Graphic Design and Gestalt Principles

CS160: User Interfaces
John Canny
Assignments

Update
Due next week

• Interactive Prototype (due Nov 5th)
  – Redesign interface based on low-fidelity feedback
  – Create first working implementation
    • Can include Wizard of Oz parts
    • Can include pre-coded functionality

• In class Presentations (Nov 5th & 7th)
  – 5 min presentation (short! be careful about timing)
  – Focus on showing prototype (live may not be best idea)
  – Feedback from class (you will need to provide feedback on each presentation on the wiki)
Presentation Schedule: 11/5/2012

Group 3
Group 5
Group 6
Group 7
Group 8
Group 11
Group 14
Group 16
Group 17
Group 19
Presentation Schedule: 11/7/2012

Group 1
Group 2
Group 4
Group 9
Group 10
Group 12
Group 13
Group 15
Group 18
Presentation tips

Time is extremely short

• Use your slides as cues, but **don’t talk at them**
• Make sure you **know what you will say**
• Share the work, **don’t try to talk and demo at same time**
• **Stand up**, talk to the people at the back of the room
• Don’t try to fit everything into your talk. Make sure the important points are there, and that you cover them thoroughly
Technology tips

• Technology: Test your setup on a projector!
• Don’t assume the projector can handle your default resolution.
• Don’t assume anyone else has the dongle you need.
• Don’t assume Powerpoint slides, videos, demos etc. will appear on the right screen. Your computer will probably default to two-screen mode, and you need to send everything to the projector screen.
• Have at least one backup computer ready to go.
• There is no time for you to figure this out during your presentation.
• Projectors will be available in GSI office hours this Thursday.
Answering Questions

1. Every question is **good**, even if it doesn’t make sense – always be polite to the questioner.
2. Act like you **enjoy** answering questions, it suggests that you know your stuff, and your product is good.
3. Questions are an opportunity to **persuade** interactively.
4. Make a **best effort** answer at every question – if you can’t answer exactly, give some information that’s relevant.
5. If you think you know what’s coming you can prepare **extra** slides.
6. Give plenty of detail, but stop to allow more questions.
Topics

1. Brief History of Graphic & Product Design
2. Simplicity and Elegance
3. Color
4. Gestalt Principles
5. Typography
6. Composition
Graphic Design is about Communication
Graphic Design is also about Interpretation

Max Huber, Poster, 1948

Wes Wilson, Poster, 1966

Great Design is about Emotion and Desire
Modern Design: Bauhaus
Bauhaus

Joost Schmidt, Exhibition Poster, 1923

Herbert Bayer, Exhibition Poster, 1926

Images from:
Jan Tschichold

Before: Tschichold, Leipzig Trade Fair, 1922

After: Tschichold, Elemental Typography, 1925
Grid-Based Design

Josef Müller-Brockmann
Exhibition Poster, 1980
Design Systems: Corporate Identity

22-17. Paul Rand, IBM trademark, 1956. The original design is shown with outline versions and the eight- and thirteen-stripe versions currently used.

22-18. Paul Rand, IBM package designs, late 1950s. A strong corporate identification was produced by a repeating pattern of blue, green, and magenta capital letters on the black package fronts, white handwritten product names, and blue package tops and sides.

22-19. Paul Rand, IBM package design, 1975. After two decades the original packaging design program was replaced by an updated design using the eight-stripe logo.
Moscow vows to avenge bomb blasts
Russia's leaders pledge to "destroy" those behind rush-hour suicide attacks on the Moscow Metro in which 38 people died.

More from BBC News
CAIN TOPS PERRY -- IN TEXAS...
Says race isn't fueling surge...
'This many white people can't pretend they
like me'...

TRANSPARENT: White House seeks to hide
documents...

DOW sheds 200...
Frustrated Sheriff Warns Citizens to Carry
Concealed Weapons...
'Don't get race. Get a firearm'...
'GPS shoes' would track Alzheimer's
patients...
Homeless sex offenders rounded up for
Halloween...
SPREAD THE WEALTH: CA Assemblywoman charged
with felony grand theft...
Obama Campaigning 'Like It's 1936'...
UPDATE: White House scrubs fundraiser with
ex-Enron trader...

LIBERATE: Al Qaeda flag flies over Libya...
Palestinians win full membership on UN
cultural agency...
US: Counterproductive...
Cuts funding...

FCC Cracks Down on Religious Broadcasters...
Second Energy Department-backed company goes bankrupt...
Corzine's MF GLOBAL files Chapter 11...
Likely Among the 10 Biggest Bankruptcies Ever...

Angry librarians stand up to 'Godfather'...
Home prices heading for triple-dip...
Gas lines after snow storm...

CURL: 'THE VERY ANGRY FIRST LADY'...
REPORT: Chinese scientists make blood from
rice...
100+ Halloween Revelers In Costume Brawl On
Hollywood Street...
Woman hit in head by shopping cart pushed
from rooftop: two 12 year olds arrested...
FBI video, documents on Russian spy ring
Product Design is about Form and Function

Philippe Starck, Juicer for Alessi

Oxo Angled Measuring Cup
Bauhaus Again

Le Corbusier
Grand Confort, 1928

Marcel Breuer
Wassily Chair, 1925
Form Follows Function

Centre Georges Pompidou, Paris
All infrastructure (ducts, vents, stairs) on outside of building
Form Follows Function

It is the pervading law of all things organic and inorganic,
Of all things physical and metaphysical,
Of all things human and all things super-human,
Of all true manifestations of the head,
Of the heart, of the soul,
That the life is recognizable in its expression,
That form ever follows function. This is the law.

- Louis Sullivan
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 often most effective
Elegance

• Reduction: Only include essential elements
• Regularization: Use one set of shapes, colors, forms etc.
• Leverage: Use elements in multiple roles
  – scrollbar allows scrolling and indicates position in document
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
Refinement

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

London Underground [Beck 33]

Geographic version of map
From Literal to Abstract
Fitness

• Match design to capabilities of technology and user

The Quick Brown Fox Jumps Over The Lazy Dog.

• 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

Shortcuts interfere with menu labels in (a) not in (b). Different shapes cause confusion in alignment tools.
Mistakes: Too Much Structure

Bounding boxes in (a) adds unnecessary structural information. Simpler structure in (b) using space rather than lines is better.
Mistakes: Belaboring the Obvious
Mistakes: Gratuitous use of 3D
Mistakes: Excessive Embellishment

Minimalists hate it, but sometimes users like embellishment
Color
Seeing color

The eye has rod and cone cells – only the cones respond to color. There are three types of cone, as shown above, and because of this, perceived color can be *roughly* modeled with 3 components.
Color Gamut

Since the responses curves for cones overlap, not all non-negative combinations of responses are possible (e.g. R>0, B>0 \(\Rightarrow\) G>0).

That means we cant synthesize most pure colors with 3 colored emitters – real displays lack vividness for these colors.
The absolute sensitivities of cones are quite different. In fact we have a hard time seeing blue, and perceiving blue contrast.
Yves Klein + IKB (#002FA7)
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
Conflicts

- Some Red Text Here
- Some Blue Text Here
- Some Yellow Text Here
- Some Red Text Here

Use intensity contrast for text!!
Tips for Picking Colors

We perceive color holistically when they are not directly related to the content – which is usually the case for interfaces.

Colors are often designed together into a “theme” – they work together to create the mood you want.
Themes
Themes

nano-chromatic

The new iPod nano. Now in 8GB and 16GB.
Saturation
Saturation

Microsoft Word
Microsoft Excel
Microsoft PowerPoint
Microsoft Access
Microsoft FrontPage
Microsoft Publisher
Microsoft Visact
Microsoft Outlook
Tempered Saturation
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Let Someone Else Pick For You

The DESIGNER’S GUIDE to COLOR COMBINATIONS
500+ Historic and Modern Color Formulas in CMYK
by LESLIE CABARGA
Let Someone Else Pick For You

A dozen instrumental jazz tributes to Frank Sinatra and his songwriters and arrangers,

including

- "I've got you under my skin"
- "you make me feel so young"
- "I've got the world on a string"

SINATRA LAND, Johnny Lee, art director: Andy Engel, designer: 1998

In this poster for a record release featuring a dozen jazz tributes to Frank Sinatra, Lee has captured the essence of that period in which the blue-eyed crooner reigned supreme. The musical instrument motif is given form by the three blocks of color behind it. These shapes are not arbitrarily placed. This example proves that there is a fine art to the design of seeming disarray.
Contrast Sensitivity
Gestalt Principles
Principles

- figure/ground
- proximity
- similarity
- symmetry
- connectedness
- continuity
- closure
- common fate
- transparency
Figure/Ground

Ambiguous
http://www.aber.ac.uk/media/Modules/MCI0220/visper06.html

Principle of surroundedness

Principle of relative size
Figure/Ground

Ambiguous
http://www.aber.ac.uk/media/Modules/MCI0220/visper06.html

Unambiguous
Proximity

Dots that are near one another are grouped.
Dots that are concentrated are grouped.

[from Ware 00]
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
Tuesday, November 4 — Election Day

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$75

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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
Symmetry

Bilateral symmetry gives strong sense of figure [from Ware 04]
Connectedness

Connectedness overrules proximity, size, color shape [from Ware 04]
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, 1987.

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, 1987.
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
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
Techniques

Canonical Grid

- Six-column grid with column separators and label templates
- Covers most common grid-based layouts
- Can be implemented with HTML tables
Summary

• Design is about communication, form and function
  – Simplicity and elegance are keys to good design
  – Minimalism constrains you and reduces chances of bad design

• Use a small palette of colors
  – Let others pick them for you (colorbrewer.org)

• Human vision is organized by Gestalt Principles
  – Be aware of these principles as you design the visual look

• Avoid common layout mistakes by using grid-based design