



# Testing Prototypes

CSCI 3002 Fall 2018

# Today

- Some more information on paper prototyping
- Prototyping

# Class stuff

- Another solo assignment (A2: UI sketching) due next Tuesday Oct 23 at 11:59pm
- Next group assignment (G3: conducting user research) due on Sunday Oct 28
- Group prototyping assignment (G4) due one week later (Nov 4)

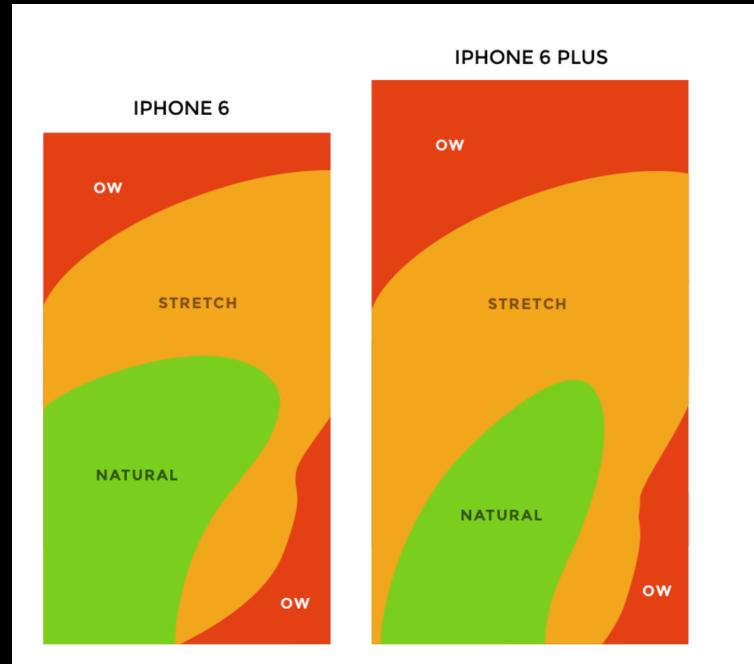
# Recap: paper prototyping

- Questions from last time?

# More on prototyping

# Prototyping for mobile and IoT

- Important to test with “real” device or similar
- Size/position matters
- Representing gestures can be tricky
  - Touch, device
- May need to create representative test environment
- May need to prototype other aspects of the device (e.g. notifications)



# Sketching physical objects

- Jeff Hawkins' (Palm) block of wood
- Google Glass in chopsticks



Rapid prototyping Google Glass - Tom Chi

modeling wire  
clay  
paper  
scale

Prototyping Rule #3:  
Use materials that  
move at the *speed of  
thought* to maximize  
your rate of learning.

through how much weight is on your nose.

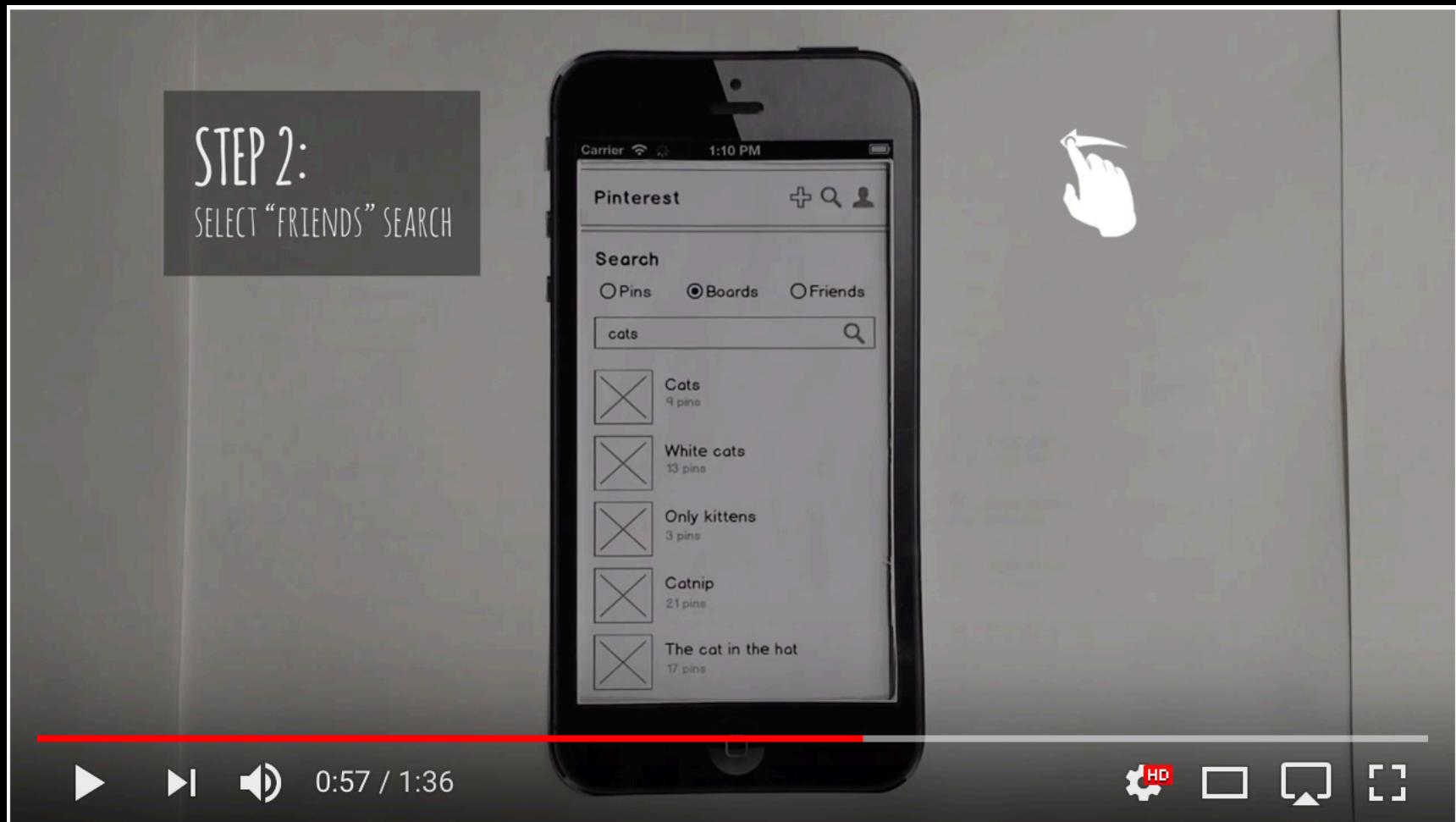
5:51 / 8:09

This image is a screenshot from a YouTube video titled "Rapid prototyping Google Glass - Tom Chi". It features hand-drawn sketches of various materials used for prototyping: modeling wire, clay, paper, and a scale. A quote by Tom Chi is overlaid on the right side: "Prototyping Rule #3: Use materials that move at the speed of thought to maximize your rate of learning." Below the quote, a smaller sketch shows a pair of glasses resting on a surface. The video player interface at the bottom includes a play button, volume control, timestamp (5:51 / 8:09), and other standard video controls.

# Input methods

- You should test out the input commands/methods, especially for anything that is not a traditional desktop GUI
- Gestures, voice commands
- Users may not know that your prototype is “swipeable” – may need to explicitly mention the allowable gestures

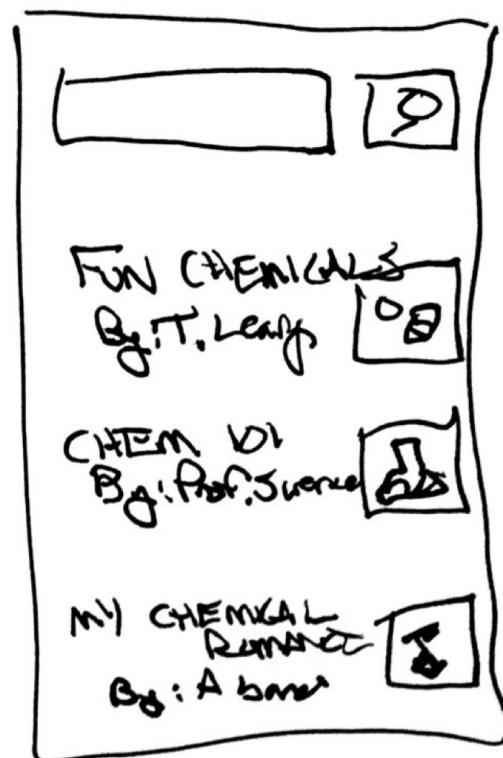
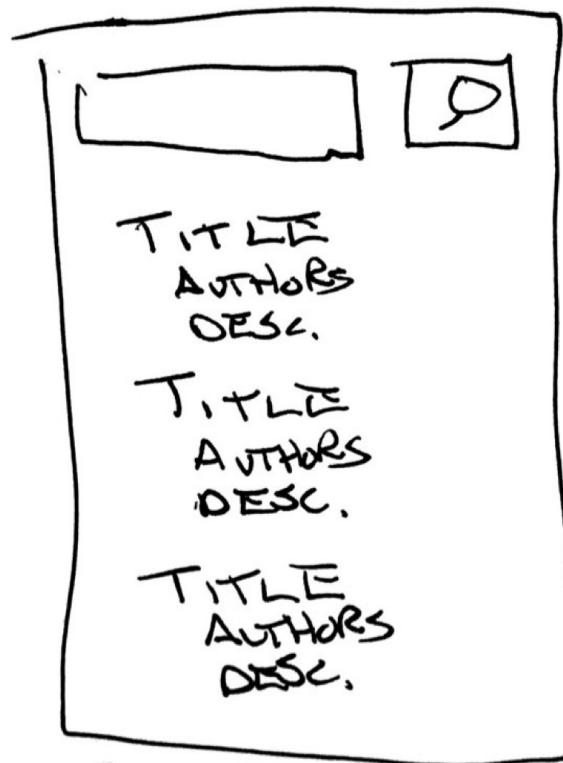
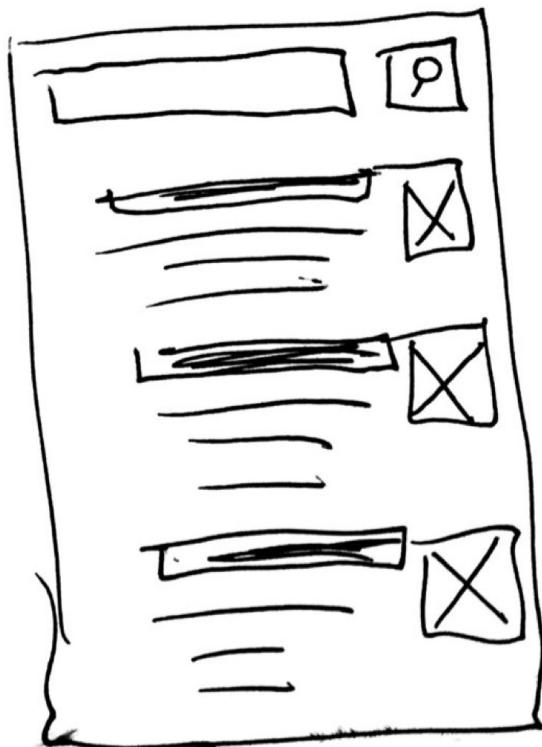
# Swiping with paper prototypes



# Data

- Does my prototype need real / realistic data?
- Often, yes
  - Allows us to test additional aspects of the interface
  - Allows us to test that everything fits

# TASK: SEARCH FOR A CHEMISTRY TEXTBOOK



# Testing your prototype

- We'll get deeper into user testing soon
- For now, we'll practice Wizard of Oz prototyping and look for usability errors
  - User doesn't understand something; tries to complete the task a different way; you forgot to include something

# Wizard of Oz setup

- One participant (in most cases)
  - Often we ask them to think aloud as they are performing the study tasks
- One “computer” – executes the paper prototype
- (Ideally) one facilitator / note-taker
- Participant goes through a series of tasks
  - Designers should provide very little/no feedback, even if the participant is stuck

# User study tasks

- Choosing study tasks is one of the most difficult parts of conducting a test
- Tasks should not be too specific – e.g. “Press the open file button and click on the file named robots.jpg”
- ... but should not be too vague – e.g. “Open a file” (how would user know what to open?)
- Good study tasks often explain the context, and provide a concrete goal, but not how to do it

# Designing tasks: tell a story

- An example task: “*Request a ride from your current location to another location*”
- What the user thinks: “*What's my location? Where am I supposed to go?*”
- In the real world, you would know where you are and where to go, so \*give this information to the user\*
- “*You are leaving the CU football game and need to meet your friend at Avery Brewing Company*”

# Example study task

- “You are making a birthday card for your nephew, who loves robots. The other day you downloaded some pictures of robots that you would like to include in the card. Locate the images you downloaded and add a picture with a red robot to the card.”

# Suggested user study tasks

- One task that is the first time use of your system
  - e.g. Creating an account, setting preferences, trying it out
- One or more tasks doing what the prototype is meant to do
  - e.g. Adopt a black cat within 10 miles of Boulder
- If there are settings, one or more tasks should involve changing them (need to include this in your prototype)

# How do we know if we did our job?

- Finding a potential design problem before it ships
- Decide between two similar approaches
- Come away with concrete changes

# Existential questions 🤔

- What is the goal of a prototype?
- What makes a “good” prototype?

# Some notes on paper prototyping

- Goal is not to ask for \*feedback\* on the design, but for end users to try out the design
- As the prototype designer, you should talk as little as possible - if you're explaining a lot, your prototype is probably missing important details
- Tasks should be described in terms of a user's goal, not the actions to perform on the UI
  - you are testing whether the user can understand how to complete tasks

# Paper prototypes

- A paper prototype can feature a \*lot\* of the work of design
  - Visual structure, conceptual structure, modes of interaction, how to handle errors
- All it doesn't contain is the final visual design and code for program logic
- Analogous to a pseudocode algorithm: once it's complete, the hard work is done, now anyone could implement it

# Paper prototyping examples

- Pieces of paper

<http://www.youtube.com/watch?v=ykJ60H4Qkvg&feature=related>

- Simulated screen with paper

<http://www.youtube.com/watch?v=oITeUEjrY3Q&feature=related>

- Cell phone testing

<http://www.youtube.com/watch?v=Bq1rkVTZLtU&feature=related>

- Prototype usability testing

<http://www.youtube.com/watch?v=L7oPR2aTGIM&feature=related>

- Complete prototyping process

<http://www.youtube.com/watch?v=5Ch3VsautWQ>

- Kid's game design <http://www.youtube.com/watch?v=L3yl9vaJuFE&feature=related>

# More on prototype testing

# A/B testing in our prototype

- Often we want to test out a hypothesis or test ideas for one part of our prototype
- We can often make multiple versions of **part** of our prototype, and keep the rest
- Use the same tasks with variations of the prototype

# How to do it

- What are the top questions that we might have about designing a user interface?
- Phrased differently, what are the top ~3 things that we might make decisions about in our user interface?

# Example

- Let's say we are designing a way to order pizzas
- What design decisions do we actually have?

# How to make A vs. B prototypes

- One approach: Explore changing a specific design element
  - Should the friends list be a list or photos?
  - Should login happen at the start or when you buy something?
  - Should you ask for the delivery address at the start or when you order the pizza?
- Make a prototype to test these designs
  - May be able to reuse some of the top level sketches (i.e. horizontal prototype)

# How to make A vs. B prototypes (2)

- Or: explore changing the high level design
  - Should textbook buyers browse a list of classes or search? (pick one at a time to test)
  - Should a click buy something or add it to my cart?
- The point is to try different ideas
  - Functionally different, not just cosmetically
    - e.g. tabs on the left vs. tabs on the bottom may affect appearance, but won't affect usability (at least not in a paper prototype)
  - Explore changes that affect how it works

# Non-traditional prototyping methods

- Experience Prototyping / Bodystorming

# Experience prototyping

- Traditional prototyping focuses on the creation of the prototype artifact
- Experience prototyping considers other aspects of the user experience
  - Context and environment
  - User needs

# Experience prototyping methods

- Prototype in the space your design will be used (or a similar space)
- Recreate the environment or tasks of your users
- Create prototypes that focus on what it is like to use a novel device

# Bodystorming

- Similar to experience prototyping
- Focus on the embodied experience of users
- Can involve simulation of user's role, abilities



Learn

Look

Ask

Try

## Bodystorming

**HOW:** Set up a scenario and act out roles, with or without props, focusing on the intuitive responses prompted by the physical enactment.

**WHY:** This method helps to quickly generate and test many context- and behavior-based concepts.

Bodystorming various ways of sleeping in airplanes helped the IDEO design team to generate a wide variety of concepts for an airplane interior.

# Bodystorming disability



# Bodystorming: advantages and disadvantages

# Activity: experience prototyping in the classroom

- Let's design a new classroom tool in the classroom
- Idea: a mobile device for digitizing and organizing shared group note
- Support shared use by groups of students at a table
- Use folded up paper, a book, etc. as your physical prototype (don't use an actual mobile device)
- Demonstrate how this device can be used: focus on interactions between students and notes

# Let's demo our experience prototypes

