Graphic Design

CS160: User Interfaces
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Topics

• Modern design
• Simplicity and elegance
• Proximity
• Alignment
• Color
• Grid-based design
Modern Design

Russian constructivism (1920s) was the first big influence. It had two themes:

• Technology
• Human behavior and rhythms
Modern Design

The biggest influence on 20\textsuperscript{th} century design was the Bauhaus School in Germany.

Formed after the collapse of the German monarchy and loss in WWI, it was part of a cultural renaissance in Germany.

The Russian and German movements sought to escape “ornamentation” which linked to their imperial past.
Design is about Form and Function

- Form – good designs should be a pleasure to use
- Function – good design supports users’ tasks
Principles of Modern Design

Form follows function
Principles of Modern Design

Form follows function
Principles of Modern Design

Integrity of materials: use the materials’ natural affordances – don’t hide them
Principles of Modern Design

Integrity of materials
Principles of Modern Design

Integrity of structure: show the structure how it supports and shapes the object
Integrity of structure:
Steal Good Design Ideas

“Good artists borrow (from other artists), but great artists steal!” - Pablo Picasso

Compelling visual design takes practice and experience—a natural part of which is study and critique of other’s work.
Simplicity and Elegance
Simplicity

Simple, minimalist, designs are usually the most effective.
Elegance

**Reduction:** Only include essential elements

**Regularization:** Use one set of shapes, colors, forms etc.

**Leverage:** Use elements in multiple roles (i.e. scrollbar)
Benefit: Approachability

Visual elements rapidly understood - invite further exploration
Benefit: Recognizability

Less visual clutter makes it easier to recognize what is there.
Benefit: Immediacy

Eye is immediately drawn to important visual elements
- Details that remain are more prominent
Unity

One path to simplicity & elegance is through unifying themes:
– Forms, colors, components with like qualities
London Underground [Beck 33]

Geographic version of map

Draw viewers’ attention to essential information
- Straighten subway lines to emphasize sequence of stops
Fitness

Match design to capabilities of technology and user

The Quick Brown Fox Jumps Over The Lazy Dog.

cdefghijklmnopqrstuvwxyz0123456789 {}(){} /\<>?

Chicago screen font designed for early low-res Macintosh display

- Thick verticals ensure visibility after applying 50% gray pattern
- Used as default font 1984-1997
Mistakes: Clutter & Noise
Mistakes: Interference
Mistakes: Too Much Explicit Structure
Mistakes: Belaboring the Obvious
Mistakes: Gratuitous use of 3D
Mistakes: Excessive Embellishment

Minimalists hate it, but sometimes users like embellishments (i.e. Apple’s designs)
Proximity
Proximity

Elements that are near each other will seem to be related…

**Dinner**
- Bison
- Chicken
- Salmon
- Crab
- Pork

**Farm**
- Calf
- Elk
- Goat
- Rabbit
- Deer
Proximity

Elements that are near each other will seem to be related...

<table>
<thead>
<tr>
<th>Farm</th>
<th>Dinner</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bison</td>
<td>Calf</td>
</tr>
<tr>
<td>Chicken</td>
<td>Elk</td>
</tr>
<tr>
<td>Salmon</td>
<td>Goat</td>
</tr>
<tr>
<td>Crab</td>
<td>Rabbit</td>
</tr>
<tr>
<td>Pork</td>
<td>Deer</td>
</tr>
</tbody>
</table>
Proximity

Think about which elements are logically related – draw a graph if necessary. Then lay them out so that the graph is as untangled as possible.

Use size and typeface to allow scanning for groups.
Tuesday, November 4
Election Day

An American Menu  $75

Caesar salad with anchovies, egg, and Parmesan cheese

Clam chowder with Maine lobster and pancetta

Grilled chicken with house-made barbeque sauce with potato purée and greens

Apple and raspberry pecan crisp with vanilla ice cream
Alignment
Alignment

Every item on a screen has a relationship to the other items. Elements that are almost collinear should be aligned.

Left, right and both-justified alignments create strong boundaries around a piece of text.

It's best to stick with one kind of justification within a page.
Alignment

Alignment creates a strong boundary on at least one side of the text:

Full of vexation come I, with complaint
Against my child, my daughter Hermia.
Stand forth, Demetrius. My noble lord,
This man hath my consent to marry her.
Stand forth, Lysander: and my gracious duke,
This man hath bewitch'd the bosom of my child;
Thou, thou, Lysander, thou hast given her rhymes,
And interchanged love-tokens with my child:
Alignment

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Thou, thou, Lysander, thou hast given her rhymes,
And interchanged love-tokens with my child:
Centering is the hardest form of alignment to work with:

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Stand forth, Lysander: and my gracious duke,
This man hath bewitch'd the bosom of my child;
Thou, thou, Lysander, thou hast given her rhymes,
And interchanged love-tokens with my child:
Emphasis:

Full of vexation
come I,
with complaint
Against my child,
my daughter Hermia.
Stand forth,
Demetrius.
My noble lord,
This man hath my consent
to marry her.
Stand forth,
Lysander:
Full of vexation come I, with complaint
Against my child, my daughter Hermia.
Stand forth, Demetrius. My noble lord,
This man hath my consent to marry her.
Stand forth, Lysander: and my gracious duke,
This man hath bewitch'd the bosom of my child;
Thou, thou, Lysander, thou hast given her rhymes,
And interchanged love-tokens with my child:
Simulating justification:

Full of vexation come I, with complaint Against my child, my daughter Hermia. Stand forth, Demetrius. My noble lord, This man hath my consent to marry her. Stand forth, Lysander: and my gracious duke, This man hath bewitch'd the bosom of my child;
Color
Color Spaces

- **RGB**
  - Additive
  - Electronic Media

- **CMY**
  - Subtractive
  - Printed Media

Parameters of color space driven by technology
Technology-Centered Colors

- Nice RGB Hex codes, “evenly” distributed
- But, lime green and hot pink?
Perceptual Organization

Parameters of color space driven by perception
Munsell Color Space

Perceptually uniform book of painted chips

Hue

Chroma vs. Value

Munsell Color Utility: www.wallkillcolor.com
Tips for Picking Colors

• Use a small palette (6 color Java look and feel)

• Don’t use all fully saturated colors

• Ensure good color contrast for text
Grid Systems

142: These typographic grids for book design subdivide the page uniformly into one to six columns. Grids for GUI design have important differences, but the goal of providing systematic structure is the same. From *Basic Typography: Design with Letters*, by Ruedi Rüegg, ABC-Verlag, Zurich, 1997.

143: Each of the grids in Figure 142 leaves a distinct imprint on the resulting layout. When the same grid is used throughout a book—or GUI application—this imprint becomes a unifying element for the entire work. From *Basic Typography: Design with Letters*, by Ruedi Rüegg, ABC-Verlag, Zurich, 1997.
Web Page Layout

Grids can shape layout without over constraining it
  – Grid is not always obvious from page layout
  – Produces good repetition of size and shape
Common Mistakes

- Arbitrary component positions and dimensions
- Random window sizes and layouts
- Unrelated icon sizes and imagery
- Poor alignment
Techniques

Reinforce structure through repetition

- Repeat design elements across the layout
- Stylesheets can help
Techniques

Canonical Grid

- Six-column grid with column separators and label templates
- Covers most common grid-based layouts
- Can be implemented with HTML tables
This two-column layout is based on the canonical grid. In our first three examples, the grid is not used for the labels in the left-hand column. To visualize this grid, ignore all but the middle three lines of Figure 17/5. The Name, Type, Vendor, and Note fields span both of the columns that remain, while the items in the Mode setting, Progress indicator, and Scope options span one column each.

In this example, the full six-column grid is used to lay out the left-most label column as well as five columns of controls. Note the presence of controls spanning one, two, three, and five columns. Note too that elements of different widths can be placed in the same row without problems.
Summary

- Modern design
- Simplicity and elegance
- Proximity
- Alignment
- Color
- Grid-based design