Graphic Design

John Stasko

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Agenda

• Typography
• Color
• Icons
Your Screen?

Typography

- Readability
  - How easy is it to read a lot of text

- Legibility
  - How easy is it to recognize a short burst of text

- Typeface = font
  (not really, but close enough)
Wow

Whenever your local SMS Administrator sends you an actual software package, the SMS Package Composer screens will appear (usually at least three times displaying the available Packages). The following screen-like display screens similar to what you will see when you receive an actual SMS Package.

To start the demonstration, click the "VIEW/READ" button on the bottom of the screen.

Yuk

Typography

- Serif font - readability
- Sans serif font - legibility
  – (both are variable spaced)

- Monospace font
Fonts

• Serif
  – Times, Bookman

• Sans serif
  – Tahoma, Arial

• Decorative
  – Comic Sans

• Script

• Monospaced
  – Courier, Lucida

Case

• Characters and symbols should be easily noticeable and distinguishable
  – Avoid heavy use of all upper case
  – Studies have found that mixed case promotes faster reading

HOW MUCH FUN IS IT TO READ ALL THIS TEXT WHEN IT’S ALL IN CAPITALS AND YOU NEVER GET A REST
How much fun is it to read all this text when it’s all in capitals and you never get a rest
Typography

• Guidelines
  – Use serif for long, extended text; sans serif for “headlines”
  – Use 1-2 fonts/typefaces (3 max)
  – Use of normal, italics, bold is OK
  – Never use bold, italics, capitals for large sections of text
  – Use 1-3 point sizes max
  – Be careful of text to background color issues

More Wow
Font Control

Example

Which do you prefer?

Applies lots of these principles
Color

- We see the world via a *reflective* color model
  - Light strikes a surface and is reflected to our eyes—Properties of surface dictate color
  - *Subtractive* color model - Cyan Magenta Yellow primaries

- Colors on display follow the *emitted* model
  - *Additive* color model - Red Green Blue primaries

Characterizing Color - HSV Model

- **Hue**
  - basic color, pigment

- **Saturation**
  - relative purity, brightness, or intensity of a color

- **Value**
  - lightness or darkness of a color

- Most commonly-used model

*Figure 2: The HSV Cone*

Image from: Adventures in HSV Space, Darrin Cardani, dcardani@buena.com
HSV Color Model

- **Hue**
  - Wavelength (red, green, yellow, blue)
  - Spectrum (VIBGYOR)

- **Saturation**
  - Pastel versus strong (baby blue, sky blue, royal blue)

- **Value**
  - Amount of energy (white, light gray, dark gray, black)
  - Usually \( V = 0.299R + 0.587G + 0.114B \)

HSV Color Space

- Typical color selection tools
Color

- On monitors, typically RGB scheme
  - 0-255 value each red, green, blue
  - Brightness is typically
    \[0.299*R + 0.587*G + 0.114*B\]
  - R: 170  G:43  B: 211

Color

- Use it for a purpose, not to just add some color in
Color Guidelines

- Display color images on black background
- Choose bright foreground color (white, bold green,...)
- Avoid brown and green as background colors
- Be sure fg colors contrast in both brightness and hue with bg colors

Color Guidelines

- Use color sparingly--Design in b/w then add color where appropriate
- Use color to draw attention, communicate organization, to indicate status, to establish relationships
- Avoid using color in non-task related ways

- (experiment coming next)
Visual Exercise

- How many small objects?
- How many rectangles?
- How many orange objects?
Visual Exercise

• Left: Find the red letter

• Right: Find the 'A'

Find the...
## Color Associations

- **Red**
  - hot, warning, aggression, love
- **Pink**
  - female, cute, cotton candy
- **Orange**
  - autumn, warm, Halloween
- **Yellow**
  - happy, caution, joy
- **Brown**
  - warm, fall, dirt, earth
- **Green**
  - lush, pastoral, envy
- **Purple**
  - royal, sophisticated, Barney

## Culturally Specific Color Meanings

<table>
<thead>
<tr>
<th>Color</th>
<th>Western European</th>
<th>Japanese</th>
<th>Chinese</th>
<th>Arabic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Danger, Aristocracy (France)</td>
<td>Anger, Danger</td>
<td>Joy, Festive Occasions</td>
<td></td>
</tr>
<tr>
<td>Yellow</td>
<td>Caution, Cowardice</td>
<td>Nobility, Childish, Gaiety</td>
<td>Honor, Royalty</td>
<td>Happiness, Prosperity</td>
</tr>
<tr>
<td>Green</td>
<td>Safe, Sour, Criminality (France)</td>
<td>Future, Youth, Energy</td>
<td>Fertility, Strength</td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td>Masculinity, Sweet, Calm, Authority</td>
<td>Villainy</td>
<td>Virtue, Faith, Truth</td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>Purity, Virtue</td>
<td>Death, Mourning</td>
<td>Death, Mourning</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>Death, Evil</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

http://www.ricklineback.com/culture2.htm
Color Palettes

- Color palette – set of colors used on one screen
- Choose color palette from HSV space by varying and two of H, S, and V.
- Don’t vary hue, saturation and brightness at the same time.
- Unless want continuous tone or ‘artsy’ effect, best to use only 4-6 colors per screen

Color Suites/Palettes

- Designers often pick a palette of 4 or 5 colors

  Professional
  Monochromatic
  Southwestern
Color Guidelines

- Color is good for supporting search
- Color generally faster
  - Shapes (60%)
  - Size (40%)
  - Brightness (40%)
  - Alpha characters (40%)
  - Letters (10%)

Color Guidelines

- Do not use color without some other redundant cue
  - Color-blindness
  - Monochrome monitors
  - Redundant coding enhances performance
- Redundant coding increases discrimination
  - Red triangle
  - Green square
Color Guidelines

- Limit coding to 8 distinct colors (4 better)
- Avoid using saturated blues for text or small, thin lines
- Use color on b/w or gray, or b/w on color

Effect of Colored Text on Colored Background

<table>
<thead>
<tr>
<th>Text Color</th>
<th>Background Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black text on white</td>
<td>Green text on white</td>
</tr>
<tr>
<td>Gray text on white</td>
<td>Light yellow text on white</td>
</tr>
<tr>
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<td>Light green text on white</td>
</tr>
<tr>
<td>Light yellow text on white</td>
<td>Green text on white</td>
</tr>
<tr>
<td>Blue text on white</td>
<td>Pale blue text on white</td>
</tr>
<tr>
<td>Dark red text on white</td>
<td>Red text on white</td>
</tr>
<tr>
<td>Red text on white</td>
<td>Rose text on white</td>
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What is an Icon?

**icon (def), n., pl. icons, icones**

1. A picture, image, or other representation
2. (Eastern Ch.) a representation in painting, enamel, etc. of some sacred personage, as Christ or a saint or angel, itself venerated as sacred.
3. (Logic) a sign or representation which stands for its object by virtue of a resemblance or analogy to it

Also, eikon, ikon. [t. L, t. Gk.: m. eikon likeness, image] – Syn. 2. See image.

Icons

- Icons might or might not "look like" that which they represent:
Icons can be used to represent

- Objects
- Classes of objects
- Actions
- Actions on class of objects
- Properties (attributes)
- Relations
- .......

Icons provide

- Layout flexibility
- Potential for faster recognition
- Potential for faster selection
- Opportunity for double coding
- Language-independent representation
- Opportunity for confusion
  - How to interpret?
  - Too many
  - Not unique
Icon Design

- Relies on drawing ability – hire someone to do it (there are standards and ways to critique icon design)
- Avoid meaningless, gratuitous use of icons
- Too many icons quickly become illegible

Icon Design

- Design task

Curvy road ahead

1-way street
Icon Design Guidelines

- Represent object or action in a familiar and recognizable manner

- Make the selected icon clearly distinguishable from surrounding unselected icons
- Make each icon distinctive
- Make each icon stand out from background
- Make icons harmonious members of icon family
- Avoid excessive detail
- Limit number of icons
- Double code with text name/meaning
Double Coding Example

• Here’s how NOT to do it!
  (Found in the Tech Square Parking Garage, third level)

• Why not?

Icon Design

What do each of these signify?

Almost always want to accompany your icons by a text label

Observation: Icon design has partially moved from symbolic to artistic
What do These Icons Mean?

Icons should be recognizable, memorable, and discriminable

What do These Icons Mean? Answers

Any use of a graphics alphabet?

From Window's Start menu:  
Common document icons:

- cut  
- open
- copy  
- new
- paste  
- save
- spell  
- check
- print
HW 2

- Observing everyday interactions (ATM)
- Watch usage and report on context, task analysis, problems, ...
- Brief report (3 pages or less)
- Due Tuesday 20th
Project Part 1

- Discuss
- Any interesting findings and/or analysis?
- What were the most challenging parts?

Project Part 2

- Design alternatives (many!)
- No working system
- Drawings, sketches, mock-ups, etc.
- What not to do
- Critique each design (strengths, weaknesses)
  - What in part 1 leads to this design?
Upcoming

- Handling errors & help
- Prototyping & UI Software