Lecture 11: Graphic Design

Guidelines for Good Graphic Design

- Simplicity
- Contrast
- White space
- Balance
- Alignment

UI Hall of Fame or Shame?

Simplicity

- "Perfection is achieved not when there is nothing more to add, but when there is nothing left to take away." (Antoine de St-Exupery)
- "Simplicity does not mean the absence of any decor... it only means that the decor should belong intimately to the design proper, and that anything foreign to it should be taken away." (Paul Jacques Grillo)
- "Keep it simple, stupid." (KISS)
- "Less is more."
- "When in doubt, leave it out."
Techniques for Simplicity: Reduction

- Remove inessential elements

Techniques for Simplicity: Regularity

- Use a regular pattern
- Limit inessential variation among elements

Techniques for Simplicity: Double-Duty

- Combine elements for leverage
  - Find a way for one element to play multiple roles

Contrast & Visual Variables

- Contrast encodes information along visual dimensions
Characteristics of Visual Variables

- **Scale** = kinds of comparisons possible
  - Nominal (\(-\))
    - All variables
  - Ordered (\(<, >\))
    - Ordered: position, size, value, texture granularity
    - Not ordered: orientation, hue, shape
  - Quantitative (amount of difference)
    - Quantitative: position, size
    - Not quantitative: value, texture, orientation, hue, shape
- **Length** = number of distinguishable levels
  - Shape is very long (infinite variety)
  - Position is long and fine-grained
  - Orientation is very short (~ 4 levels)
  - Other variables are in between (~ 10 levels)

Attention

- Recall the spotlight metaphor
  - Attention spotlight moves serially from one input channel to another
  - All stimuli within spotlighted channel are processed in parallel
- **Input channel** = one or more visual variables
  - e.g., position, hue

Selectivity

- Selective perception: can attention be focused on one value of the variable, excluding other variables and values?
  - Selective: position, size, orientation, hue, value, texture
  - **Not selective**: shape

Selectivity Diagram

- N M Z
- M K N
- Z K M
- K Z N
- N K M
- M N K
- Z N M
- N K Z
- M Z N
- K M Z
- M K Z
- N K Z
- M Z N
- K M Z
- M K Z
- N K Z
- M Z N
- K M Z
- M K Z
- N K Z
- M Z N
**Associativity**

- Associative perception: can variable be ignored when looking at other variables?
  - Associative: position, hue, value, texture, shape, orientation
  - Not associative: size, value
    - Small size and low value interfere with ability to perceive hue, value, texture, and shape

**Recall the Stroop Effect**

- Green
- Orange
- Red
- Black
- Pink
- Blue

**Techniques for Contrast**

- Choose appropriate visual variables
- Use as much length as possible
- Sharpen distinctions for easier perception
  - Multiplicative scaling, not additive
  - Redundant coding where needed
  - Cartoonish exaggeration where needed
- Use the “squint test”
**Choosing Visual Variables for a Display**

<table>
<thead>
<tr>
<th>Title</th>
<th>Subtitle</th>
<th>Heading</th>
<th>Column 1</th>
<th>Column 2</th>
<th>Column 3</th>
<th>Column 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date 1</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
<td>Value 4</td>
<td>Value 5</td>
<td>Value 6</td>
</tr>
<tr>
<td>Date 2</td>
<td>Value 1</td>
<td>Value 2</td>
<td>Value 3</td>
<td>Value 4</td>
<td>Value 5</td>
<td>Value 6</td>
</tr>
</tbody>
</table>

**Designing Information Displays**

**Contrast in Publication Styles**

**Title**

This is body text. It’s smaller than the heading, lighter in weight, and longer in line length. We’ve also changed its shape to a serif font, because serifs make small text easier to read. Redundant encoding produces an effective contrast that makes it easy to scan the headings and distinguish headings from body text.

---

**Simplicity vs. Contrast**

<table>
<thead>
<tr>
<th>max</th>
<th>75%</th>
<th>50%</th>
<th>25%</th>
</tr>
</thead>
<tbody>
<tr>
<td>min</td>
<td>Tukey</td>
<td>Tufte #1</td>
<td>Tufte #2</td>
</tr>
</tbody>
</table>

---

Footnote: It’s even smaller, and positioned at the bottom of the page.
**Contrast Problems**

*Source: Interface Hall of Shame*

**White Space**

- Use white space for grouping, instead of lines
- Use margins to draw eye around design
- Integrate figure and ground
  - Object should be scaled proportionally to its background
- Don’t crowd controls together
  - Crowding creates spatial tension and inhibits scanning

*Source: Mullet & Sano, p. 110*

**Crowded Dialog**

*Source: Mullet & Sano, p. 110*

**Using White Space to Set Off Labels**

(a)

*Source: Mullet & Sano, p. 96*
The Gestalt Principles of Grouping

- Gestalt principles explain how eye creates a whole (gestalt) from parts
  - Proximity
  - Similarity
  - Continuity
  - Closure
  - Area
  - Symmetry

White Space Avoids Visual Noise

Balance & Symmetry

- Choose an axis (usually vertical)
- Distribute elements equally around the axis
  - Equalize both mass and extent

Symmetry Example
**Alignment**

- Align labels on left or right
- Align controls on left and right
  - Expand as needed
- Align text baselines

**Grids Are Effective**

Source: Mullet & Sano, p. 165