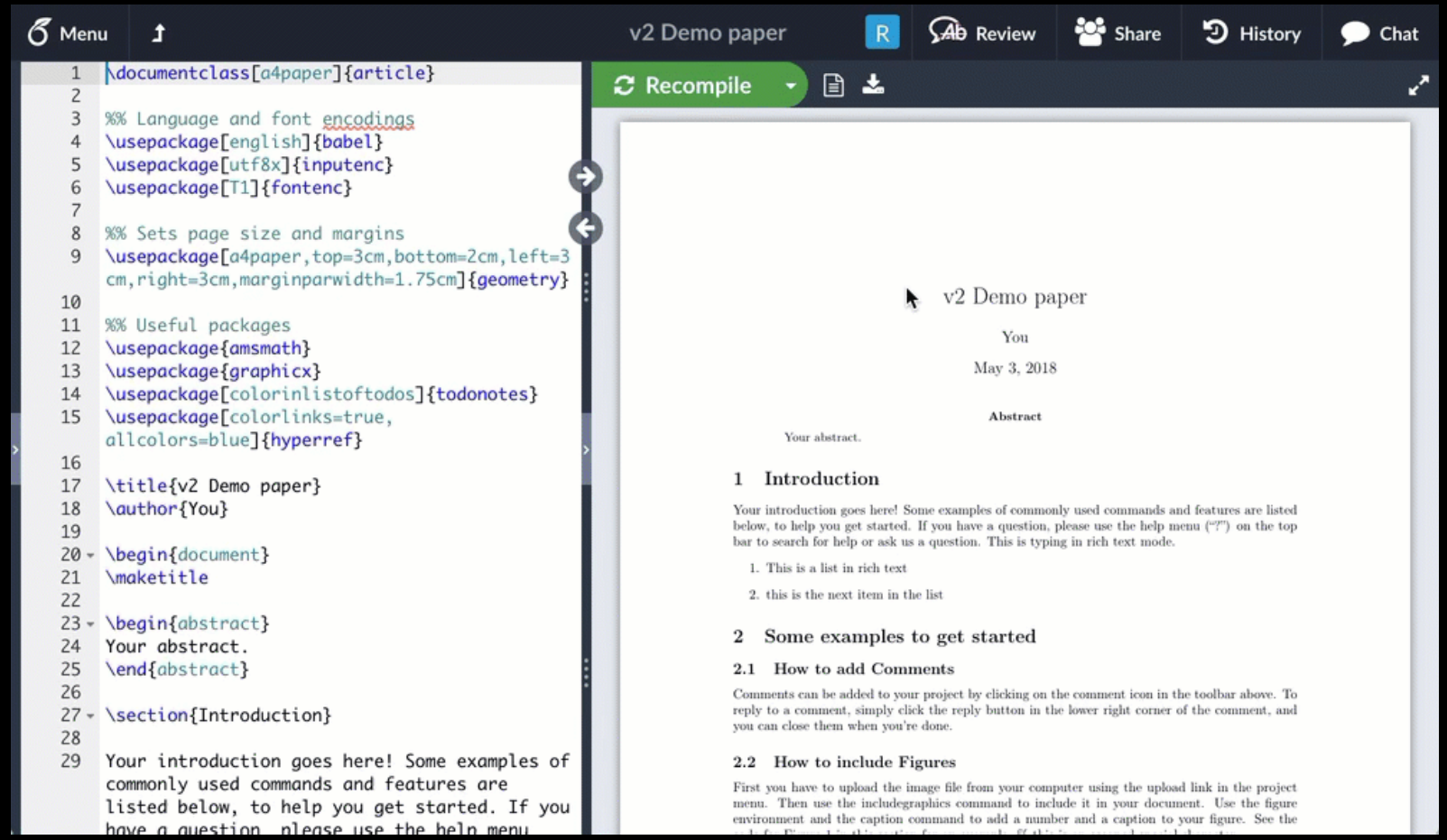
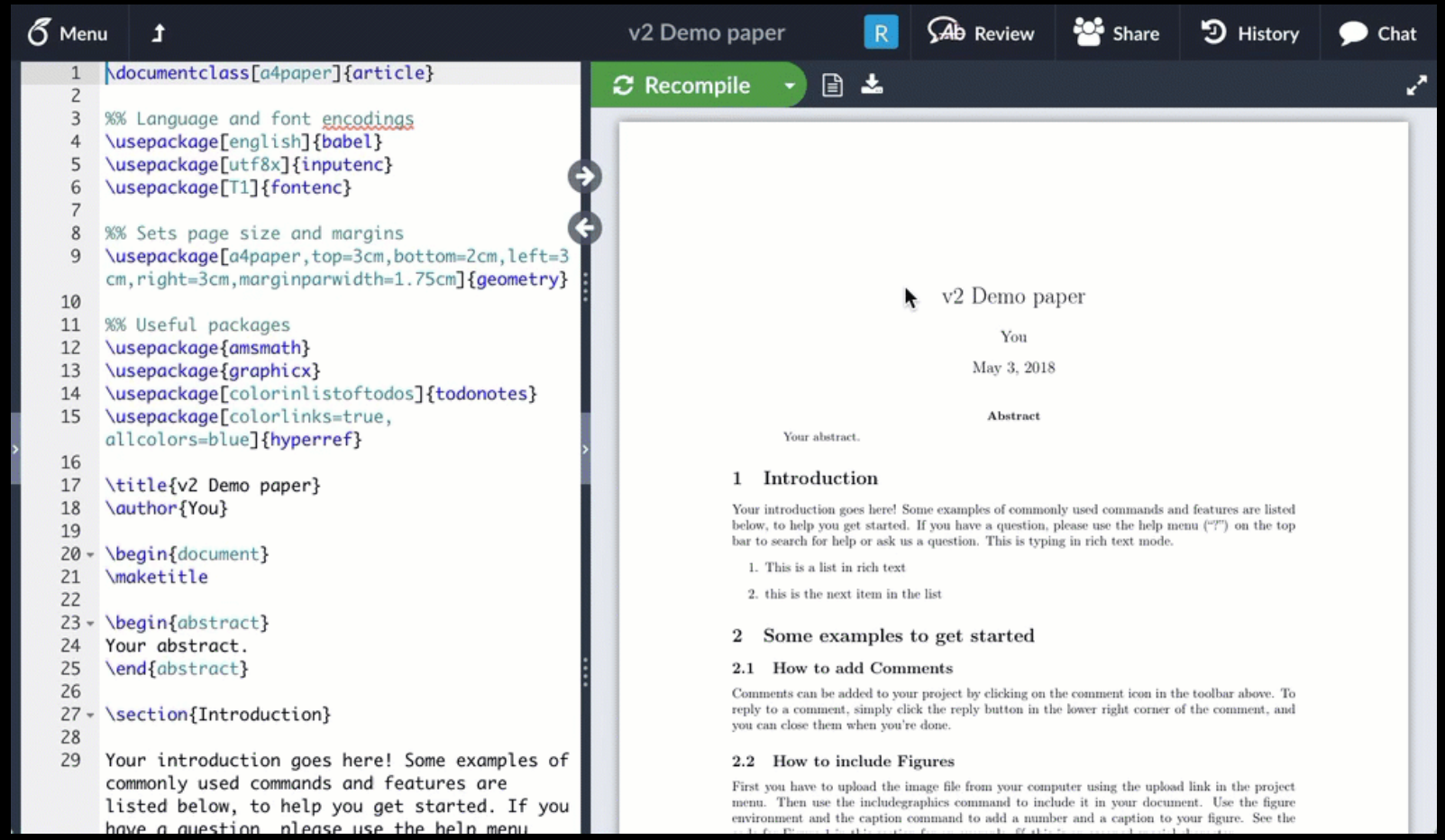
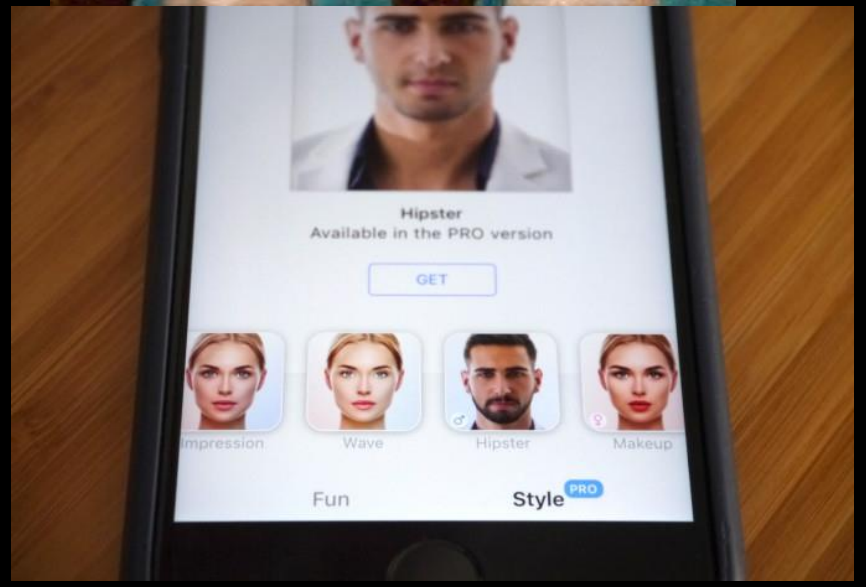
- Any thoughts- think about something you learned to use recently…
- 2 approaches:
  - Learn to use by just trying to accomplish your task
  - Learn to use by reading a manual/how-to or watching tutorial video
- When are these 2 approaches used?

Learning approaches



Learning approaches





In some cases, you will learn by reading a manual, watching a tutorial, taking a course

Complex tasks

Specialists/experts

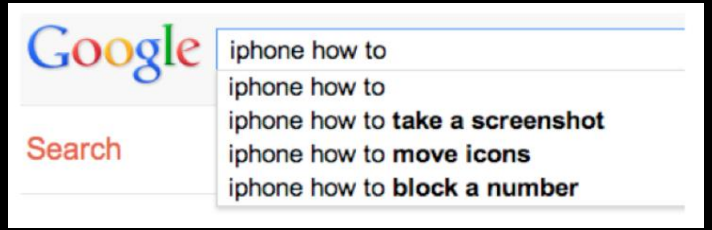
Tasks you need to accomplish for work

But- ideally you try to design so people can learn by doing.

Not the goal….


THIS IS PHIL. OUR NEW VICE PRESIDENT OF MARGINALLY LEGAL ACTIVITIES.
HE'LL BE LEADING THE EFFORT TO MAKE OUR USER INTERFACES SO CONFUSING THAT PEOPLE HAVE TO PAY US FOR TRAINING.
WE ALREADY DO THAT UNINTEN- TIONALLY.
SURE, BUT WE CAN'T ALWAYS RELY ON LUCK.
www.dilbert.com

Learn by seeking help?



- Users resort to seeking help when they get stuck
- User already has a problem and are looking for concrete solutions

- Last resort options:
  - Chatbots to help
  - Help buttons
  - Search

- Giving these help options is good, but not enough

- But- at least make the help searchable and goal-oriented
  - Ex- overlays

Learn by watching others?

- You watch someone use something
- (note- this is how I learned to use Sage)
- But, can't count on this….
- Maybe professional software…

How did you learn Alt-Tab?

Most users learn by doing

- Users don’t start using a system to learn it
- User’s typically try to do what they want to do, they have a goal in mind
- They explore the interface to see if they can figure out how to do it.
- Users are more interested in achieving their goal than in learning your interface
- As a UI designer your job is to clearly communicate how to use the UI, through the design, and help the user achieve their first goal
- User expectation: getting things done, not learning the interface.

Lessons for UI Designers

We want to match the design to the user's goals

So, we need to:

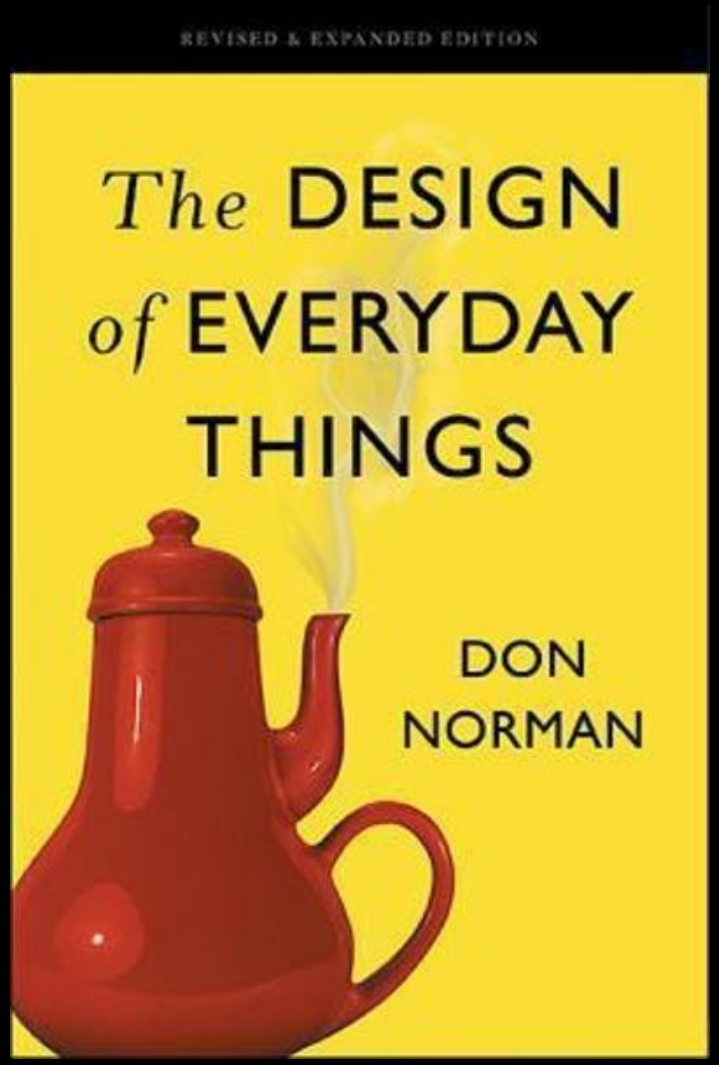
- Know who the users are
- Know the users' goals when you design

- Process for collecting this information -> user centered design process

But before we understand our users’ goals….

But before we understand our users' goals….

- Fundamental concepts about how people interact with things and discover what they do (Don Norman)
  - Affordances
  - Signifiers
  - Constraints
  - Mappings
  - Feedback
  - User's conceptual model of the system



Affordance

- Affordances are perceivable action possibilities
- Affordance refers to the perceived and actual properties of a thing that determine how it is operated
- Affordances are how an interface communicates non-verbally, telling you how to operate it

Returning to our joke about learning to use a book

- Books have affordances
- Pages are for flipping
- Pages can be flipped forwards and backwards
- Book covers can be opened, closed

- It doesn’t need a sign, or a manual
- It’s physical properties communicates these things

Returning to our door example

- Doors have an affordance of being pushed or pulled open
- Handles have an affordance of being grabbable and pullable
- People will walk up to this ‘push’ door and try to pull it open

Returning to our interface hall of shame example

- Scrollbars have a property (affordance) of being continuously draggable for continuous scrolling – smooth movement left/right
  - Not for discrete selection

Perceived vs actual affordances

- We may perceive that something has an affordance, but it may not have it
  - Paper chair may look like you can sit on it, but it does not afford sitting
  - Fire hydrant may not look like it has an affordance for sitting- no flat surface- but it does afford sitting (not comfortably but….)
- This is where things can go wrong in our interface design
  - I think I can click this, I think I can drag this, I think I can click and type here…. But I can’t

Hidden affordances

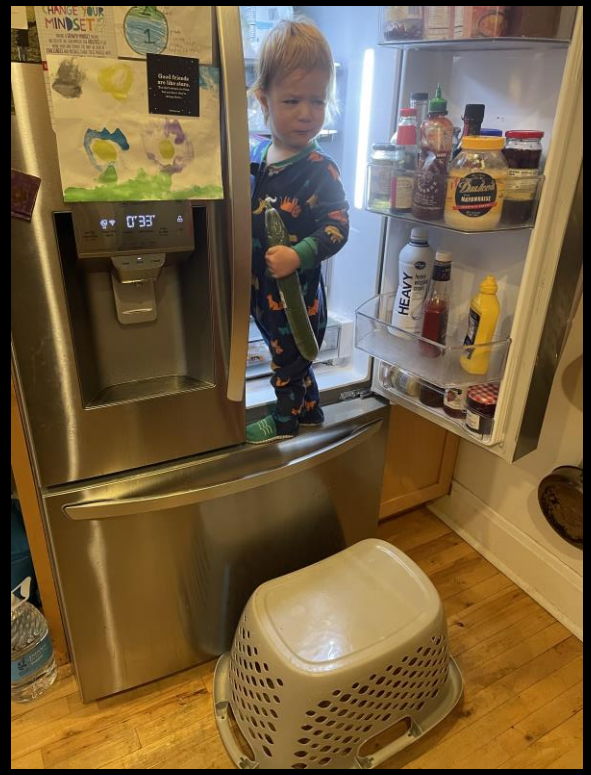
- Chairs have a design that reveals an affordance of being able to sit on it- it’s shape mirrors a human, seated body
- But- you can stand on a chair to change a lightbulb

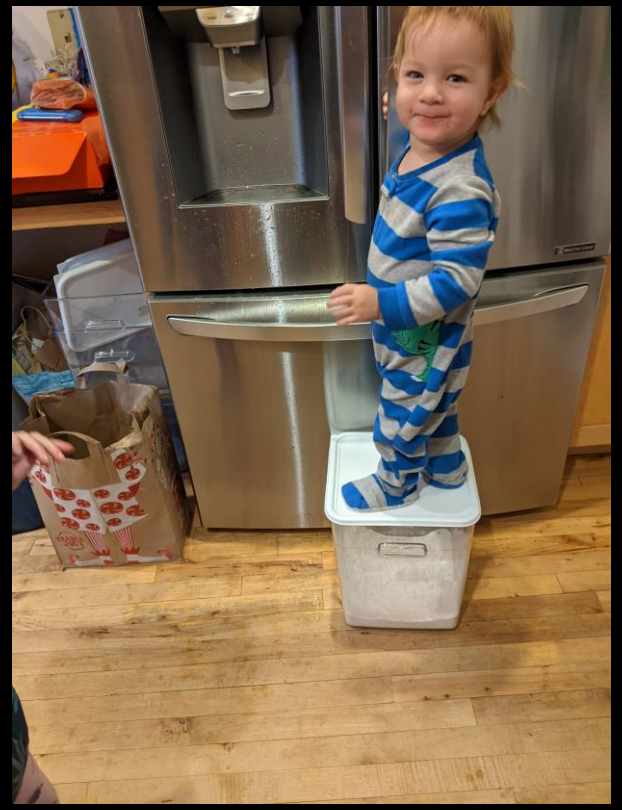
- An object’s affordances can be revealed by what people do with it

Affordances are learned

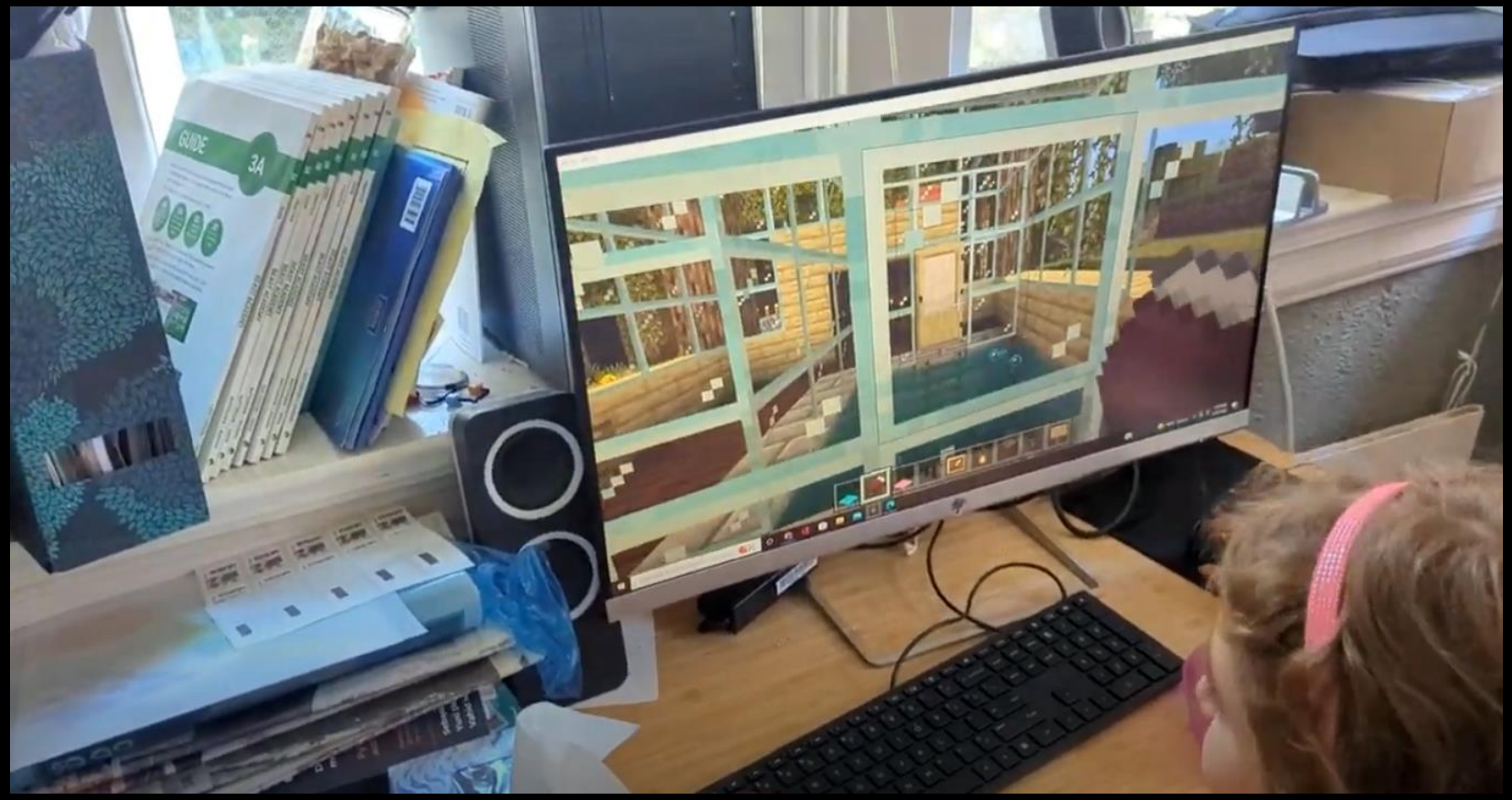
- Affordances are rarely innate, we learn about them from experience
  - We have experience sitting on chairs, and we recognize the properties suitable for sitting
  - Same with door handles, book pages, scrollbars…..
- You learn what the thing is capable of doing from lots of experiences with physical objects and digital interfaces

My kids…. Learning the physical world





My kids… Learning about digital things



Learned, but also fundamental to the object

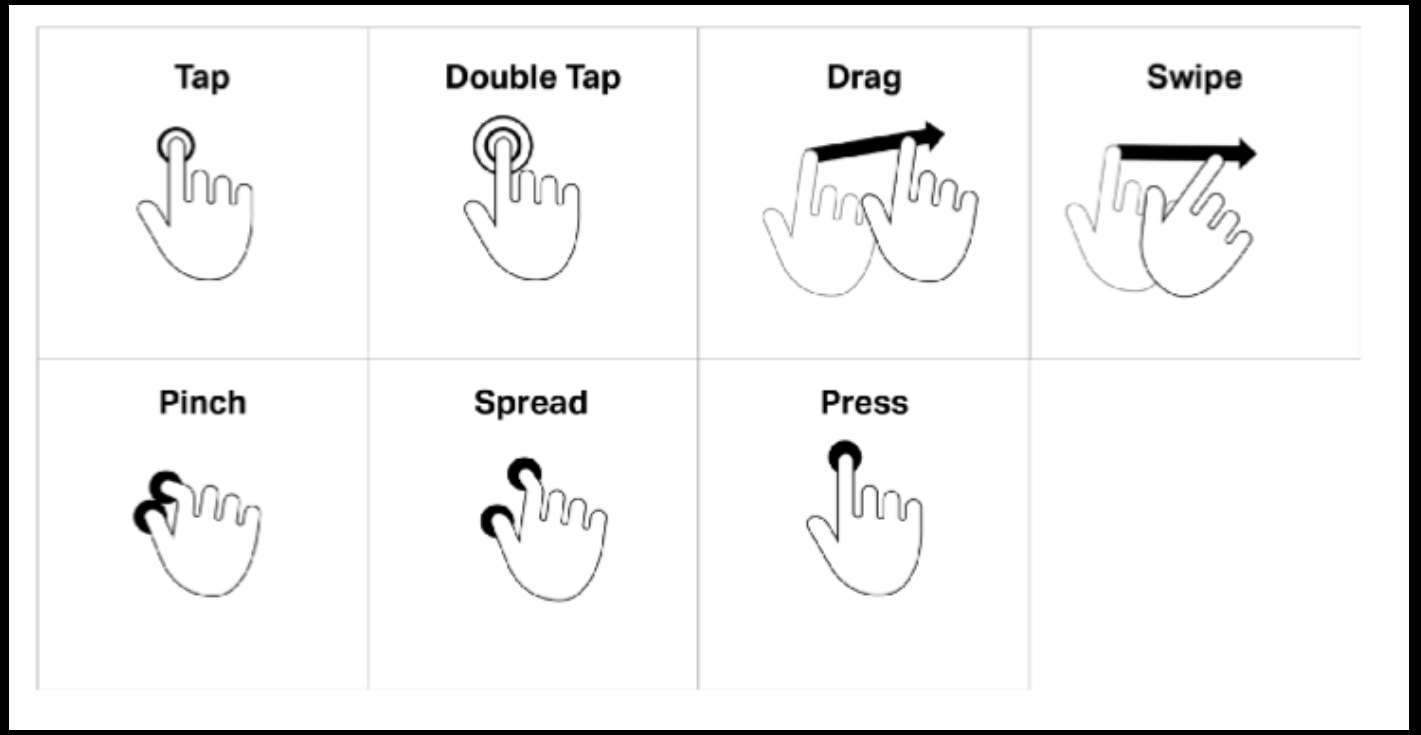
- So, yes these are learned
- But, also they have much to do with the actual properties of how something works

Take-away

- Use interface elements, or physical elements for devices in ways that match the affordance of the interface element
- Consider the affordances!
- Let’s quick think about the affordances of….

Sometimes you need help to learn an affordance

- Touch screen interactions we have learned- this touch screen can be …. (Tapped on, double tapped on, dragged, swiped, pinched….)
- Become universal affordances across devices and platforms
- But in the early days of touch interaction, we hadn’t learned them
- Needed help



Sometimes you need a signifier

But, what if the affordance of an interfaces is not immediately perceived by the user?

Where do I touch to interact?

Or, what if the current state or significance of the element needs to be highlighted?

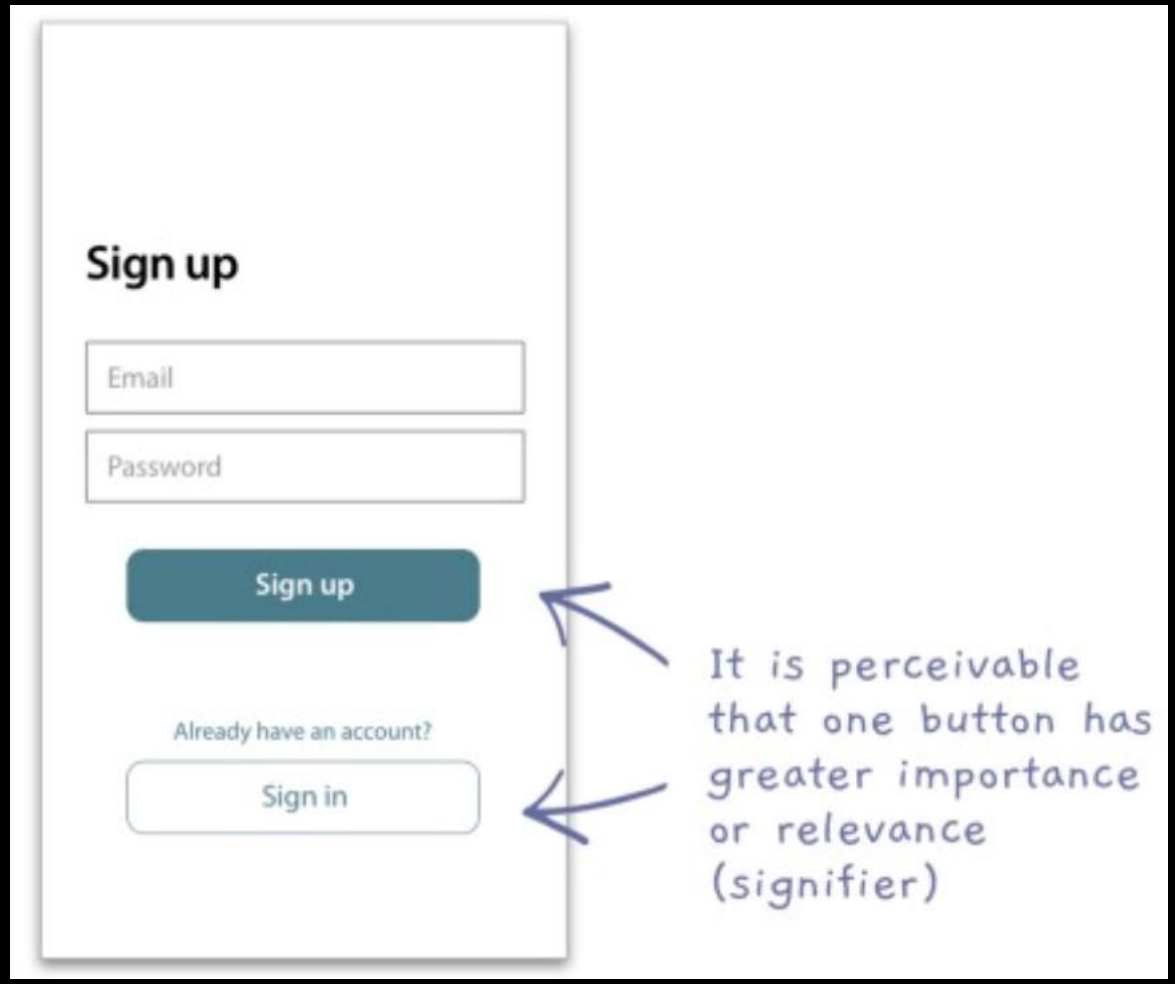
Need a signifier

Where do I click? Where can I touch?

Signifiers

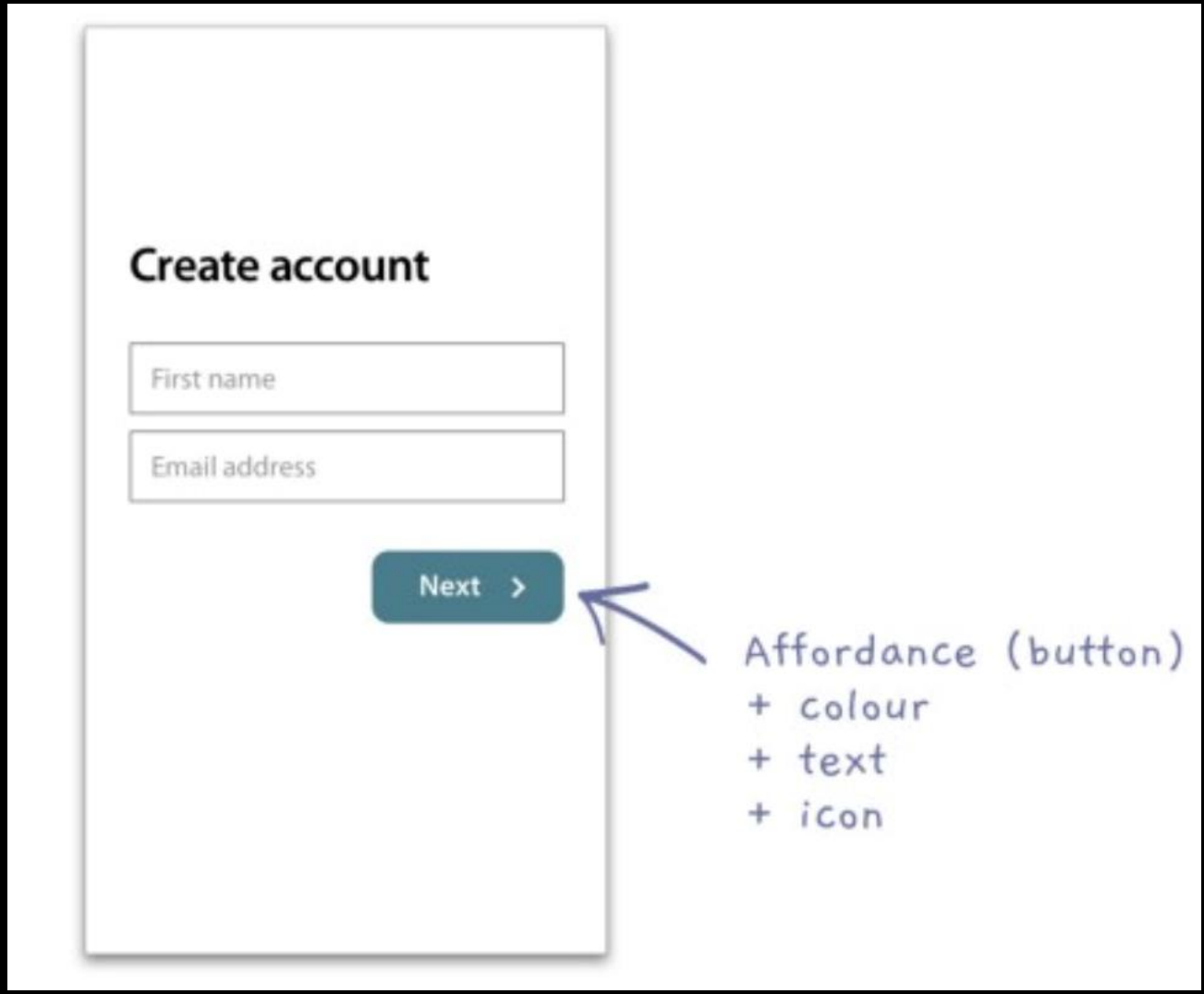
https://medium.com/@h_locke/affordances-and-signifiers-82bd6f50fc1a

Signifiers


Sign up
Email
Password
Sign up
Already have an account?
Sign in
It is perceivable that one button has greater importance or relevance (signifier)

You can use layers of signifiers to increase clarity

- Button
  - Affordance of being clickable
  - Has a color signifier which highlights that is active
  - It has a word signifier which describes the action
  - And a forward arrow, indicating the direction this action will take you in through the interface



Ways you can confuse your user by mis-using signifiers and affordances

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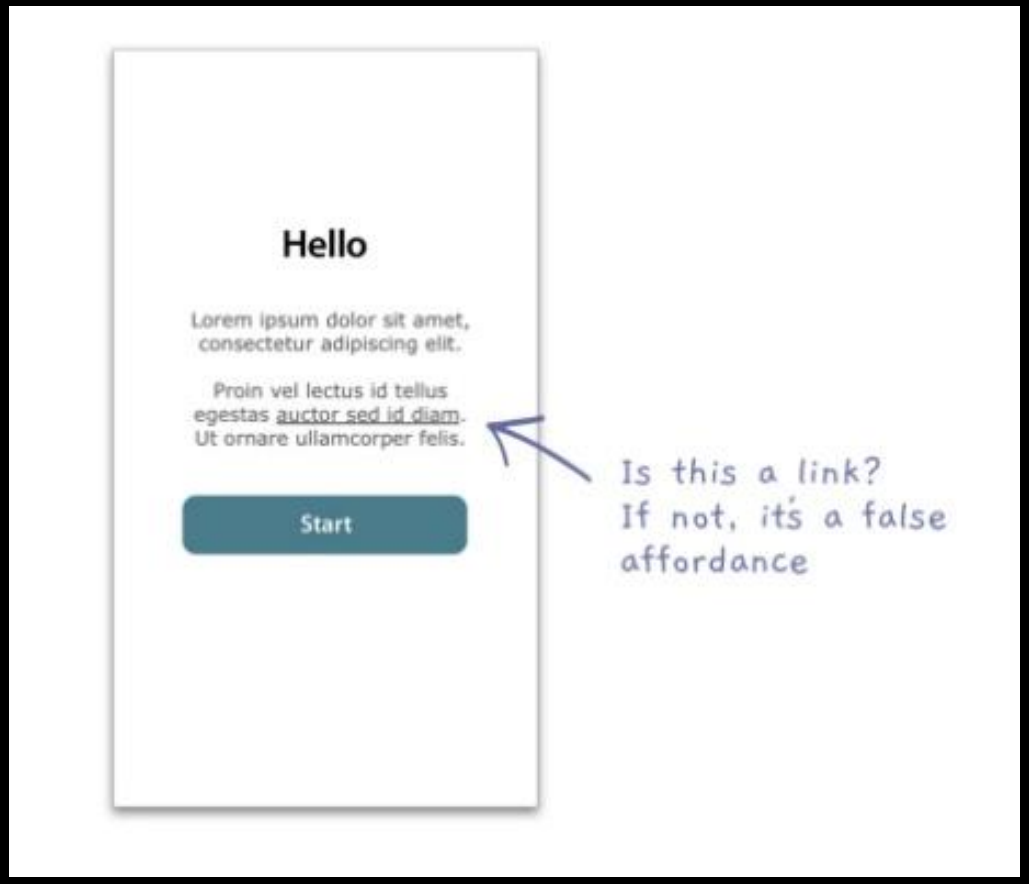


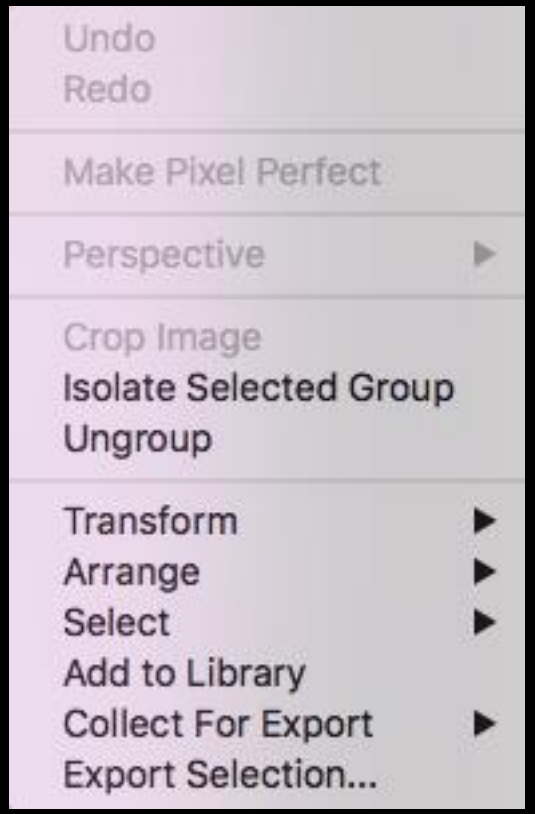
Constraints

- Affordances
- Signifiers
- Constraints
- Mappings
- Feedback
- User’s conceptual model of the system

What are constraints

- Constraints are about limiting the range of interaction possibilities for the user, to
  - Simplify the interface
  - Guide the user to the appropriate next action


Sign in
Email
Password
Forgot password?
Sign in
The button (affordance) is greyed out (signifier)


Undo
Redo
Make Pixel Perfect
Perspective
Crop Image
Isolate Selected Group
Ungroup
Transform
Arrange
Select
Add to Library
Collect For Export
Export Selection...

Constraint challenges

- Conversational interaction or natural interaction
- Hard to convey to someone what are the constraints
- We feel unconstrained in how we interact through conversational interactions

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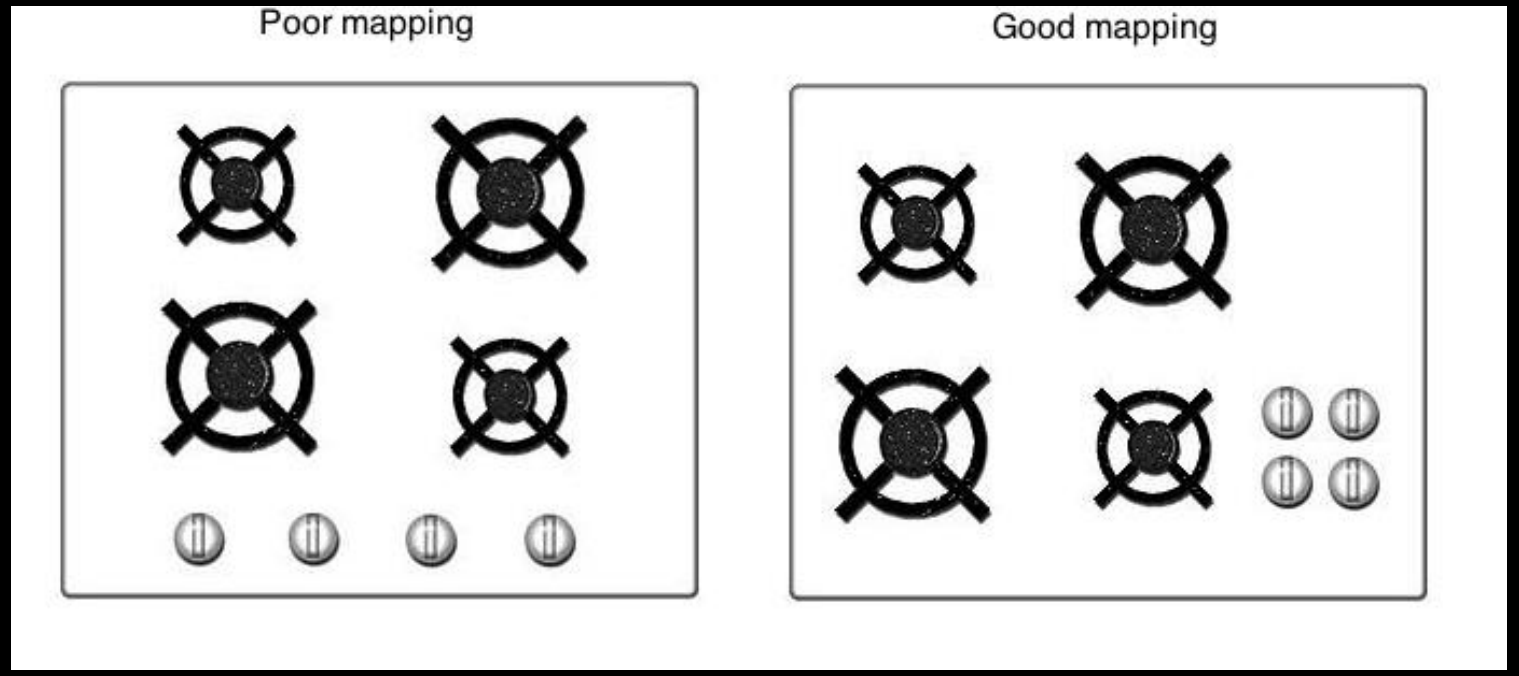
Mappings

- How to communicate what an action will do
- Considering the mapping – or relationship- from the controls and the impact real world



Other examples

- Placement of light switches and the actual lights in the room
- No need for a sign, if you spatially map it to the room

Spatial positioning to convey

- Affordances
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What is feedback?

- Response- often visual, sometimes auditory- we get from performing an action
- Serves as a confirmation that the action was performed

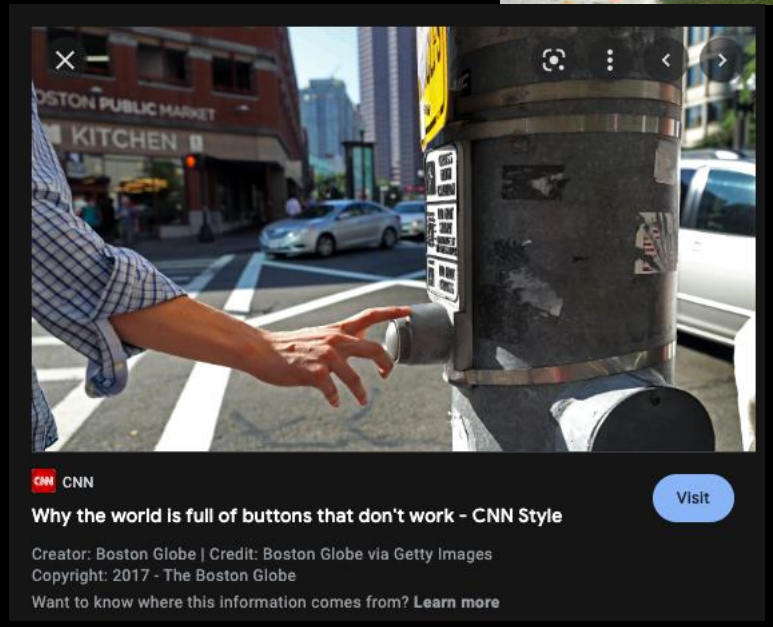
- Anyone have examples of interfaces or controls with insufficient feedback
  - Did this work?
  - Did I press it?
  - Should I press it again?

Return to our learnabiity of a book

- When I turn the page, I get lots of visual feedback that I have succeeded in accessing new content

Some situations with lack of feedback

- Pushing the up button in an elevator over and over
- Pushing the walk button at a traffic stop over and over
- Sitting at the light in your car- did it detect that I am here? Will it change?



Feedback- needs to be fast!

- Studies- even 1/10 of a second can feel too slow
- If people don’t get feedback, they’ll give up

Feedback needs to be informative and not distracting

- Indicator lights or sounds are good but
- Don’t convey much
- Distracting

Too much feedback -> people will ignore

- Especially important in mission critical situations
- Don’t want constant beeps and boops and flashing lights

Next time…..

- User’s conceptual model of the system
- And how to understand what user’s want to do with your interface- their goals

For our first project, we are going to design an interface to an appliance

- “Interface of a smart <insert device>”
- Redesign the interface to a <insert device>

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- I would like to brainstorm with you some possible devices we could choose

- Refrigerator door interface “Smart fridge”
- Redesign a car interface
- Design an UI for a shopping cart

- Think about it…..