Visual Information Design

Prof. James A. Landay
Computer Science Department
Stanford University
Autumn 2016
November 8, 2016
* Based on slides by Luke Vink, Scott Klemmer, and James Landay

Hall of Fame or Shame?

Palm Beach, Florida
Ballot 2000
Eye drawn to the wrong holes
If only 1% error rate, can still change a close election

One Possible Redesign

William Lidwell, Kristina Holden, and Jill Butler Universal Principles of Design

Hall of Shame!

iFitness
iOS App

Non-conventional design is a waste of resources—iOS has better defaults
Know your users! 99% of users will want to enter today’s weight
‘Record’ button almost invisible

Hall of Shame!
Possible Re-design

¼ of the controls

Saved space can be used for statistics

Date and time can be recorded automatically

Hall of Fame!

Minimalist design w/ large & simple instructions
Automatic location setting
Large calendar for easy/fast date selection (Why?)

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Information is Beautiful

A collection of intriguing visualizations that strike a balance between art and data representation

David McCandless

Outline

• Typography, layout, color
• Good Form
  – layout, proximity, small multiples, space, grids & icons
• Mid-quarter Feedback
• Team Break
• Color
• Interesting Design

Wilfred Castillo: Tide Prediction: http://wilfredcastillo.com/Tide-Prediction

Partly Cloudy

iOS App
How well does it work? How well does it communicate?

The Art of Balance
Promotion & demotion of important objects

First Question for any design ➢ What are the most important things?

Information should be prioritized based on its importance to the user

Visual Design that has Good Form (Purpose)

Using Context to Determine Layouts
Know Thy Users! (Design Discovery)

Context is extremely important to how much “Stuff” should be visible
Using Context to Determine Layouts

Screen Space
- Time for tasks
- UI Elements

Mobility
- Importance of Information
- Hierarchy

Responsive Layout Design for Web

Using Proximity to Indicate Relationships

“The whole is greater than the sum of the parts.”
- David Hothersall

Gestalt Psychology in information design
Information blocks should be grouped together if related, but unrelated elements should be located at some distance from each other.
Using Proximity to Indicate Relationships

Using Proximity to Indicate Relationships

Using Proximity to Indicate Relationships

Small Multiples

• Economy of line
• Similarities enable us to notice differences

International Women’s Day

Small Multiples

Proximity and Small Multiples in Use

Today Weather iOS App

Images from Edward Tufte’s Envisioning Information
Proximity and Small Multiples in Use

Today Weather
iOS App

Using Blank / White Space as an Object

- White space can be used to suggest importance or prestige
- The more space around a group, the more valuable it should be for the user
- Think of whitespace as an “element” so as to consider its positioning

What Are The Important Things Here?

Jan Tschichold’s Revolution
Champion of Modernist Typography

http://builtbybuffalo.com/White Space = Value
Type Classifications

Typeface (Arial) vs Font (Arial Bold)
Serifs: Structural details in letters that (may) help the reader connect them

<table>
<thead>
<tr>
<th>Sans Serif</th>
<th>Serif</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optima</td>
<td>answ</td>
</tr>
<tr>
<td>Helvetica</td>
<td>answ</td>
</tr>
<tr>
<td>True Italic</td>
<td>answ</td>
</tr>
</tbody>
</table>

Asymmetric Typography

How blocks used to be arranged in magazines. Schizophrenic, thoughtless centering of blocks (is ugly).
The same blocks, correctly arranged in the same type area. Constructive, meaningful, and economical (is beautiful).

Grid Systems

- A key pattern for implementing rationality, modernism, asymmetry
- Note that no elements are “centered”

Iconography:
Differences that Make a Difference

Java Look and Feel Design Guidelines

www.jensondesign.com/1+1=3.pdf

The Noun Project
A “Language” of icons

Mid-quarter Feedback: “I Like”

- Teams for projects, team meetings/breaks
- Like quarter-long project goes all the way
- “learning by doing” on personalized projects
- Lectures w/ lots of examples
- TA feedback helpful
Mid-quarter Feedback: “I Wish”

- "Grading appears inconsistent and subjective”
  - some of this is inherent to design
  - TA's spend time every Friday going over criteria
  - detailed grading rubric
  - but, we will take more effort to try for consistency
- Workload for project high, especially interviews unrealistic
  - need to do this to get through the entire process (5 credits)
  - good news: no more interviews/users needed this quarter
  - discuss more in advance next year
- Point breakdown / Steps to complete homework sometimes unclear
  - will continue to promptly answer questions on Piazza/class/OH, if unsure please ask
  - continue to improve based on your feedback
- Unclear on what will be on the midterm & reason for having it
  - will review before midterm, but again: lectures, HWs, readings

Mid-quarter Feedback: “I Will”

- Take advantage of office hours & Piazza
- Get feedback earlier from TAs/professor

Administra

- iOS Workshop
  - Tuesday, 11/8, 6-8 PM, Bldg 380-380F (Math Corner)
- React Native Workshop w/ Quora co-founder Charlie Cheever
  - Thursday, 11/10, 6-8 PM, Bldg 380-380F (Math Corner)
- Android Workshop
  - Thursday, 11/10, 8-10 PM, Bldg. 380-380F (Math Corner)

Hi-Fi Prototype Assignment posted Thu
- mid-way milestone is due on Thursday/Friday Dec. 1-2 (at start of studio)
- final prototype due Thursday/Friday Dec. 8-9 (at start of studio)
- key deliverables:
  - make prototype sufficient to carry out usability test w/ target users completing your three tasks
  - with mid-way milestone you should have a prototype with a clear visual design
  - initial functionality does not have to work
  - key deliverables (midway):
  - prototype sufficient to carry out usability test w/ target users completing your three tasks
  - initial functionality does not have to work
  - report (cumulative)
    - key deliverables (midway):
      - at least 1 of 3 tasks should work (you will demo)
      - 10-minute presentation describing how you got to the new design & current implementation status

TEAM BREAK
(TALK ABOUT HI-FI PROTOTYPE PLANS)

Color Definitions (digital)

- **Hue** is gradation of color (i.e., name: “yellow”)
- **Saturation** is purity of the hue (vividness)
  - how much gray
- **Luminance** is the brightness in an image
The Basics of the Color Wheel

Warm Colors: Triggering / Sensual

Colors in Culture

Color: Edward Tufte – by hue

Color: Edward Tufte – by luminance
Cool Colors: Conserved / Relaxing

Color Harmonies
“A pleasing arrangement of parts, whether it be music, poetry, color, or an ice cream sundae.”

Using Appropriate Color “Harmonies”

Complimentary (e.g., Children’s Bedroom)

Complimentary

Analogous

Triad

Split Complementary

Rectangle (Tetradic)

Square

This color scheme must be managed well so it is not jarring. Bad with Text!!

Not so good for text

Hard on the eyes

Not so much

Always easy on the eyes, this type of color scheme always looks “natural”

Always easy on the eyes, this type of color scheme always looks “natural”

This type of color scheme always looks “natural”
Analogous (e.g., Beyond Oil)

Split Complimentary

Often a good choice for beginners, because it is difficult to mess up.

EG Split Complimentary

EG Analogous

EG Monochromatic

Start with Greyscale

... then accent or enhance with color
Action + Passive Colors

Poor Use of Color

Redesigned to Use 3 Actionable Colors
Tools that help with color selection

- http://colorschemedesigner.com/
- http://kuler.adobe.com/
- http://www.colourlovers.com

Visual Design that is Interesting
[the wow factor]

Why Make Information Interesting?

- Differentiation from similar work
- Creates “willful” interaction as opposed to “forced”
- With an interesting interface that is simple to learn, the user will teach themselves

Non Conventional Layouts

- Hard to get right & easy to overdo!
- Try new shapes:
  - Circular charts
  - Hexagonal Objects
- Like all techniques (color, etc) – restrict unconventional layouts to the most important information

Dynamic Movement

- Hard to get right & easy to overdo!
- Animation is best used to connect information & create “flow”
- Like size, color & unusual shapes, animation draws attention to the eye & suggests importance
Metaphors (using the real world to describe info)

- Hard to get right & easy to overdo!
- Very useful to provide meaning and connect information to logic
- As you have seen before, the more direct or specific a metaphor, the more contextually relevant it is to a generation.

The best designs balance the techniques you have seen

and

The less techniques used, the easier it is to balance them

In other words,

Keep it Focused
Summary

- Start with Context, what is the nature of the information? What is the most important?
- Design first in gray scale to focus on hierarchy
- Small changes help us see key differences (e.g., small multiples)
- Avoid clutter, focus on the essence of your tasks
- Use color properly – not for ordering!
- Only use one or two colors at a time, unless absolutely necessary

Further Reading

- Kevin Mullet and Darrell Sano, *Designing Visual Interfaces*
- Edward Tufte’s books and course
- Anne Spalter, *The Computer in the Visual Arts*
- Robin Williams, *The Non-Designer’s Design Book*
- Typography
  - Jan Tschichold, *The New Typography*
  - Robert Bringhurst, *The Elements of Typographic Style*
  - http://www.adobe.com/type/

Further Reading

- Typography on the web
  - http://www.microsoft.com/typography/

Next Time

- Conceptual Models & Interface Metaphors
- Reading
  - “The Psychology of Everyday Things” (Ch. 1), from *The Design of Everyday Things* by Donald Norman
- Next assignment
  - Group Heuristic Evaluation (in studio)