visual design

learning goals

- Explain why visual design is important and useful to consider when building interfaces
- Describe visual hierarchy, visual flow proximity and grouping, positive/negative space, and how they are related to one another
- List the gestalt principles of closure, continuation, similarity, and proximity, and briefly explain the differences between each
- Give examples of how all of the above can be achieved effectively using visual cues
- For a given design: identify examples of the above concepts and critique their effectiveness in that design

Ask yourselves…

What are the goals visual design?
i.e., what are we trying to do?

What are the acts of visual design?
i.e., what are we actually doing?
Acts of graphic design

**Typography:** manipulating type (i.e., fonts, characters, glyphs, etc.) for readability, emphasis, and aesthetic value.

**Illustration:** creating symbols and pictures to communicate a concept (can include photography).

**Layout:** arranging graphic elements (type, illustrations, lines, etc.) on a workspace (page, device, etc.).

**Animation:** setting the changing properties of graphic elements over time.

**Interaction:** animating with user input.

goals of visual design

**Main goals:** to direct your user’s attention and communicate meaning.
- **provide guidance:** by communicating structure, importance, and relationships
- **control pace:** by providing orientation, space to breathe, clean routes through content
- **express meaning:** by communicating style, feeling, message, emotion, engagement

questions to ask while doing visual design

*Every graphic design is a kind of user interface, so ask yourself UX questions.*

- practical considerations, e.g.,
  - is it readable?
  - understandable?
  - efficient?
  - what’s the experience of using it?

- aesthetic considerations, e.g.,
  - what feelings, emotions, etc. does the design evoke?
  - is it clean and/or nice to look at?

visual language

- A **visual language** is like a spoken language: it’s a set of signifiers that convey meaning.
- layout, typography, colour, all factors in visual language.
  - need to understand them to exploit them effectively

- a visual language is defined by:
  - tradition and culture
  - human perception and cognition

*Like spoken language, it’s really complicated and ever-changing. Not just one thing.*
Page layout is the art of manipulating the user’s attention on a page to convey meaning, sequence, and points of interaction.” – Tidwell. Designing Interfaces (2006)

**Definition**: arranging graphic elements (type, illustrations, lines, etc.) on a workspace (page, device, etc.).

A good layout considers:

- visual hierarchy; visual flow; grouping & alignment; positive and negative space

**Visual Hierarchy**

**Definition**: the structure of information on a page that communicates order, emphasis, and relationship.

Communicating designer’s conceptual model:

- **Emphasize** what’s most important; **de-emphasize** what isn’t.
- start with structural hierarchy
  - how should the information be organized/grouped?
  - what’s the same? what’s different? what’s related?
- communicate levels/differences in hierarchy with one or more **visual cues**
what's in a hierarchy?
example: elements of applications

visual cues

- **Definition:** sensory input via the eyes that are processed during visual perception—basically, everything on the page
- own every dot/line/pixel; be aware what you’re communicating by presence and absence
- use individual or combined cues, including (not limited to):
  - whitespace, groupings, indents and alignments
  - line breaks
  - contrasting **font**, **weights**, **colours** or **SMALL/LARGE CAPS**
  - graphics, lines, rules, bars, etc.

visual flow

**Definition:** the order in which the eyes/attention naturally pass through page elements

- **focal points:** are deliberate visual cues to draw the viewer’s attention
- **points of entry:** where you start on the page

English speakers naturally read left-right, top-bottom
- Consider the “Z”
- focal points can counterattack this flow
- is that good or bad? depends on what you’re going for

1. what elements are in this example?
2. what visual cues communicate this hierarchy?
1. what’s the point of entry?
2. what visual cues manipulate the visual flow in this dialog?

**gestalt: grouping and alignment**

usually a question of “what goes with what”?

- grouping and alignment can be used intentionally to create hierarchy and visual flow

two ways to approach the problem:

- knowledge of human perception can help
  – e.g., gestalt principles
- grid systems
  – smashingmagazine.com/2014/03/design-principles-visual-perception-and-the-principles-of-gestalt/

---

**gestalt principles**

examples of cognitive principles that explain how people interpret groupings and alignments

**proximity:** nearby things are perceived as related

**similarity:** things that are the same in size, shape, color etc. are perceived to be associated

---

**gestalt principles**

**closure:** groups of things that create shapes/forms are often perceived as whole forms

**continuation:** users tend to perceive curved or straight lines caused by alignment

redrawn from Tidwell. (2012). Designing Interfaces.
activity: design critique

work in groups 2-3
• we will take up and discuss together

summary: gestalt

• many other principles that we haven’t discussed here
• and there’s lots more detail to know about the mechanisms of how they work, both
  – within the human perceptual system
  – and how to manipulate them

supporting alignment: grid systems

act as a framework to organize elements in a logical way
• origins in print media
• increasingly common in web frameworks

grids vary in complexity
• can be challenging to build a grid for complex layouts
• even simple grids are useful to layout major components of designs
web layout, same grid

breaking alignment
misaligning items on purpose can be very effective.
Compare:

breaking alignment cont.
but when not done carefully, it just looks off.

I have this really great grid layout.

positive vs. negative space
positive space: the space your objects occupy
negative space: the space between and around your objects (often “whitespace”).

- defines the content in the positive space
- defines focal points

• one common philosophy is to strive for a balance
  - not too cluttered; not too empty

example inspired by Lupton (2004). Thinking with Type.
consider positive vs. negative space when applying other concepts
e.g., proximity only works to show what's related if there is enough space between groups

e.g., good alignment, grid use, visual hierarchy, all work best with consistent application of white space

practicing good visual design
good design
• is invisible
• requires making tradeoffs
• is not just a matter of preference
  – there are right ways to approach the problem
  – you should be able to justify any element in your design

try to solve your design as opposed to just creating a design

practicing good visual design
How do you know whether you’re design is successful?
just like everything else in this class . . .
- Self critique
- Post mortems
- Discount methods
- Usability studies
- Justification – can you explain to someone else WHY it’s set up a certain way?

Starting a visual design...
1. Make sure you know about all of the elements that need to go into the design
   • UI elements
   • Dimensions and abilities of your display system
   • Content
2. Make grid system on your page.
3. Distribute UI elements onto your page.
4. Rearrange grids and previous elements.
break

learning goals

• describe basic typographic concepts
  • e.g., x-height, cap height, ascender, descenders, baselines, serif/sans-serif, measure, line spacing
• explain and give examples of how these typographic concepts influence readability and legibility
• describe and give examples of some basic guidelines for choosing colors

some basic anatomy

A shiny manx cat

cap height  ascender height  x-height: height of the body of lower case letters (literally the height of a lower case x).

baseline: where the letters sit.
important edge for alignments
descender height
effects of x-height on legibility

variation affects apparent size, space efficiency, visual impact

<table>
<thead>
<tr>
<th>Calibri</th>
<th>Century Gothic</th>
<th>Cochin</th>
</tr>
</thead>
<tbody>
<tr>
<td>tall x-height</td>
<td>tall x-height</td>
<td>short x-height</td>
</tr>
</tbody>
</table>

tall x-heights
- are often easier to read at small sizes
  - double story letters are less compressed (e.g., e, a, s)
- but look bulky when large in small spaces (denser)
  - letters with ascenders/descenders often suffer, because less differentiated from main body

legibility vs. readability

legibility: how well you can make out individual letters in a font
- largely influenced by the design of the font itself
  - e.g., x-height, ascenders/descenders, serifs, ornament, etc.

readability: arrangement of whole groups of text
- influenced by the arrangement of whole groups of text
  - e.g., line spacing, measure, serifs

serifs

serifs are the little handles on some fonts

sans-serifs: literally without the serifs

the following guidelines reflect common design wisdom…

BUT when to use which actually a heavily debated question!
- very few recent scientific studies
- many old studies now criticized as flawed

legibility on web vs. print

detailed rendering of serifs can be effected by low resolutions
- so sans serif generally recommended for screens

graphic from www.urbanfonts.com
common arguments for serifs

SERIFS
guide the eye horizontally between letters

SERIFS give the eye something to hook onto ➔ see whole words easier

GUIDELINE: use serifs when you have a lot of body text to reduce reading fatigue

common arguments for sans serif

SAN SERIF
easier to read at small sizes on screens

sans serif sans serif sans serif sans serif

better retains shape when blown up

GUIDELINE: use for emphasis and headings, body text onscreen

point size

point size: often defined as cap height to lowest descender (but definition varies)

• measurement of point size is a historical precedent
  – from when type was set on lead blocks digitally fonts are defined in a sort of imaginary box.

• what you should need to know: what maps to 12pt in one font will often varies for a different font

Calibri Helvetica Courier New

typesetting

line spacing

line spacing (leading): measured from baseline to baseline. Term 'leading' refers to the use of lead blocks to space letters in printing.

• standard spacing = 120% of point size
  – e.g., 10pt font would have 12pt spacing

• but different fonts at different sizes often needs adjustments

• And depending on the context and feeling you want to evoke ➔ may want to increase or decrease spacing
Variations in line spacing

Designers play with line spacing in order to create distinctive layouts. Reducing the standard distance creates a denser typographic color—while risking collisions between ascenders and descenders. Expanding the line spacing creates a lighter, more open text block.

What is the effect of the different spacing?

Text & example from: Lupton. (2004). Thinking with Type.

Typesetting measure

Measure: length (width) of a line of text on the page

The measure of your text has implications for readability.

Shorter lines are generally easier to read than longer lines.

Because long lines break up the reader’s rhythm and they are more likely to lose their place when the eye starts the next line.

→ Aim for something in the middle (that feels easy to read)
  • for reading: ~65 characters (± 10)
  • for headers: width to length ratio changes

Legibility vs. readability

Rules to remember

An illegible font, no matter how you set it, won’t be readable.

Poor setting can make a legible font completely unreadable.

So which font do I use?

Common heuristic: maximum 3 fonts

• use other visual cues to distinguish further, e.g.,
  – different sizes for different headings

  HEADING 1
  HEADING 2
  HEADING 3
  – mixing of CAPS and Sentence case
  – bold and italic for emphasis
  – color to communicate similarity and difference
so which font do I use?

consider your constraints
– what types of elements do you have?
– how much space do you have?
– what's the context and/or technology (web vs. mobile)?

choose a font and typeset it to:
– balance good legibility / readability
– achieves the look / feel / personality you want

colour

Part 2:

colour

color wheels, choosing and combining colours
colour in information design.

consider the use of typography in the following examples:
• what feeling or mood do you think each is going for?
• what factors are in play that achieve this?
http://www.mcsweeney's.net/tendency
http://ballastmag.com/
http://www.theglobeandmail.com/

colour in visual design

colour has many uses in design, which include:
• creating visual cues and hierarchy
• conveying feeling, style
### Colour Models

**Additive**: add light together (computers, RGB)

**Subtractive**: take light away (ink, CMYK)

### Super Ultra Basic Colour Theory

**Shades and Tints**

- **Shade**: adding black to hue
- **Tint**: adding white to hue

Even though this shows discrete colours, it's really a continuous gradient (infinite colours from white to black).

### Color Relationships

- **Complementary colours**: are a good place to start
  - Work best in as a combination of main colour/accent
  - But are hard to read when used as text on background

*Image from Williams (2008). The non-designer's design book*

### If You're Interested

**Many Other Colour Relationships**

- **E.g., triads**: a set of three equidistant colours
  - These tend to harmonize well

*Image from Williams (2008). The non-designer's design book*
combinations of colors

• most colour combinations can look good together
  – the key is to vary the contrast to enhance readability
  – to increase contrast, you can adjust shade/tint of colours that bump into one another

this is pretty hard to see
this has some contrast

guidelines for choosing colors

• discussed in W11 reading (Tidwell)
  – use as broad guideline (not for specifics)
• limit your palette – use what you need;
• think about what you intend to communicate with color!
  you might use color to:
  – communicate information or hierarchy
  – evoke certain emotions or feelings
    – e.g., calm and warmth
    – e.g., edginess and tension
    – e.g., energy and excitement

• use colour-blind safe colours
  – ALWAYS for critical information
  – when colour is the only way to distinguish the content

• less important to avoid common color-blind combinations
  if multiple visual cues distinguish same content

  e.g., for showing changes in stock prices, which is best?

<table>
<thead>
<tr>
<th>Change in %</th>
<th>Red</th>
<th>Green</th>
<th>Blue</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.08%</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>0.90%</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>0.8%</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>0.90%</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

resources

• color index books
• color blind simulators: http://www.vischeck.com/
• color advice for maps and data: http://colorbrewer2.org/
Advanced techniques

Advanced technique 1: make rules

Creating rules for yourself are a great way to populate your “design toolkit.”

e.g. ALWAYS put the visual centre higher than the mathematical centre.

e.g. NEVER trap white space

Advanced technique 2: break rules

Breaking your (and others’) rules intelligently is even better…but you should be ready to defend yourself!

Advanced design is about designing the design space

The design space is really, really big.

You need to filter it down.

A savvy designer spends their time working to reduce their work time later.

All of the following are techniques for making your choices later easy.
Stylesheets

Most design programs/paradigms allow you to define a style once, and use it many times.

A stylesheet is a list of definitions of UI element’s visual attributes, e.g., font sizes, line widths, colours.

*Think CSS, paragraph/character styles, etc.*

Every UI element should be associated with a named class.

The power of a style sheet is in redefining your elements: you can change the definition of a style and have all elements automatically update.

Libraries

Libraries are lists of modular, reusable UI elements that can be input into a design.

If you’re going to be designing a lot of things that share elements, create a library of commonly used items.

Masters

Similar to libraries, a master is a reusable layout template that can be used to initiate a design.

Similar to stylesheets, a master can be updated and all of the changes can cascade to every layout started with that master.

Colour palettes

A predefined set of colours that work well together.

Usually chosen for a particular aesthetic or function.

Helps to reduce the design space, create consistency, save time.
Design systems

Typically, visual designers don’t design a single product; instead, they design a series of products that work together.

Design systems are composed of:

- Stylesheets
- Libraries
- Masters
- Colour palettes
- Grid systems
- Assets such as logos
- A set of guidelines on how to use the above (see brand.ubc.ca for an example)