GUI Bloopers

Graphic Design, Layout, and Web Page/Style Design

Graphic Design and Layout Bloopers

• Once you have GUI controls appropriate for your software you have to decide on:
  – Layout
  – Colors
  – Fonts

• The following bloopers diminish software’s perceived quality – it only takes a few to look amateurish and untrustworthy

• Poor graphic design and layout can also decrease user’s ability and motivation to absorb the software’s content
Blooper 32 : Easily missed information

- Software developers often assume that if information is displayed users will see it. Not so!
- Common flaw: not focusing user’s attention
  - People scan for information, left to right, top to bottom
  - Should design for how human perception works
  - Examples users can miss:
    - Status or mode indicators
    - Prompts for input
    - Results
    - Error or status messages
    - Controls

Blooper 32 Examples

- Information too small or not where the user is looking
Blooper 32 Example

• Information buried in noise

• Consider these prompts:
  – Enter filename and press ENTER
  – Enter username and press ENTER

• Only difference is the second word which has the only real information:
  – Filename:
  – Username:

• Status displays another common trouble spot:
  – Containing tank: normal
  – Pressure valves: normal
  – Fuel rods: abnormal
  – Discharge pump: normal

Blooper 32 Example

• Messages that don’t die
  – New message displayed over a similar old message. Did it change or is it still searching?

Microsoft Office Clip Gallery Search leaves old error messages up and displays new ones over them.
Avoiding Blooper 32

• Construct a visual hierarchy
  – Organize information displays in hierarchical chunks; users ignore irrelevant chunks and find what they want much faster

• Make important information bigger

• Put important information where the user is looking
  – Center of field, not periphery

• Use color to highlight

Avoiding Blooper 32

• If necessary, use heavy artillery
  – Dialog boxes and pop-ups
    • Impossible to ignore, but it better be important
  – Sound
    • Simple beeps usually sufficient
  – Vibration and animation
    • Peripheral vision for stationary objects is poor, but is very good at noticing movement or changes
    • Distracting if too much; have been abused by web advertisers
    • Make sure animation stops quickly and can be stopped
Avoiding Blooper 32

• Don’t bury the wheat in chaff
• Display information graphically instead of textually

<table>
<thead>
<tr>
<th>Note Onset Error</th>
<th>Notes Released</th>
</tr>
</thead>
<tbody>
<tr>
<td>Note Onset Error = 0</td>
<td>Notes were started without bias</td>
</tr>
<tr>
<td>Note Onset Error = 15</td>
<td>Notes were started very consistently</td>
</tr>
<tr>
<td>Note Release Error = 5</td>
<td>Notes were released too early</td>
</tr>
<tr>
<td>Note Release Error = 6</td>
<td>Notes were released very consistently</td>
</tr>
</tbody>
</table>

Overall Score = 89%

A

<table>
<thead>
<tr>
<th>Notes Total</th>
<th>Note Onset</th>
<th>Note Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>131</td>
<td>TOO EARLY</td>
<td></td>
</tr>
<tr>
<td>5 Extra Missed</td>
<td>CORRECT</td>
<td></td>
</tr>
<tr>
<td>6 Extra Blocks</td>
<td>TOO LATE</td>
<td></td>
</tr>
</tbody>
</table>

Overall Score = 99%

B

Rhythm Tutor score display: (A) Before redesign: textual; (B) After: more graphical.

Side Topic: Color

• Technical characteristics of color
  – Hue: Frequency / Wavelength
  – Value: Intensity of the hue
  – Saturation: Purity of the color from gray/vivid

• Use the color wheel

Choose:
  Opposite, nearly opposite
  Varying degree of value for hue
  Equidistant hues
Uses of Color

- Call attention to specific data or information
- Identify elements of structure and processes
- Portray natural objects realistically
- Depict the logical structure of ideas and processes
- Portray time and progress
- Increase appeal, memorability, and comprehensibility
- Reduce errors of legibility or interpretation
- Increase the number of dimensions for coding data

Pitfalls of Color

- May cause problems for color deficient vision (8% of Caucasian males)
- May cause visual fatigue with strong colors
- May contribute to visual confusion if too complex
- May have negative cultural or historical associations
  - E.g., using black in master/slave controller diagram
- May exhibit confusing cross-disciplinary or cultural connotations
  - E.g., Red in Chinese = Warm/Happy, America = Hot/Flashy
1. Use five +/- two colors
2. Use foveal and peripheral colors appropriately
   - Blue for background, not for center
   - Black, white, yellow for periphery, no red or green
   - No blue for text or diagrams

3. Minimum shift in color/size
   - Light text on dark background for dark environment
   - Dark text on light background for light environment
4. High-chroma, spectrally extreme colors may create illusions of shadows/after-images
   - Bright blue/green
5. Use familiar, consistent color coding
   - Red – stop, danger, hot, fire. Yellow – Caution, slow
   - Green – go, okay, safe. Blue – Cold, water, death
   - Warm colors – Action, response
   - Cool colors – stats, background, distance
   - Gray, white – neutral
   - Context-dependent
The 10 Commandments of Color

6. Use the same color for grouping related elements.

7. Color to your audience
   - Men prefer blue to red, women red to blue
   - Men prefer orange to yellow, women yellow to orange
   - Young prefer bright, old prefer sober/restrained colors

8. Use high-value, high-chroma colors to attract attention.
   - Bright red better / faster than yellow, orange
   - Older viewers have easier time with bright

The 10 Commandments of Color

9. Use redundant coding of shape, as well as color, if possible. The more cues to remember an object, the better.

10. Use color to enhance black-and-white information.
    - People remember better with color
    - Different emotional reaction
Examples of Bad Color Usage

• Poor background pattern
  – [http://www.kencole.org/frctltes.htm](http://www.kencole.org/frctltes.htm)
  – Also make background images large enough to avoid repeat pattern
Color Contrast

• Hard to read colors:
  – [http://www2.cajun.net/~hugh/tradewar.html](http://www2.cajun.net/~hugh/tradewar.html)

• Watch out for default colors!
  – Some browsers default to a white background and others to gray. Specify a background color in your body tag to ensure all browsers use the same color.
Blooper 33 : Mixing dialog box control buttons with content control buttons

• This happens when you add new buttons to the standard “OK”, “Apply”, “Close”, “Cancel” buttons

• Everything OK here?

Align Buttons To Controls

• It can be hard to see the connection between the new buttons and data

• Make functions clear by separating content control buttons from window control buttons
Blooper 34 : Misusing Group Boxes

- Group boxes put a visible border around related controls and have a slot for a label
- Serve no purpose around one setting; in this case a simple label is better.

Blooper 34 Examples

Group boxes around one item. (A) Microsoft Windows. (B) National Geographic Trip Planner.
**Blooper 34 Example**

- **Variation: Group boxes within group boxes**
  - Causes needless clutter

![SmartDraw: group boxes nested two and three deep. Some are merely label-holders.](image)

**Blooper 34 Example**

- **Variation: Group boxes around everything**
  - Causes needless clutter

![Unlabeled group box around everything. (A) SoundBlaster Wave Studio. (B) Windows Media Player.](image)
Avoiding Blooper 34

• Use group boxes for what the name suggests – boxing related groups of settings
• Container controls like tables, lists, etc. have their own borders and don’t need a second one
• Label a single setting without putting a group box around it

Blooper 35: Radio Buttons too far apart

• Related radio buttons should be grouped closely together

<table>
<thead>
<tr>
<th>Display:</th>
<th>● Summary</th>
<th>○ Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cheese:</td>
<td>● Mozzarella</td>
<td>○ Jack</td>
</tr>
<tr>
<td>Meat:</td>
<td>○ Sausage</td>
<td>● Ham</td>
</tr>
<tr>
<td>Spiciness:</td>
<td>○ Mild</td>
<td>○ Medium</td>
</tr>
<tr>
<td>Crust:</td>
<td>○ Whole Wheat</td>
<td>● White</td>
</tr>
</tbody>
</table>
**Improved Spacing**

- **Cheese:**
  - Mozzarella
  - Jack
  - Swiss

- **Meat:**
  - Sausage
  - Ham
  - Pepperoni

- **Spiciness:**
  - Mild
  - Medium
  - Hot

- **Crust:**
  - Whole Wheat
  - White
  - Sourdough

---

**Blooper 35 Examples**

E-Notice

If you received an e-mail message from the IEEE San Francisco Bay Area Council and you wish to unsubscribe, please complete and submit the following form:

- **IEEE Member Number:** (included in your e-mail message)
- **Member Name:**
- **List Name:** IEEE San Francisco Bay Area Council e-Notice

If you would like to subscribe to the IEEE San Francisco Bay Area Council e-Notice, be sure to include your e-mail address.

- **Subscribe:**
- **E-Mail Address:**

---

IEEE.org: radio buttons spaced too far apart to be seen as related.
Blooper 35 Examples

Blooper 36 : Labels too far from data fields

• Sometimes GUI’s are developed where the label is placed too far from the control it describes
  — Common in automatic layouts where size is dictated by the largest field or screen width
**Blooper 36 Example**

CA.gov unemployment insurance form: “Yes”/”No” radio buttons are too far from their labels.

• Variation: labels closer to other settings than their own

 LLBean.com: State and ZIP labels closer to previous data field than to their own.

 LLBean.com: hypothetical label components inverted to show their full width.
Avoiding Blooper 36

• Don’t attach labels and data fields to opposite edges of a form or control panel
• Don’t allow a few long labels to dictate the alignment of the entire form
• Labels should be closer to their own field than to other fields
• Put labels above fields

United.com: labels above fields.
Blooper 37: Inconsistent Label Alignment

- Labels should be consistent in where they are placed throughout the application
- Extreme case:

```
<table>
<thead>
<tr>
<th>Repeat</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>weekly</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Until</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/4/2004</td>
</tr>
</tbody>
</table>
```

Blooper 37 Example

Microsoft Office for MacOS: inconsistent label alignment in a single dialog box.
Blooper 38: Poor Window Location

• Where should an application’s windows first appear?

• Heuristics:
  – On-screen
  – Staggered
  – No occlusion

Blooper 38 Examples

• Display all windows at the same coordinates

Blooper: all of an application’s windows open at position [0, 0].
Blooper 38 Examples

• Displaying subordinate windows in middle of parent

Avoiding Blooper 38

• Decide where each window appears
  – Don’t just let the OS decide or use [0,0]
• Optimal position depends on the type of window
  – Primary or informational?
• Stagger windows
• Make sure child windows don’t cover important information
• Don’t place windows directly on top of each other
Blooper 39: Tiny Fonts

- Lots of people with impaired vision can’t read small fonts
  - Includes old folks over 45

MinneapolisFed.org: tiny, nonadjustable fonts in navigation bar.
Blooper Bonus: Un-Natural Order

• Avoid the “random” layout

Add proper tab stops, but also reorganize layout

Excuses for Tiny Fonts

• I can read it. What’s the problem?
• Hey, we gotta fit all this info in somehow.
• I just used the default font.
• It’s not my fault, the text is in the image.
• It’s big enough in low resolution.

• Minimum font size is 10, but 12 better
• Design for high resolution displays
• Let users adjust the font size
• Test it on users
Web Page Design

Yale Design Guidebook

User Interface Design

• We’ll focus on website design, but most of the same concepts apply to standalone applications too
• What makes a good web site?
  – Similar to, but differences from printed medium
  – Hyperlinks!
  – Attempt to make web page “Free Standing”
    • Someone may link to it, or print it
Same Questions as Print

• Who is talking? Is it an individual or an institution?
• What is the content about?
  – Titles, Headers
  – Consider bookmarks
• When?
  – Our CS page is an offender
• Where on your site are you currently located?
  – Navigational aids or pointers to the main page may be appropriate.
  – Button Bars

Every page should have

• Informative title
• Creator’s identity / contact link
• Creation or revision date
• At least one link back to home

• These basic elements will get you 90% of the way to an understandable interface

• Example of missing information:
  – http://www.1amp.com
Fundamentals of Page Design

• What should be on an individual page or screen?
• Don’t dumb-down the readers -- just design to their needs
  – short, fast, easy access
• Guide the user
  – Left to right, top to bottom
  – design appropriately to guide user to the next element
  – Headlines at the top
  – Don’t forget whitespace
Page Design

- Avoid too-fancy graphics (unless experienced)
- Label icons
- Combine navigation bar with logo/graphics, use consistently!
- Remember that the screen is small
- Graphics or Forms too large: Layout more than 600 pixels wide may not properly render on a single page. (1024x768 probably safe assumption today, unless for an ultraportable... or cell phone...)

Image Guidelines

Safe dimensions for Web page graphics

- Use blue dimensions to fill the maximum safe area on most screens
- Use red dimensions for pages that will print well.

US Letter size page = 535 by 670 pixels safe area
Page Design Guidelines

Grid Layout

Page Template
## Fonts Different on Platforms

<table>
<thead>
<tr>
<th>Windows 95, 12 pt type</th>
<th>Macintosh, 12 pt type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arial</td>
<td>Arial</td>
</tr>
<tr>
<td><strong>Arial Black</strong></td>
<td><strong>Arial Black</strong></td>
</tr>
<tr>
<td>Arial Narrow</td>
<td>Arial Narrow</td>
</tr>
<tr>
<td><strong>Arial Rounded MT Bold</strong></td>
<td><strong>Arial Rounded MT Bold</strong></td>
</tr>
<tr>
<td>Book Antiqua</td>
<td>Book Antiqua</td>
</tr>
<tr>
<td>Bookman Old Style</td>
<td>Bookman Old Style</td>
</tr>
<tr>
<td>Century Gothic</td>
<td>Century Gothic</td>
</tr>
<tr>
<td>Century Schoolbook</td>
<td>Century Schoolbook</td>
</tr>
<tr>
<td>Courier New</td>
<td>Courier New</td>
</tr>
<tr>
<td>Garmond</td>
<td>Garmond</td>
</tr>
<tr>
<td>MS LineDraw</td>
<td>MS LineDraw</td>
</tr>
<tr>
<td>Times New Roman</td>
<td>Times New Roman</td>
</tr>
<tr>
<td>Verdana</td>
<td>Verdana</td>
</tr>
</tbody>
</table>

## Page Guidelines

- Consider tables without borders to control text layout or even better is CSS
- Caution with frames!
  - Opening new pages in frames
  - Search engines don’t track frame context
  - Problems with back button
Technical Considerations

• Plug-Ins
  – PDF, Flash, RealAudio, etc.
  – Don’t use unless necessary or if you know that almost all of your targeted users will have the plug-in application already installed

• Java, Javascript, Flash?

In Lynx:

Technology

• Compare to Yahoo!
Animation

• Animation
  – Appropriate for a very limited number of web sites
  – Can be distracting and generally not appropriate on information or e-commerce web sites
  – Appropriate for children, entertainment, perhaps ads

  – Example: http://www.aurigamusiconline.com/
  – Example: http://www.qualitycollisionservices.com/
  – Example: http://www.ridertown.com/

User Behavior on the Web

• Reduce clicking
  – Users prefer menus with at least 5-7 links
  – Prefer dense screen with many choices over deep path with few choices
  – Chunking of data vs. hundreds of individual menu choices
Clicks per User

- Study by Huberman, et. al 1998
- Users clicking on a given number of links within a site
  - Most click once!
  - Average is three clicks
- One of Huberman’s “Laws of the Web”

Organizing Information

- Divide your content into logical units to minimize the number of clicks
- Establish a hierarchy of importance among the units
- Use the hierarchy to structure relations among units
- Build a site that closely follows your information structure
- Analyze the functional and aesthetic success of your system
Chunk your Info

• Chunking
  – Short chunks of information that fit on a screen
  – Few users read long passages of text on screen
  – Discrete chunks lend themselves to a link
  – Supports a uniform format
• Text Length
  – Yale Style Guide suggests a max of four screens of information in most cases

Site Design

• “Chunk” your information
Site Organization

**Too Shallow**
Main menu becomes a massive “laundry list” of unrelated topics

Site Organization

**Too Deep**
Menus are numerous and too thin. Users are driven through an endless series of nested menus.

Content pages
Balanced Site Organization

Range of Choices
Case Study

• Time is Money -- redesign at Sun
• Average employee views 12 intranet pages per day
• Could save 5 minutes per week per employee by redesigning the site
• $10 million/year in “lost” time

Example of Menus

• Too flat and shallow
  – Get There Fast
  – UAA Weather Observation Database
• Good example of chunking
  – Yahoo’s Site
Navigation Techniques

• Topical Sections
  – Most common technique
  – Problem if user picks wrong topic
  – Some pages in multiple topics

• Path Analysis
  – Provide user the path that was used to reach the current page, shows where they are now
  – Requires hierarchical organization

Screen Size and Good Navigation

• Caution with right-hand menus
  – Example: UAA site
  – One study showed that it does provide easier access to scrollbars for longer pages with more to navigate
  – What about menus on the bottom of the page?

• Can address browser width issue programmatically:
  – http://www.google.com
Preferred Navigation

• Left seems to be best

![Example of a Top – Left – Left navigation structure.](image1)

Preferred Navigation

![Example of a Left – Left – Left navigation structure.](image2)
Preferred Navigation

• Kingsbury and Andre's Study
  – Results showed that the left-left-left (LLL) and left-top-top (LTT) navigational structures were the top performing and most preferred.

• The three navigation structures eliciting slower performance and lower preference ratings were:
  – Top – Top – Left (TTL)
  – Top – Left – Top (TLT)
  – Right – Top – Right (RTR)

Summary of Interface Design Tips

• Build Navigational aids.
  – Navigation bars, frames
  – Critical for giving user a sense of where they are
  – Must provide context, e.g. bar with page headers
  – User shouldn’t have to go “back” to figure this out

• Avoid dead-end pages

• Keep download time short
  – Frustration after 10 seconds

• Consistency!
  – E.g., keep “home” button in the same place, don’t change link colors
  – Simplicity often appreciated

• Offer feedback

• Design for the disabled
  – ALT tags
    • E.g., modem user might disable graphics
  – Use elements as designed
    • E.g. don’t use blank GIF as a spacer
Some Design Considerations

- Animations (e.g. Flash), older browsers, web TV won't view them
- Need for “What’s new?” RSS? Only if lots of new content
- FAQ page
- Site Cover - splashy graphics or animation to draw users in. For others, an annoying click that needs to be bypassed.

Top Ten Mistakes

- Jakob Nielsen’s top design mistakes
  1. Using Frames
  2. Gratuitous use of bleeding-edge technology
  3. Scrolling text, marquees, and constantly running animations
  4. Complex URLs
  5. Orphan pages
  6. Long, scrolling pages
  7. Lack of navigation support
  8. Non-standard link colors
  9. Outdated information
  10. Overly long download times
Evaluating Your UI

• Don’t forget User Centered Design

• User Testing
  – Focus Group
  – Ask users to perform a task, watch sequence of steps taken
  – Time users on specific tasks
    • E.g., shopping for a specific item

• Build from your users and work your way up!
  – Readjustment to meet user needs