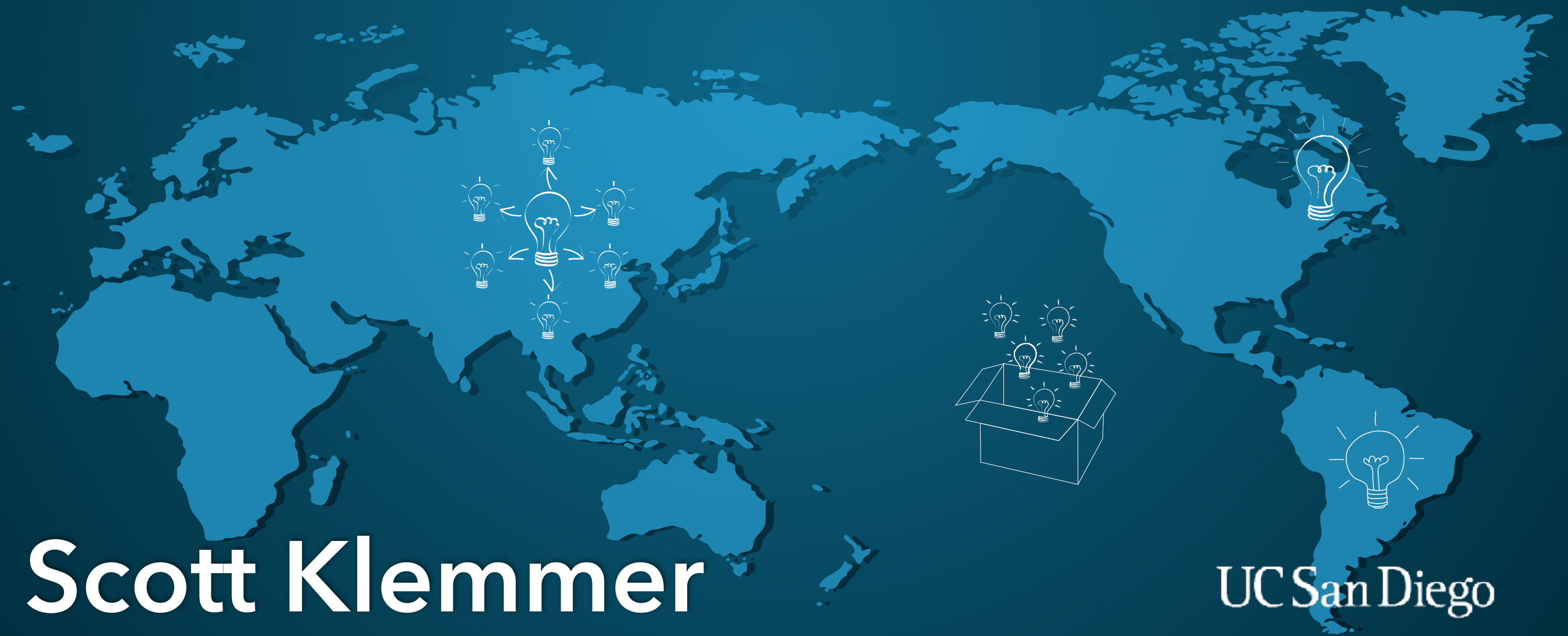


Direct Manipulation



Scott Klemmer

UC San Diego

A4 Example

Good HE: Crystal Vo

USER CONTROL AND FREEDOM

Prototype 1

- (1) The tag system is useful, but something that came up was trying to fine-tune what you're looking for by touching two tags at the same time. For multiple tags, there is no distinction or clarity of whether you're looking at Tag 1 AND Tag 2 or Tag 1 OR Tag 2. Suggestion: add an advanced search option to select photos with all tags or either of the tags.
- (4) No way to delete a class once it's added on your screen.
- (4) When you upload a photo, there's no way to cancel while it's uploading if you change your mind. (What if you realize it's the wrong one?) Suggestion: have a generic "Cancel Upload" button for a super clear exit.

Prototype 2

- (3) No way to restart an audio recording from scratch without exiting out of the entire file screen; an option like this would save users time when they realize that they started recording too early and want to redo it.
- (4) No option to delete or edit a sticky note, favorite, or photo when inputted (no visible button).
- (1) No way to look at audio only and edit from there, like viewing the name of the stick note or why the time was favorited; this option would be great if users work visually and like to be able to organize their notes by touching a certain time in the audio.
- (4) No search function for looking through notes, like looking for keywords or specific note names for easier navigation.
- (4) No way to reorganize the notes once they're created, such as moving a note to a different folder or putting folders within folders, etc.

Comparison

- Both prototypes are missing essential "Delete" and "Edit" buttons, which is costly for the user because it doesn't give them any power in trying to alter their files. While there is a way to delete a photo that you've uploaded, mentioned for Prototype 1, this option is very limited and could affect other people (mentioned above).

CONSISTENCY AND STANDARDS

Prototype 1

- (4) No back button on any page, but the user photo/class photo is at the top of the screen, so there is a good

opportunity to touch to go to the homepage.

- (1) Design inconsistency with creation of courses – since the course is created by one user only, there is no

Good list of changes: Hasan Al-Jamaly

- **List of improvements to be done (for prototype #1, which is the chosen prototype for the remainder of the quarter):**
 1. Adding a “Back” button to all of the pages that are not the Home page – resolves the user control and freedom feedback.
 2. Create a story board homepage that navigates the user’s choice of what interest they want to read about – resolves the visibility of the system feedback.
 3. Place the registration button further away from the login section of the Main page – resolves the match between the system and the world feedback.
 4. Provide limited functionality for beginning users at first entry to the application, to provide guidance towards setting interests before accessing the story board – resolves the recognition rather than recall feedback.
 5. Allow user to click on foreign words to present the definition of the word when there is a confusion on what they mean – resolves the flexibility and efficiency feedback.
 6. Place a confirm button for setting interests to ensure a change in the system – resolves the visibility of the system feedback.
 7. Place labels on the flags, homepage buttons and list of interests that the user can choose from to avoid confusion – resolves the aesthetic and minimalist feedback.
 8. Provide a resetting password functionality for forgotten password – resolves the recovery from error feedback.
 9. Provide more documentation on the uses of the application, either separately or integrated into the pages of the application – resolves the documentation feedback.

Good Video: Eunice Kim, Yu Hao Chang, Andy Xia

*[https://drive.google.com/file/d/
1jRVj1sAqsKiXWchHQu8qkFLL2eT
_pHVR/view](https://drive.google.com/file/d/1jRVj1sAqsKiXWchHQu8qkFLL2eT_pHVR/view)*

Key to good design:

- What makes an interface easy, hard, or “natural”?

How might we improve the measuring cup?



Henry Ford, Innovation, and that “Faster Horse”



The Simpsons, *Homer Designs a Car*

Measure Cups & Automobiles

What We Learned

The Execution Gap: How do you *do*?

The Evaluation Gap: How do you *know*?

Finding gaps: questions?

- Function: What is this thing?
- Actions: What can this thing do?
- Mapping: Can I figure out how to do it?
- Performance: Can I do it?
- Feedback: Did I do it?
- Meaning: What is the system telling me?

To reduce the gaps, provide...

- Visibility (perceived affordances or signifiers)
- Feedback
- Consistency (also known as standards)
- Non-destructive operations (hence the importance of undo)
- Discoverability: All operations can be discovered by systematic exploration of menus
- Reliability. Operations should work. Period. And events should not happen randomly.

COMMAND LINE v. GUI

Direct Manipulation

- Immediate feedback on actions
- Continuous representations of objects
- Leverage metaphor

Principle

Command Line

GUI

Visibility

Feedback

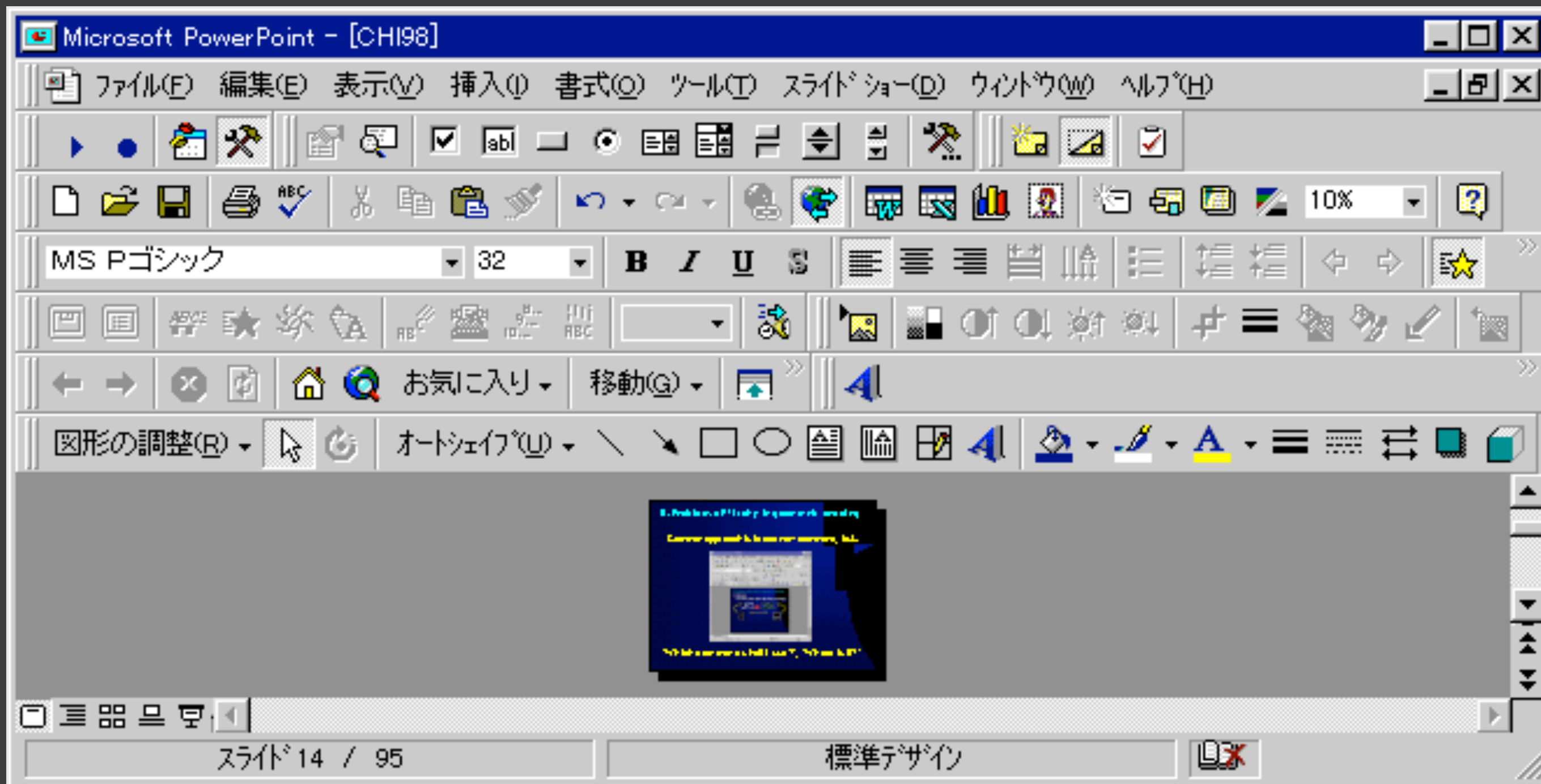
Consistency

Non-destructive

Discoverability

Reliability

Successful
Indirection?



Eye to the Future: Gestures

- The solution to menu creep?
- Even more direct?

The Oranges Puzzle

goal Order the oranges by size: largest-to-smallest, left-to-right

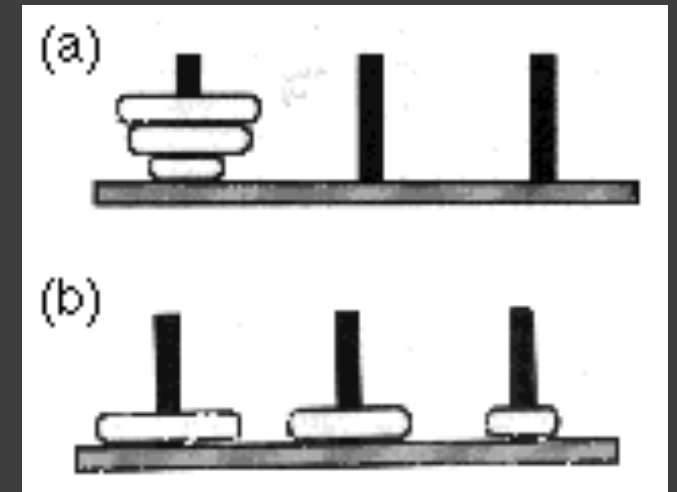
rule 1 Only one orange can be transferred at a time

rule 2 An orange can only be transferred to a plate on which it will be the largest

rule 3 Only the largest orange on a plate can be transferred to another plate

The Bagels Puzzle

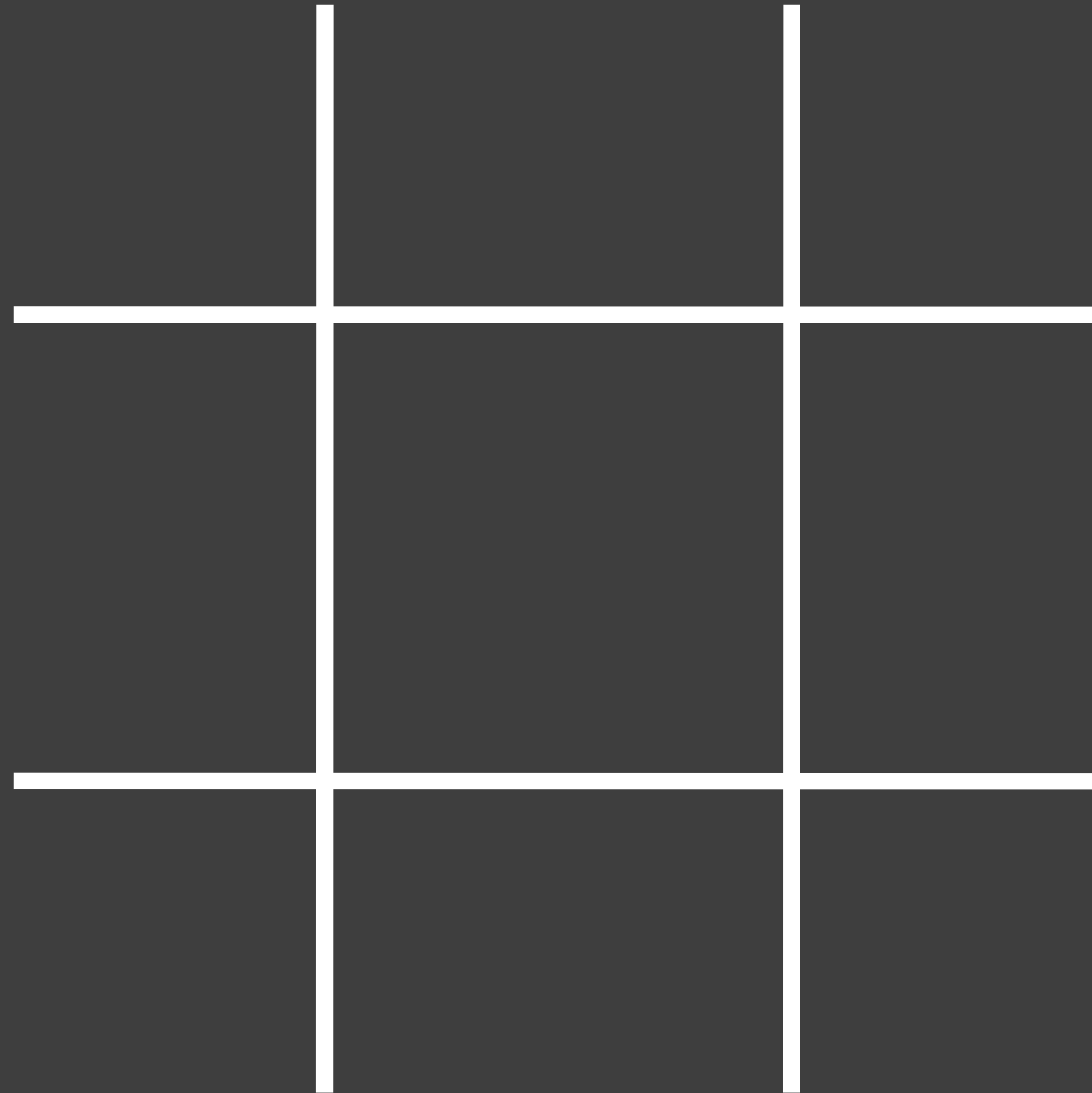
- goal Order the donuts by size:
largest-to-smallest, left-to-right
- rule 1 Only one donut can
be transferred at a time
- rule 2 A donut can only be transferred to a
peg on which it will be the largest
- rule 3 Only the largest donut on a peg can
be transferred to another peg



Let's play a number game!

- Two players
- Think of the numbers 1 to 9
- Players draw alternately, without replacement
- Objective: make a set of 3 that adds to 15

How about Tic-Tac-Toe?



These games are
Isomorphs

Problem Solving as Representation

“Solving a problem simply means representing it so as to make the solution transparent”

—Herbert Simon, *The Sciences of the Artificial*

Working Memory

Getting Things Done

Naturalness

- Cognition is aided when the properties of the **representation** match the properties of the **thing** being represented

Proteus Ingestible Networked Pill



QUARTER

- Access opens for course enrollment.
- M.D. students, first day of instruction.
- Course enrollment deadline to receive stipend or refund check on first day of term.
- New undergraduates arrive; Convocation.
- First day of quarter; instruction begins.
- Preliminary Study List deadline Students must be "at status"; i.e., students must have a study list with sufficient units to meet requirements for their status, whether full-time, 8-9-10 units (graduate students only), or approved Special Registration Status.
- Deadline to submit Leave of Absence for full refund. A full refund schedule is available here.
- Conferral of degrees, Summer Quarter.
- Yom Kippur (classes held; some students will be observing Yom Kippur and are not expected to attend classes; some faculty will not be holding classes).
- Final Study List deadline. Last day to add or drop a class; last day to adjust units on a variable-unit course. Students may withdraw from a course until the Course Withdrawal deadline and a "W" notation will appear on the transcript.
- Term withdrawal deadline; last day to submit Leave of Absence to withdraw from the University with a partial refund. A full refund schedule is available here.
- Change of grading basis deadline.

SPRING QUARTER

FEBRUARY

7 (Sat)

19 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

29 (Mon)

1 (Tue)

9 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

16 (Fri)

MAY

12 (Wed, 5:00 p.m.)

21 (Fri, 5:00 p.m.)

21 (Fri, 5:00 p.m.)

21 (Fri, 5:00 p.m.)

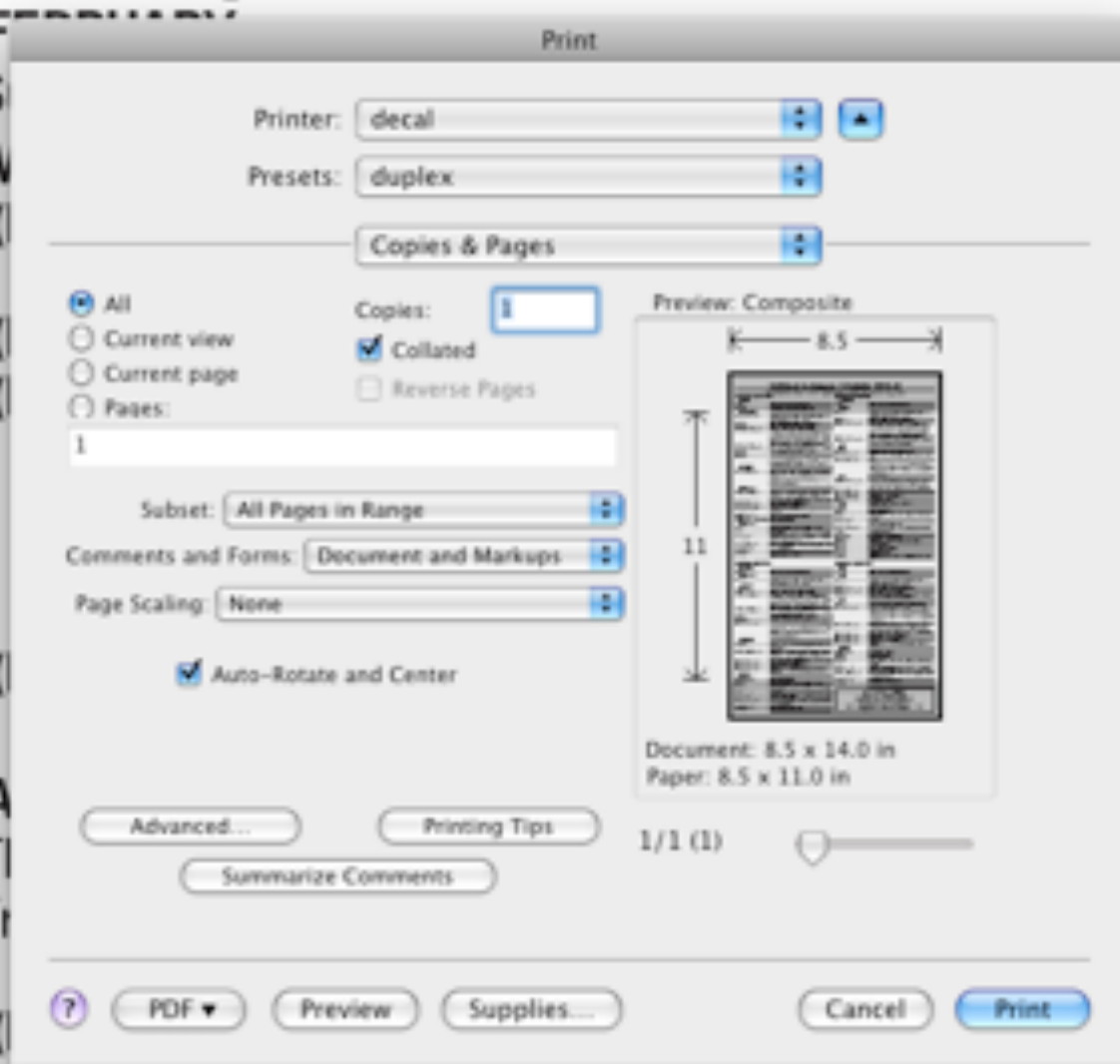
28-June 3 (Fri-Thu)

31 (Mon)

31 (Mon)

31 (Mon)

- Term withdrawal deadline; last day to submit Leave of Absence to withdraw from the University with a partial refund. A full refund schedule is available here.
- Change of grading basis deadline.
- Course withdrawal deadline.
- End-Quarter Period.
- Memorial Day (holiday, no classes) .



Keywords: Design by example.

INTRODUCTION

Many users learn web design by viewing and modifying the source code from other pages on the web. For its ability to scaffold learning, the “view source” option in web browsers is a pinnacle of interface design. Leveraging examples of previous work is an established technique in design [3, 32]. Many design education programs teach students to think like experts by exposing them—and encouraging them to draw upon—examples of previous work. Merging and adapting past solutions to fit the current context can facilitate creativity in new situations [20, 21]. Design compendiums such as *The Big Book of Logos* [5] serve as valuable resources for inspiration, and the advent of prolific, searchable Web content has provided ready access to a broad array of work created by other designers. When appropriate, example designs can offer pragmatic value as well as inspirational value. Starting with an existing design and modifying it can provide a lower barrier to entry than starting with a blank slate. Amateurs, prototypers, and designers can all create a new design quickly by finding and reusing existing designs, especially valuable [2, 17, 27].

Designers’ current practices for working with examples are largely informal and ad hoc [19, 28]. Can

we examine the specific context of Web page design, the intuitions this work draws upon—most notably, the importance of analogy in creative cognition [13, 40]—suggests these findings likely have broader import.

The Existing and Potential Role of Examples

While it sometimes seems like ideas arise out of thin air, creativity is necessarily the result of applying existing knowledge [1]. Our prior experiences provide the scaffold upon which we create new ideas [13, 30, 36], and copying someone else’s successful actions is more efficient than re-inventing them from scratch. As Gick and Holyoak succinctly put it, “analogy pervades thought” [16]. Despite the centrality of experience to creativity and insight, people often neglect to draw on relevant knowledge, even when encouraged to do so through summarizing the relevant experience, stating the principle it embodies, or creating a diagram [15, 16]. People are much more likely to draw on analogous experiences and infer the underlying principle when provided with multiple examples, or when presented

with a single example, and asked to compare them. These comparison processes can reveal how people combine partial structures and thus how they learn early in learning when neither examples nor principles [14]. The benefits of principle-



A footer of section 1 is set outside the printable area of the page. Do you want to continue?

No

Yes

Thanks for Your
Midterm Feedback

What are we doing well?

- Feedback and interaction in studio are helpful
- Going through the design process with tools and techniques used in the real world
- Videos that supplement lecture to help with design concepts

What can we do better?

- Labs too easy, labs too hard
- More details about why we're doing what we're doing in lab
- Assignment wording and grading are vague

What's one thing you could do better?

- Go to office hours
- Go to lecture/lab
- Work on assignments sooner
- Spend time exploring concepts