SWE 432 -Web Application Development

Fall 2021

George Mason University

Dr. Kevin Moran

Week 13: Interaction Techniques & Visual Design

Administrivia

- *HW Assignment 4* - Due Today!
- *HW Assignment 5 -* Out now, Due in 2 weeks (November 30th)!
- *Reminder:* Recorded Lecture for November 23rd (next week)

Quiz #7 Review

- What makes an interface usable?
- Identify one Heuristic violation …
- What's the difference in when and how you might use a sketch, storyboard, or prototype in the design process?

HW Assignment #5

Overview

In this homework, you will conduct a think-aloud usability study to identify usability issues with existing web application(s) and then prototype the design of a new interface that addresses these issues.

Step 1: Develop user task

In this step, you will select a user task. You should follow the guidelines for choosing and communicating tasks given in the Week 12 Lecture. Your task may focus on a single web application (e.g., PatriotWeb) or may involve multiple applications. You should choose a task that is challenging for users. Write up a description of your task which you will give to participants. You should aim for a task that will take participants 10-15 minutes.

HW Assignment #5

Step 2: Conduct think-aloud usability evaluation

In this step, you will conduct a short think-aloud usability study with two participants. As users work, you should take notes, identifying and describing any critical incidents as they occur. You are free to recruit participants from any source you'd like, including friends, family, and other students in this class.

HW Assignment #5

Step 3: Identify usability issues and potential fixes

Based on the results from your two study sessions, in this step you will consolidate similar critical incidents that occurred (if any) and reflect on the underlying usability issue each embodies. For each critical incident that you identified, first reflect on if it is similar to any other critical incident. After identifying groups, reflect on what is the underlying potential cause? What caused the user to experience this critical incident? What change might help address this issue?

HW Assignment #5

Step 4: Storyboard a new user experience

Based on what you learned, you will now design a new and improved user experience that supports your user task. Your user experience might take the form of a new version of the web app(s) that the user was using or might consist of an entirely new web app. Your goal in building a storyboard is describe how users will use your web app. Your storyboard should consist of key steps, illustrating how a user will act in these steps to accomplish their task. The sketch does not need to be visually detailed: either a hand-drawn sketch or simple drawing program drawn sketch is fine.

As you are building your storyboard, you should design your user experience so that it follows the principles for designing usable interfaces discussed in lecture. In particular, you should identify at least 5 aspects of your user experience design and explain how each of these follows a 1) heuristic evaluation heuristic or 2) principle for building user interfaces described in the Week 11-14 Lectures. You may only use a single heuristic or principle once.

HW Assignment #5

Requirements

- **Step 1: Task design**
  - Follow guidelines given in Lecture 22 to ensure that the 1) goal is specific, 2) a scenario explains the background of what users will be doing, 3) end criterion for task is communicated, and 4) participants have a max time limit.
- **Step 2: Think-aloud usability evaluation**
  - Conduct a think-aloud usability evaluation in which 2 participants work for at least 10 minutes each.
  - Identify critical incidents that occurred.
- **Step 3: Usability issues**
  - Identify at least 3 separate usability issues that participants experienced, describing the symptoms that occurred as well as a possible underlying cause.
- **Step 4: New User experience storyboard**
  - Build a story board describing how users will work in your new web app.
  - Include at least 7 separate steps in the storyboard.
  - Annotate the storyboard with the action that the user or system takes to advance to the next step
  - Describe how the new design follows at least 5 separate heuristic evaluation heuristics or principles given in lecture, clearly identifying the heuristic or principle and briefly describing (in a few sentences) how the design follows the principle.

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Class Overview

- ***Part 1:*** Interaction Techniques
  - Quick Lecture
  - Designing Alternative Interactions Activity
- ***10 Minute Break***
- ***Part 2:*** Visual Design
  - Quick Lecture
  - Creating a Design Language (if we have time)

Interaction Design Overview

Identifying Actions

Goals → Action Sequence

Signifiers

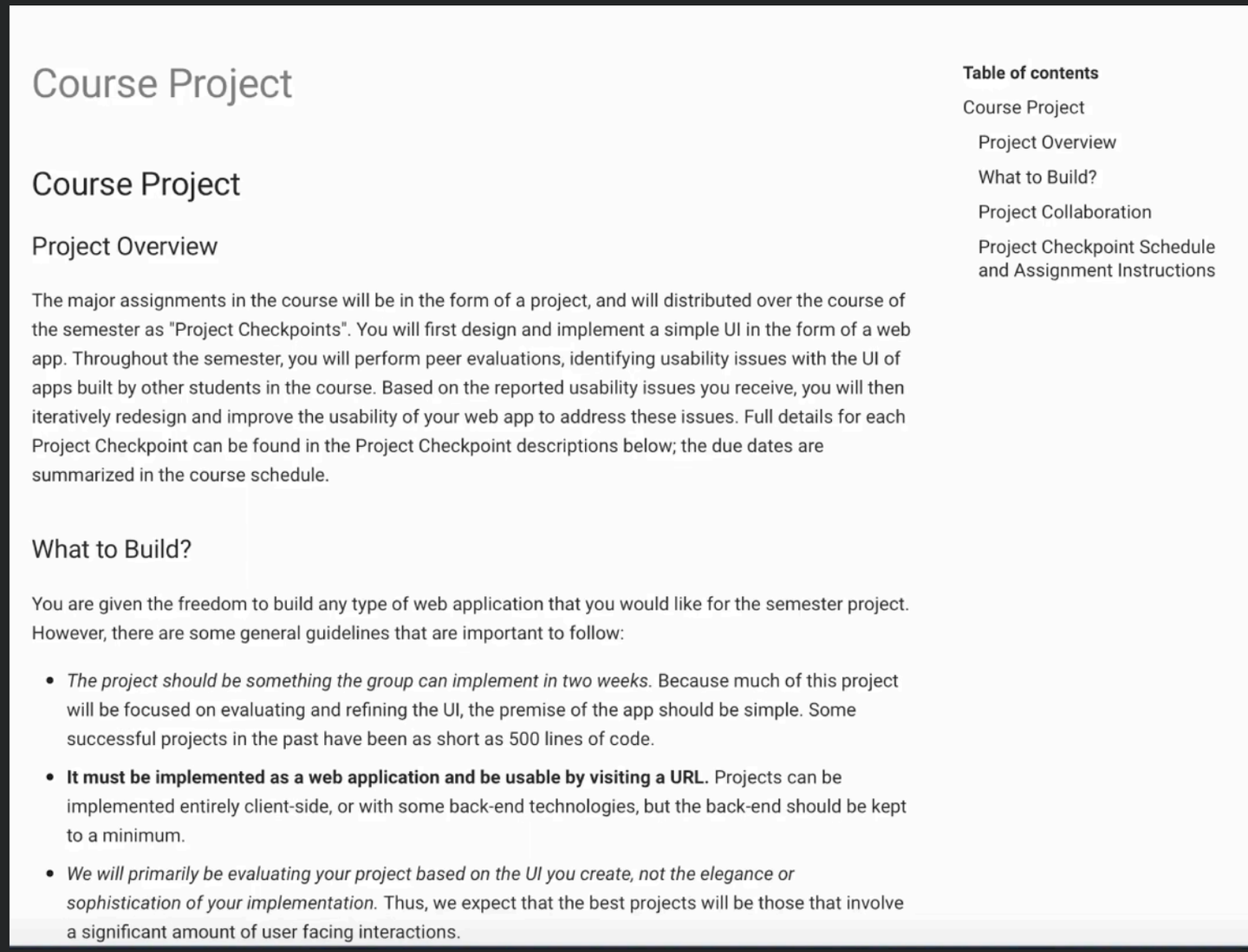
Is this a button?

Or a link?

- Goals
  - Show which UI elements can be manipulated
  - Show how they can be manipulated
  - Help users get started
  - Guide data entry
  - Suggest default choices
  - Support error recovery

Hinting

- Indicate which UI elements can be interacted with
- Possible visual indicators
  - ***Static hinting*** - distinctive look & feel
  - ***Dynamic hinting*** - rollover highlights
  - ***Response hinting*** - change visual design with click
  - ***Cursor hinting*** - change cursor display



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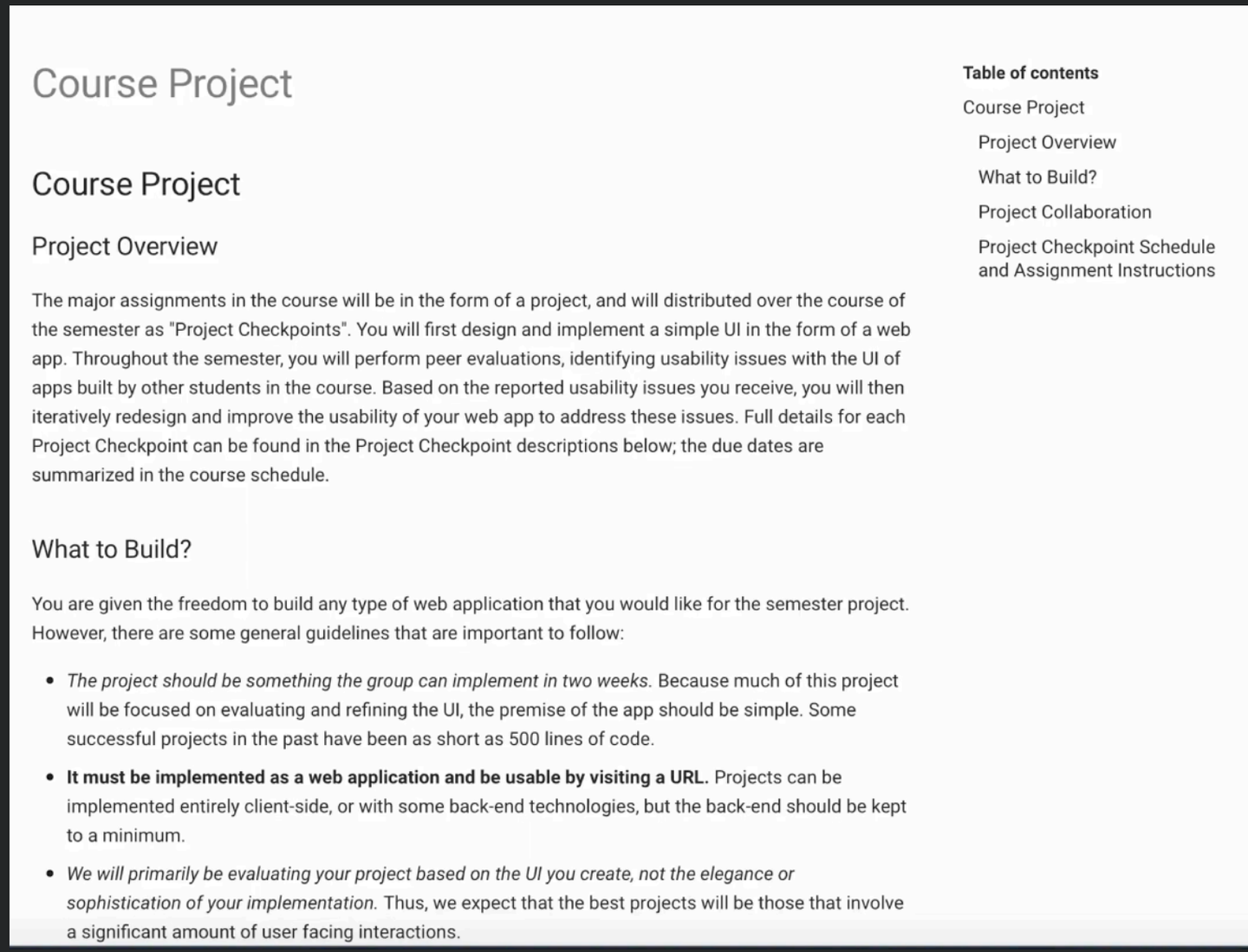
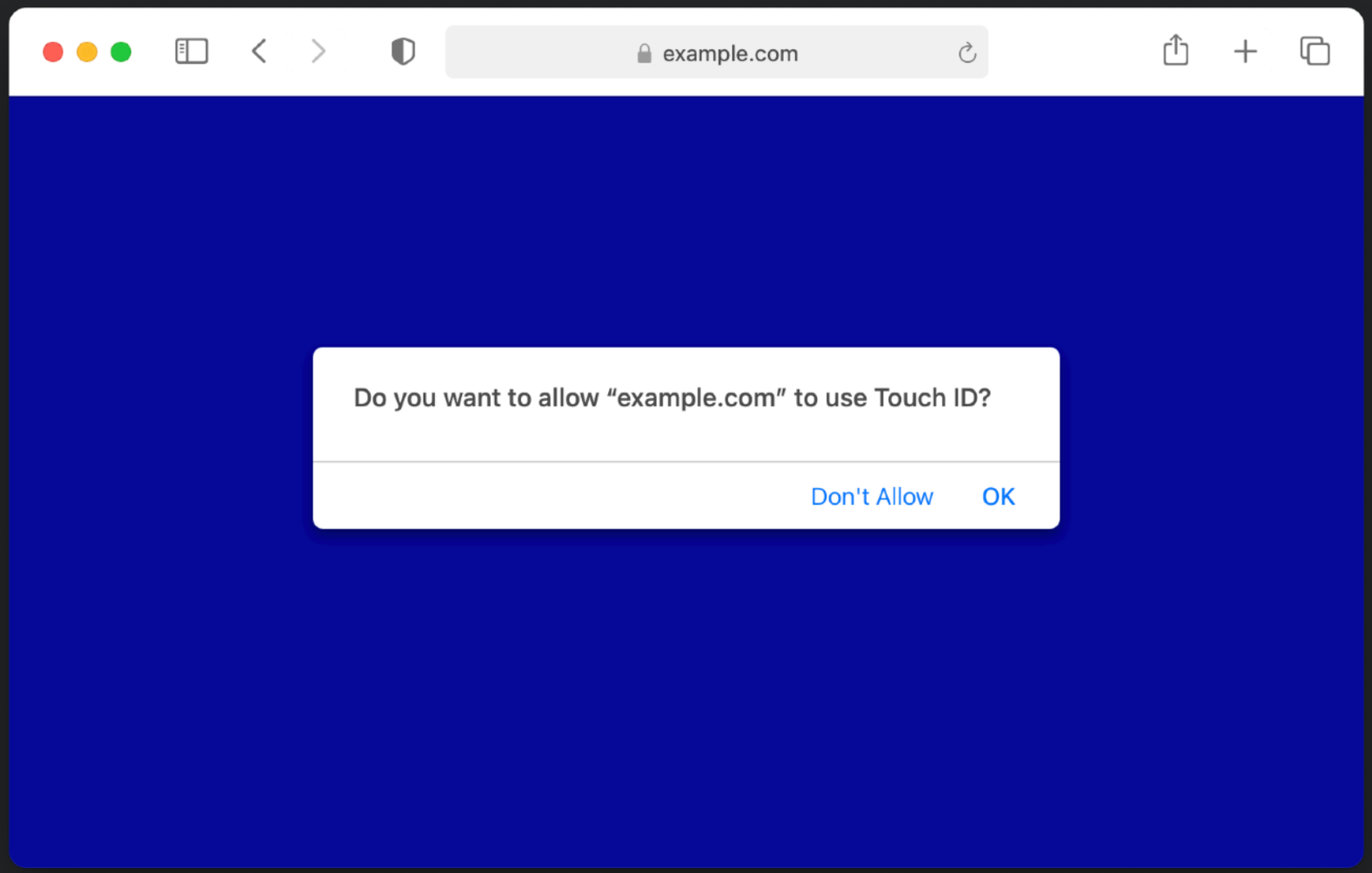


Help Users Predict Outcome of Actions

- What does this do?
- Should I click it?

Clarity of Wording (Bad Example)

- Design for clarity & precision



Clarity of Wording

- Choose words carefully
- Speak the user's language
- Avoid vague, ambiguous terms
- Be as specific as possible
- Clearly represent domain concepts

Likely & Useful Defaults

- Default text, if relevant (e.g., date)
- Default cursor position
- Avoid requirements to retype & re-enter data

Modes

- Vary the effect of a command based on state of system
- Examples
  - caps lock
  - insert / overtype mode
  - vi / emacs command modes
  - keyboard entry used for controlling game and chatting

Challenges with Modes

- Modes create inconsistent mapping
  - E.g., control S sometimes saves, sometimes sends email
  - Especially dangerous for frequent interactions that become highly automatic System 1 actions

- Avoid when possible
- Clearly distinguish if necessary
  - Make clear to user which mode they are in and how to change

Command Interactions

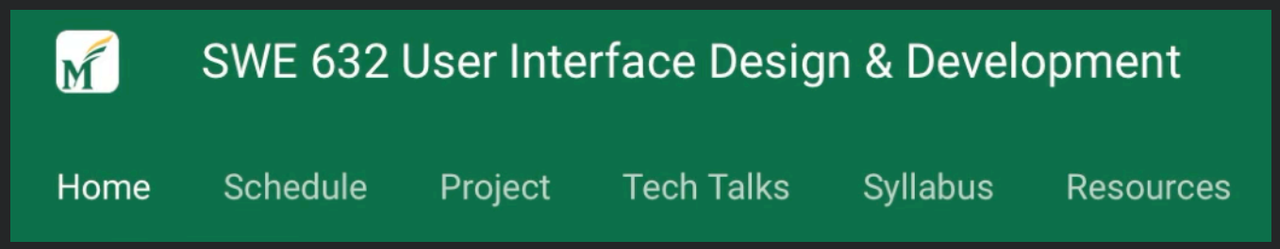
- How can a user invoke a command?
- Common examples
  - Menus
  - Buttons
  - Toolbar
  - Dialog box
  - Keyboard shortcut
  - Gesture
- What are some advantages and disadvantages of each approach?

Physical Actions

Avoid Physical Awkwardness

- Switching between input devices takes time
- Avoid forcing user to constantly switch between input devices (e.g., keyboard & mouse)
  - e.g., Effective tab order between fields
- Avoid awkward keyboard combinations

Moving the Mouse



- After a user has (1) realized that a region is interactable, (2) decided that it will cause the desired action to be invoked
- How long does it take for a user to move the cursor to click on it?
- What factors might influence this time?

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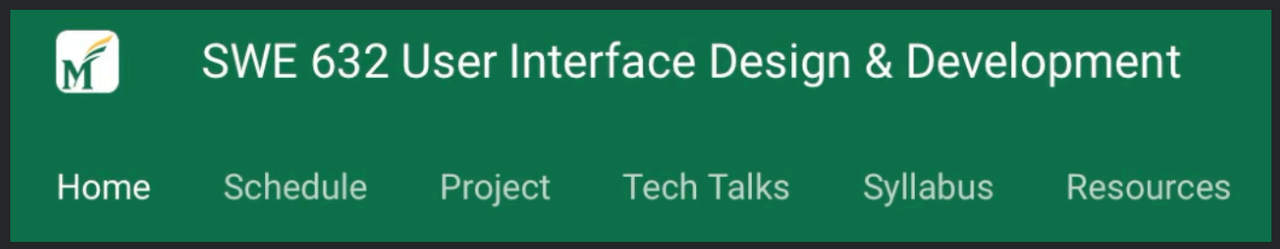

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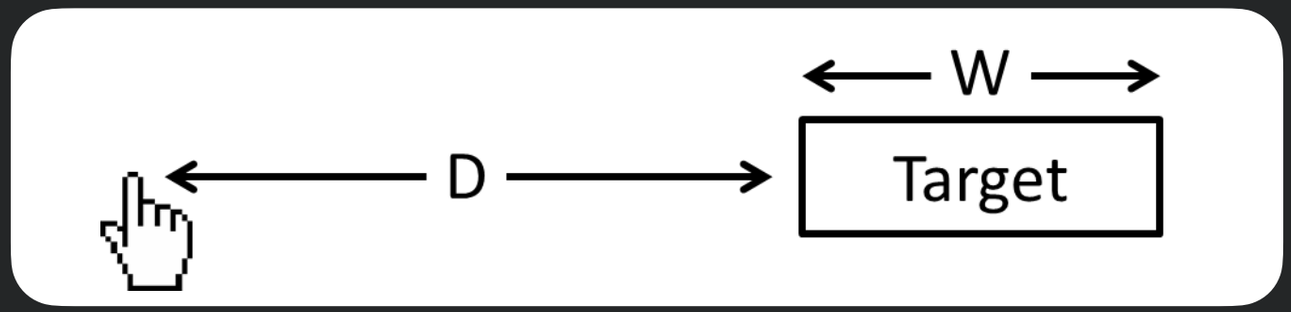
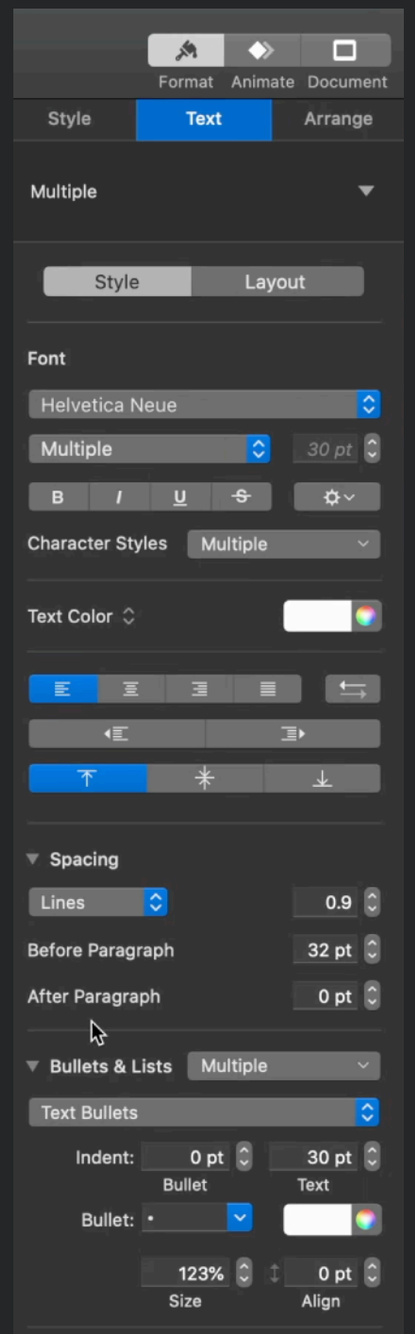
Fitt's Law



- Time required to move to a target ***decreases*** with target ***size*** & ***increases*** with ***distance*** to the target
- Movements typical consist of
  - one large quick movement to target (***ballistic*** movement)
  - fine-adjustment movement (***homing*** movements)
- Homing movements generally responsible for most of movement time & errors
- Applies to rapid pointing movements, not slow continuous movements



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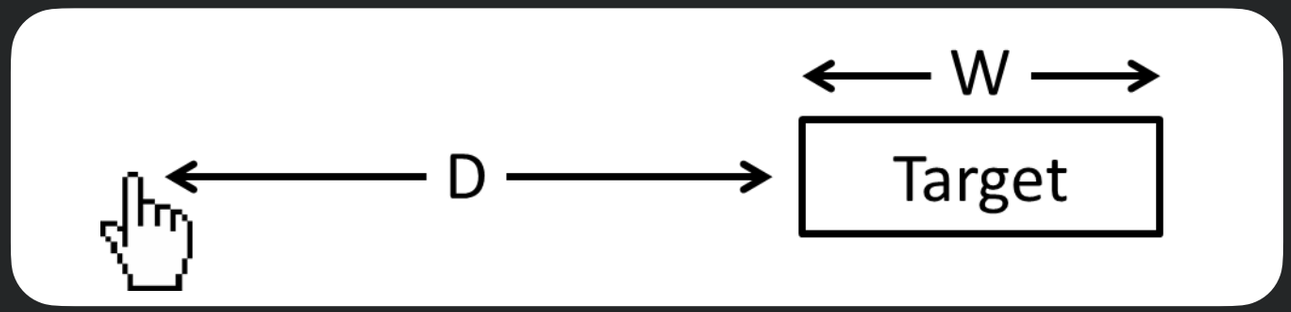

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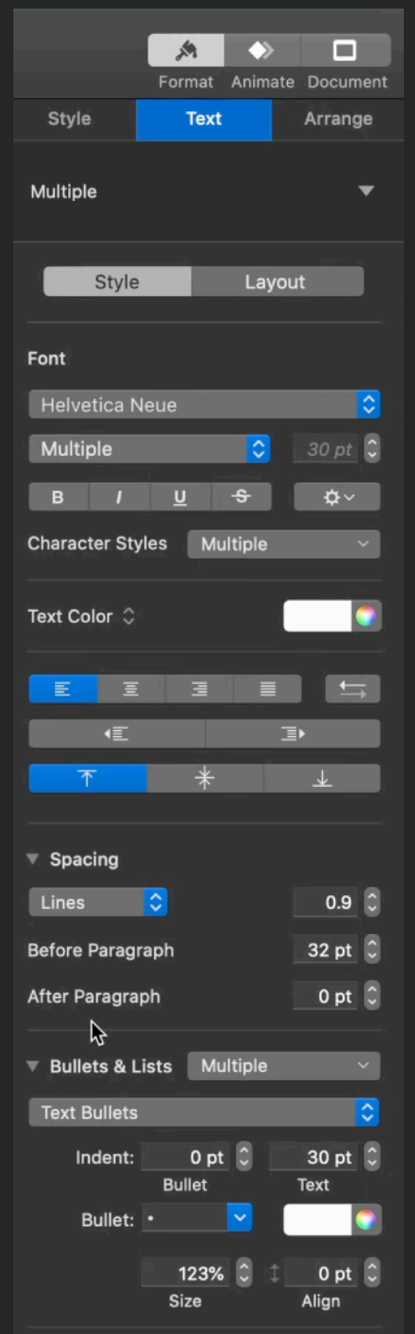
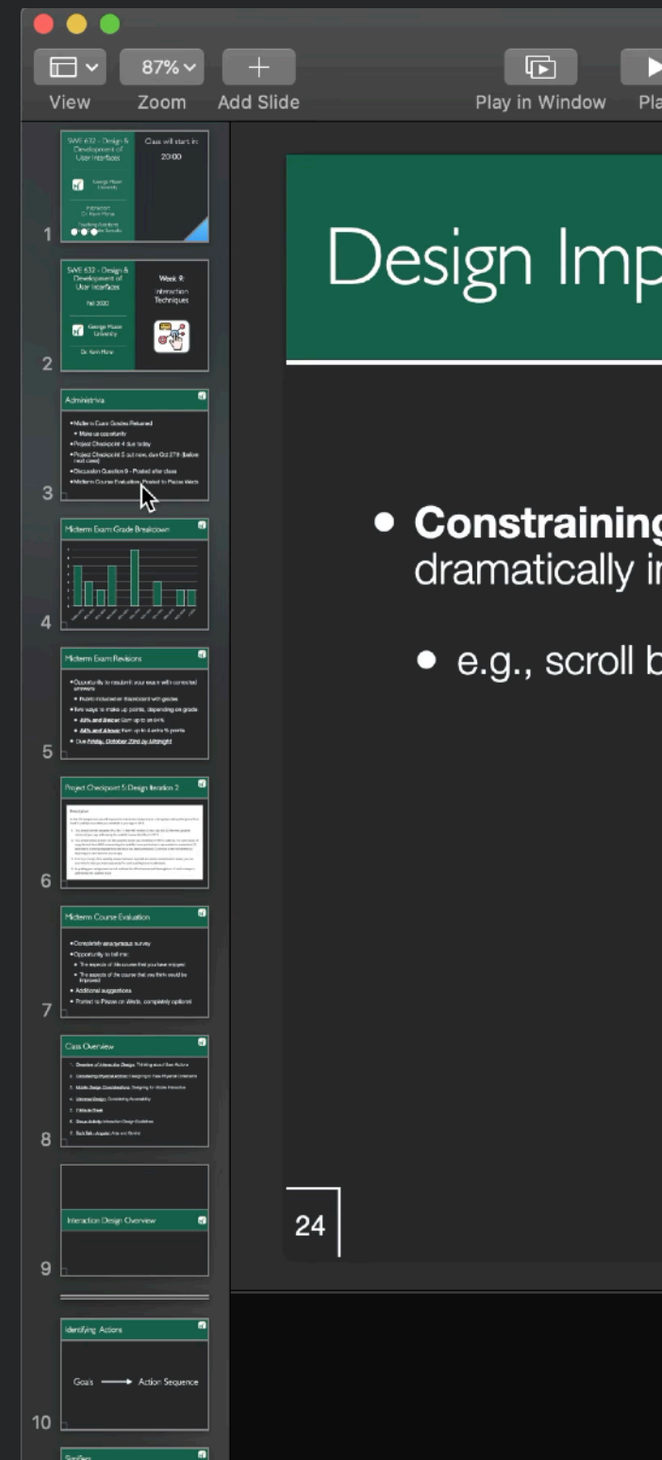


Design Implications of Fitt's Law

- ***Constraining*** movement to one dimension dramatically increases speed of actions
  - e.g., scroll bars are 1D



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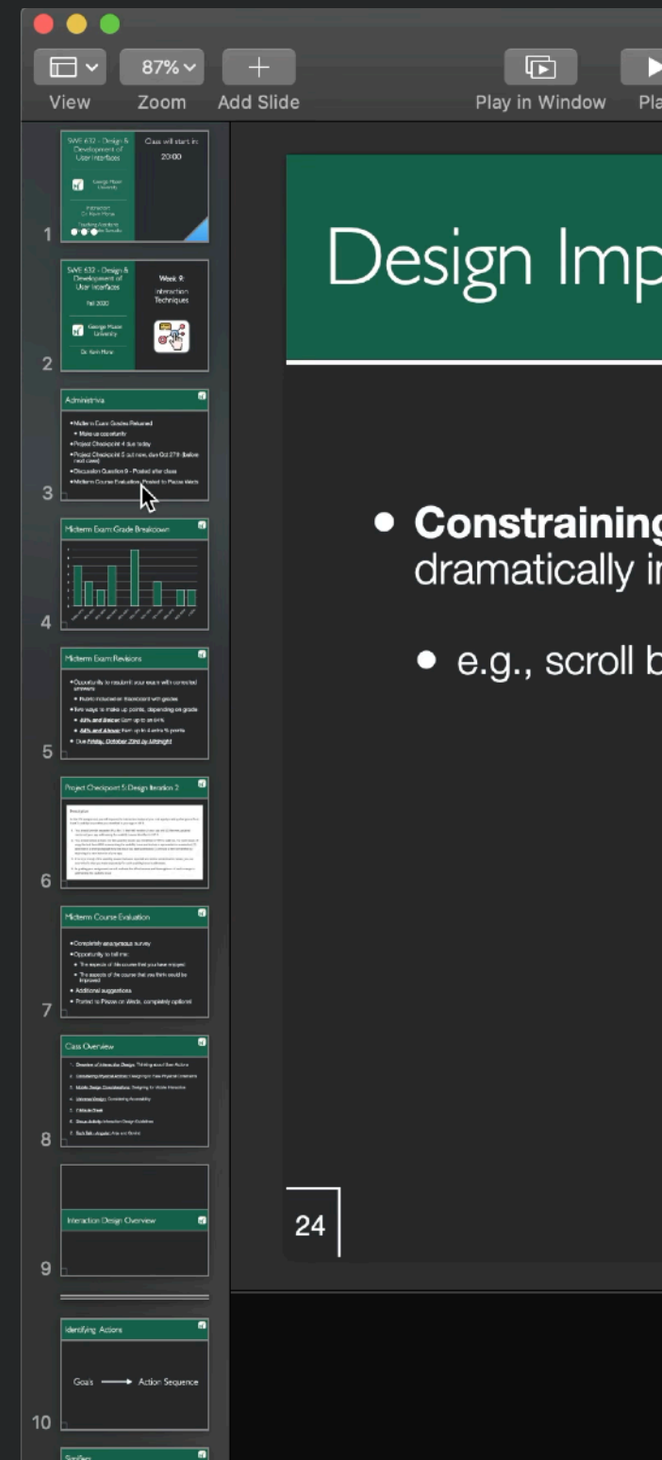

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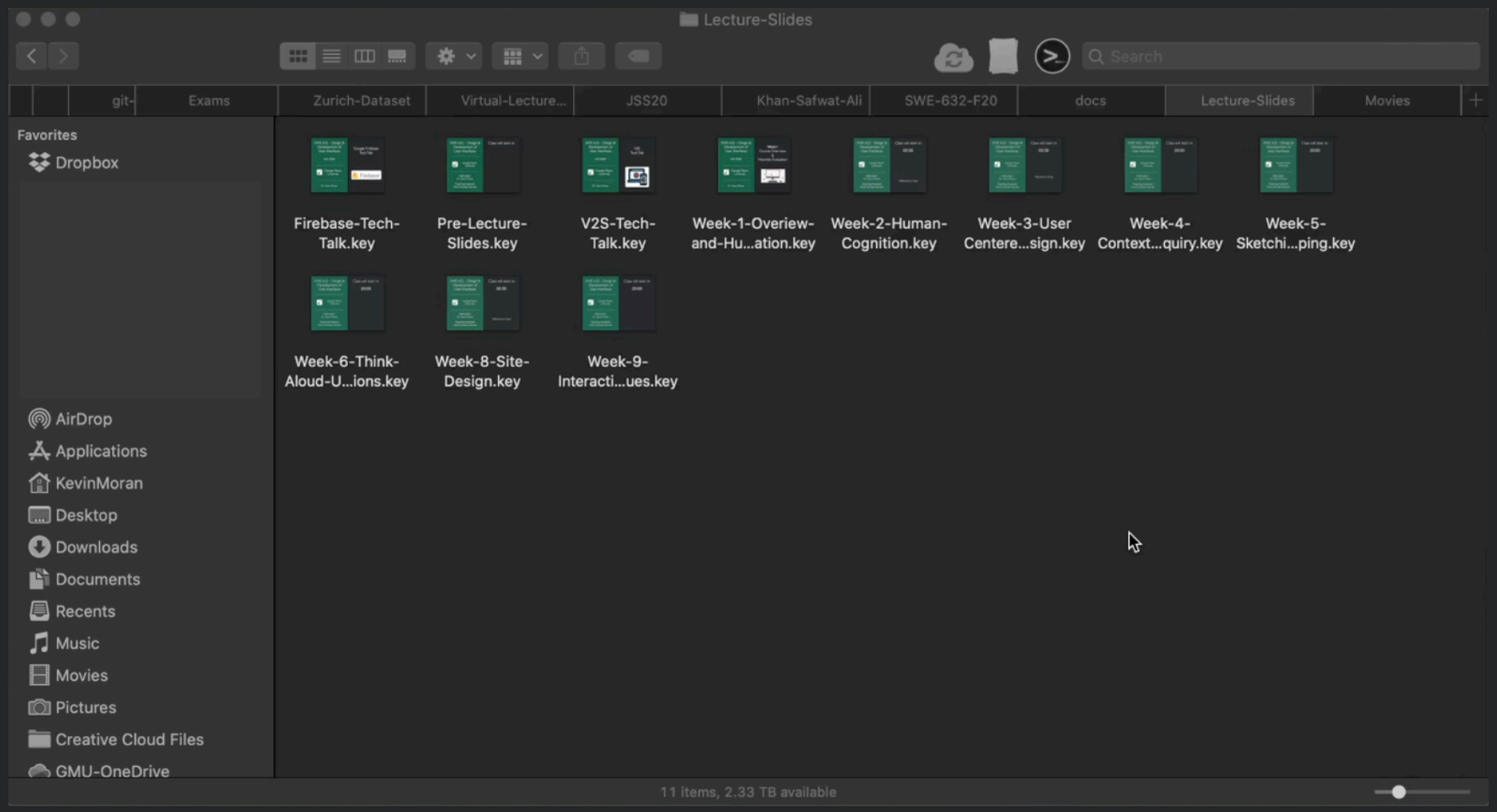
- Making controls ***larger*** reduces time to invoke actions
- Locating controls closer to user ***cursor*** reduces time
  - e.g., context menus



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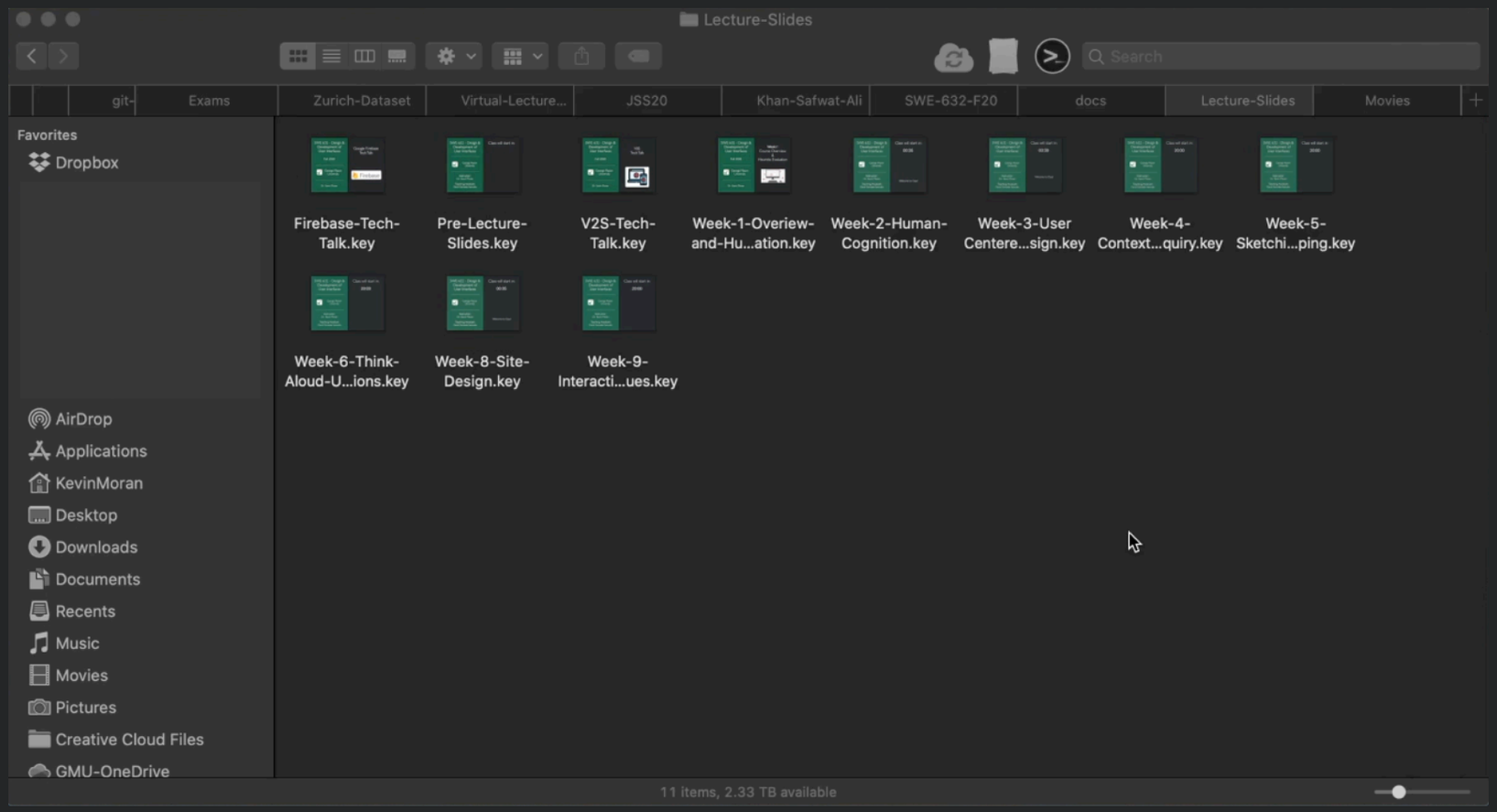

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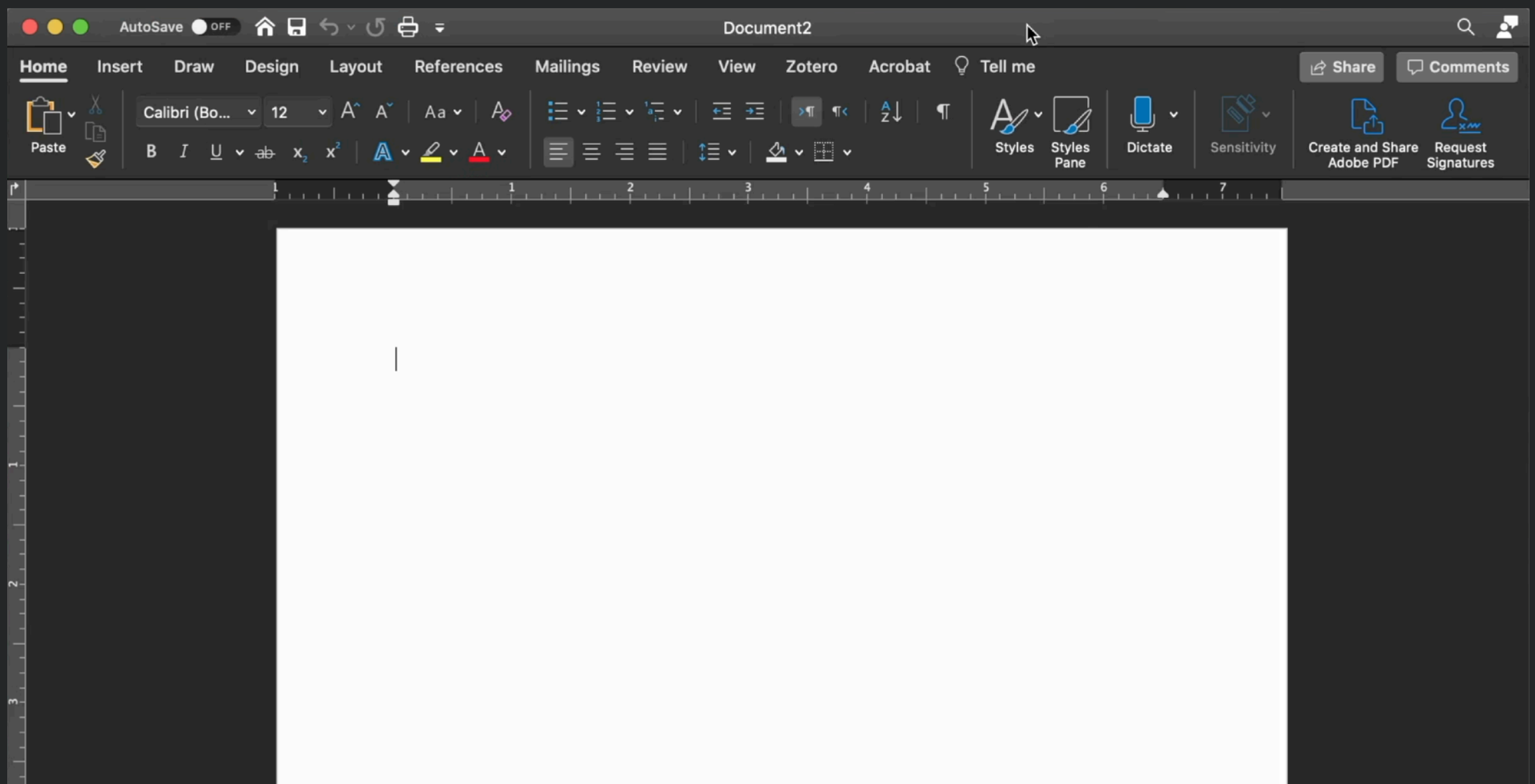

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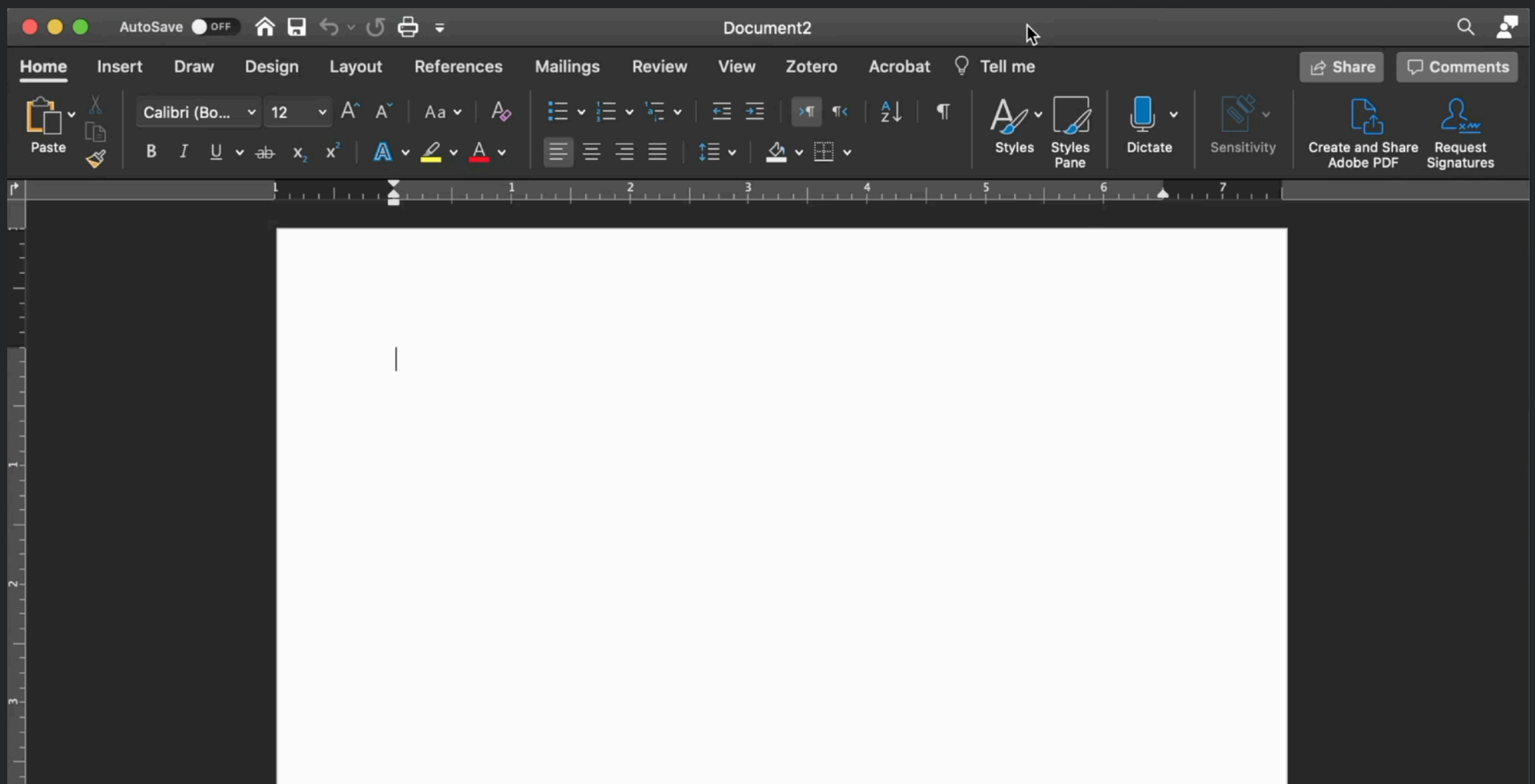

Mobile Design

Responsive Design

- Mobile devices often have smaller form factor than desktop / laptop OS
- Can design a separate UI
- Or may build a ***fluid*** UI that rescales for different display sizes

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Where's the Cursor?

- No cursor on many mobile devices
- Cannot use dynamic hinting to determine which elements can be interacted with
  - May require more use of static hinting
- Fitt's law still applies
  - Fingers are less sensitive, hard to select small buttons, occlude elements

Alternative Inputs

- Modern mobile devices often have a wide range of sensors which can be used for input
  - Camera
  - Microphone
  - Accelerometer
  - Three-axis gyro
  - GPS
  - Barometer
  - Proximity sensor
  - Ambient light sensor
- Enables new interaction techniques

Augmented Reality

- Overlaying generated content on top of view of the real world

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Alternative Inputs + Augmented Reality

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Universal Design

A Personal Subject for Me…

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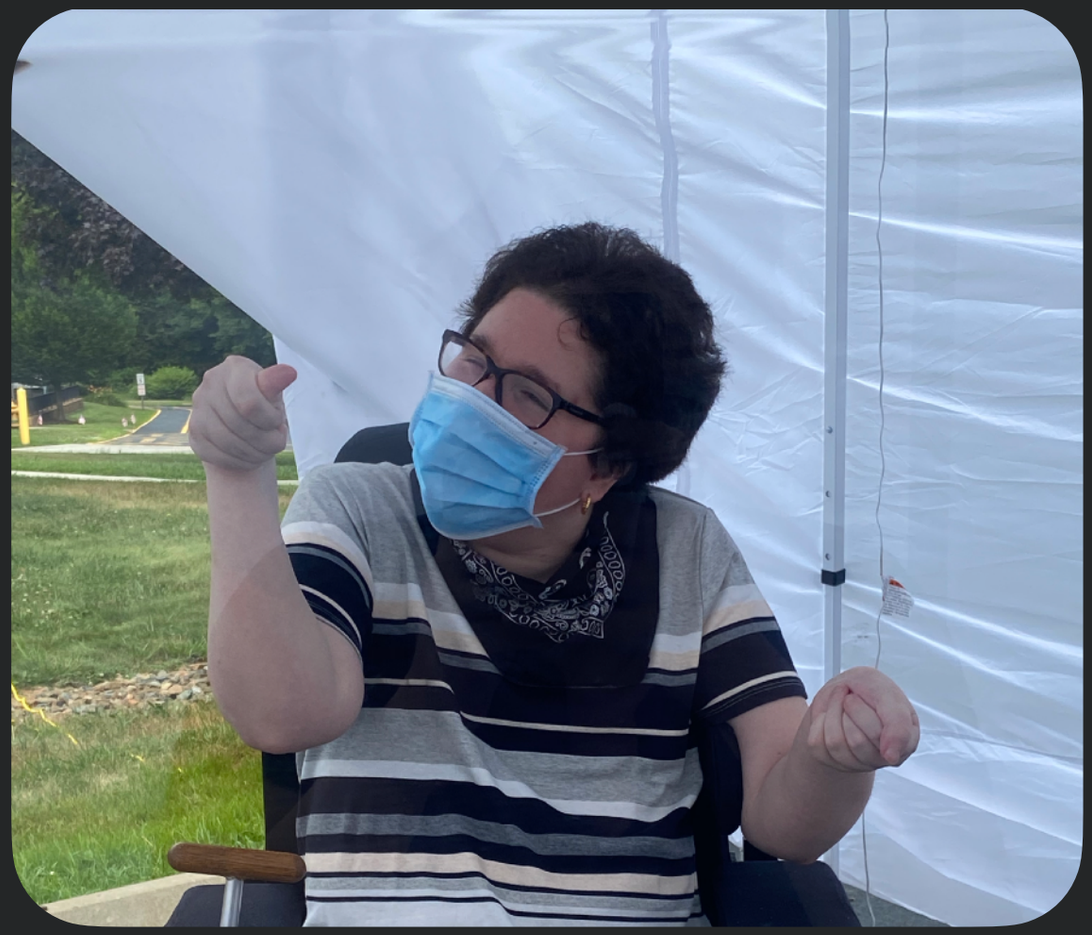

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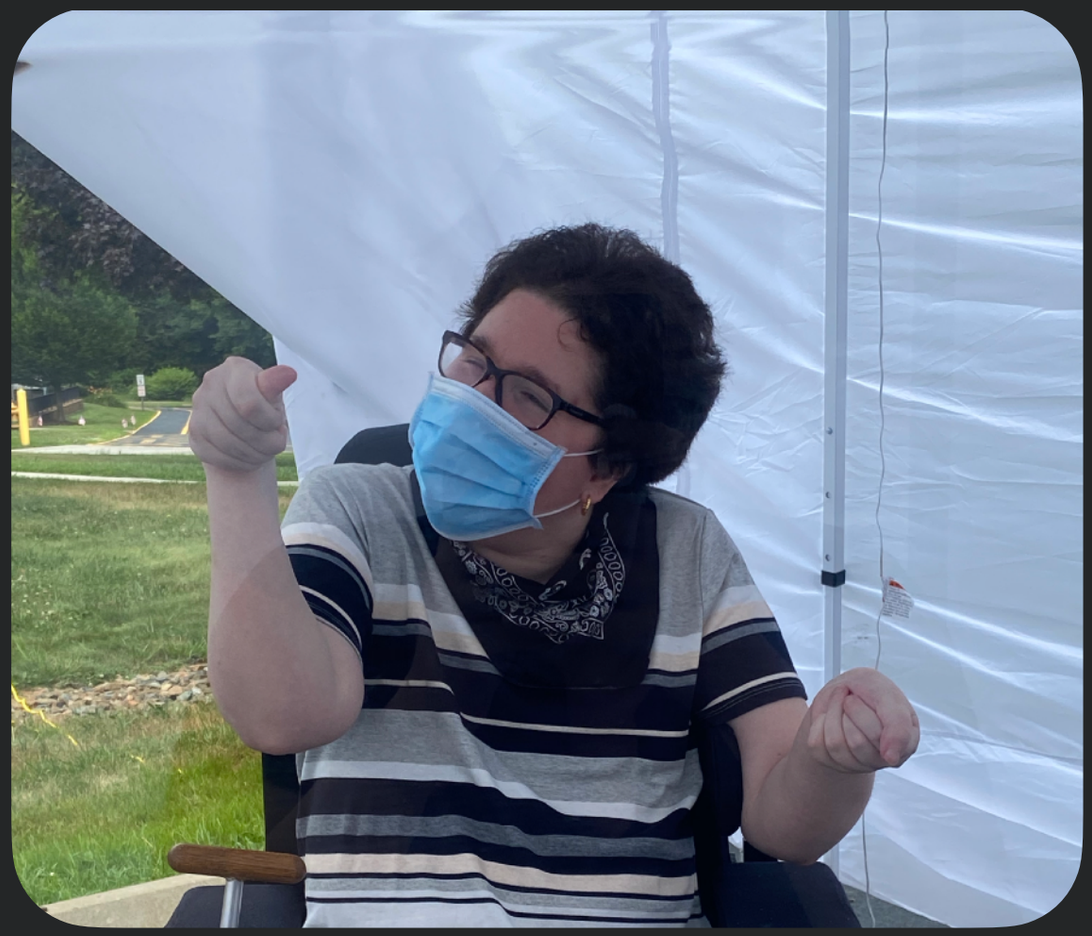

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Supporting Users with Disabilities

- **Perception** - visual & auditory impairments
  - Blindness or visual impairments
  - Color blindness
  - Deafness & hearing limitations
- **Motion** - muscle control impairments
  - Difficulties with fine muscle control
  - Weakness & fatigue
- **Cognition** - difficulties with mental processes
  - Difficulties remembering
  - Difficulties with conceptualizing, planning, sequencing actions

Blindness and Visual Impairments

- Users use screenreader to listen to screen elements
- Reads all of the text on the page
  - Through practice, learn to listen to text at 400+ words per minute
- Important to have ***alt-text***
  - Images should have labels that explain them
- Important to have ***hierarchy***
  - Rather than visually skimming page, skims page by listening to section heads to determine which level to navigate to next

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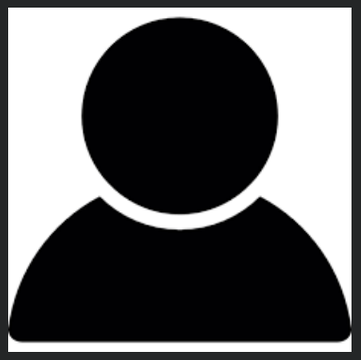
Motion Impairments

Motion Impairments

Universal Design

- How can users with physical disabilities be supported in user interactions?
- Good: ***assistive design*** - offering equivalent actions for disabled users that cannot take normal actions
- Better: ***universal design*** - designing interactions so broadest set of users across age, ability, status in life can use normal actions



Example - Curb cut

- Initially designed for ***accessibility*** - support for disabled & wheel chairs
- But potentially benefits ***all users*** of public spaces - people w/ suitcases, hand carts, roller blades, bikes, …

7 Principles of Universal Design

- ***Equitable use:*** The design is useful and marketable to people with diverse abilities
- ***Flexibility in use:*** The design accommodates a wide range of individual preferences and abilities
- ***Simple and intuitive:*** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level
- ***Perceptible information:*** The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities
- ***Tolerance for error:*** The design minimizes hazards and the adverse consequences of accidental or unintended actions
- ***Low physical effort:*** The design can be used efficiently and comfortably and with a minimum of fatigue
- ***Size and space for approach and use:*** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility

http://universaldesign.ie/What-is-Universal-Design/The-7-Principles/

Big Topic - Further Reading

Jeff Bigham's Course at CMU: http://www.accessibilitycourse.com

Amy Ko's Book Chapter on Accessibility:
https://faculty.washington.edu/ajko/books/user-interface-software-and-technology/#/accessibility#ref-islam10

In-Class Activity

In-Class Activity: Interaction Design Guidelines

- Envision a fictional app (e.g., a mobile AR tour-guide app for visiting Antartica)
- Build a list of alternative interaction techniques for your category
  - Identify examples from desktop / web / mobile apps
- Describe pros and cons of each for your design context
- Describe how you will support mobile and universal design

- ***(1) Navigating lists of items***
  - Examples: grids, lists, pages of results, infinite scrolling, filtering
- ***(2) Invoking commands on content***
  - Examples: toolbar, floating toolbar, cards, context menu, sidebar pane
- ***(3) Invoking top level commands***
  - Examples: drawers, toolbar, menus, dialog
- ***(4) Entering formatted text***
  - Examples: toolbar commands, Markdown, HTML
- ***(5) Panning and zooming***
  - Example: zoom slider, scrollbars, pinch to zoom, drag to pan
- ***(6) Accelerometer-based control***
  - Examples: shake to undo, rotate to pan, roll / pitch / yaw game control
- ***(7) Chat bots***

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Teaching Assistant:
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Class will start in:

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Overview of Visual Design

Elements of Visual Design

Visual Design

- *Solving **<u>communications problems</u>** in ways that are both functionally effective and aesthetically pleasing.*

- Creating a visual language containing a vocabulary of design elements characterized by

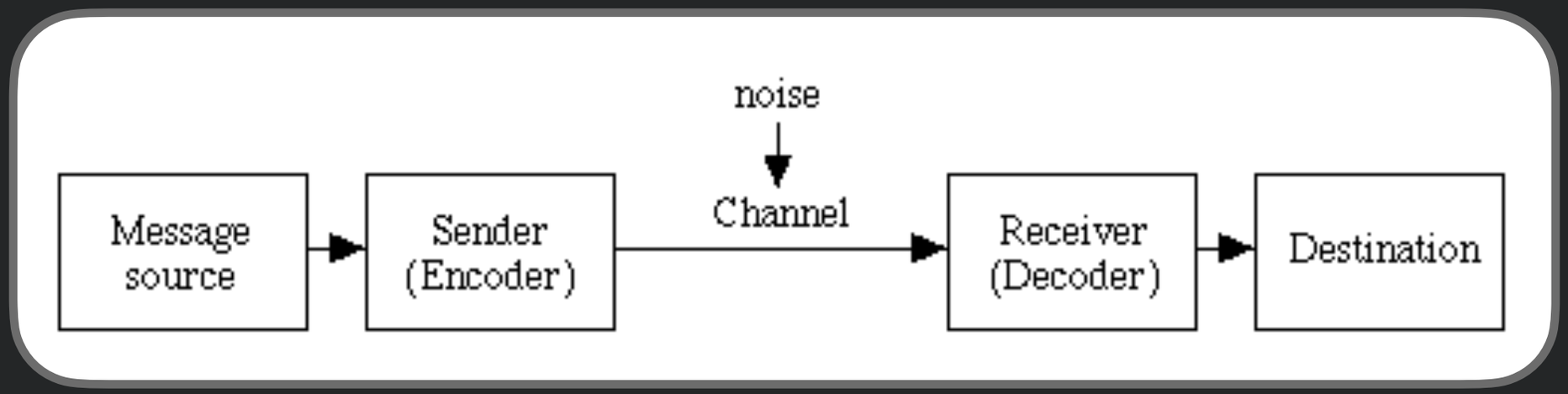
  - Visual variables—shape, size, position, orientation, color, texture, …

  - Organizational relations between elements—balance, structure, proportion, …

  - Visual syntax—rules for assembling elements w/in design language

Visual Design as Communication

- Goal: ***efficiently*** & ***accurately*** transmit information from system to user
- Visual variables & organization encode information



Goals for Visual Design

- Successfully ***transmit*** information
- Present coherent & consistent design that reduces ambiguity and potential confusion
- Reduce visual ***search*** time through layout & organization
- Create desired ***emotional*** reactions through aesthetic choices

General Guidelines for Visual Design

Elegance & Simplicity

- ***Elegance*** — derives from Latin eligere, to “select carefully”
- ***Judicious*** selection of elements and economy of expression revealing an intimate understanding of problem
- Removing & combining superfluous elements until only the necessary remains

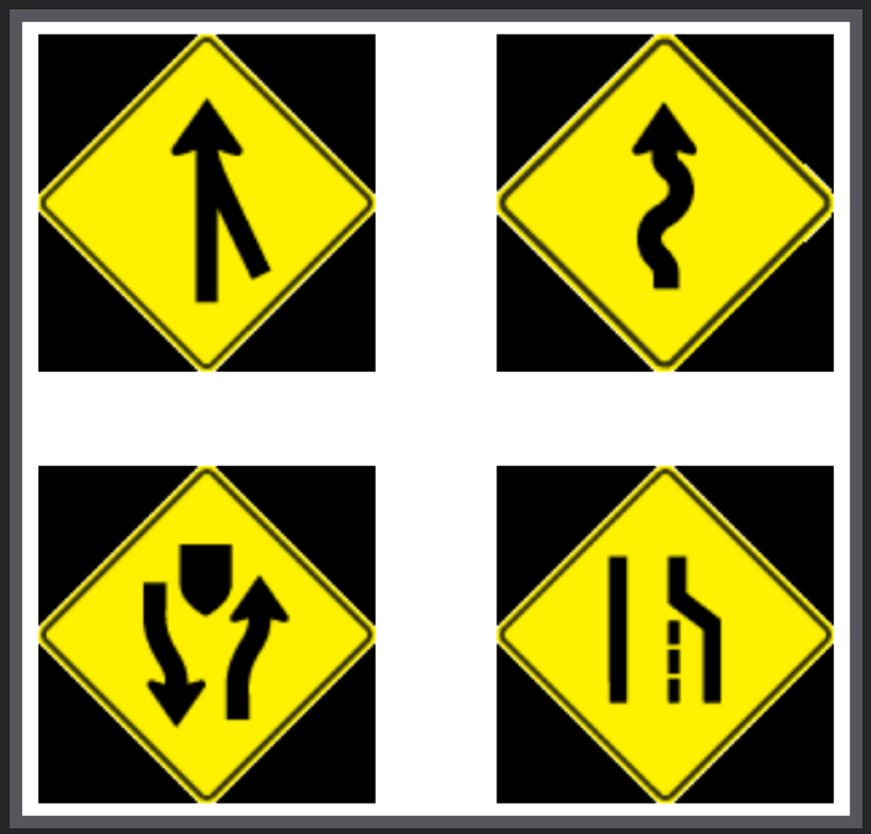
Benefits of Simplicity

- ***Approachability*** - rapidly understood affordances, allowing glanceable understanding of possible interactions

- ***Immediacy*** - greater emotional impact because interactions can be quickly understood

Marc Berthier. Tykho Radio. 1997. Synthetic rubber and other materials, 5 1/2 x 5 1/2 x 1 5/8″ (14 x 14 x 4.1 cm). Manufactured by Lexon, France. The Museum of Modern Art, New York. Gift of the manufacturer.

Reducing a Design to its Essence



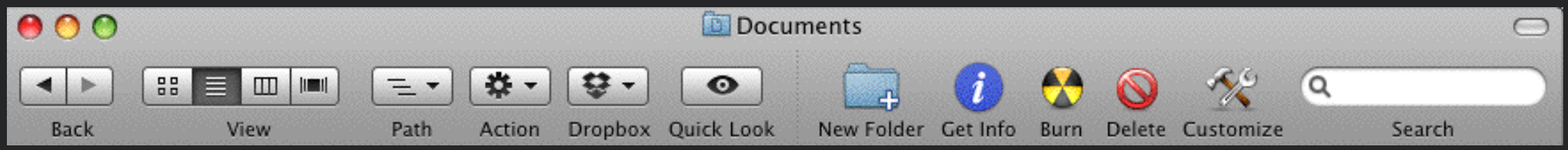
- Make design simple, bold, and direct by removing inessential details & elements
  - Even essential elements may be suggested

1. *Determine essential qualities & information to be conveyed*

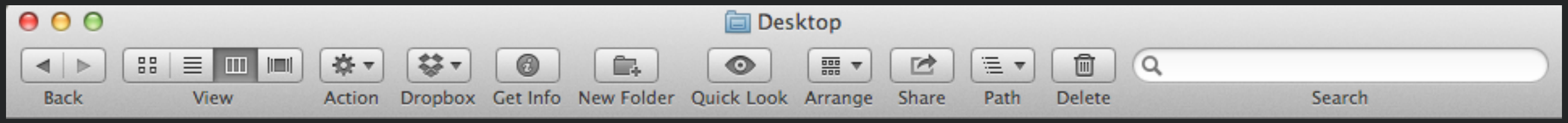
2. *Critically examine each element & ask how design would suffer without it.*

3. *Try removing elements. What happens?*

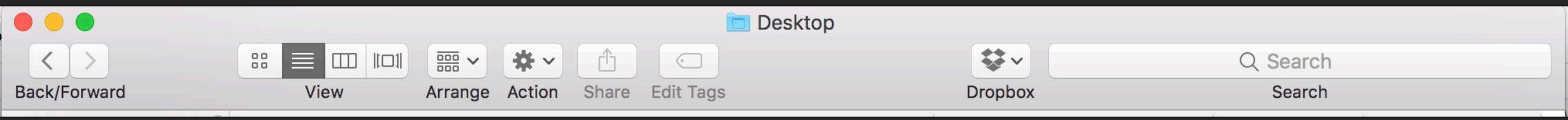
Trade-offs in Simplicity



OSX c.2010

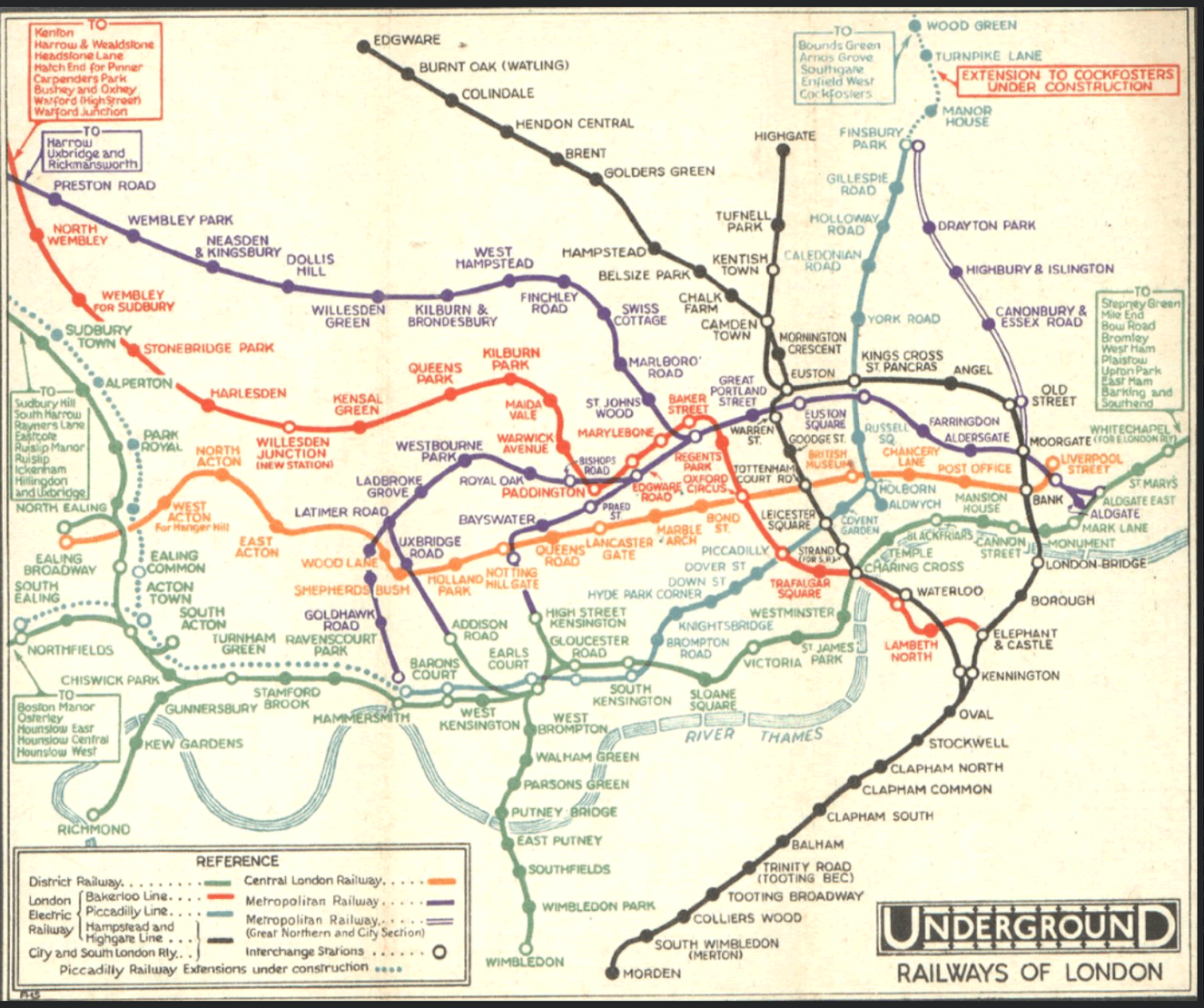


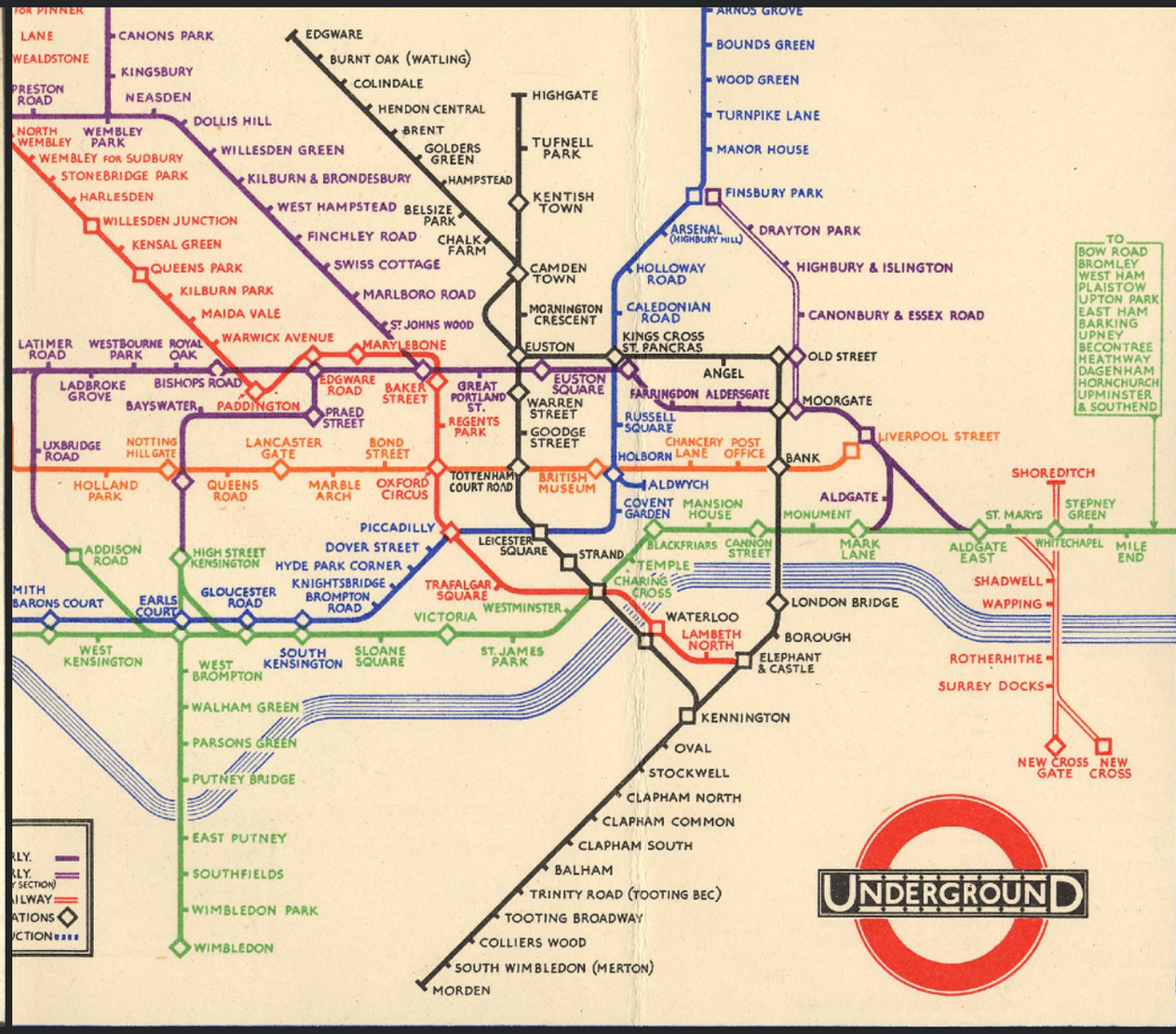
OSX c.2011



OSX c.2016

Guidelines for Visual Design





Reduction in new map: relative distances don’t matter

Regularizing the Elements of a Design

- Reduce information by repeating elements according to a rule, principle or rhythm
- Enable user to scan ahead
- Use irregularity where needed to clarify that something is irregular!

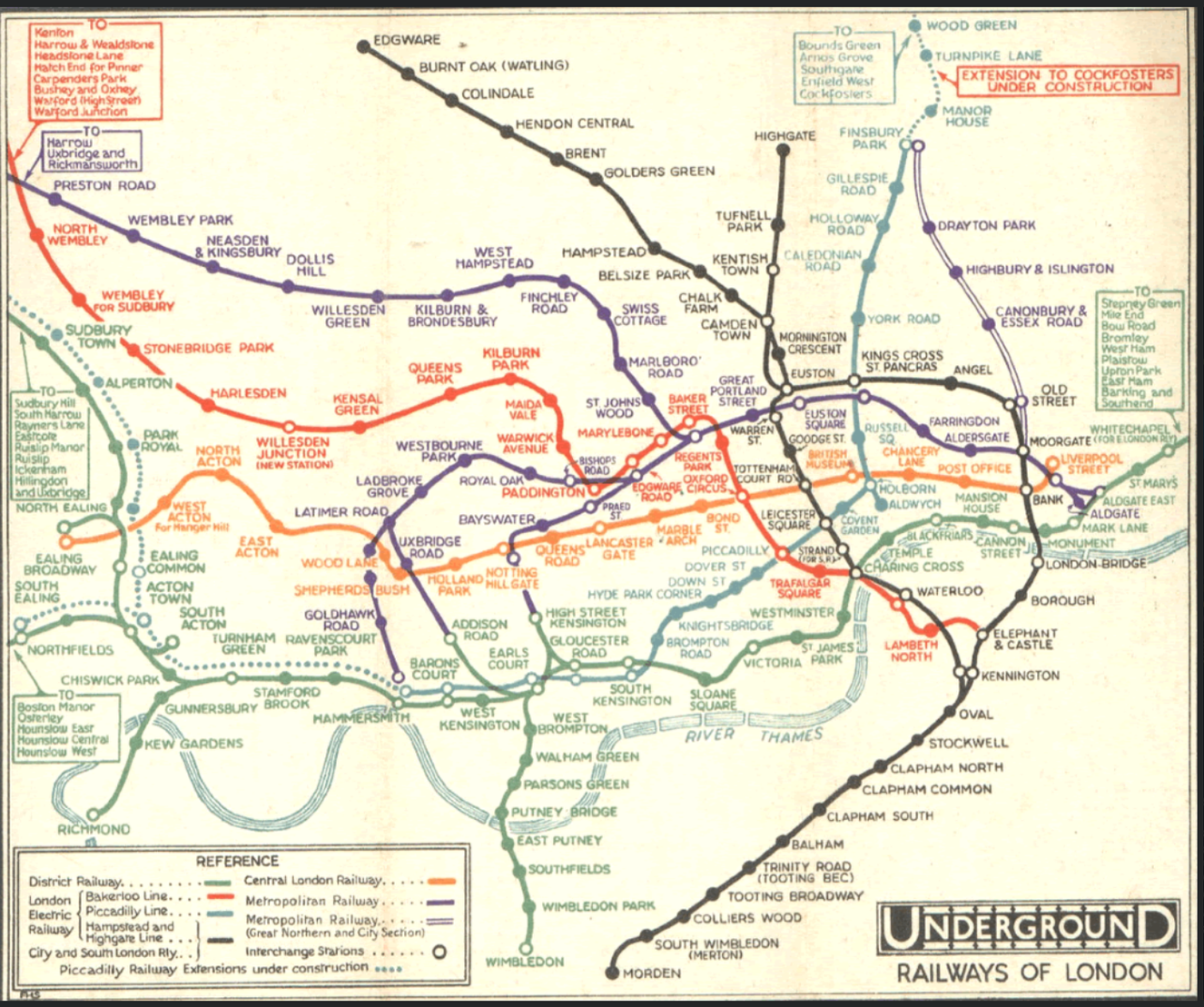
1. Use ***regular*** geometric forms, simplified controls, muted colors where possible

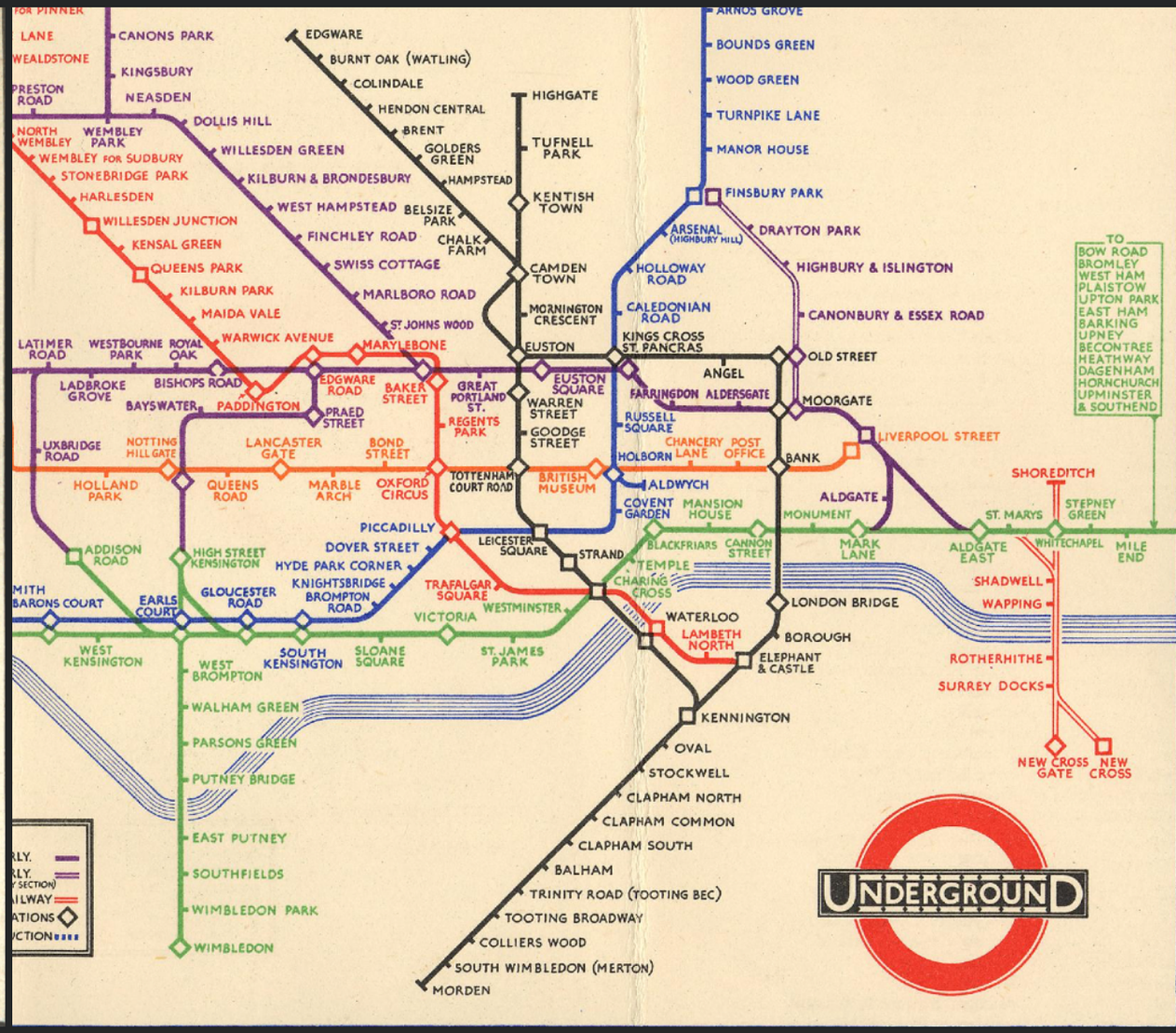
2. If multiple similar forms required, make them ***identical*** as much as possible in size, shape, color, texture, spacing, alignment

3. ***Limit variation*** in typography to a few sizes

4. Make sure critical elements intended to stand out are ***not*** regularized

Guidelines for Visual Design

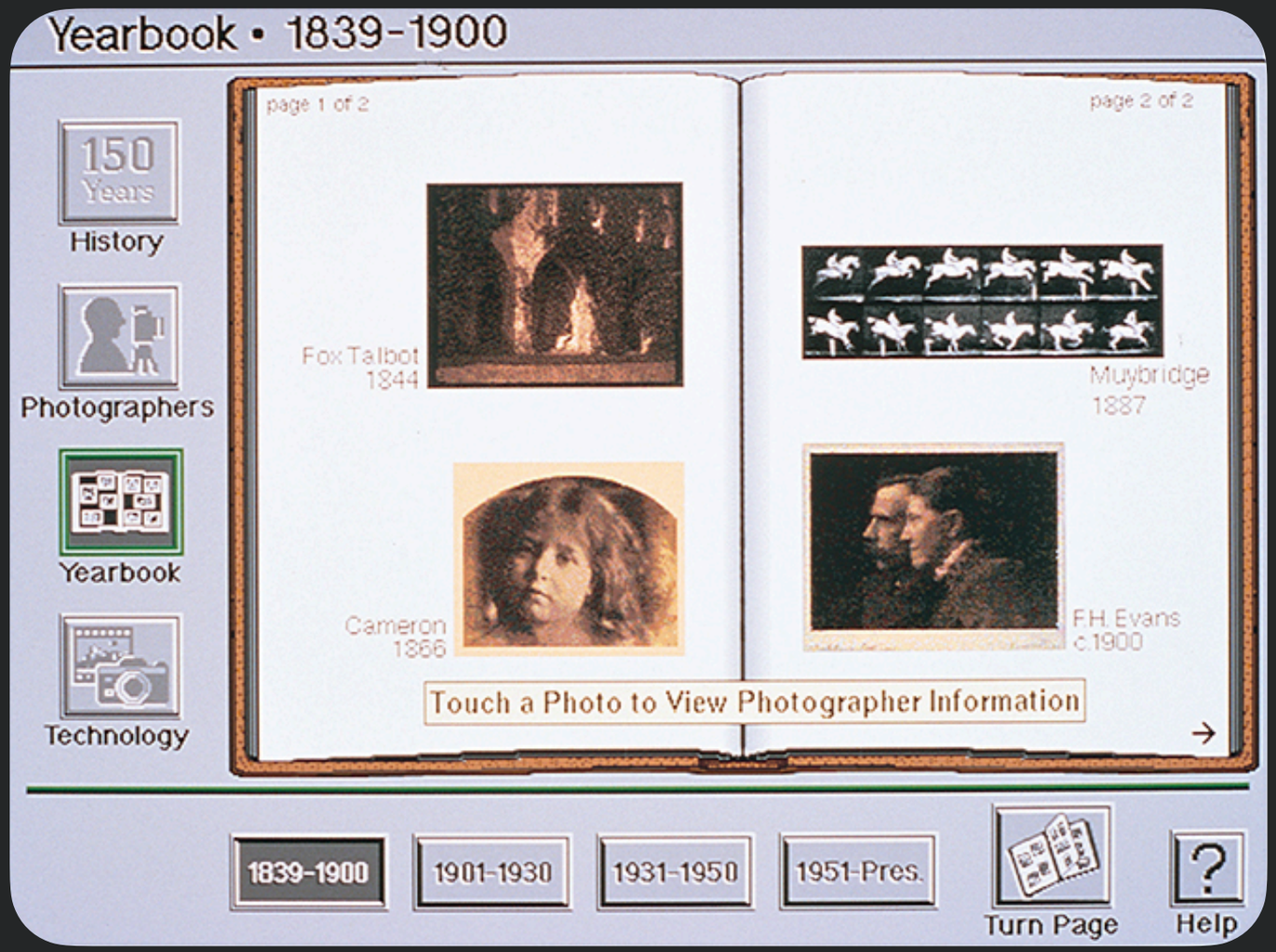




Regularization in new map: Straight lines result in station names laid out in a line, rather than bouncing around

Error - Excessive Skeuomorphism

- Skeuomorphism - making visual design resemble reality (like metaphors)
- Excessive skeuomorphism is distracting and wastes potential visual bandwidth that could encode meaningful information
- Trend towards "flat" interfaces



July 2013

Wednesday July 3

Ted Faszer's Birthday all-day

Mike Yutzy's Birthday all-day

Thursday July 4

Cherie Yvette's Birthday all-day

Monday July 15

Allie Johnson's Birthday all-day

Dr Stoll 8:45 AM to 9:45 AM

Thursday July 18

Richard Gintowt's Birthday all-day

Jacks birthday 11 AM to Noon

Monday July 22

Alisha Campbell's Birthday all-day

Saturday July 27

Ted Faszer's Birthday

Details

Wednesday, July 3, 2013

all-day events

Mike Yutzy's Birthday

Ted Faszer's Birthday

2 PM
3 PM
4 PM
5 PM
6 PM
7 PM
8 PM
9 PM

November 2016

Day | Week | Month | Year

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		• SWE 432 Noon				
20	21 • SWE meeting 11 AM	22 • Office Hours 10:30 AM • SWE 432 Noon	23	24 • SWE 432 Noon	25	26
27	28	29 • Office Hours 10:30 AM • SWE 432 Noon	30			
				Dec 1 • SWE 432 Noon	2	3
4	5	6 • Office Hours 10:30 AM • SWE 432 Noon	7	8 • SWE 432 Noon	9	10
11	12	13 • Office Hours 10:30 AM	14	15	16	17

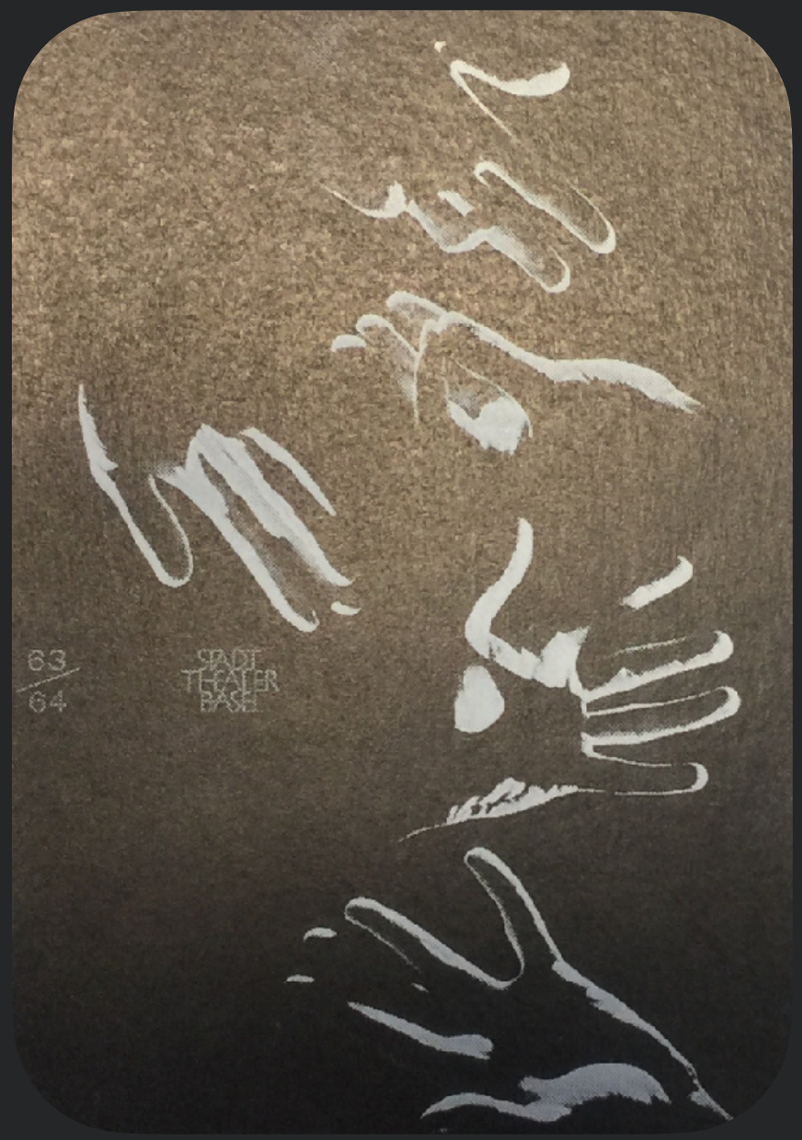
Scale, Contrast, & Proportion

Scale, Contrast, & Proportion

Information consists of differences that make a difference.
(Edward Tufte, Envisioning Information)

Individual visual variables of design that encode information

Terminology



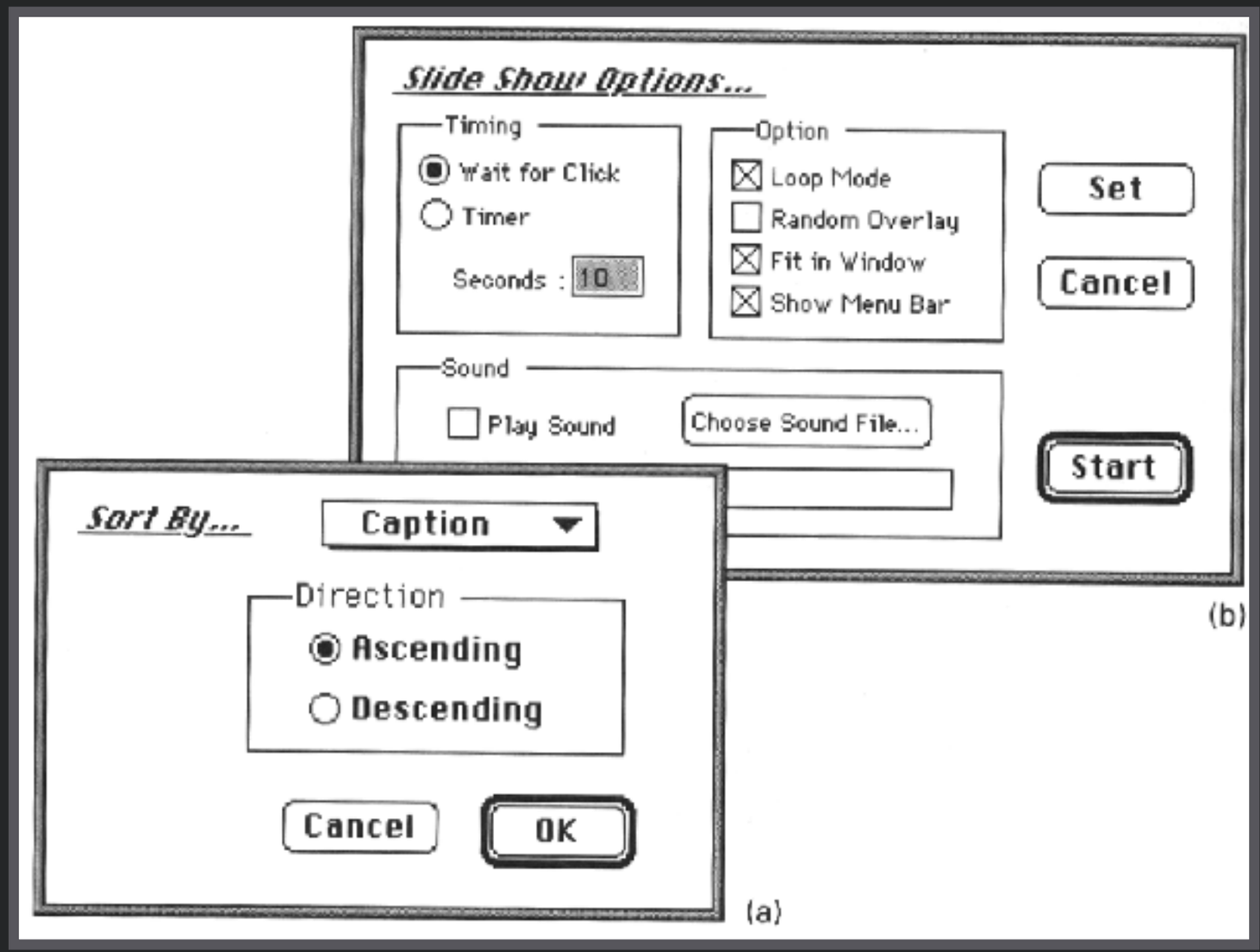
- Scale - ***relative*** size or magnitude of element in comparison to related elements
- Contrast - visually noticeable ***distinctions*** along a common visual dimension
- Proportion - ratio and ***balance*** between elements
- Emphasis - contrasts can emphasize important elements or areas & add visual ***interest*** by creating tension & drama

Principles

- ***Clarity*** - contrasts should be clear and easily differentiated, not slight and subtle
- ***Harmony*** - proportions and ratios should be harmonious
- ***Activity*** - use contrasts to maintain orientation & context within design
- ***Restraint*** - contrasts should be conscious, strong, few in number, and never overwhelming

Error - Excessive Typographic Contrasts

5 different types sizes in 3 different fonts (!!)



Layers

- Contrasting color, value, texture can segregate information into separate layers

- Supports ***overlapping*** information in displays, allowing selective processing of specific sets of elements

- Allows different layers to be read and interpreted ***separately***

Creating Layers

1. Group items into categories based on intended use

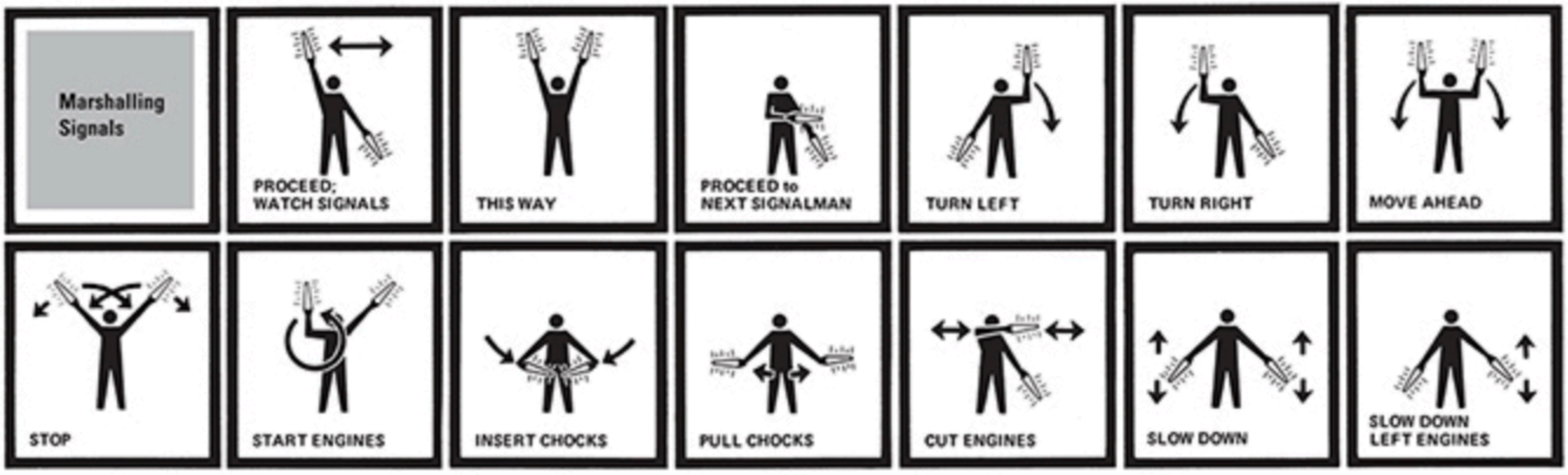
2. Determine rank & importance of groups

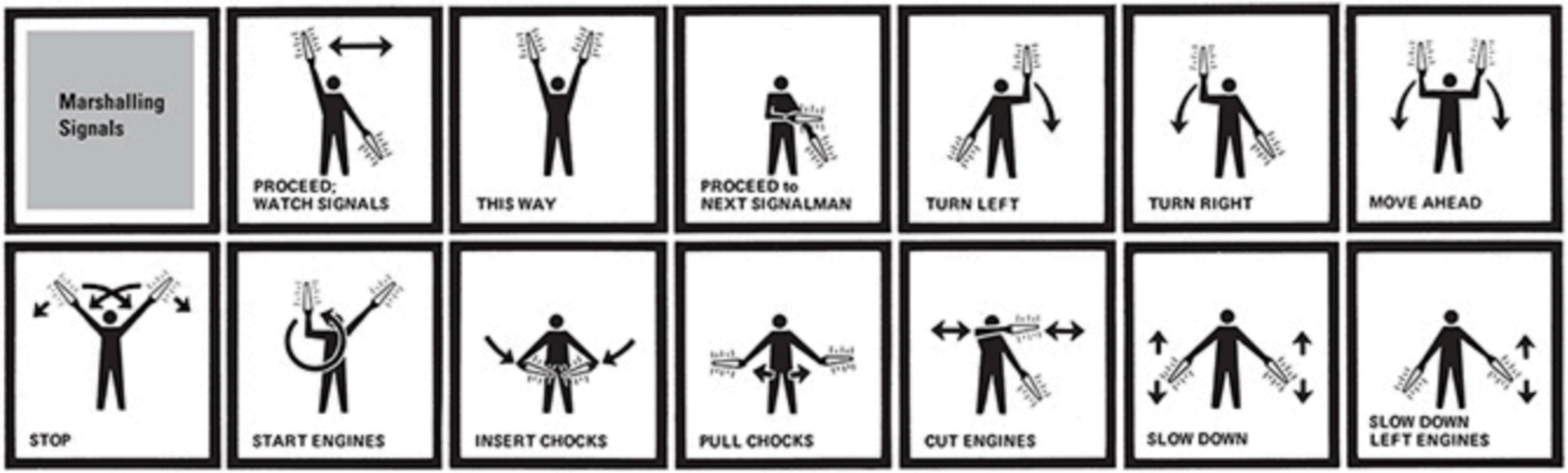
3. Use perceptual variables (size, value, hue, etc.) to establish layering effect

4. Maximize differences between groups while minimizing differences within groups

5. Use squint test to ensure elements in group retain together but visually separated

Layers


Marshalling Signals
PROCEED; WATCH SIGNALS
THIS WAY
PROCEED to NEXT SIGNALMAN
TURN LEFT
TURN RIGHT
MOVE AHEAD
STOP
START ENGINES
INSERT CHOCKS
PULL CHOCKS
CUT ENGINES
SLOW DOWN
SLOW DOWN LEFT ENGINES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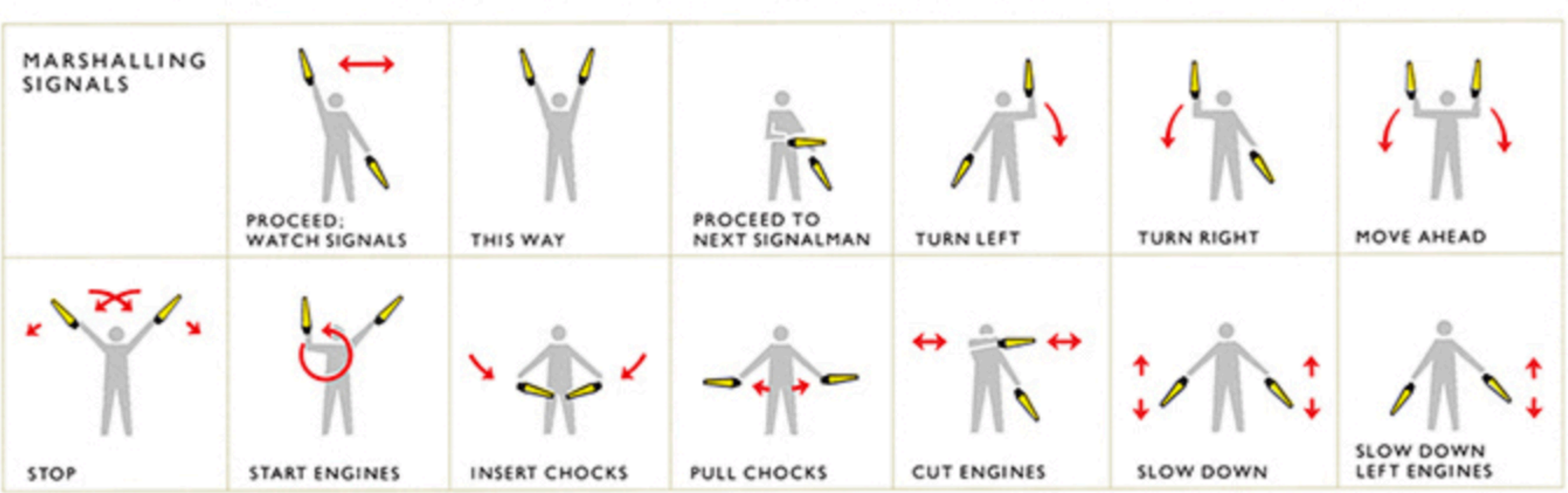
MARSHALLING SIGNALS
PROCEED; WATCH SIGNALS
THIS WAY
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TURN LEFT
TURN RIGHT
MOVE AHEAD
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INSERT CHOCKS
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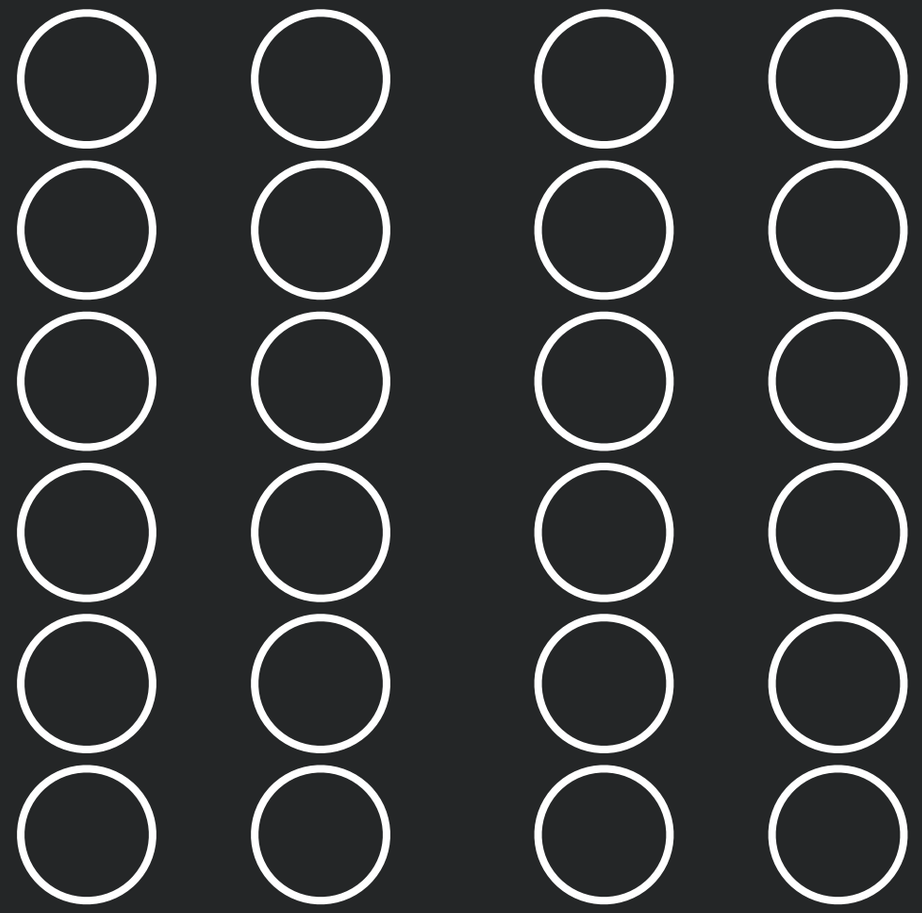
Organization & Structure

Organization & Structure

- Organization needs to be ***designed***
- Benefits
  - Unity - ties together related elements so that they work **together**
  - Integrity & readability - offers structure that helps user to easily scan & make comparisons
  - Control - determines where user will focus **attention** in the design
- Gestalt -> psychology of perception

Gestalt Principle - Proximity

- Elements associated ***most*** strongly w/ nearby elements



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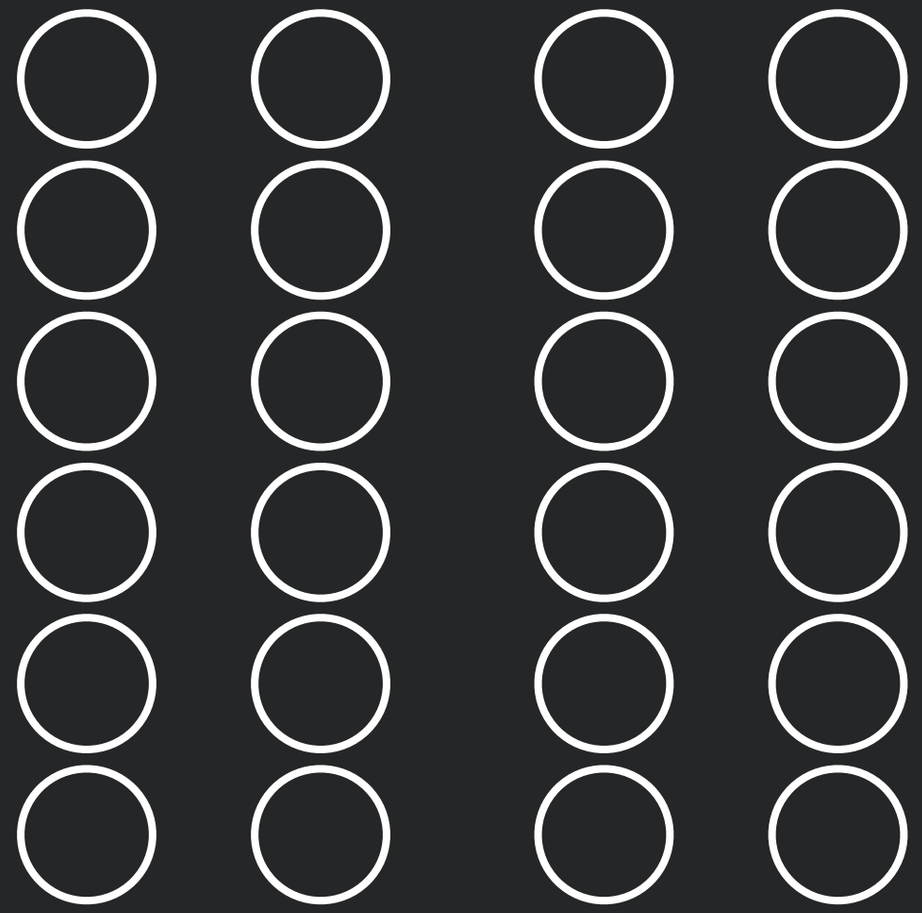
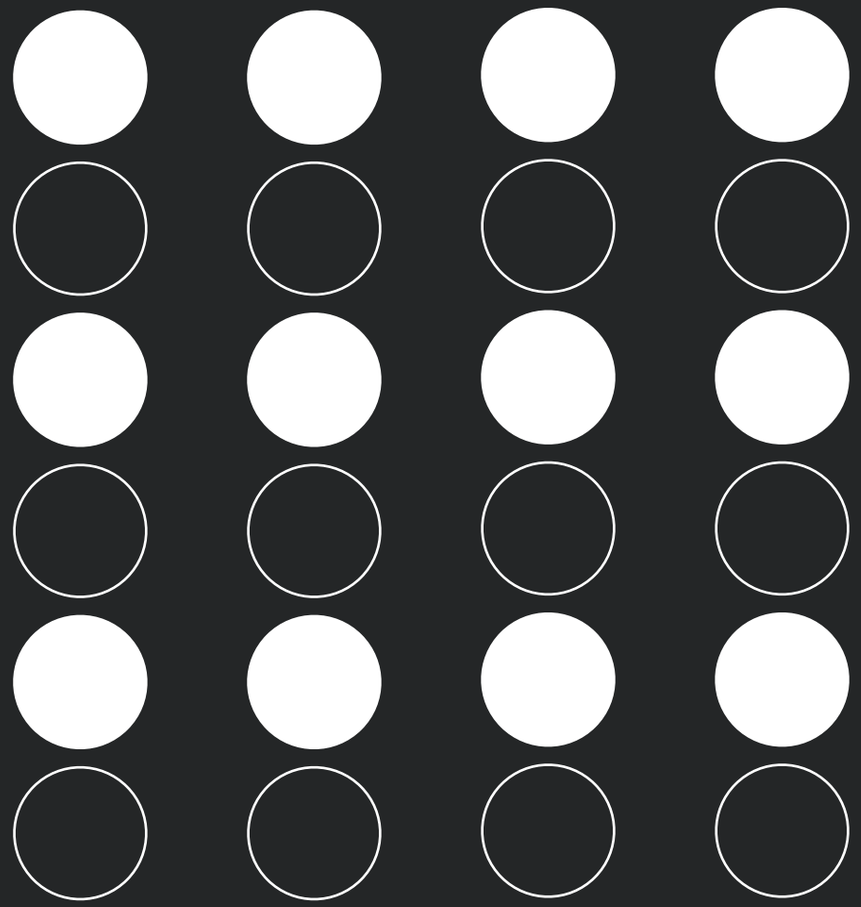


parsed as 4 columns based on close vertical spacing
then parsed as two sets of two columns based on spacing

Gestalt Principle - Similarity

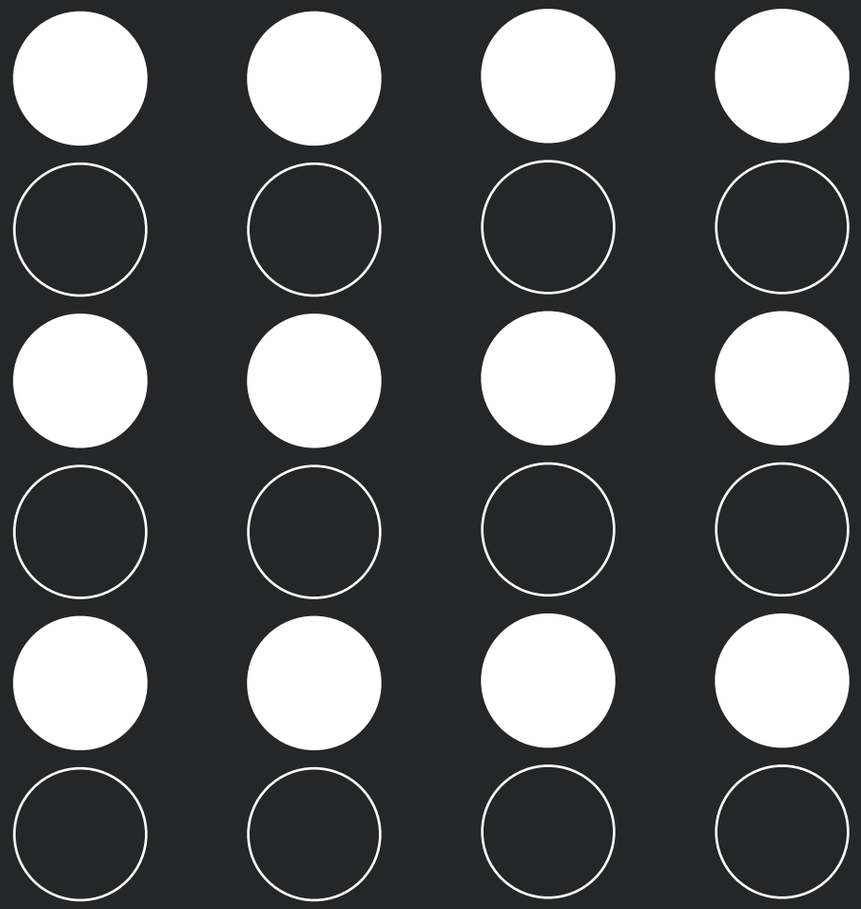
- Elements associated more strongly when share common visual attributes than when they differ



Gestalt Principle - Similarity

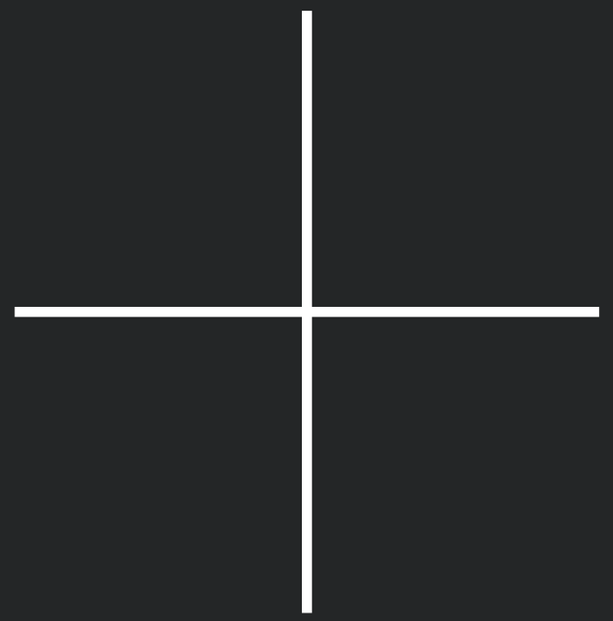
- Elements associated more strongly when share common visual attributes than when they differ

parsed as rows based on fill similarity,
despite closer column spacing



Gestalt Principle - Continuity

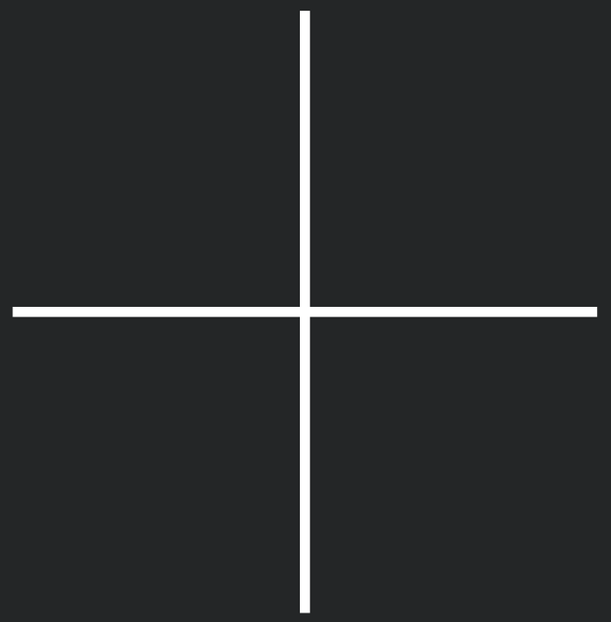
- Preference for ***simplest*** physical explanation of complex figure



Gestalt Principle - Continuity

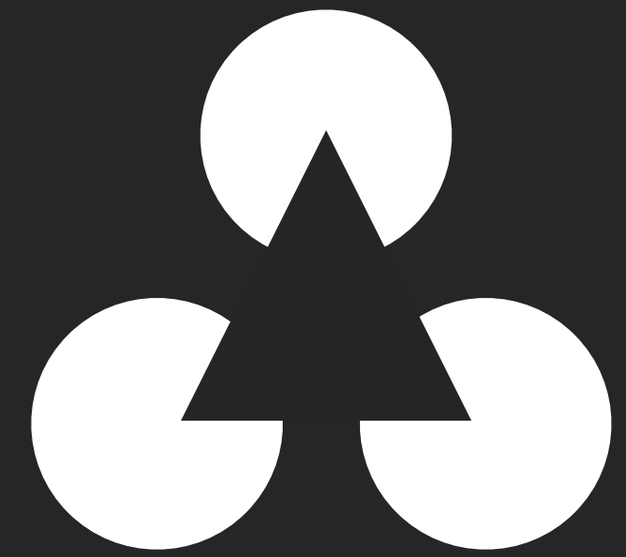
- Preference for ***simplest*** physical explanation of complex figure

parsed as two lines, rather than 4 separate lines or 4 opposing angles



Gestalt Principle - Closure

- Preference to interpret figures as complete, even when missing information



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Parsed as triangle superimposed on 3 complete circles, even though none of these is actually present

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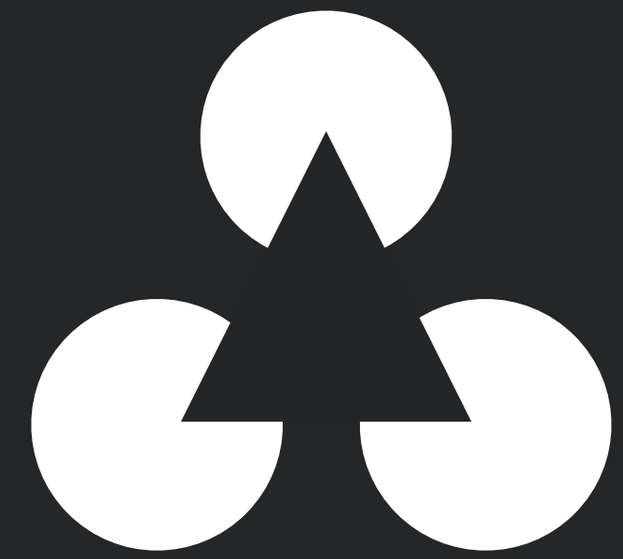

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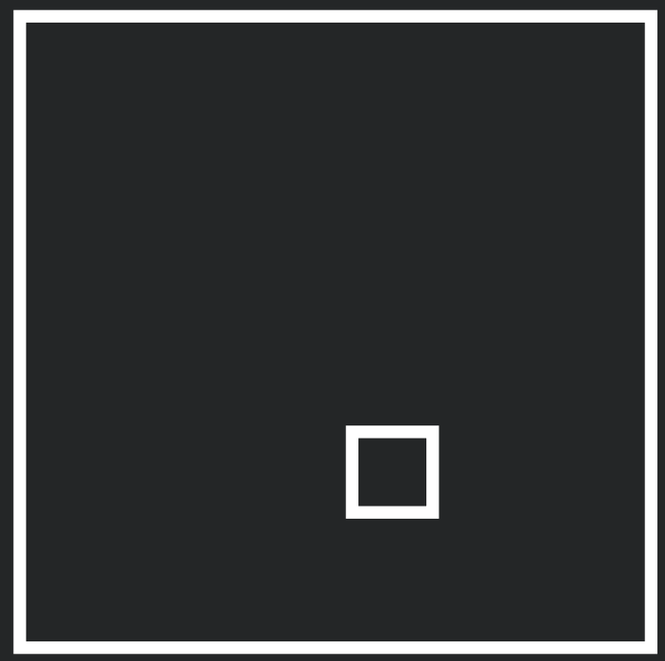
Gestalt Principle - Area

- Preference to interpret smaller overlapping elements as figure, larger as ground



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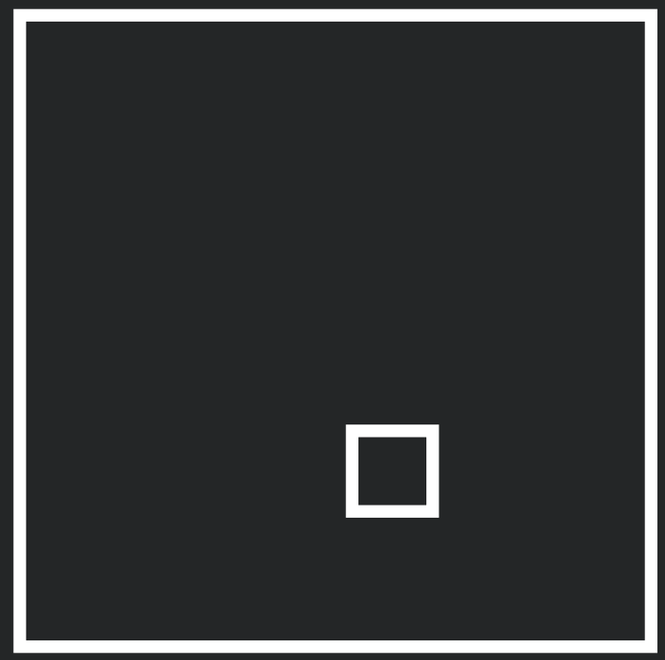
Small rectangle parsed as small rectangle on top of larger, rather than hole



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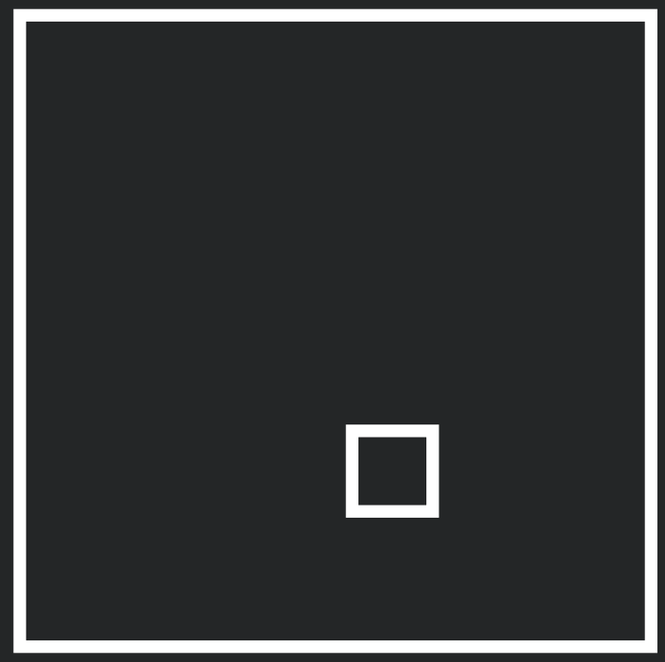

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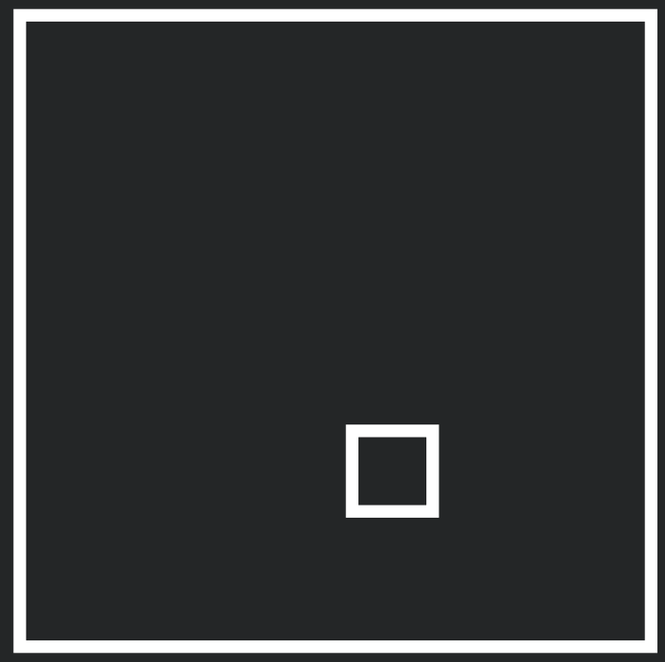


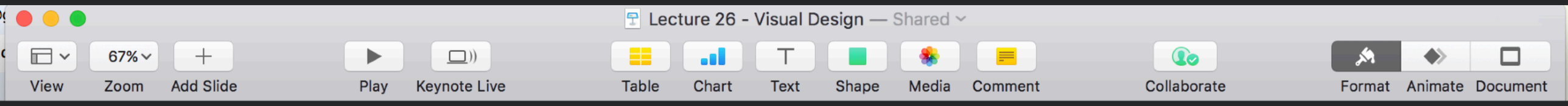
Gestalt Principle - Symmetry

- Preference to interpret ambiguous form as multiple symmetric elements

Parsed as two overlapping objects rather than 3 separate shapes

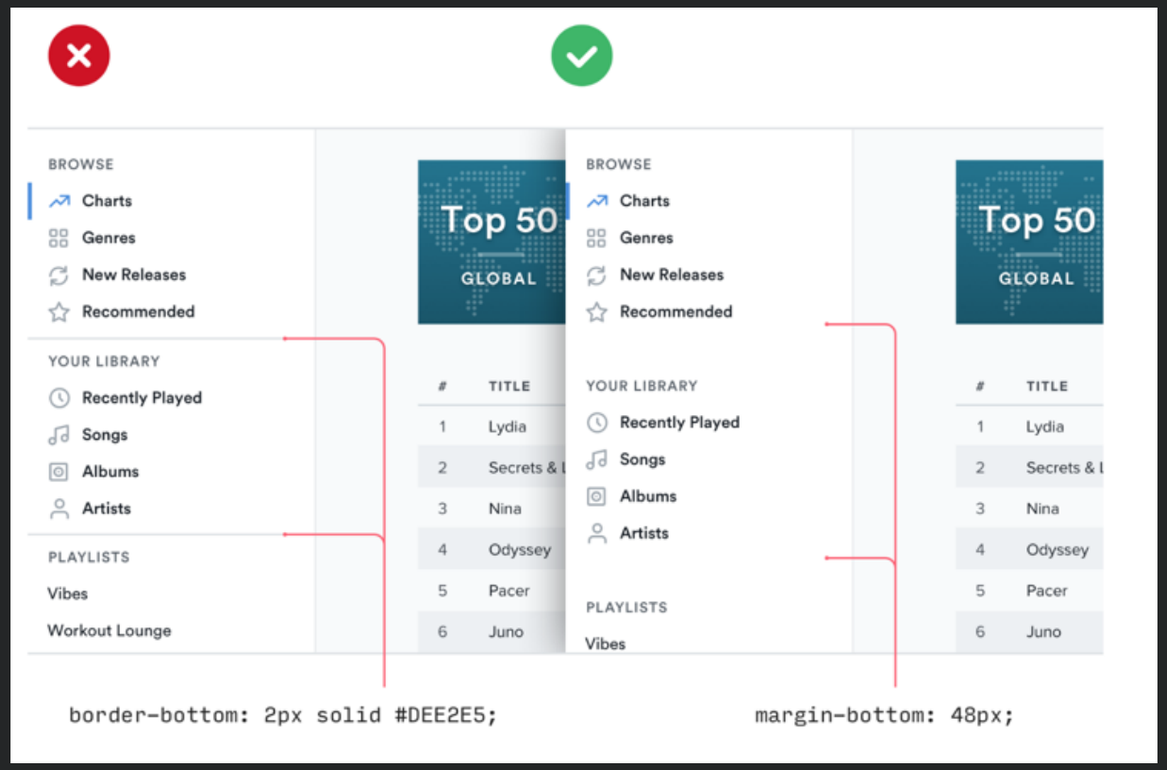
Grouping

- Binding UI elements tightly together while distinguishing them from surrounding controls
- “Showing” not “telling”
- Can be achieved through
  - Bounding boxes (not recommended)
  - Negative space & contrasts
  - Arrangement & alignment

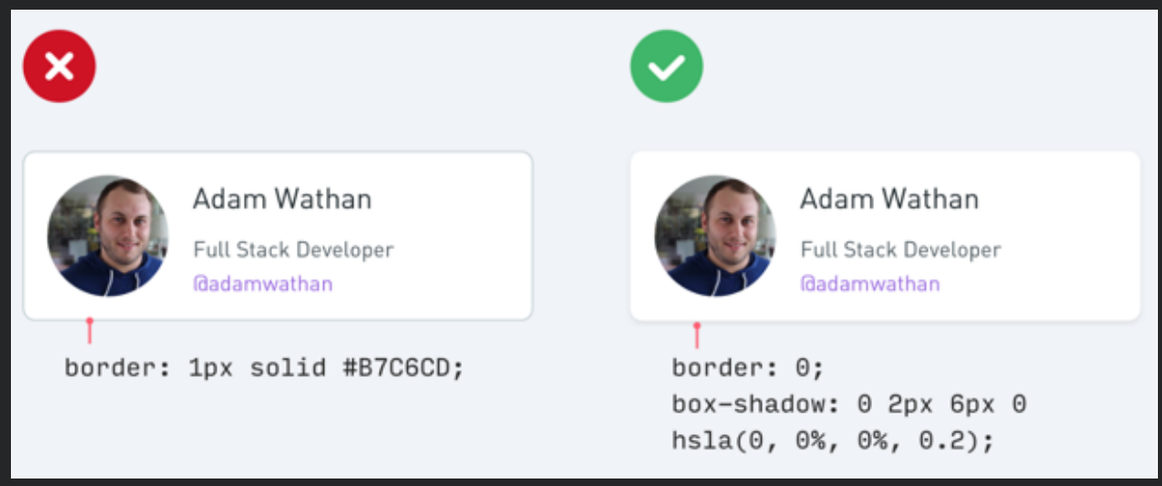


Use Fewer Borders

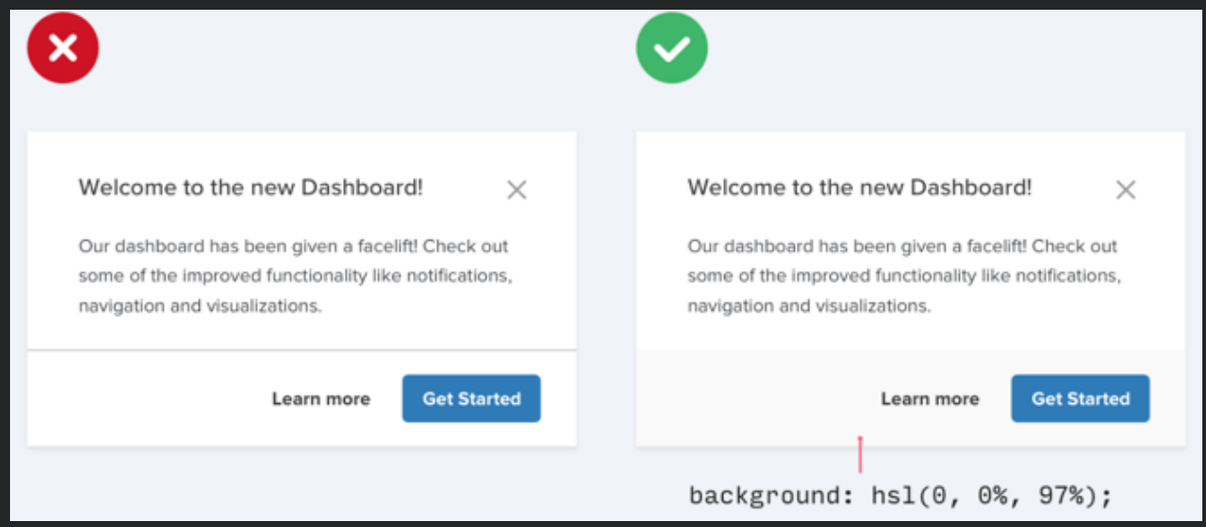
https://medium.com/refactoring-ui/7-practical-tips-for-cheating-at-design-40c736799886



negative space



box shadows



different backgrounds

Hierarchy

Order groups based on perceptual prominence corresponding to intended reading sequence

Can help solve “skimming” problems

Structure can help people focus attention on key parts

Key points might **get lost though.**

Hierarchy

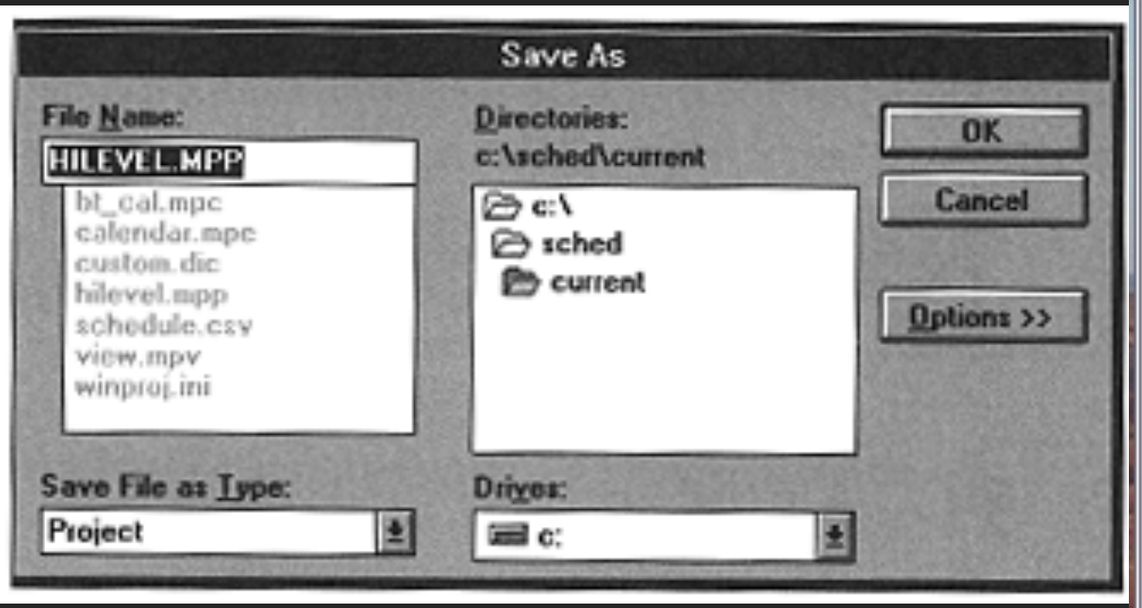
Order groups based on perceptual prominence corresponding to intended reading sequence

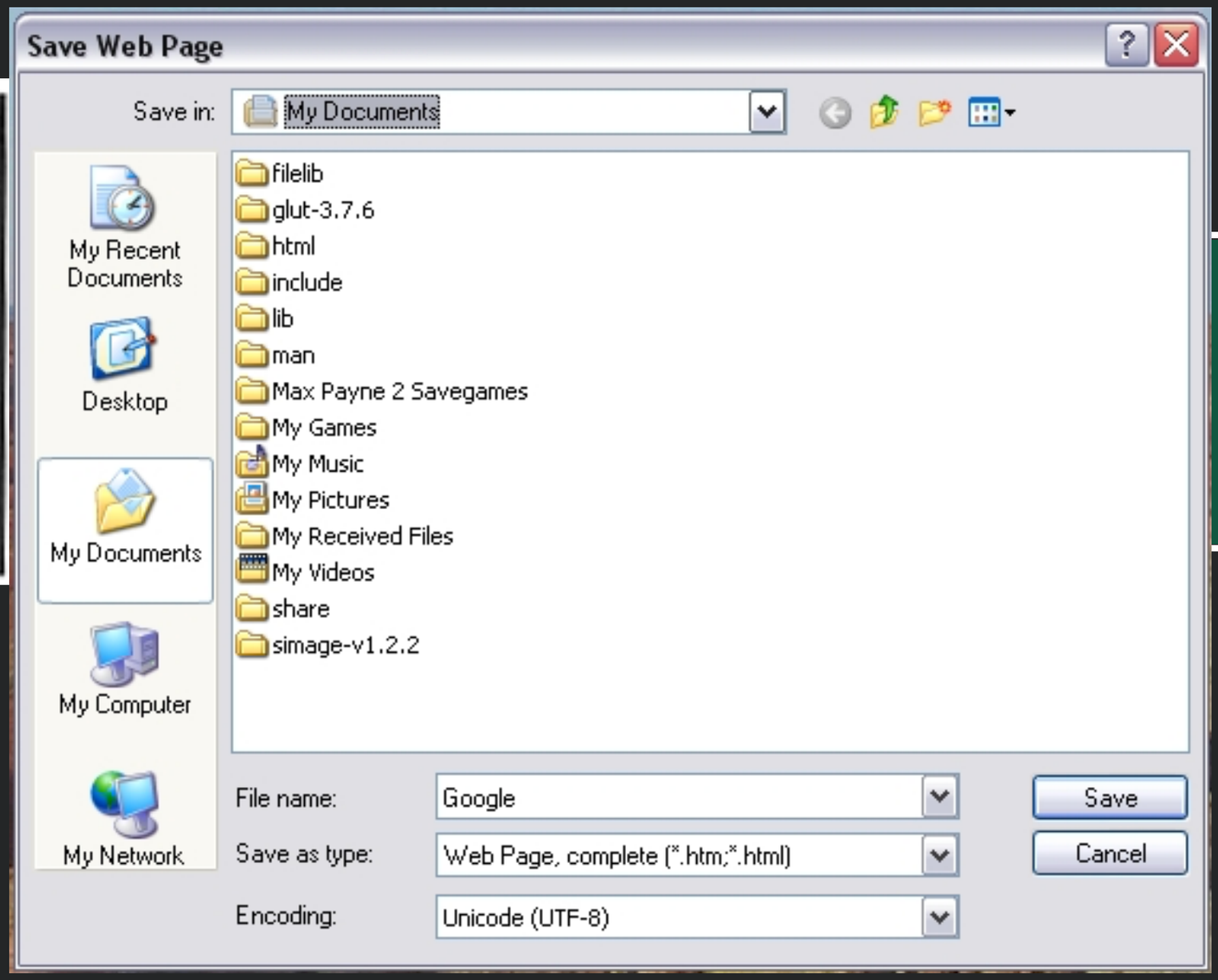
Can help solve “skimming” problems

Structure can help people focus attention on key parts

Key points might **get lost though.**

But bolding helps! Plus this obnoxious red arrow and text in a totally different font!


Save As
File Name:
HILEVEL.MPP
bt_cal.mpc
calendar.mpc
custom.dic
hilevel.mpp
schedule.csv
view.mpv
winproj.ini
Directories:
c:\sched\current
c:\
sched
current
OK
Cancel
Options >>
Save File as Type:
Project
Drives:
c:


Save Web Page
Save in:
My Documents
My Recent Documents
Desktop
My Documents
My Computer
My Network
filelib
glut-3.7.6
html
include
lib
man
Max Payne 2 Savegames
My Games
My Music
My Pictures
My Received Files
My Videos
share
simage-v1.2.2
File name:
Google
Save as type:
Web Page, complete (*.htm;*.html)
Encoding:
Unicode (UTF-8)
Save
Cancel

Use Negative Space

- Directs ***attention*** to critical regions of display

1. Review design, prioritizing groups

2. Add extra ***space*** to ensure spatial separation & emphasis, particularly for important elements

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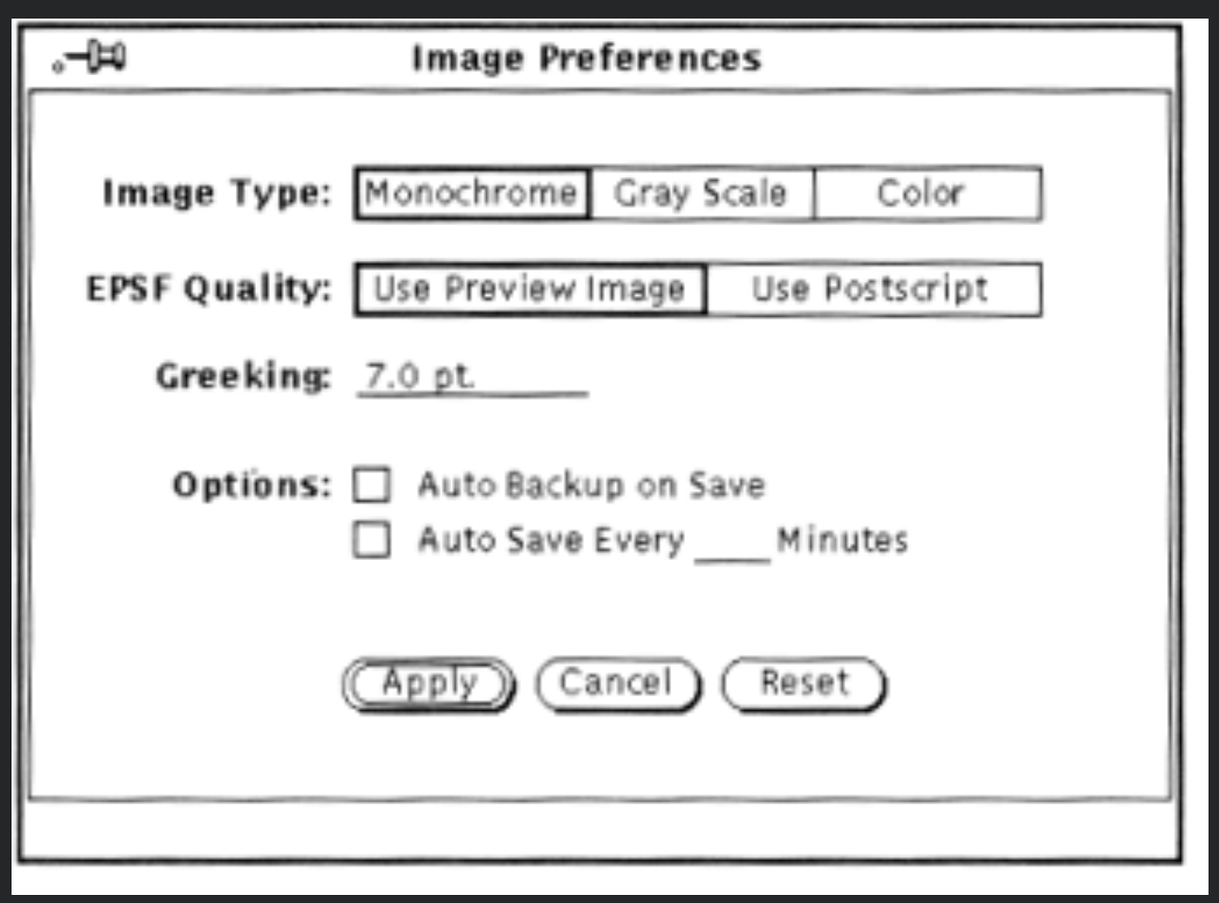
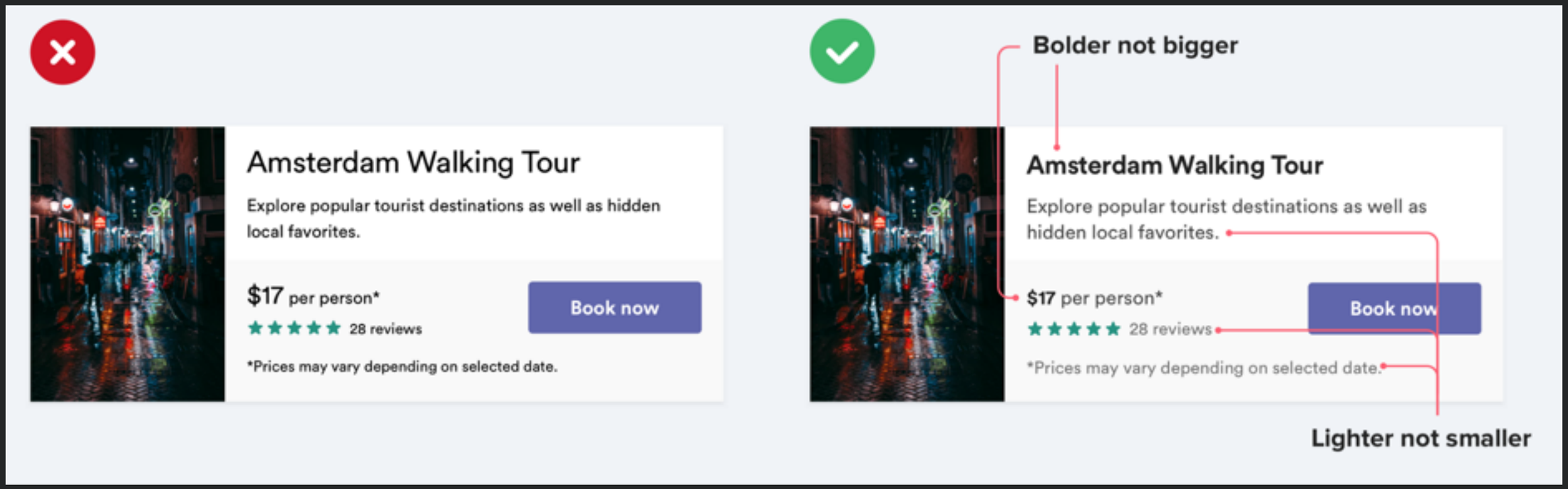
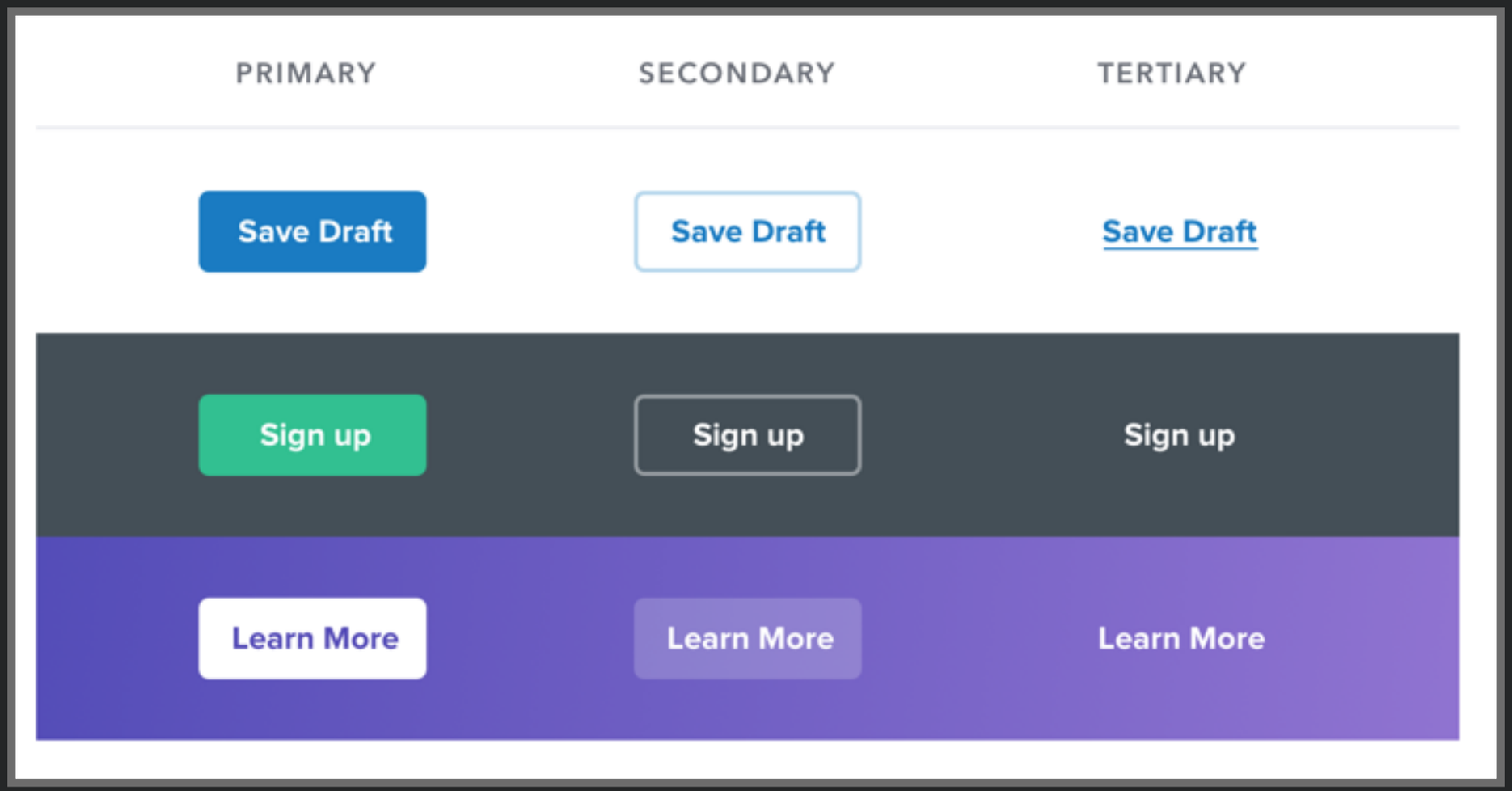


Creating Hierarchy: Color and Weight Instead of Size



https://medium.com/refactoring-ui/7-practical-tips-for-cheating-at-design-40c736799886

Signal Importance of Action



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Images & Icons

Images & Icons

- Benefits
  - Identification - images are easy to recognize
  - Expression - breadth of artistic expression that can make design more engaging & enjoyable

Types of Iconic Representation

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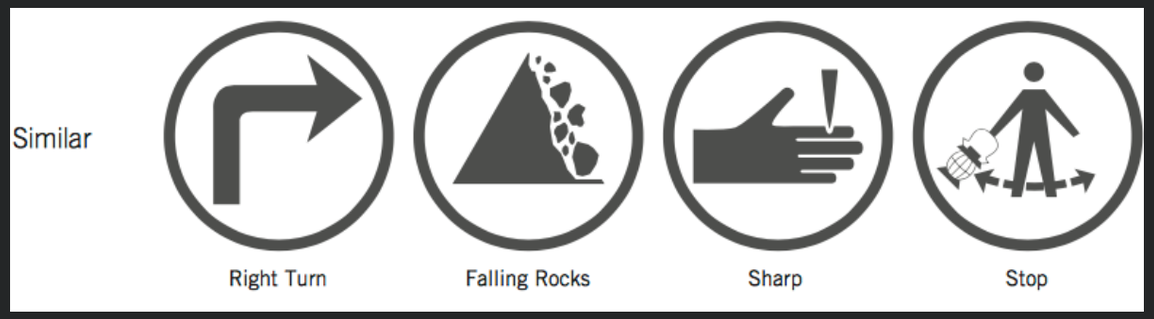
- Similar - visually ***analogous*** to action, object, concept



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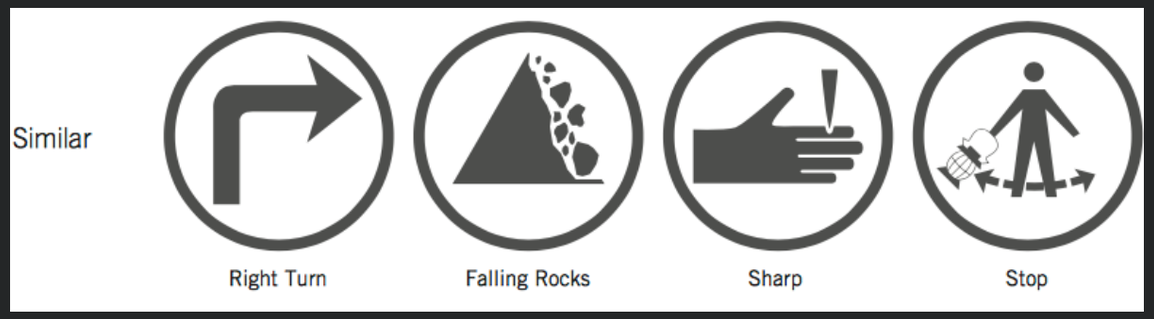
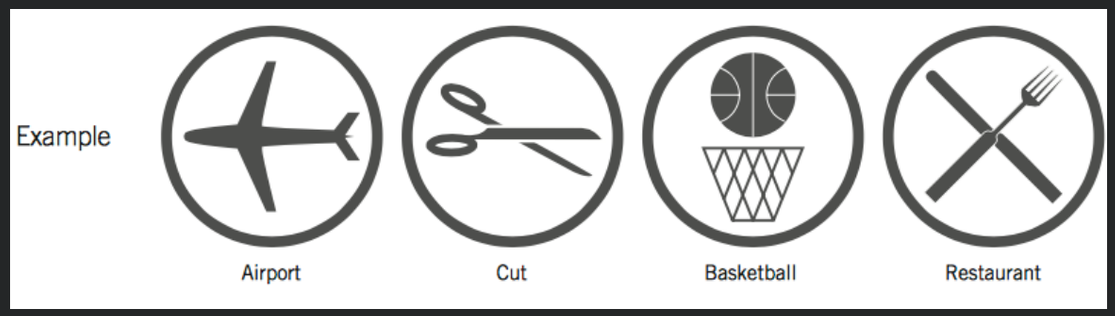
    - Example - things that exemplify or are commonly associated





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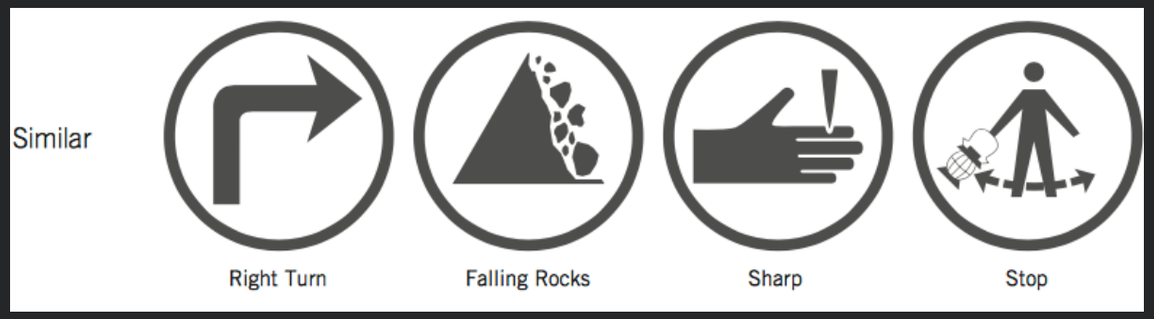
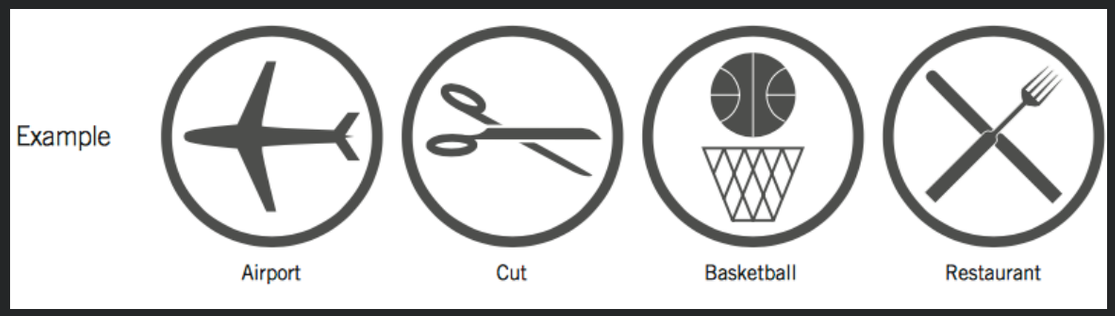
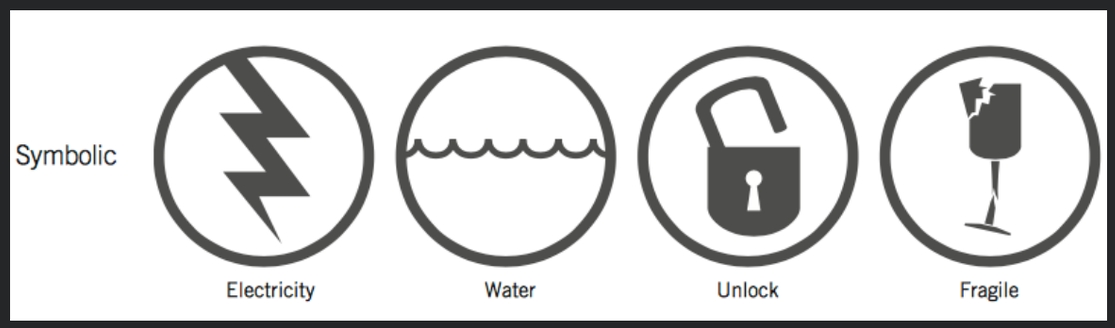
- Similar - visually ***analogous*** to action, object, concept
  - Example - things that exemplify or are commonly associated
- Symbolic - represent concept at higher level of ***abstraction***

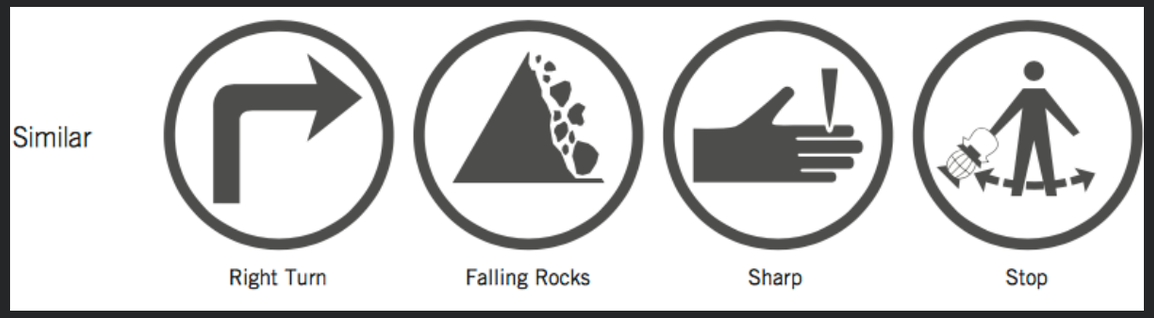


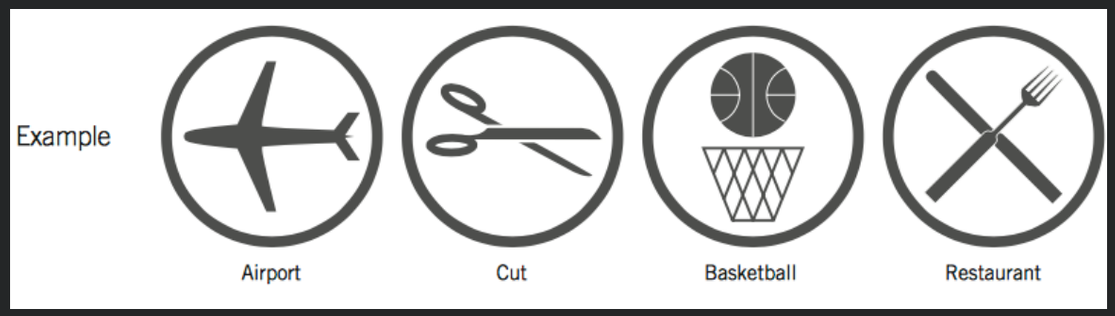


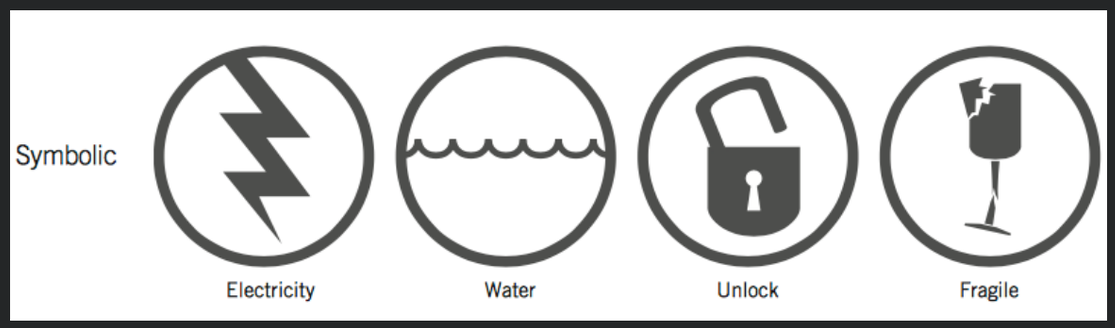


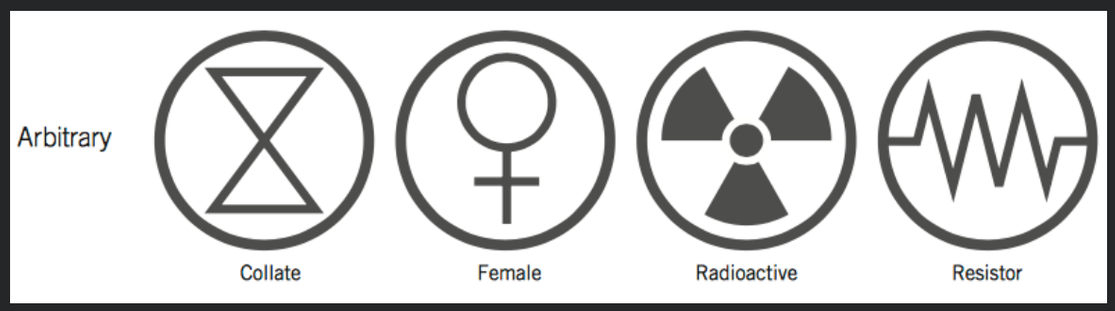
Types of Iconic Representation

- Similar - visually ***analogous*** to action, object, concept
  - Example - things that exemplify or are commonly associated
- Symbolic - represent concept at higher level of ***abstraction***
- Arbitrary - little or no relationship to concept, must be learned through ***standard***









Use of Abstraction

- Simplifying highly concrete, realistic representations makes them easier to interpret up to the point at which further abstraction obscures icon's semantics
- Makes icon more generic, more canonical, less complex

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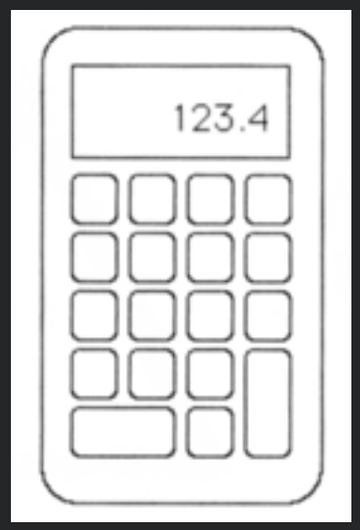

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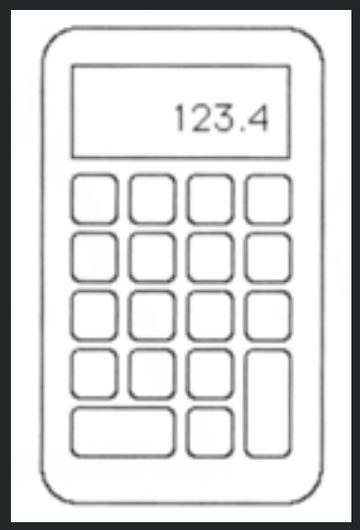

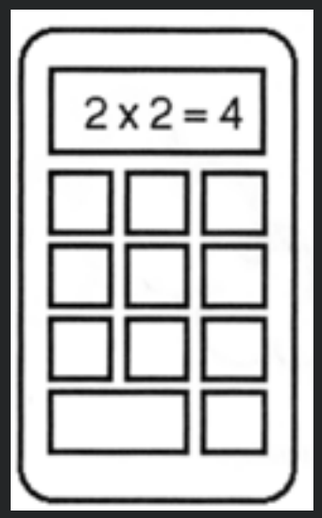

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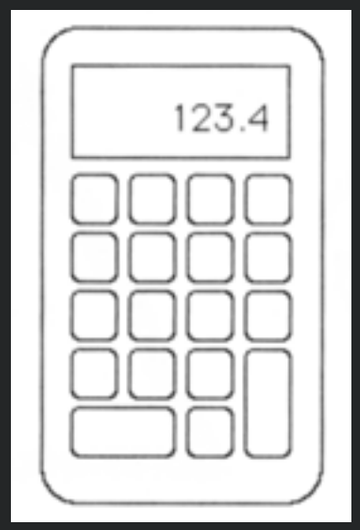
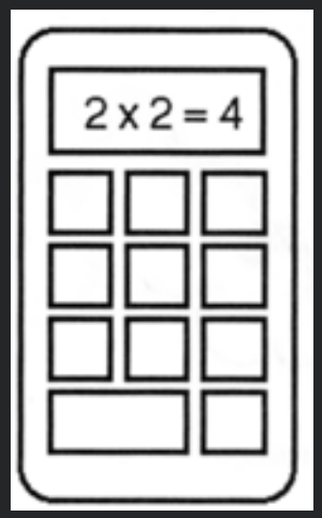
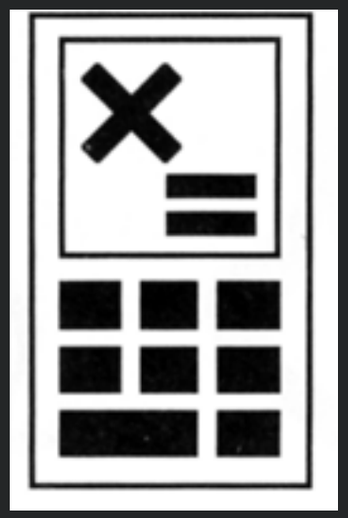
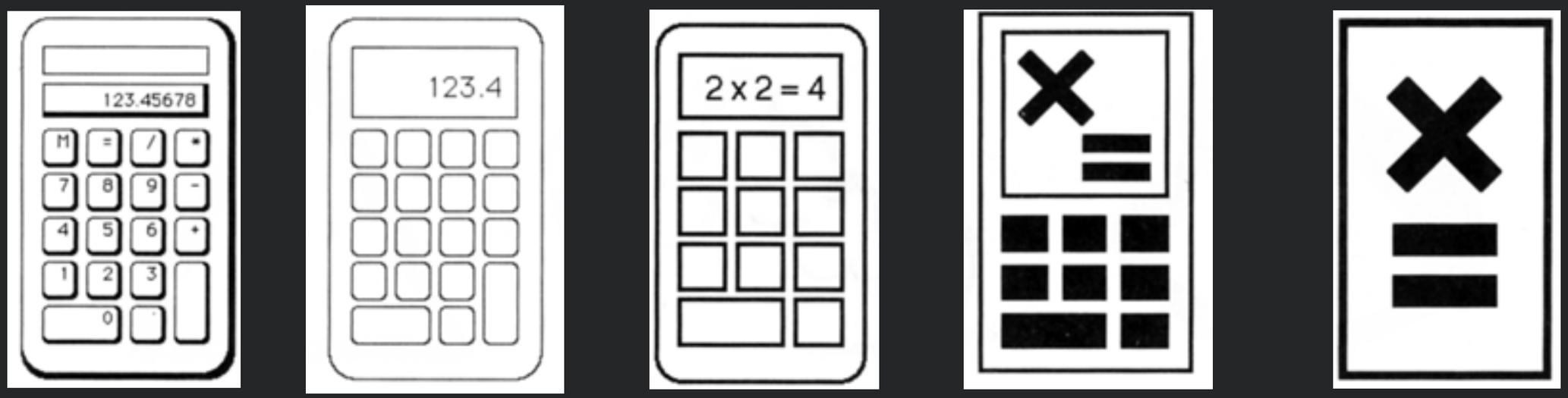






Use of Abstraction

- Simplifying highly concrete, realistic representations makes them easier to interpret up to the point at which further abstraction obscures icon's semantics
- Makes icon more generic, more canonical, less complex



Principles of Icon Design

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- Immediacy - can be perceived effortlessly & involuntarily by being ***bold***, clear, balanced

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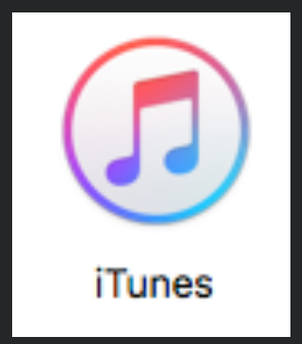
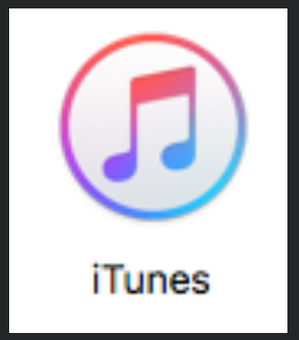
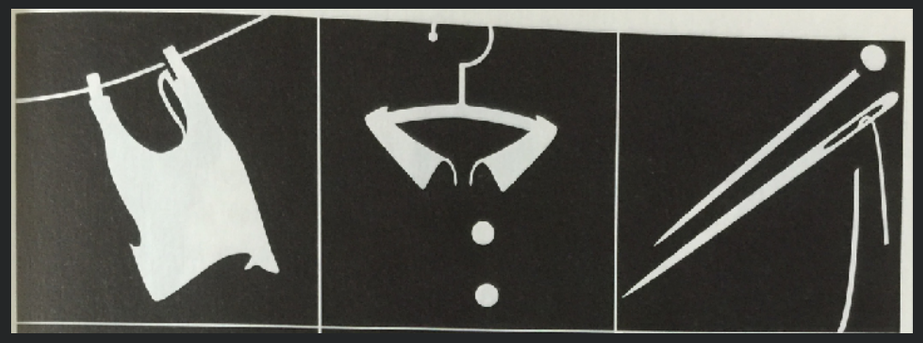


- Immediacy - can be perceived effortlessly & involuntarily by being ***bold***, clear, balanced
- Generality - represents a ***class*** of items, rather than an individual element, by removing details that may vary
- Cohesiveness - set of icons that function ***together*** by sharing visual variables

Principles of Icon Design





- Immediacy - can be perceived effortlessly & involuntarily by being ***bold***, clear, balanced
- Generality - represents a ***class*** of items, rather than an individual element, by removing details that may vary
- Cohesiveness - set of icons that function ***together*** by sharing visual variables
- Characterization - call to mind one or more ***distinctive*** features

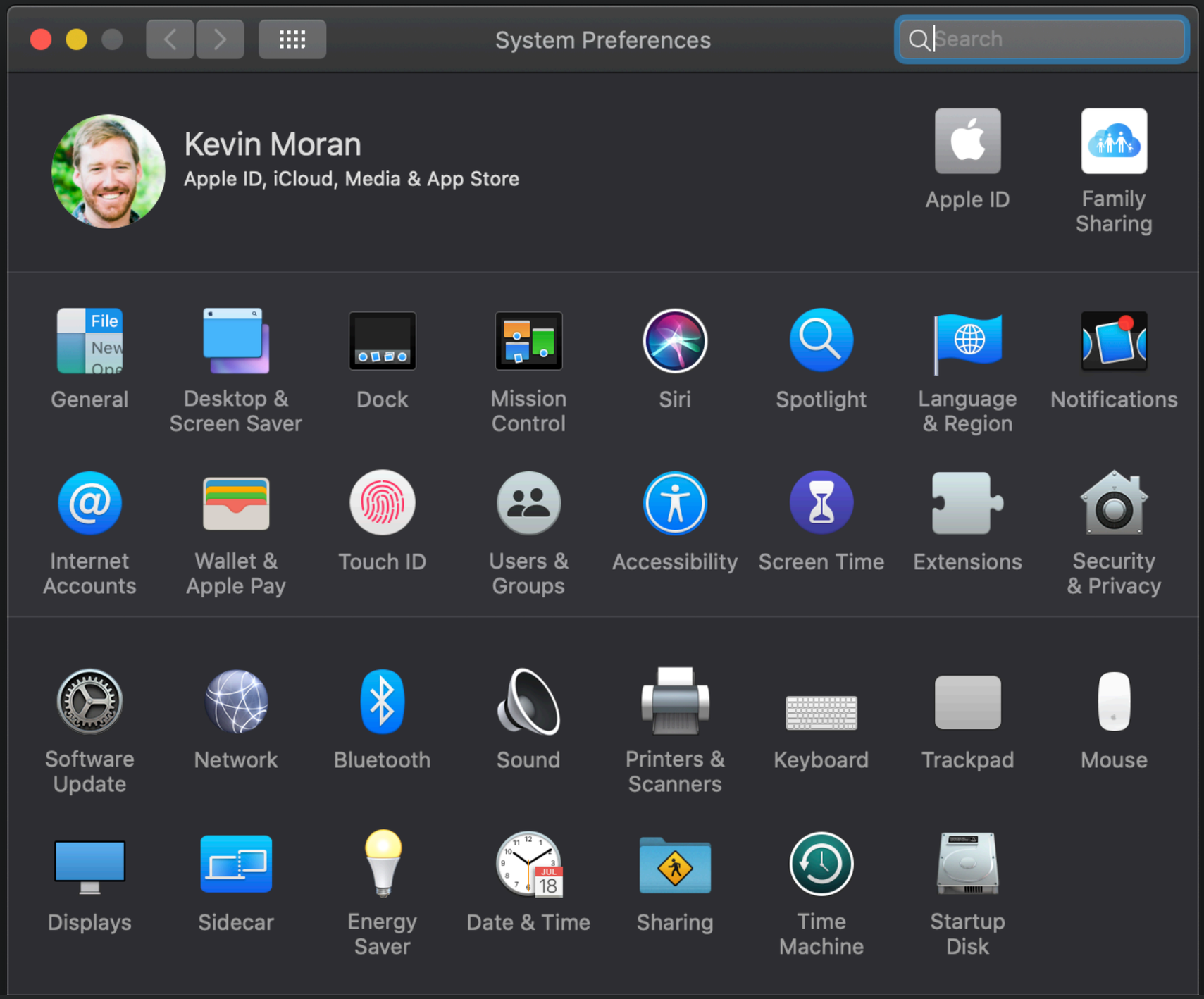
Selecting the Right Type of Icon

- If concept is concrete, familiar, tangible, use similar or example icon
- If concept will be used repeatedly, consider using more symbolic or arbitrary icon based on convention
- If concept is abstract process or subtle, use textual label

Activity: OS 10.2 Preferences Icons

Best 3, worst 3 and why? Then: How to make worst 3 better?

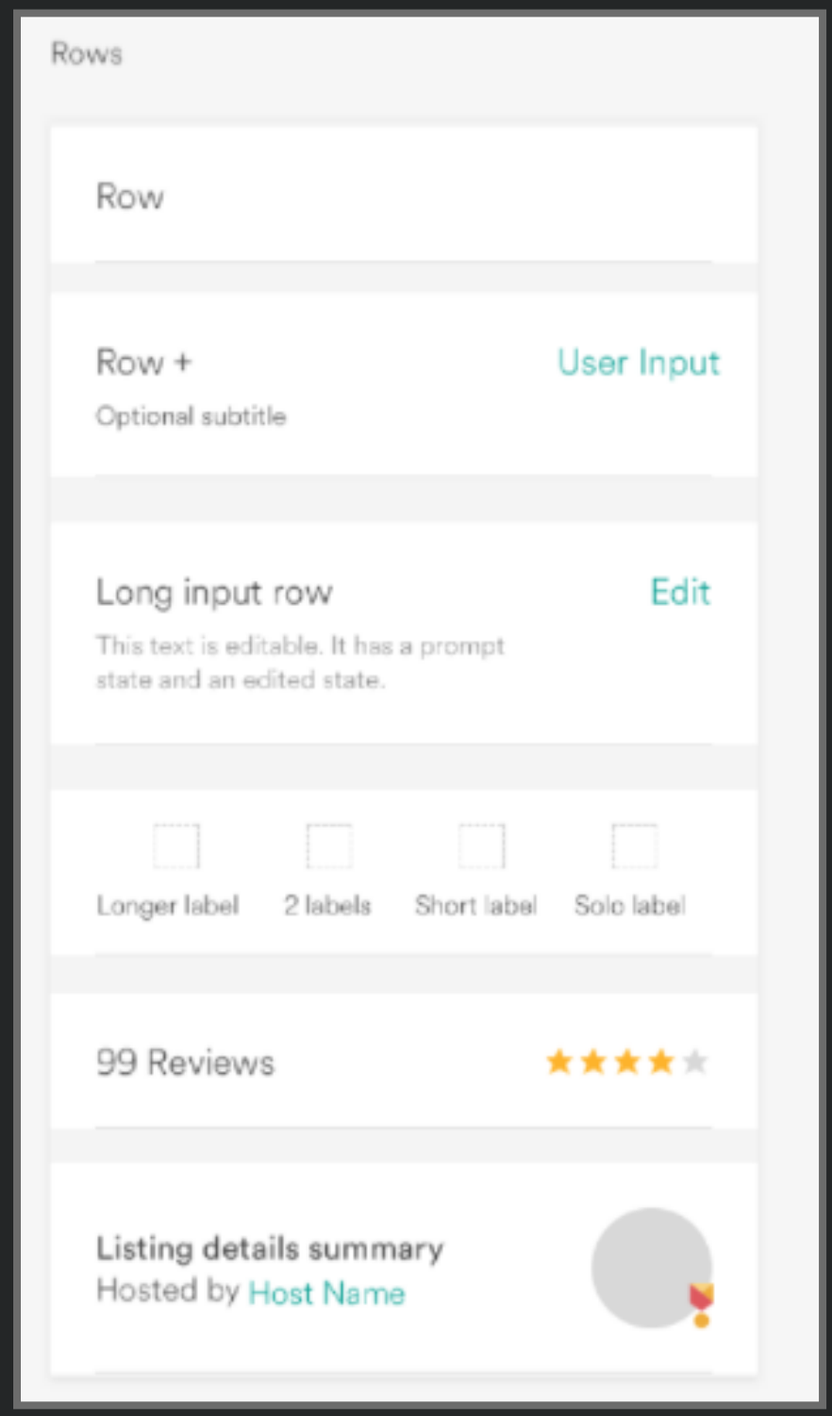
Activity: OS 10.15 Preferences Icons



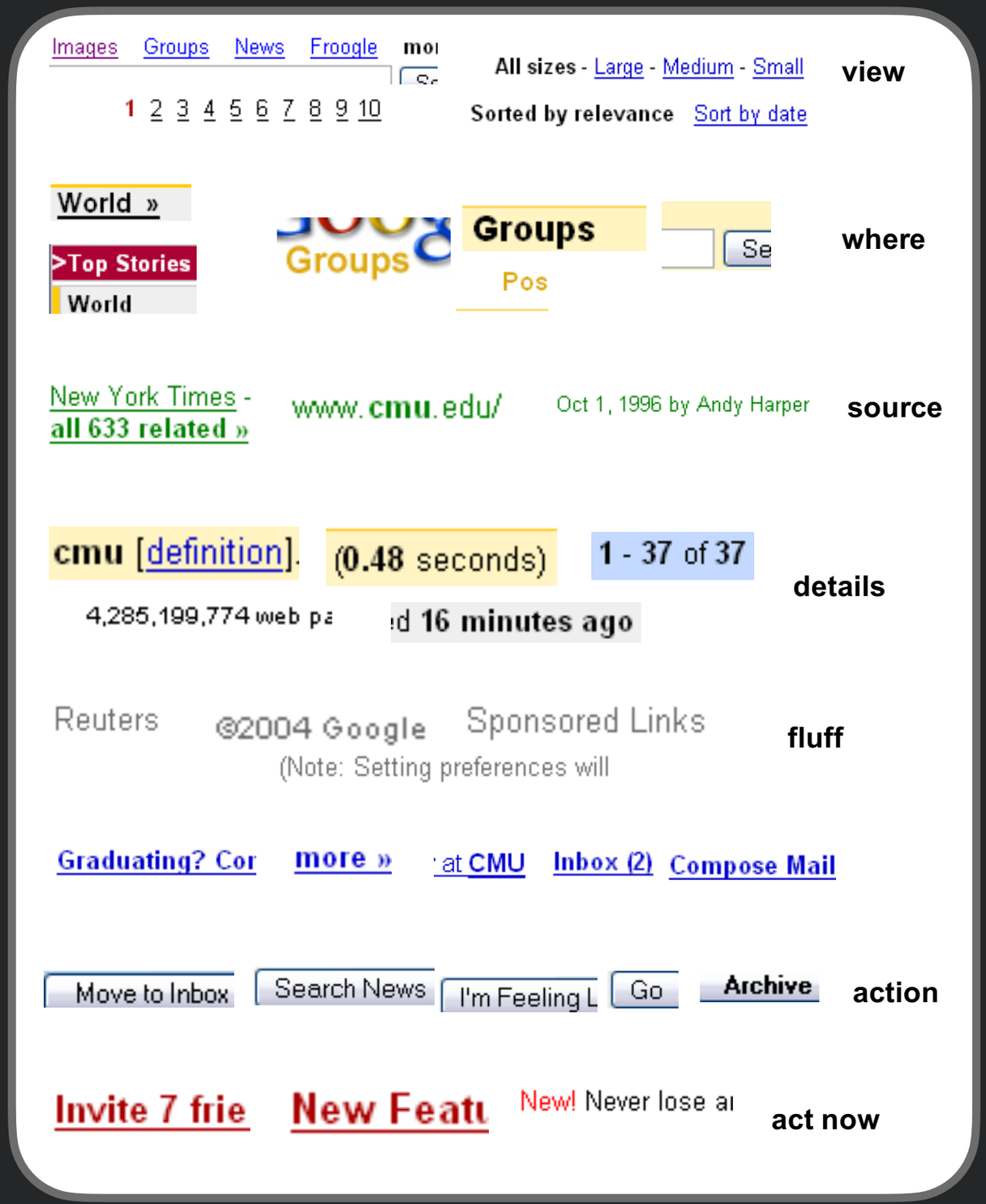
Design Languages

Design Languages

- Many, ***many*** choices about visual variables and syntax of composition
  - How do you ensure choices are made consistently across web app?
- Solution: design language
  - Describes how to express ideas and concepts in the interface
  - May be communicated through Human Interface Guideline documentation
  - (Example of consistency and standards)

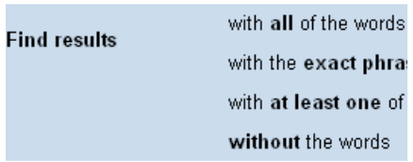


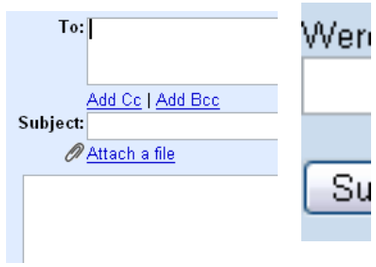
Example: Elements, Google 2004



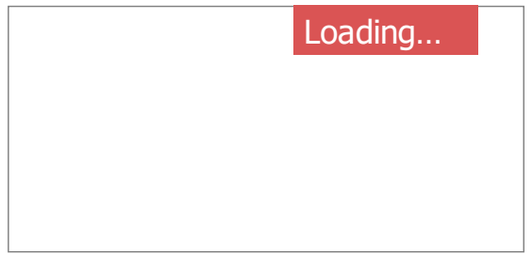
Example: Syntax, Google 2004

task

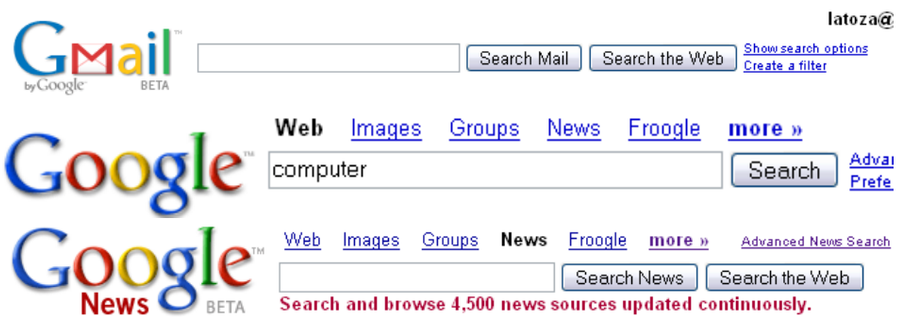




placeholder

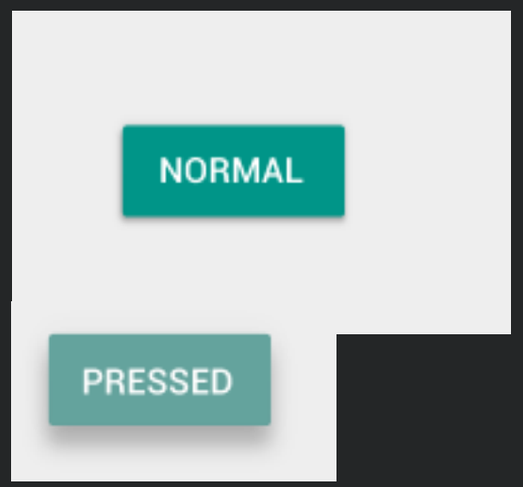


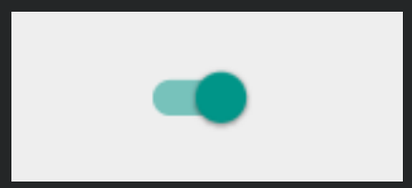
toolbar

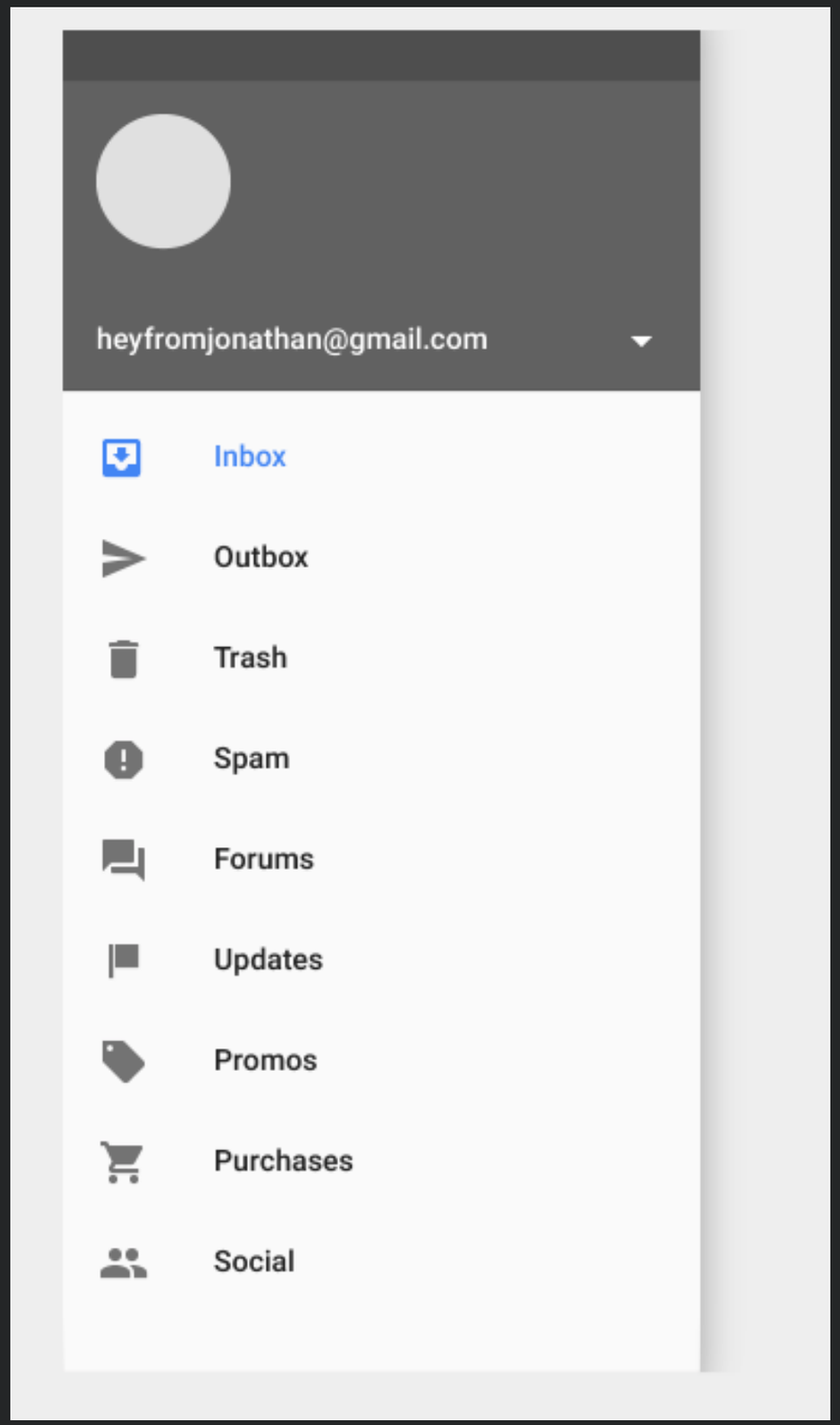


list

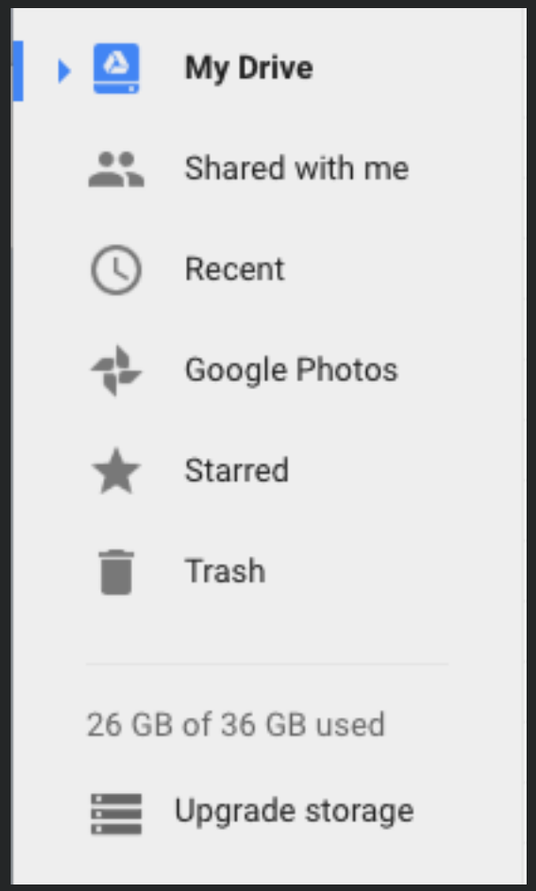
Examples: Google 2016

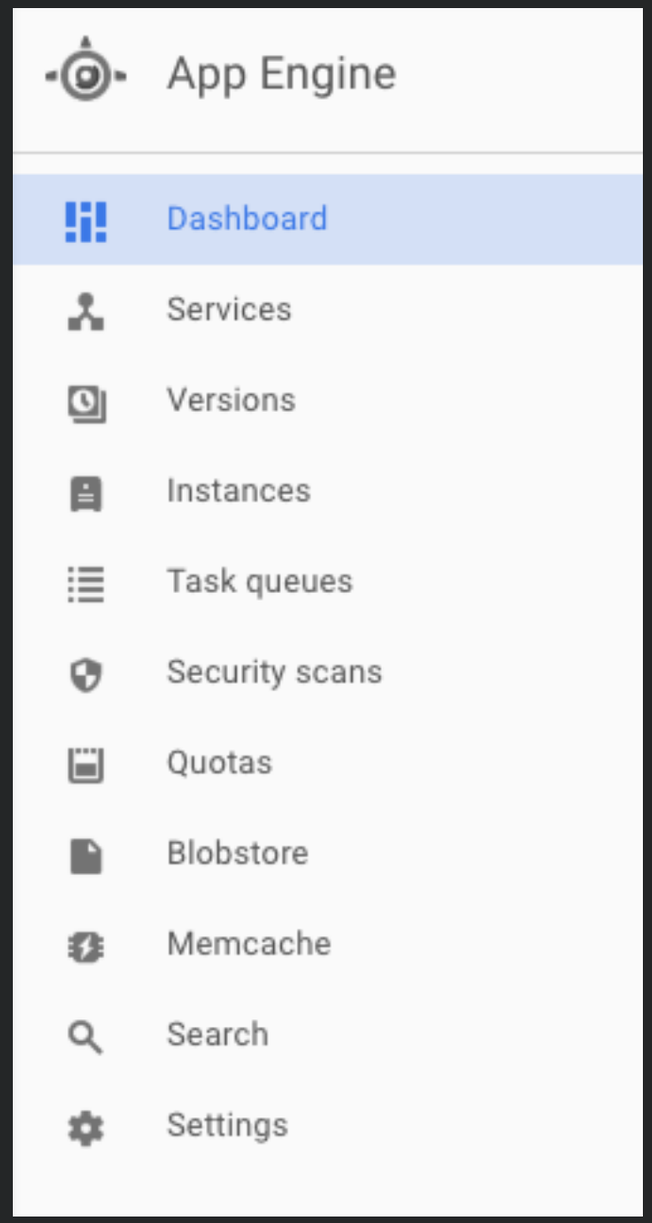


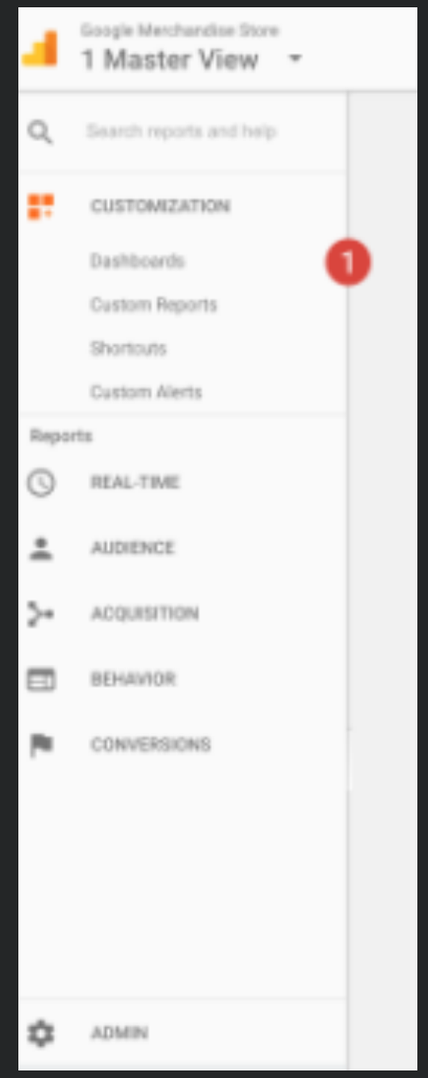




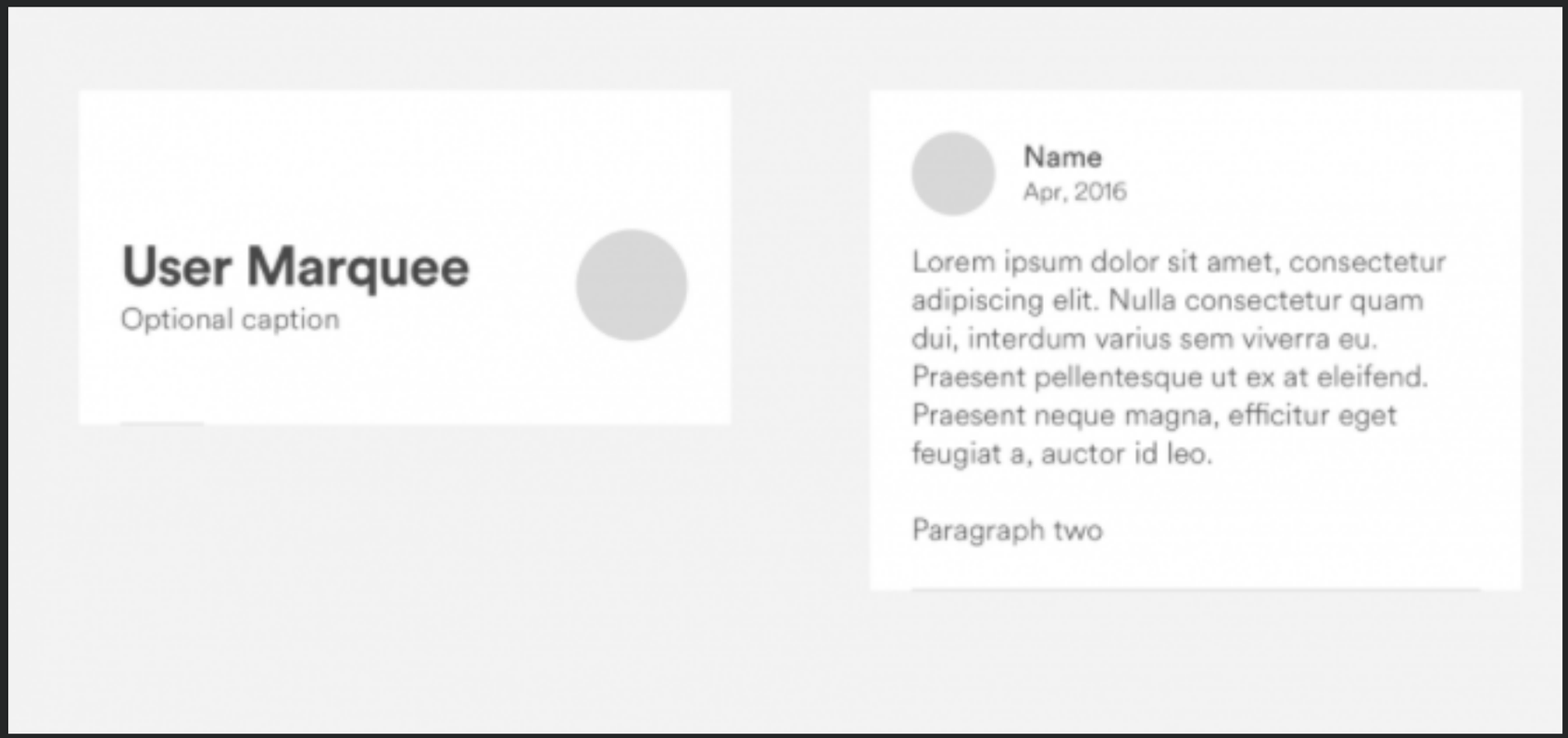
Examples: Google 2016



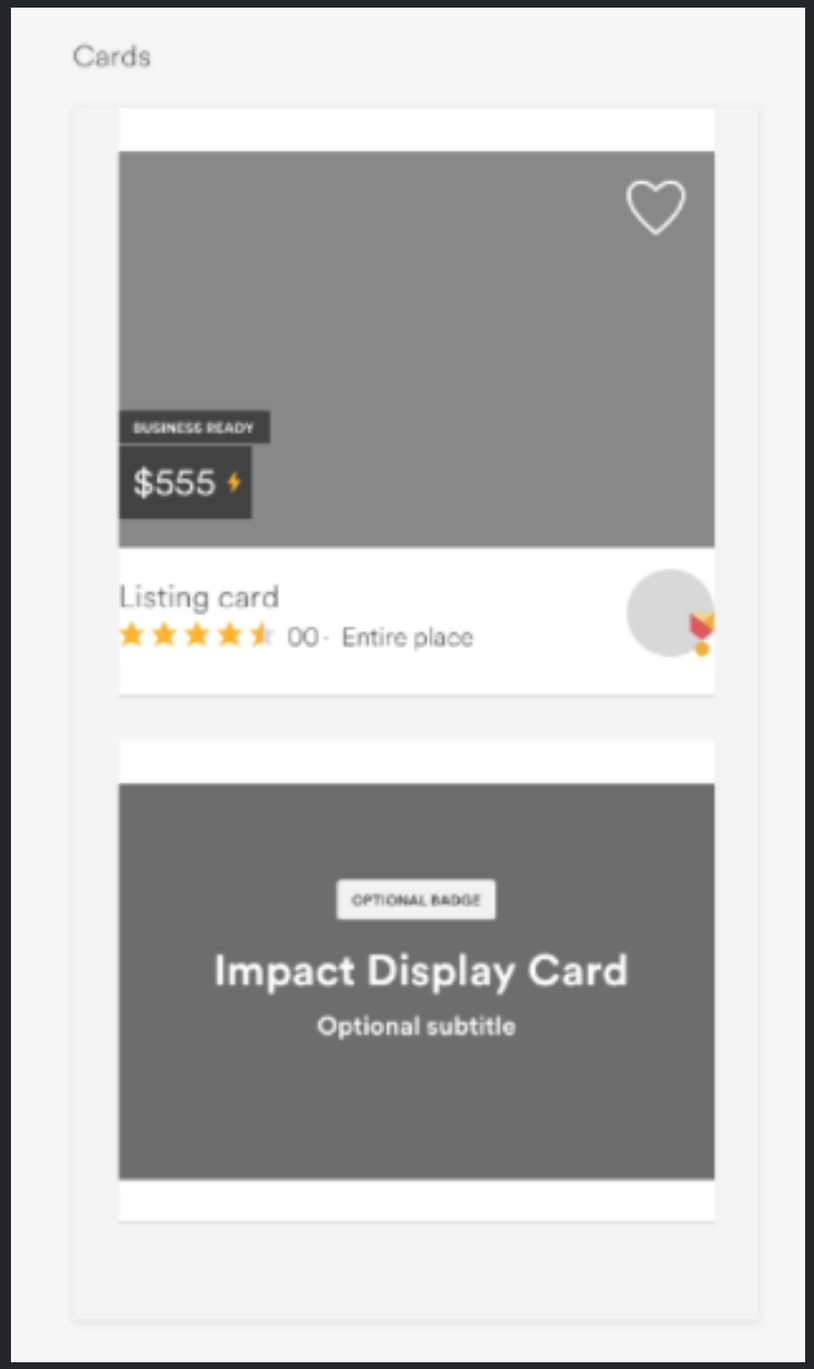


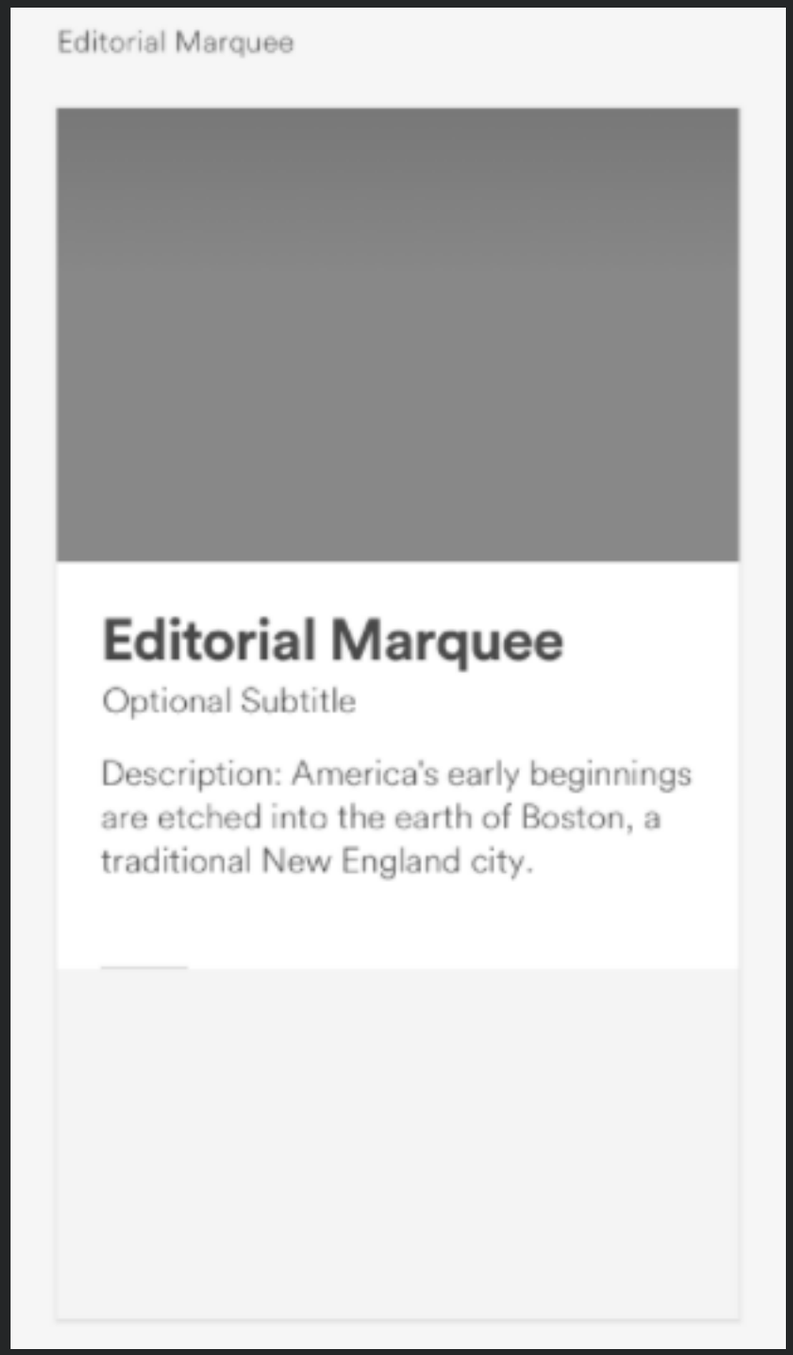


Examples: AirBnb

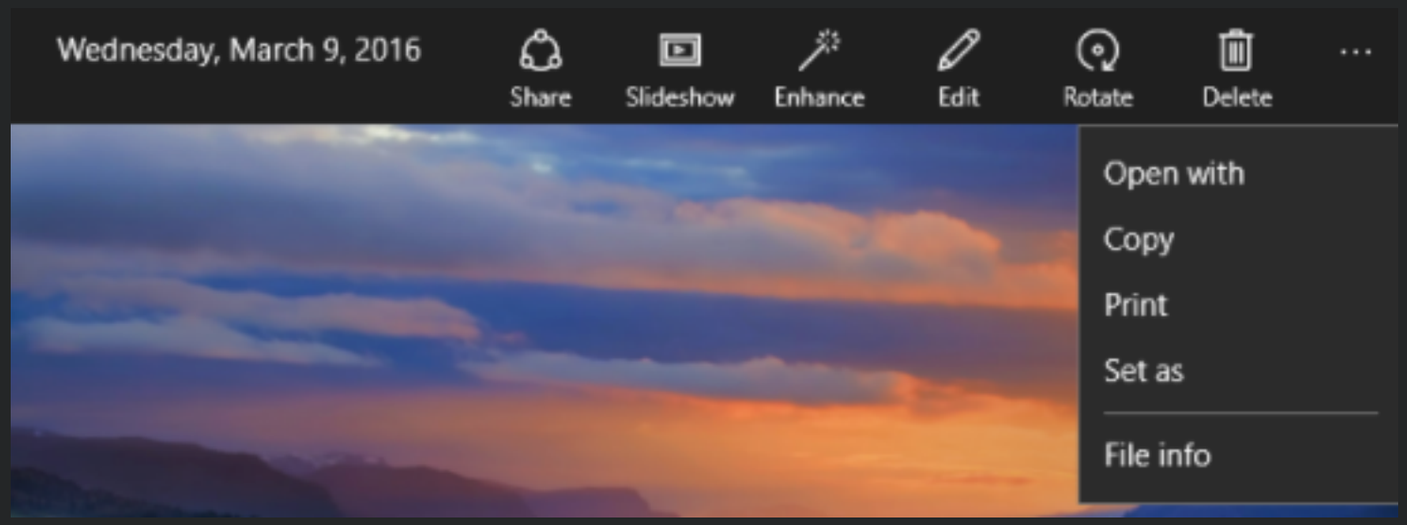


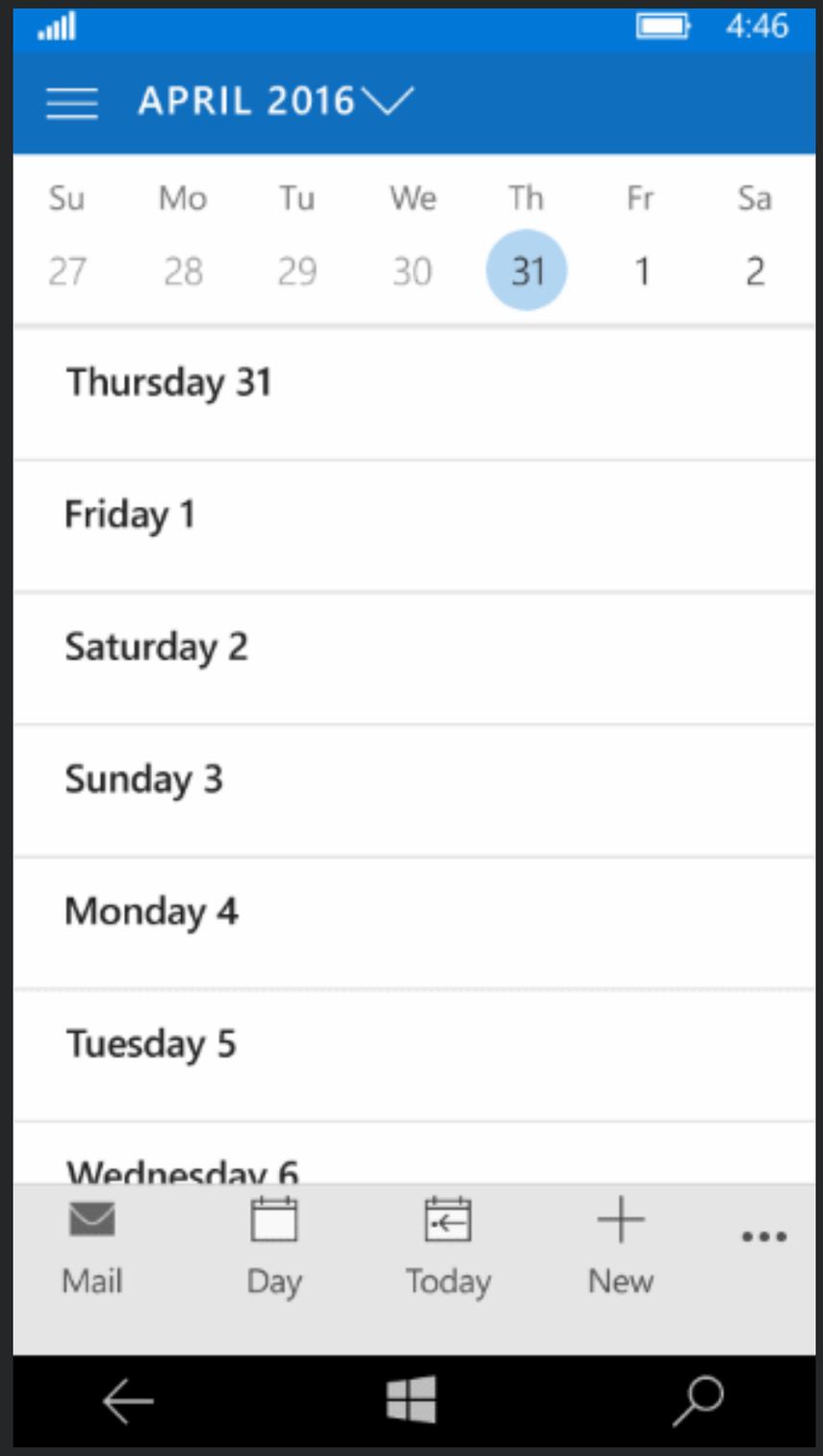
Examples: AirBnb



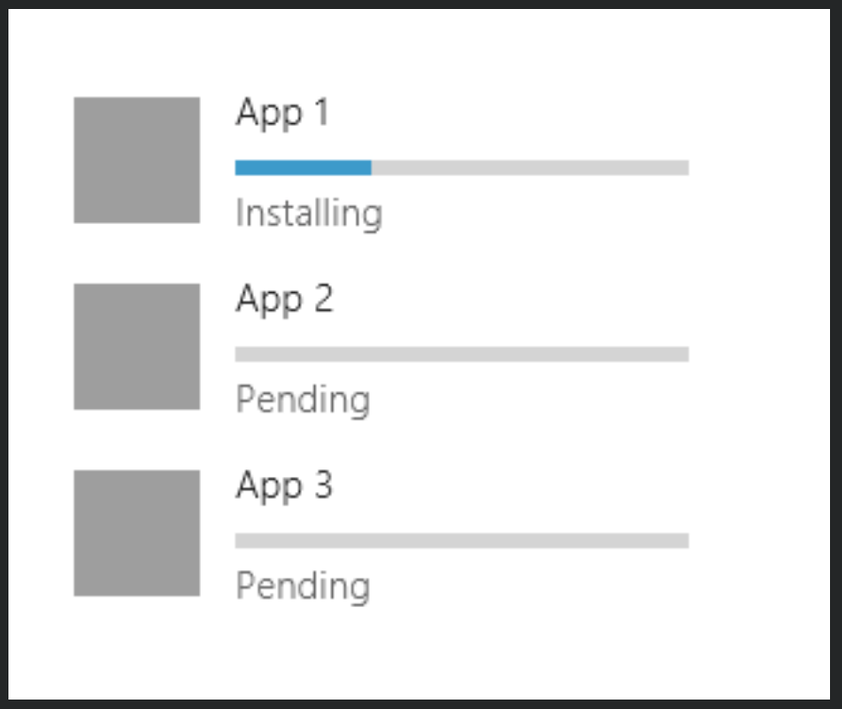


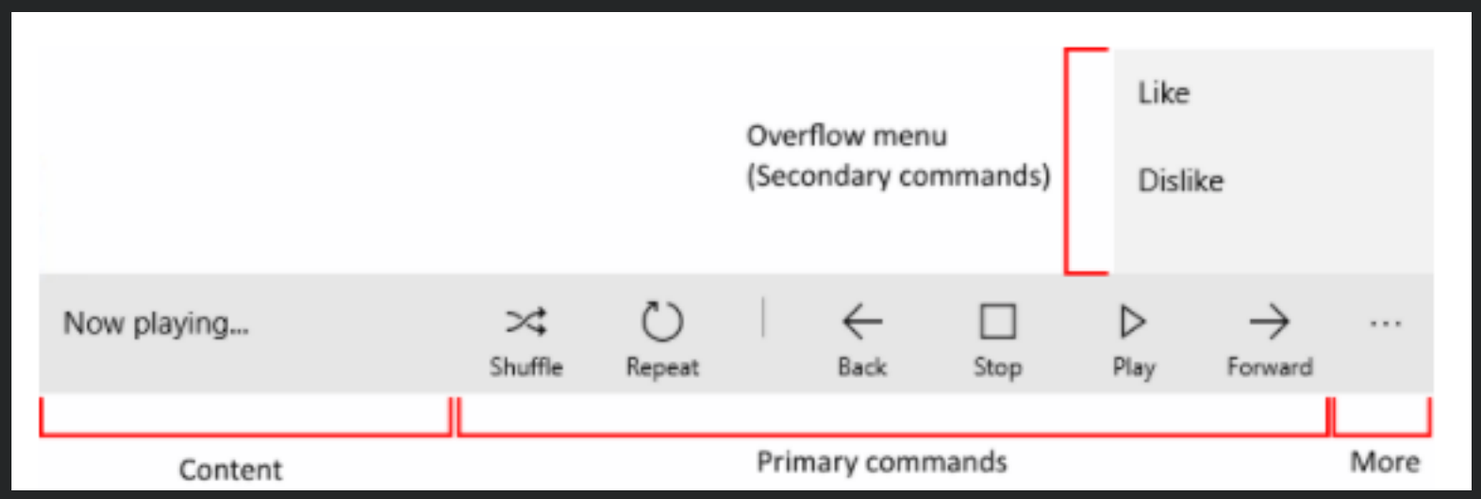
Examples: Microsoft

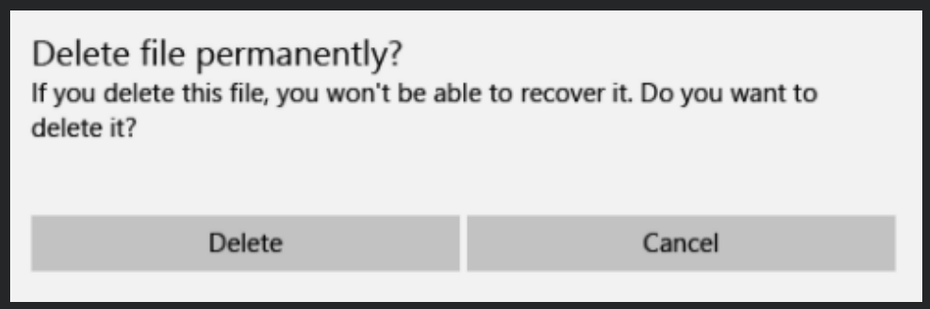




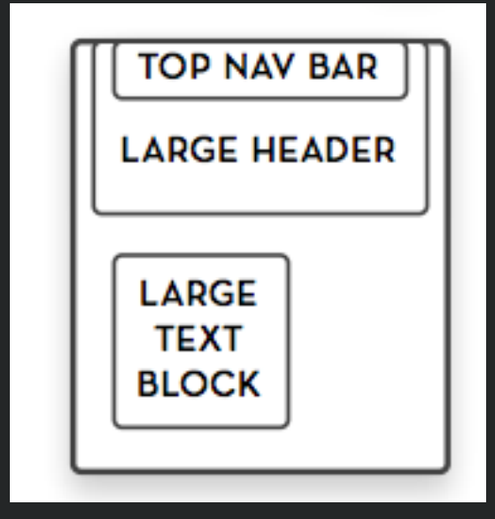
Examples: Microsoft

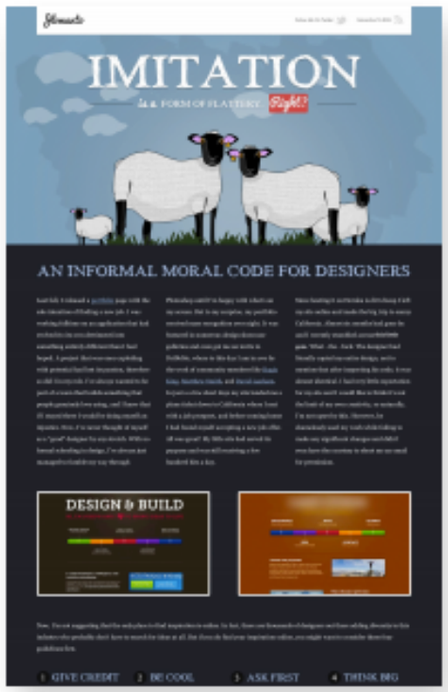






Example: Header with text blocks layout



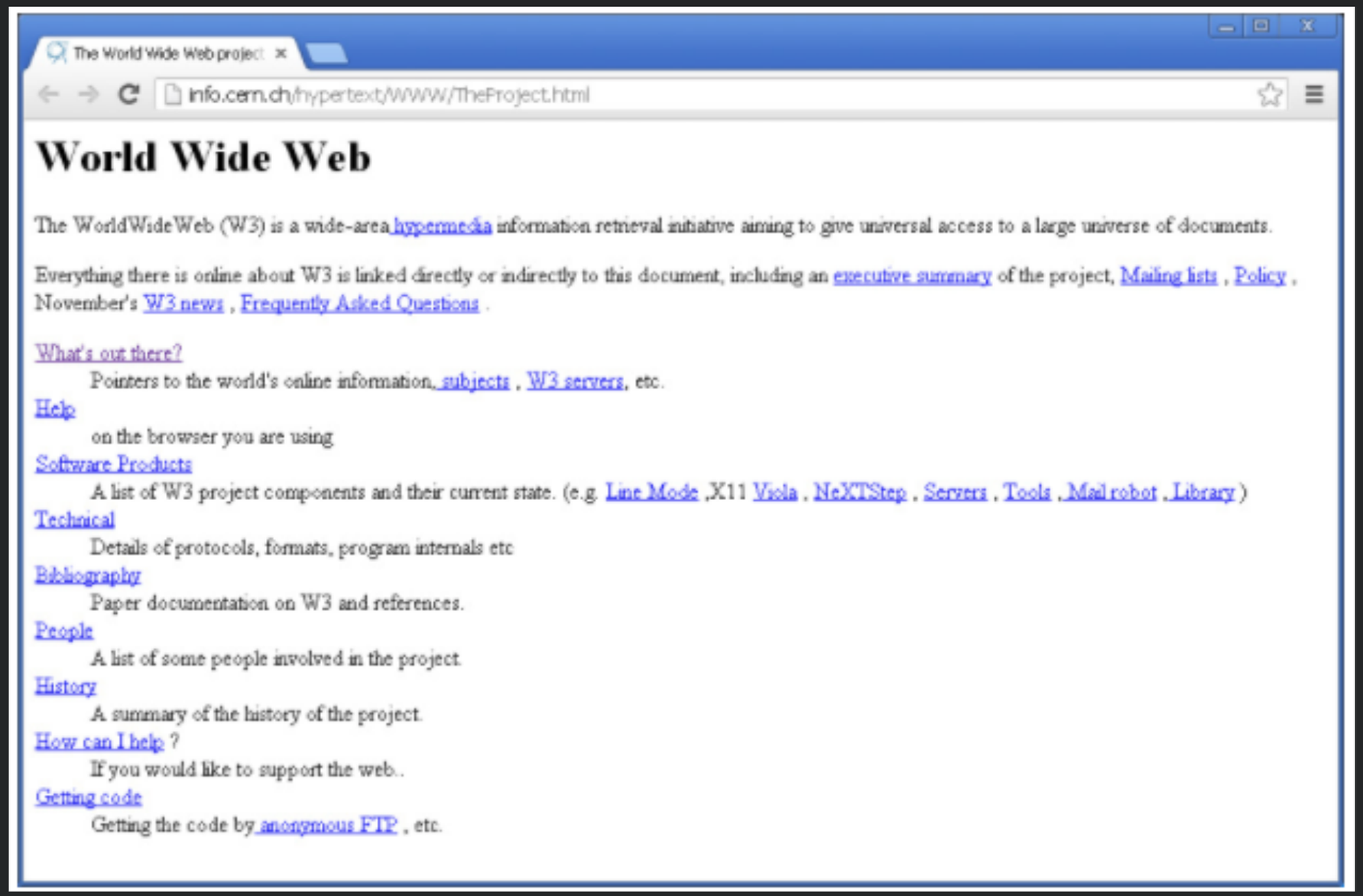


http://ranjithakumar.net/resources/webzeitgeist.pdf

Position Encodes Meaning and Function

http://ranjithakumar.net/resources/webzeitgeist.pdf

Web Design Languages Over Time



https://blog.hubspot.com/marketing/look-back-20-years-website-design#sm.00000ip14jejk1d51u53crk6cwrns

Web Design Languages Over Time

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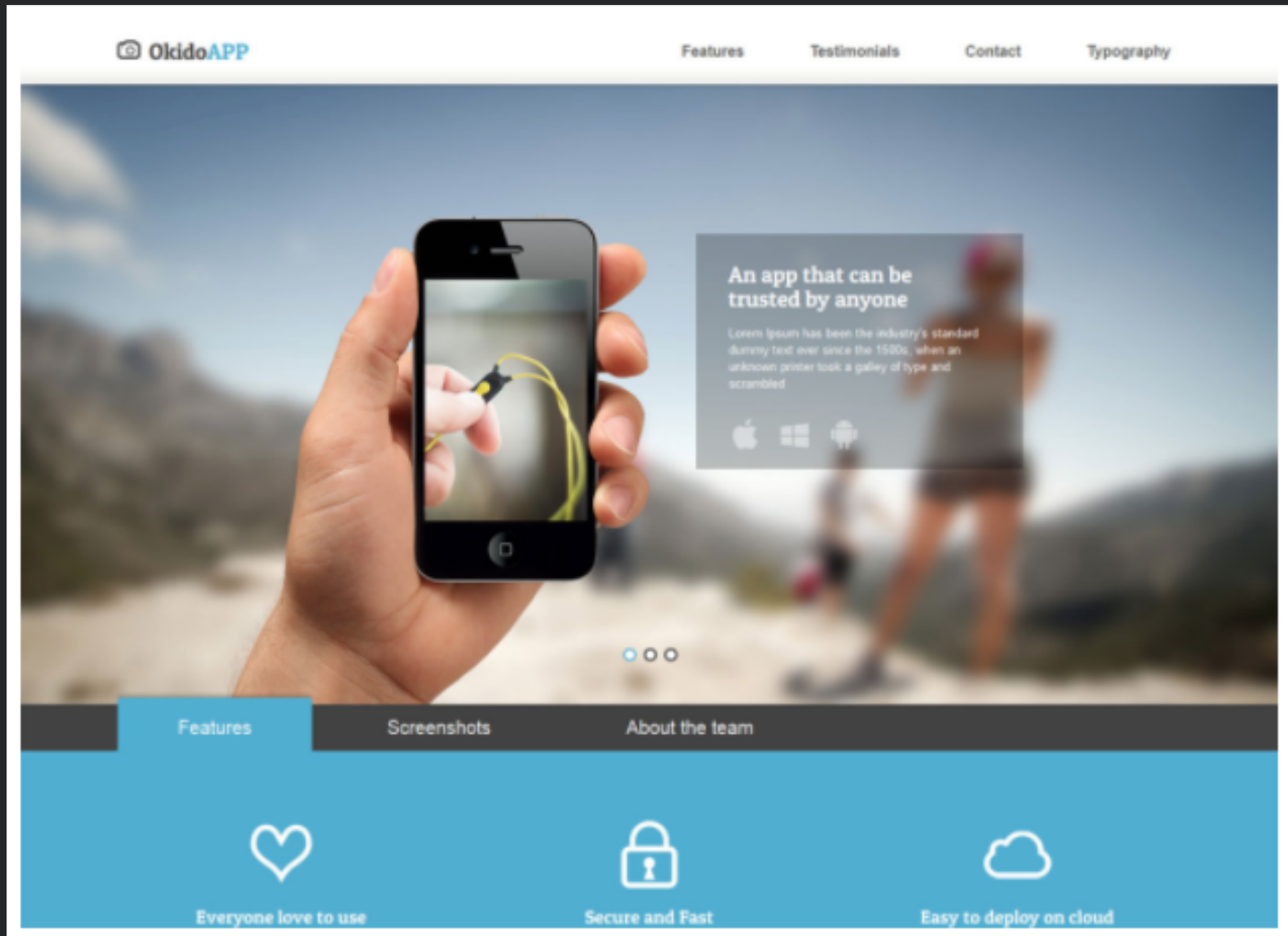
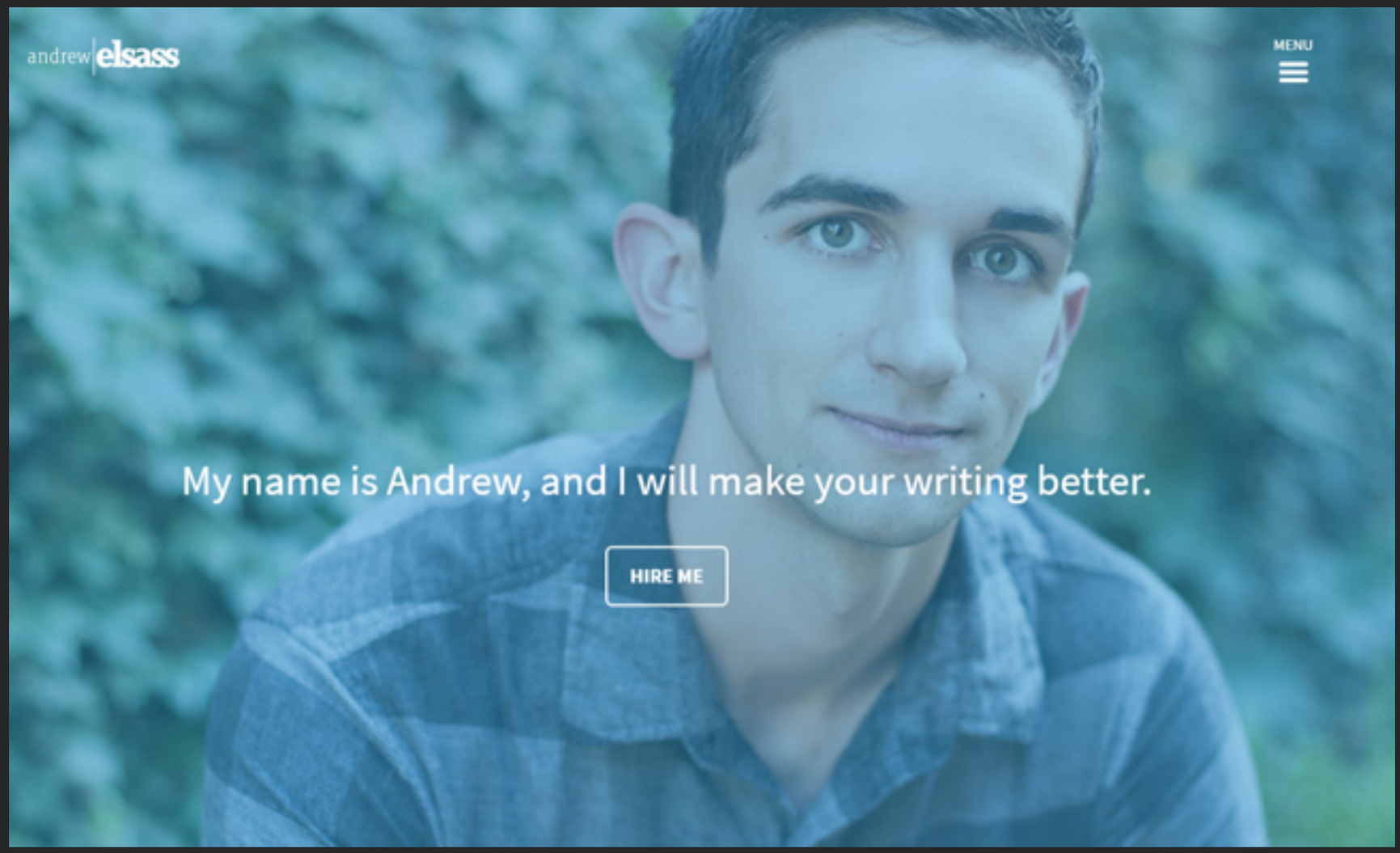


Common Visual Idioms, Circa 2016

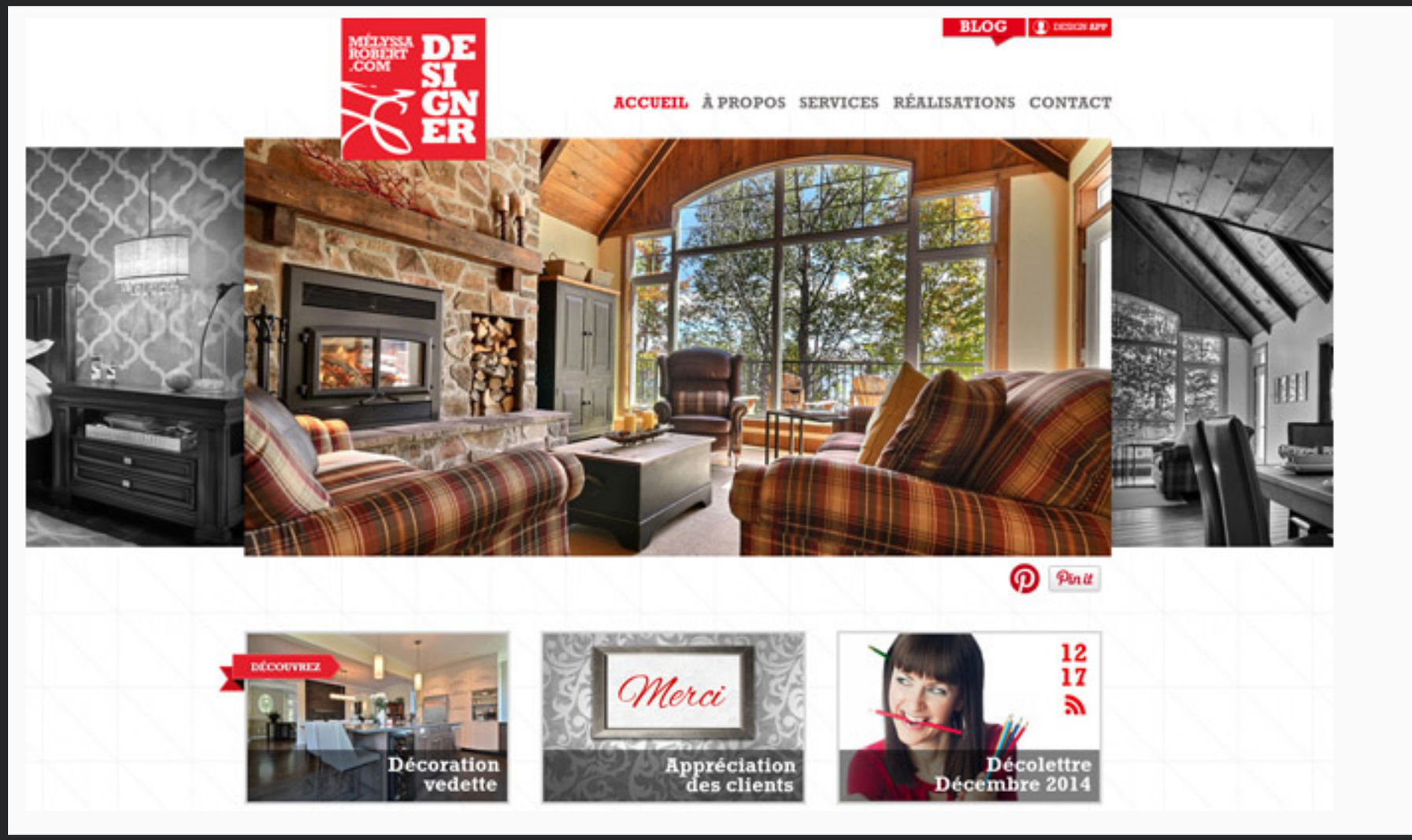
- Hero images: large attractive header image



https://envato.com/blog/exploring-hero-image-trend-web-design/

Common visual idioms, circa 2016

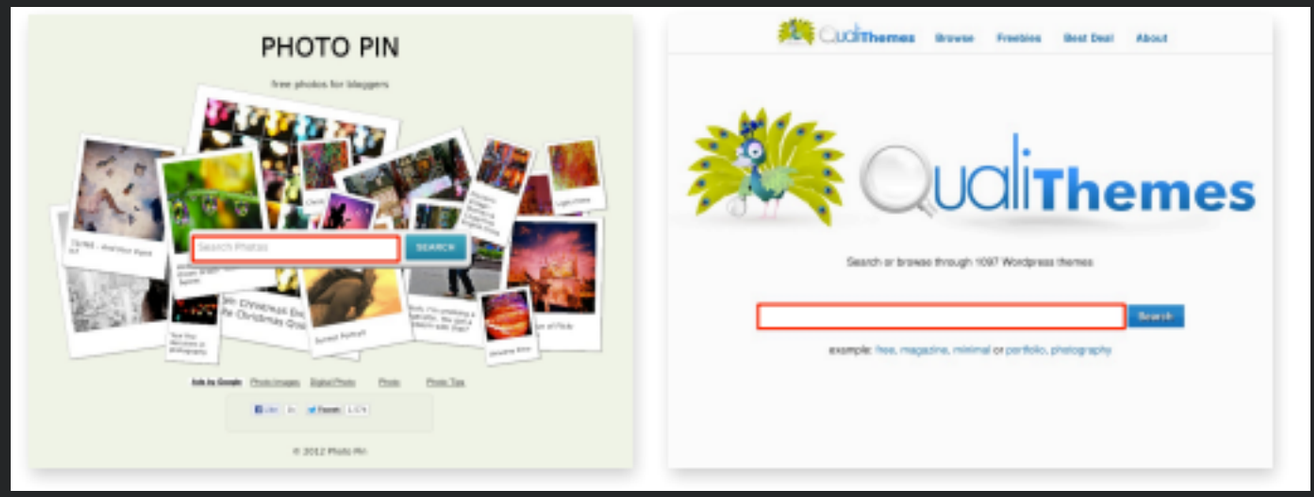
- Rotating image galleries (carousels)



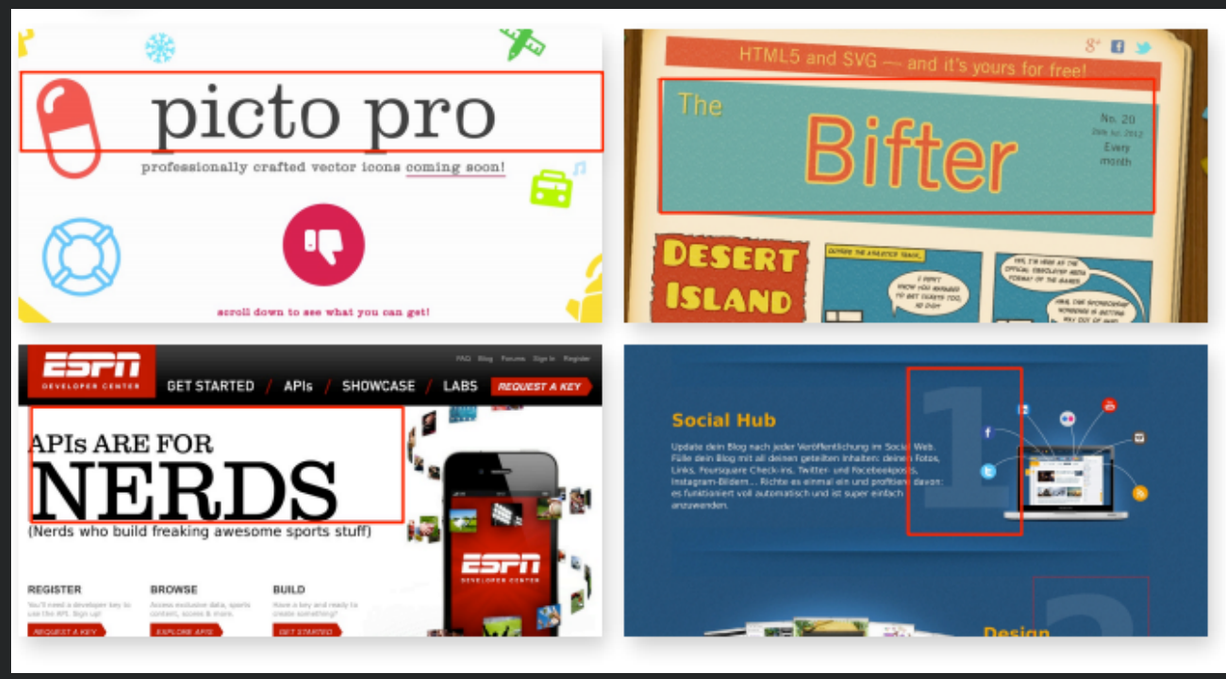
https://envato.com/blog/exploring-hero-image-trend-web-design/

Why it Matters

- Users will have idioms they expect to see, particularly if suggested by other related elements



- Branding: Users will see your website and have particular associations based on what it exemplifies



Goals in Designing a Design Language

- Offer guidance and options on
  - Colors: examples of color palettes
  - Typography: justification, sizes, fonts, different heading levels
  - Organization
- Support different resolutions, devices
- Support universal design
  - Visually impaired, color blind users

In-Class Activity

Activity: Design a Design Language

- Brainstorm an idea for a new company, and then design a Design Language for the new company.
- You should identify the key elements of the design language. Some of these key elements might include Typography, Colors, Translucency, and Animations.
- For each element that you define you should identify:
- What differentiates from other mainstream designs?
- What does it mean/What is it's purpose?
- In which situations can it be used?

Activity: Design a Design Language

- Some example visual design guidelines from well-known companies:
  - https://developer.apple.com/design/human-interface-guidelines/macos/visual-design/
  - https://material.io/design
  - https://brand.gmu.edu
  - https://docs.microsoft.com/en-us/windows/uwp/design/

Acknowledgements

- Slides adapted from Dr. Thomas Latoza's SWE 432 course