Graphical Screen Design

Grids are an essential tool for graphical design

Important graphical design concepts include

visual consistency   visual relationships

visual organization   legibility and readability

navigational cues   appropriate imagery

familiar idioms

Screen Interactions

How we are able to interact with elements on a screen is very important.

If the technology supports it, direct interaction and manipulation is usually the best design direction, for example.

However, if precision is important, direct manipulation might be out-performed by +/- buttons or text entry.

The course topic we are looking at now is at the visual design of the screens with which users interact…

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Graphical Design

Good GUI design must account for:

- comprehensible mental images
  - eg: good use of metaphors

- appropriate organization of data, functions, tasks and roles
  - eg: support a reasonable cognitive model

- quality appearance characteristics
  - sometimes called the "look" of a UI

- effective interaction sequencing
  - sometimes called the "feel" of a UI

These ideas are not new…

- "Macintosh Human Interface Guidelines"
- "Principle of Effective Visual Communication for GUI design"
  - Marcus article in "*Human-computer interaction: toward the year 2000*" *by* Baecker, Grudin, Buxton and Greenberg
- "Designing Visual Interfaces" (1994) - Mullet & Sano, Prentice Hall

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Components of Visible Language

Layout
- formats, proportions, and grids

scarves: 10.75
hats: 5.43

Typography
- typefaces and typesetting

bold serif `fixed`
italic sans-serif variable

Imagery
- signs, icons, symbols; concrete to abstract

Sequencing
- how the interface unfolds

Visual identity
- unique appearance

Animation
- dynamics of display

Color and Texture
- convey complex information and pictorial reality

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Use of Grids

Horizontal and vertical lines to locate window components
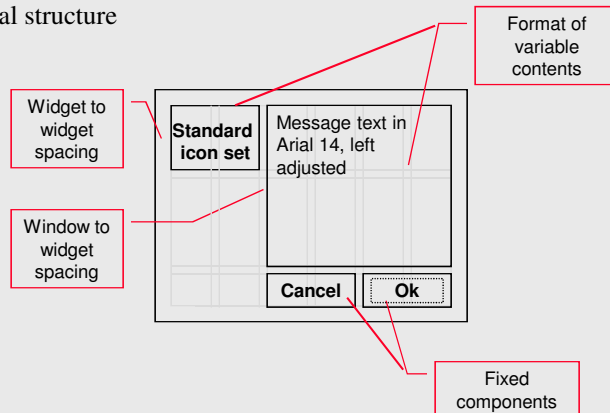- aligns related components

Organization
- contrast to bring out dominant elements
- grouping of elements by proximity
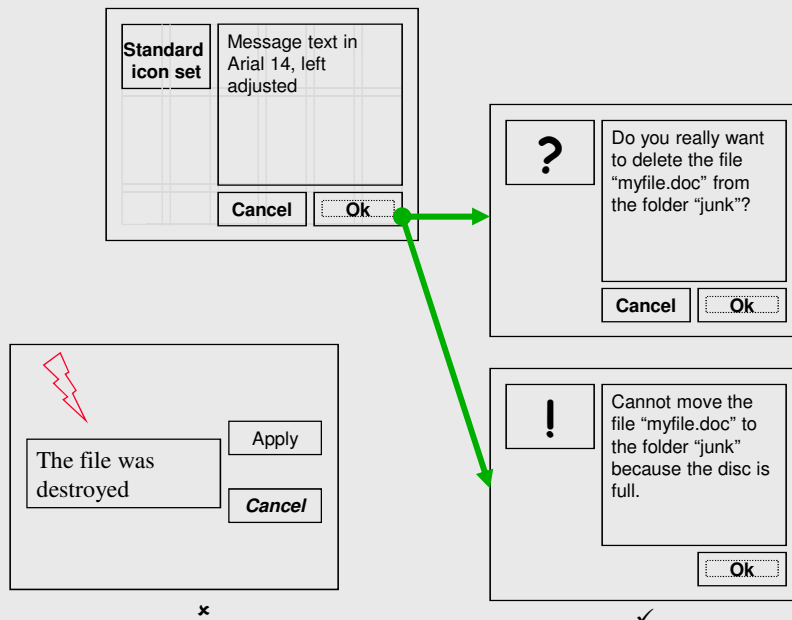- show organizational structure
- alignment

Consistency
- location
- format
- repetition
- organization

Format of variable contents

Widget to widget spacing

Standard icon set | Message text in Arial 14, left adjusted

Window to widget spacing

Cancel | **Ok**

Fixed components

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Using same Grid-Based Template across project

Standard icon set | Message text in Arial 14, left adjusted

Cancel | **Ok**

? Do you really want to delete the file "myfile.doc" from the folder "junk"?

Cancel | **Ok**

The file was destroyed

Apply

Cancel

✗

! Cannot move the file "myfile.doc" to the folder "junk" because the disc is full.

Ok

✓

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Ok

✓

3

Generic Grid to Specific Use

Two-level Hierarchy
•indentation
•contrast

Logic of organizational flow

Grid for Form Type 1

Heading 1

Label Text field

Label Combo1

Label Large multiline text field

Heading 1

☐ Check box   ☐ Check box
☐ Check box   ☐ Check box

Apply   Cancel

Note Sender

Send to

Name

Email

Message

Instructions

Type Normal mail

☑ Include attachememts
☐ Carbon copy

Apply   Cancel

Alignment connects visual elements in a sequence

Grouping by white space

Classic Mac Guidelines (the 1980s)

Image Preferences

Image Type:
Monochrome | Gray Scale | Color

EPSF Quality:
Use Preview Image | Use Postscript

Greeking Text Limit:
7.0 pt.

Options:
☐ Auto Backup on Save
☐ Auto Save Every ____ Minutes

Apply   Cancel   Reset

Image Preferences

Image Type: Monochrome | Gray Scale | Color

EPSF Quality: Use Preview Image | Use Postscript

Greeking: 7.0 pt.

Options: ☐ Auto Backup on Save
☐ Auto Save Every ____ Minutes

Apply   Cancel   Reset

Classic Mac Guidelines (the 1980s)

Find dialog box "English"

More Choices dialog box "English"

Find dialog box "Arabic"

More Choices dialog box "Arabic"

Classic Mac Guidelines (the 1980s)

Display rectangles are different sizes.

Display rectangles are same size.
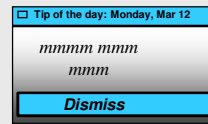
Visual Consistency

Internal consistency
- same conventions and rules for all elements of the GUI unless strong reason
- having a set of application-specific grids can help enforce this

Package/Suite consistency
- in a "family" of products, a consistent look and feel (this can be important for users and transfer effects)

External ("platform") consistency
- follow platform and interface style conventions
- use platform and widget-specific grids
- deviate from conventions only when it provides a clear benefit to user

Help □	Warning □	□ Tip of the day: Monday, Mar 12
? mmmm mmm mmm mmm	! mmmm mmm mmm	*mmmm mmm mmm*
(Okay)	(Okay)	***Dismiss***
	✓	✗

Relationships between screen elements (Grouping)

Link related elements, disassociate unrelated elements

- proxemic clusters
- white (negative) space
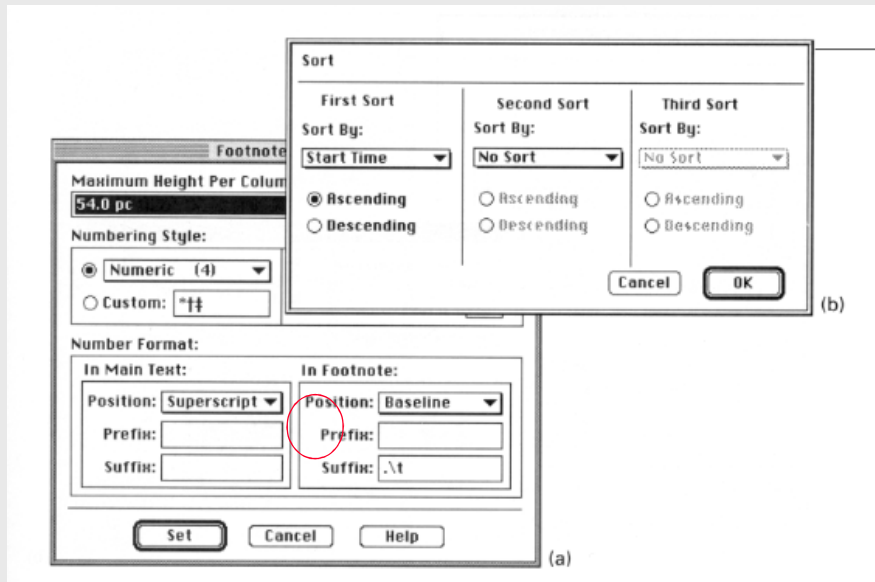- alignment
- explicit structure

Mmmm: [   ]   Mmmm: [   ]   Mmmm: [   ]

Mmmm: [   ]   Mmmm: [   ]   Mmmm: [   ]

Mmmm: [   ]   Mmmm: [   ]

Mmmm: [   ]   Mmmm: [   ]   Mmmm: [   ]

Mmmm: [   ]   Mmmm: [   ]   Mmmm: [   ]

☹   ☺   ☺

Explicit Structure via *Lines* can get cluttered

Sort

First Sort
Sort By:
Start Time ▾
◉ Ascending
○ Descending

Second Sort
Sort By:
No Sort ▾
○ Ascending
○ Descending

Third Sort
Sort By:
No Sort ▾
○ Ascending
○ Descending

Cancel   OK

(b)

Footnote

Maximum Height Per Column
54.0 pc

Numbering Style:
◉ Numeric (4) ▾
○ Custom: *†‡

Number Format:

In Main Text:
Position: Superscript ▾
Prefix:
Suffix:

In Footnote:
Position: Baseline ▾
Prefix:
Suffix: .\t

Set   Cancel   Help

(a)

Using explicit structure as a crutch
from Mullet & Sano

UMEG | Grades | Enter Grades - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back ▾ ⊗ ⟳ Search Favorites Media

Address https://www.umeg.umd.edu/bin/grdEntry   Go

UMEG

University of Maryland Electronic Grading system

Logout

Rosters   Grades

Enter Grades   Review Grades   Correct Grades   Authorize Grader   Incomplete Grades

Term: Fall ____   Title: _____
Course: CMS____   Instructor(s): Golub, Evan
Section: 0101   TA(s): None

For a list of grade definitions, click here.
Only getting a partial grade roster for a 300- or 400-level course?
We ONLY monitor Early Warning Grades for first-year students and student athletes in 300- and 400-level courses.

Use Text Entry   Save and Finish Later   Submit Grades   Quit Without Saving
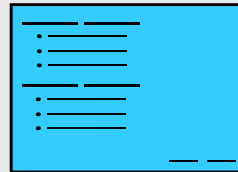
UID	Student Name	Grade
		+ A - + B - + C - + D - F S U Z
		+ A - + B - + C - + D - F S U Z
		+ A - + B - + C - + D - F S U Z
		+ A - + B - + C - + D - F S U Z
		+ A - + B - + C - + D - F S U Z

Done   Internet

Navigational cues are good because they...

- provide initial focus
- direct attention to important, secondary, or peripheral items as appropriate
- assist in navigation through material
- order should follow a user's conceptual model of sequences
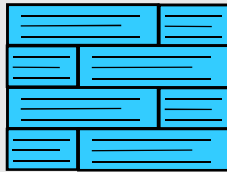
Economy of visual elements

- General philosophy sometimes expressed as "Make simple things simple, and hard things hard."

- Try to minimize number of controls

- Include only those controls that are necessary
  - eliminate, or relegate others to secondary windows

- Minimize clutter/overload (don't fear multiple windows)
  - so information is not hidden/obscured
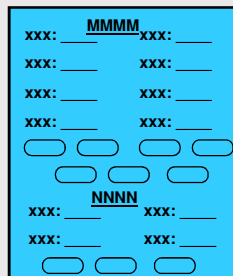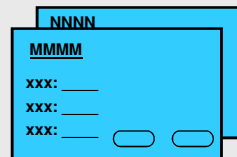
Tabs to help Visual Economy

Excellent means for factoring/grouping related items.

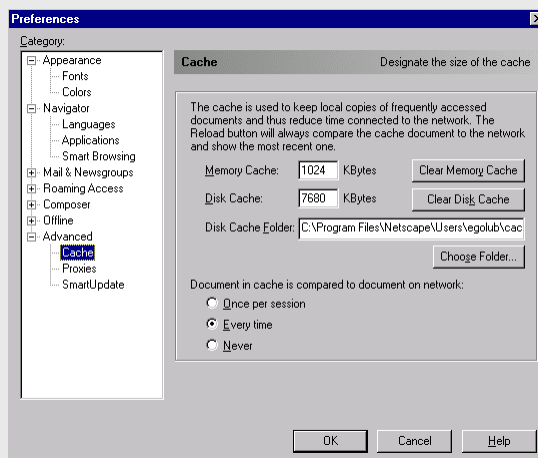**However, can be overdone or not taken far enough, so think it out!**
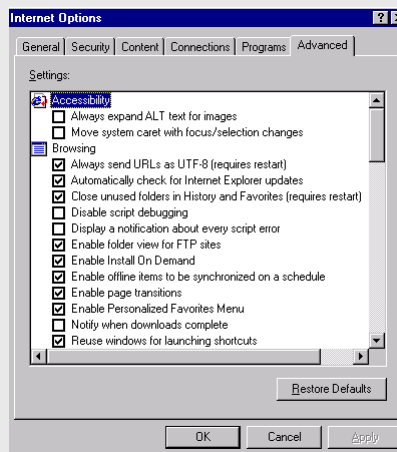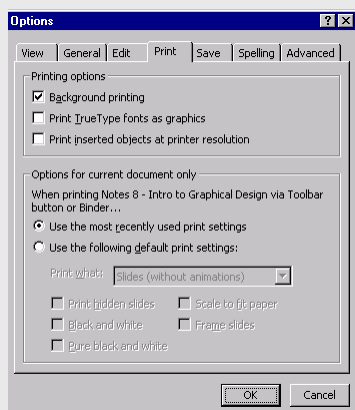
Tree Views to help Visual Economy

Another excellent means for factoring/grouping/clustering related items.

However, these can be difficult for some users to know how to use them.

Legibility and readability (I)

Characters, symbols, graphical elements should be easily noticeable and distinguishable.

Text set in
Helvetica

Text set in
Times Roman

✓

TEXT SET IN
CAPITALS

**Text set in
Braggadocio**

Text set in
Courier

✗

Legibility and readability (II)

Proper use of typography
- 1-2 typefaces (3 max)
- normal, italics, bold
- 1-3 sizes max

Large
Medium
Small

Readable

Design components to be
inviting and attractive

Design components to be
inviting and attractive

✓

Large
Medium
Small

Unreadable

Design components to be
inviting and attractive

Design components to be
inviting and *attractive*

✗

Legibility and readability (III)

Typesetting
- point size
- word and line spacing
- line length
- indentation

Readable

Design components to be inviting and attractive

Design components to be inviting and attractive

✓

Unreadable: Design components to be easy to interpret and understand. Design components to be inviting and attractive

✗

Imagery

Signs, icons, symbols
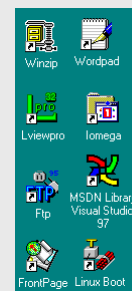- right choice within spectrum from concrete to abstract

Icon design *very* hard
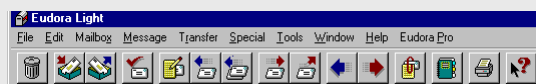- except for most familiar, always label them

Image position and type should be related
- image "family"
- don't mix metaphors

Consistent and relevant image use
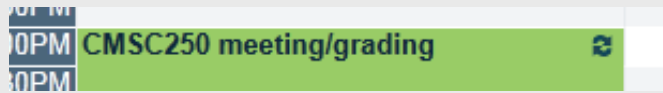- not gratuitous
- identifies situations, offerings...

Partial icon family

Accurate/Appropriate Imagery

What does that icon in the upper-right corner mean on this event scheduling page?

CMSC250 meeting/grading

Visual Identity

Think about the GUI of systems such as the various "generations" of Windows (eg: 3.1/95/XP/7), MacOS (eg: 6/7/8/9/X), NeXT, mobile, etc. and how easily you could spot them in a visual line-up.

Microsoft Windows
Version 1.01

Copyright (c) Microsoft Corporation, 1985. All Rights Reserved.
Microsoft is a registered trademark of Microsoft Corp.
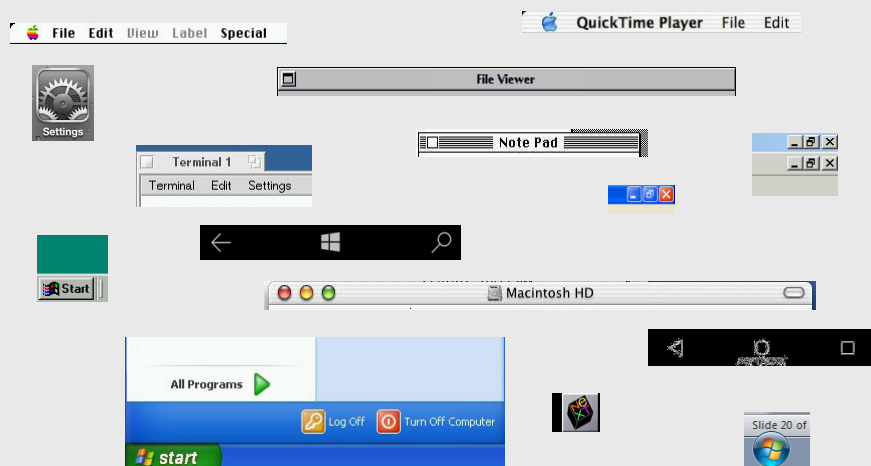
Motion/Animation: Many forms…

Some examples are fading transitions such as some menu animations as sub-menus open, directional effects such as minimizing in OS X using the genie effect, fisheye effects such as the magnification option on the MacOS X docking bar, zooming such as pinching (or unpinching?) on mobiles, and "traditional" animations (like animated gifs) to name a few. There can be both good and bad consequences. Here are some examples:

•Pro: Could provide more visual cues about a transition.
•Pro: Could inform a user that they can interact with an item.
•Pro: Could give sense of locality and/or relationships within data or documents.

•Con: Could make the process slower overall.
•Con: Could be visually distracting.
•Con: Could become "annoying" to the user.

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Color

The selection of the "right" color scheme can be important in design.

Some things to consider include:
- metaphor issues: red=**bad**, green=**good**
- psychological issues: light blue-green=tranquil, red=take a risk
- conflicting colors: `dark blue on black` -vs- `blue on yellow`

Some Examples of Web resources (there are far many more):
http://www.colorschemer.com/online.html
http://www.colormatch.dk/

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Some Examples of Color Use

What do you think these colors mean here?

Visual Cue for Current Position

◄ Gooooooooooooooooooogle ►
Previous 1 2 3 4 5 6 7 **8** 9 10 11 12 13 14 15 16 17   Next

Below is what I would call a poorly designed menu. Everything looks inactive, but they were actually live links. There are no actual visual cues until mouse-over.
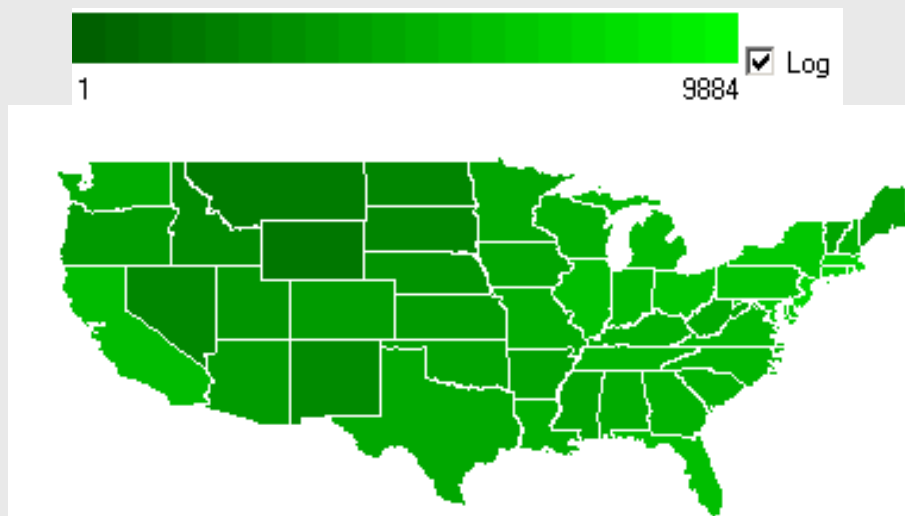
RESOURCES FOR:

ALUMNI

BUSINESS, INDUSTRY AND GOVERNMENT

CURRENT STUDENTS

FACULTY AND STAFF

MEDIA

PARENTS, FAMILIES, FRIENDS

PROSPECTIVE STUDENTS

VISITORS

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FACULTY AND STAFF

MEDIA

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PROSPECTIVE STUDENTS

VISITORS

An example of using gradation

1   9884   ☑ Log

Can you see relative levels for the states at a glance?

Universal Usability

Something that in some ways is a topic of its own, but that is strongly tied to this topic is universal usability, but I will discuss that more in the "Web Design" slides.

What you now know

Grids are an essential tool for graphical design

Important visual concepts include
- visual consistency
  - repetition
- visual organization
  - contrast, alignment and navigational cues
- visual relationships
  - proximity and white space
- familiar idioms
- legibility and readability
  - typography
- appropriate imagery

The use of color and animation needs to be considered carefully

Evan Golub / Ben Bederson / Saul Greenberg

Readings…

Optional reading after this slide set is "Designing the User Interface" Chapter 12 (advancing the user experience).