Visual Information Design

Prof. James A. Landay
Computer Science Department
Stanford University

Autumn 2022
October 26, 2022

* Based on slides by Luke Vink, Scott Klemmer, and James Landay
Hall of Fame or Shame?

Palm Beach, Florida
Ballot 2000
Palm Beach, Florida
Ballot 2000

Eye drawn to the wrong holes

If only 1% error rate, can still change a close election

<table>
<thead>
<tr>
<th>Electors for President and Vice President</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Republican)</td>
</tr>
<tr>
<td>George W. Bush - President</td>
</tr>
<tr>
<td>Dick Cheney - Vice President</td>
</tr>
<tr>
<td>(Democratic)</td>
</tr>
<tr>
<td>Al Gore - President</td>
</tr>
<tr>
<td>Joe Lieberman - Vice President</td>
</tr>
<tr>
<td>( Libertarian)</td>
</tr>
<tr>
<td>Harry Browne - President</td>
</tr>
<tr>
<td>Art Olivier - Vice President</td>
</tr>
<tr>
<td>(Green)</td>
</tr>
<tr>
<td>Ralph Nader - President</td>
</tr>
<tr>
<td>Winona LaDuke - Vice President</td>
</tr>
<tr>
<td>(Socialist Workers)</td>
</tr>
<tr>
<td>James Harris - President</td>
</tr>
<tr>
<td>Margaret Trowe - Vice President</td>
</tr>
<tr>
<td>(Natural Law)</td>
</tr>
<tr>
<td>John Hagelein - President</td>
</tr>
<tr>
<td>Nat Goldhaber - Vice President</td>
</tr>
<tr>
<td>(Reform)</td>
</tr>
<tr>
<td>Pat Buchanan - President</td>
</tr>
<tr>
<td>Ezola Foster - Vice President</td>
</tr>
<tr>
<td>(Socialist)</td>
</tr>
<tr>
<td>David McReynolds - President</td>
</tr>
<tr>
<td>Mary Cal Hollis - Vice President</td>
</tr>
<tr>
<td>(Constitution)</td>
</tr>
<tr>
<td>Howard Phillips - President</td>
</tr>
<tr>
<td>J. Curtis Frazier - Vice President</td>
</tr>
<tr>
<td>(Workers World)</td>
</tr>
<tr>
<td>Monica Moorehead - President</td>
</tr>
<tr>
<td>Gloria La Riva - Vice President</td>
</tr>
</tbody>
</table>

Write-In Candidate
To vote for a write-in candidate, follow the directions on the long stub of your ballot card.
One Possible Redesign

William Lidwell, Kritina Holden, and Jill Butler  *Universal Principles of Design*
Visual Information Design

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Outline

- Good Form
  - visual hierarchy, layout, proximity, small multiples & space
- Team Break
- Good Form (cont.)
  - typography, grids & icons
- Color
- “Interesting Design”
Based on David McCandless
http://www.informationisbeautiful.net

How well does it work?
How well does it communicate?

interestingness
- relevant
- meaningful
- new

integrity
- truth
- consistency
- honesty
- accuracy

function
- easiness
- usefulness
- usability
- fit

form
- beauty
- structure
- appearance

proof of concept
experiment
ugly
boring
sketch
eye candy
useless
rubbish
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 Hierarchy and Reading Order

Strong visual hierarchies guide visual & logical progression by showing what is important.

Weak visual hierarchies provide little or no guidance about what is important.

source: http://52weeksofux.com/post/443828775/visual-hierarchy
Watch Season 1 Now

He's the biggest hero the world has ever seen. But even Kong will need help to stop this army of high-tech beasts!

Continue Watching for Jenny

- Expedition Unknown
- Anthony Bourdain Parts Unknown
- Parks and Recreation
- Midsomer Murders
- SlugTerra
- The Mind of a Chef
The First Read: Reading order pillars

1. size
2. color
3. layout
4. spacing
5. style

source: http://thenextweb.com/dd/2015/04/30/the-5-pillars-of-visual-hierarchy-in-web-design/#gref
Using **Proximity** to Indicate Relationships

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
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Using **Proximity** to Indicate Relationships
Using Proximity to Indicate Relationships
Small Multiples

- Economy of line
- Similarities enable us to notice differences

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International Women’s Day

Echeverria, Heriberto  1971
March 8 - International Women’s Day

Diaz, Estela  1974
March 8 - International Women’s Day

Revolucion!: Cuban Poster Art by Lincoln Cushing
http://www.amazon.com/Revolucion-Cuban-Poster-Lincoln-Cushing/dp/0811835820
Proximity & Small Multiples in Use

Today Weather
iOS App

Pittsburgh
30°
feels like 27°
39° / 27°
100%
3 mph
12am 4am 8am
29° 32° 31°
updated 12/21/12, 8:26 PM

Sun Mon Tue Wed Thu Fri Sat
10% 10% 40% 52% 28% 48%
41° 48° 37° 39° 28° 48°
25° 34° 23° 28° 25°

Sunday, December 16
9am 10% 31°
10am 10% 34°
11am 10% 37°
12pm 10% 37°
1pm 10% 37°
2pm 10% 37°
3pm 10% 36°
4pm 10% 35°
Sunset 4:36pm
5pm 10% 34°
6pm 10% 31°
7pm 10% 28°
Proximity & Small Multiples in Use

Today Weather
iOS App

Pittsburgh
30°
feels like 27°

39° / 27°
10%
40%
3 mph

12am 4am 8am
29° 32° 31°

SUN MON TUE WED THU FRI SAT

Sunday, December 16

9am 10am 11am 12pm 1pm 2pm 3pm 4pm
10% 31° 34° 37° 37° 37° 37° 36°

5pm 6pm 7pm
10% 10% 10°
Proximity & Small Multiples in Use

Today Weather
iOS App

Pittsburgh
30°
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100%
3 mph

12am 4am 8am
29° 32° 31°

10% 10% 40%
41° 48° 52°

41° 34° 37° 39° 28° 28° 48°

Sunday, December 16
9am 10am 11am 12pm 1pm 2pm 3pm 4pm
31° 34° 37° 37° 37° 37° 36° 35°

Sunset 4:36pm
5pm 6pm 7pm
34° 31° 39°
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” – consider its position
A higher plain

White Space = Value
What Are The Important Things Here?
Administrivia

- Grading on Assignment #4 – Concept Video
  - Slides Average (92.6): ✔️ (4%), ✔️ (52%), ✔️+ (32%), + (12%)
  - Video Average (94.9): ✔️ (0%), ✔️ (24%), ✔️+ (48%), + (28%)

- Web site
  - must be on web site by studio next week or grade will be docked
  - problem getting a web site up, talk to your CA now

- CS 194H
  - follow-on to CS147
  - offered this Winter
Assignment Grading Buckets

Far exceeds expectations: Reserved for ~ the top 1-3 submissions that can be used as examples in class. This is an A+, often a perfect or > 97% score.

Fulfills the expectations in the spec and some elements exceed expectations. Strong engagement with the design process. Excellent presentation of the work. This is an A range grade (93 - 97%).

Fulfills the expectations in the spec. Students engaged with the design process, though maybe some small issues remain. Presentation understandable. This is a B+/A- range grade (88 - 92%).

Relatively complete, but there are components of unsatisfactory quality. Presentation may fall short (e.g., poor image resolution, too much text). This is a B range grade (83 - 87%).

Incomplete or multiple parts are of unsatisfactory quality. Shows sub-par engagement with the design process. Presentation likely falls short in many ways. This is a C+/B- range grade (78 - 82%).

Missing substantial assignment components and/or mostly poor quality. Does not represent engagement with the design process. This is a C range grade or lower (< 78%).
TEAM BREAK
(FINISH LOW-FI PROTOTYPE OR SLIDES)
Jan Tschichold’s Revolution

Champion of Modernist Typography

Die Neue Typographie
Berlin, 1928

Bauhaus school
Dessau, 1925-26
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><strong>Optima</strong></td>
<td><strong>Fenice Bold</strong></td>
</tr>
<tr>
<td>Roman</td>
<td>answ</td>
</tr>
<tr>
<td>Obliqued</td>
<td>answ</td>
</tr>
<tr>
<td>True italic</td>
<td>answ</td>
</tr>
</tbody>
</table>
Asymmetric Typography

JAN TSCHICHOld

How blocks used to be arranged in magazines. Schematic, thoughtless centering of blocks (= ugly).

The same blocks, correctly arranged in the same type-area. Constructive, meaningful, and economical (= beautiful).
Grid Systems

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

Java Look and Feel Design Guidelines
Iconography:
Differences that Make a Difference

www.jensondesign.com/1+1=3.pdf
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
Color: Edward Tufte – by hue

IMAGE REMOVED FOR COPYRIGHT REASONS
Color: Edward Tufte – by luminance
The Basics of the Color Wheel
Color *Harmonies*

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

<table>
<thead>
<tr>
<th>Complementary</th>
<th>Analogous</th>
<th>Triad</th>
<th>Split Complementary</th>
<th>Rectangle (Tetrad)</th>
<th>Square</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Complementary" /></td>
<td><img src="image2" alt="Analogous" /></td>
<td><img src="image3" alt="Triad" /></td>
<td><img src="image4" alt="Split Complementary" /></td>
<td><img src="image5" alt="Rectangle (Tetrad)" /></td>
<td><img src="image6" alt="Square" /></td>
</tr>
</tbody>
</table>

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dt-UX: Design Thinking for User Experience Design, Prototyping & Evaluation
This color scheme must be managed well so it is not jarring. Bad with Text!!
Complimentary (e.g., Children’s Bedroom)
Analogous

Always easy on the eyes, this type of color scheme always looks “natural”
Analogous (e.g., Beyond Oil)
Often a good choice for beginners, because it is difficult to mess up.
Split Complimentary

split-complementary
Monochromatic or Grayscale

monochromatic
Start with Greyscale

... then accent or enhance with color
Action + Passive Colors
Poor Use of Color

Phew! I wasn't sure I'd make it today but since I'm amazing, I did.

Made it. Proud it.

Brett & 3 Others Gave A Bump!

Made it! 5 Days Left!

Beatrice Paddington

Nice. Thought we were going to

Meredith Von Berr

3X/WK 7 WKS.

Jessica Longname

TIME LEFT TODAY

07:32

5 HOUR DELAY

3 Days Off

3 Makes

Don Wilburforce Commented

I'm not sure that I'll make it tonight.
Redesigned to Use 3 Actionable Colors
Action

Immediate

Analogous
Tools that help with color selection

https://coolors.co/

http://color.adobe.com/

http://www.colourlovers.com

https://paletton.com/
Mood Boards

LOREM IPSUM DOLOR SIT AMET
AN EST NIBH ILLUM CONCLUDATURQUE
Mood Boards – Team Exercise (10 min)

• Before starting your mood board, think of 3-5 adjectives giving vibe you’d like your solution to convey to users (write them down)
• From those adjectives, have each team member search online for images to convey that tone & compile them all onto a team slide
• From the images, choose the primary & secondary colors you want to use for your medium-fi

• Copy this slide deck to your team folder
Exit Ticket
Visual Design that is **Interesting**

[the wow factor]
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
Wilfred Castillo: Tide Prediction: http://www.wilfredcastillo.com/Tide-Prediction
Dynamic Movement / Animation

- 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
- The more direct or specific a metaphor, the more contextually relevant it is to a generation or time
GLOBAL EMISSIONS

As the world gets closer to the COP26 Climate Change conference, it's important to look at where the emissions around the world are coming from. Last year, some countries have started to clean up their act, while others continue to pump out carbon dioxide.

This is a look at the top 20 highest-emitters in terms of the world and whether they have increased or decreased their total emissions in the past 5 years and their ranking on the list of biggest emitters.

Metaphors
The best designs **balance** the techniques you have seen

and

The **less** techniques used, the easier it is to balance them
Overwhelming Use of Different Techniques
In other words,

Keep it Focused
Based on David McCandless
http://www.informationisbeautiful.net
Interestingness

Form

Integrity

Function
Summary

- Start with **context** – what is the nature of the information? What is the most important?
- Design first in grayscale 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 **1-2 colors at a time**, unless absolutely necessary
Further Reading

- Kevin Mullet and Darrell Sano, *Designing Visual Interfaces*
- Edward Tufte’s books and course
- Robin Williams, *The Non-Designer’s Design Book*
- Typography
  - Jan Tschichold, *The New Typography*
  - Robert Bringhurst, *The Elements of Typographic Style*
- Typography on the web
  - http://www.adobe.com/type/
  - http://www.microsoft.com/typography/
Next Time

• Mon
  – Designing the Future: Early & Future Visions of HCI
  – Read
    • As We May Think by Vannevar Bush
    • Tools For Thought Ch 9 (Engelbart Demo)
    • Listen to: Of Mice and Men (99% Invisible podcast)

• Studio on Friday
  – present low-fi prototype/user study results – key things learned
  – work on sketching out new designs