HCI Lecture 5 Design Principles

29th April 2022

Todays' plan

- Admin
 - Icebreaker 10 things I hate about 'Instagram'
 - The Gooey GUIs
 - Project stuff
- Lecture

Design Principles

 Guest speaker – Prof. Chris Lawrence, Dean of Indigenous Engagement, Faculty Science & Eng.

Assessment schedule

	Task	Value %	Date Due	Unit Learning Outcome(s) Assessed	Late Assessments Accepted?*	Assessment Extensions Considered?*
1	Presentation	20%	Week: 8 Day: - Time: -	1,2,4	No	No
	Assignment 1 - Interface Design with group report	50%	Week: 12 Day: - Time: -	1,2,3,5	No	No
3	Assignment 2 - Interface Evaluation	30%	Week: 13 Day: - Time: -	1,2,4,5	No	No

^{*}Please refer to the Late Assessment and the Assessment Extension sections below for specific details and conditions.

Tutes – check in

- Last tute (worksheet 03)
 - Solutions to pain points
 - Functional and non functional requirements
- Next tute (worksheet 4):
 - Wireframing (hand-drawn alternative designs)
 - Designing low fidelity prototype
 - Need to have this complete by the following tute as swapping with another team to review
- Web/Mob?
- Tip: Lots of resources e.g. LinkedIn Learning (free?)

https://www.linkedin.com/learning/figma-essential-training-the-basics/get-creative-with-effects?autoplay=true&u=67553442

Looking out for...

- In Assignment 1 quality of analysis/justification
 - User-centricity how does it make user lives better, easier, helps user achieve goals?
 - Usability goals (Lecture 1)
 - User experience goals (Lecture 1)
 - Usability heuristics (Lecture 4)
 - Design principles (Lecture 5)
- Why did you make the choices that you did?
- Include Figma screenshot and also link

User interviews

- User Interviews
 - ~3 (4-5 is all that is required in industry)
 - Interviews/surveys in smallscale study
 - Open ended
 - ~30-40 mins
 - Assignment 1
- Synthesise results
 - Quick findings report
- Google forms survey
 - metrics

Participant Data Summary

From the data gathered, we discerned that our pool of testers was comprised of young adults (all in the range of 25 to 35 years old), and all possessing at least one higher degree. The majority of our testers (62.5%) were female, and 50% of testers were familiar with PEN America. Professionally, our testers represented a wide array of careers that fell into PEN America's target demographic. Specifically, our testers identified as follows:

- 1 city employee (12.5% of testers)
- 2 creative professionals (25% of testers)
- 1 student (12.5% of testers)
- 4 librarians and information professionals (50% of testers)
 Note: 2 of 4 participants who primarily identified as library and information science (LIS) professionals also identified themselves at students. The data reflects their profession as indicated in the pre-test questionnaire.



Figure 1.

Findings & Recommendations

In the following section, we have detailed our major findings and recommendations for improving the PEN America Archive's usability. We have included quotes from our participants, who are listed as by their user ID number (for example, participant 1 will be listed as 'P1').

Finding 1. Users had difficulty locating the search bar, and didn't have confidence using it.

Upon being prompted to find a specific item, users were immediately unsure of how best to begin a search. Users commonly first chose to use a more standard filtering method like the "Search by Timeline" tool, and tried typing in the search bar as a last resort. They commented that "the search feels so big," (P2) and that it "felt like I really worked up and down the page, instead of using the top space," (P7). Overall, the average time spent on the first task, which was designed to have users interact with the advanced search fields and filters, was 8 minutes and 30 seconds.

On average, users thought the advanced search was "somewhat" clear and understandable, 38% of users agreed that the website is "very cumbersome to use" and 50% agreed that various features in the website were not well integrated. Our analysis reveals that users are uncertain of how to efficiently begin and conduct an advanced search.

Recommendation 1. Incorporate a search bar prominently on the homepage.

Incorporating a prominent search bar on the Archive homepage will clearly communicate to users of all levels how to begin a search for content. In addition, providing suggested terms in the search bar encourages users to interact with the tool. It will also signify to visitors a core purpose of the website—as a searchable archive of PEN America's media assets.

Teams – check in

- Don't underestimate amount of work required
- 10 hours per week?
- Minutes
- Tracking your teams contribution toggl or simply a spreadsheet

Week	Output	Skills and Tasks	
5	Wireframe and lo-fi prototype	Design in Figma Iterate design	
6	Swap & evaluate design with another team	Evaluate design Iterate design again	
7	Hi-fi prototype	Figma skills are well-developed. Iteration	
Study week	Assignment 1	'Pro' skills in Figma. Iterate and again Writing and presentation skills. Short video	

Personas



Nerdy Nina

"The book is way better than the movie!"

#booklover #bookaddict #booknerdproblems

DEMOGRAPHICS

25 Age:

Sao Paulo, Brazil Location: Education: Software Engineer

Q/A at Indie Game Company Job:

Lives with her boyfriend Family:

TECH

Internet Social Networks

Messaging Games

Online Shopping



GOALS

- · Discovering new books / authors to read
- · Finding unique stories
- Cataloging book collection

FRUSTRATIONS

- · Keeping track of different series
- · Forgetting a book launch date
- · Finding space for more books

READING HABITS

- · Fast pace reader
- · Never lends books
- · Likes hardcovers and boxed collections
- · Pre-order books to get them first
- · Reads eBooks, but prefer physical copies
- · Always finishes a book
- · Loves binge reading and re-reading

FAVORITE BOOKS





American Gods Harry Potter Neil Gaiman J.K. Rowling



Ready Player One





28 yo Lives London,UK Sound Engineer Studied at SUBBASS



Traits

000

Social &

Confident















Creative & Spontaneous



Like the status quo



Fussy. Egocentric Disobedient

Interests

















Music usage

Browsing

Other type of media

Music Behaviour



"Music

Theo Parish

Soundcloud

Youtube

Lastfm



Dig for unknown

bands

Music Related Platform

iTunes

Discogs

Bandcamp

Favourite Bands



Floating Points Nicolas Jaar Radiohead

Carl Craig



Like it

off the radar

Songkick

Facebook



Frustrations:

- Difficult to find suitable content
- Collection/playlists spread on different platforms
- Too much "noise" on social media
- Create & manage playlists
- Adverts
- Time consuming

Key goals:

- Share music & new discoveries on a blog
- Manage playlists and "Listen Later" lists quickly and On the Go
- Get all playlists from different platforms synced in one place.

Recap last week's lecture

- Design thinking process and use-cases
- Functional and non functional requirements
- Wireframing and prototyping
- 10 usability heuristics evaluate your use of these after study break

10 Usability Heuristics for User Interface Design (Jakob Nielsen)

- 1. Visibility of system status
- 2. Match between the system and the real world
- 3. User control and freedom
- 4. Consistency and standards
- 5. Error prevention

- 6. Recognition rather than recall
- 7. Flexibility and efficiency
- 8. Aesthetic and minimalistic design
- 9. Help users recognise, diagnose and recover from errors
- 10. Help and documentation

See these references for more detail:

https://www.nngroup.com/articles/ten-usability-heuristics/ https://media.nngroup.com/media/articles/attachments/Heuristic Summary1-compressed.pdf

6 UI/UX Design Principles (by Don Norman)

- 1. Visibility
- 2. Feedback
- 3. Affordance
- 4. Mapping
- 5. Constraints
- 6. Consistency

1. Visibility

- What options are available?
- Mobile apps visual clutter
- Move from Hamburger menu to tab-bar menu to improve visibility of key experience
- Discoverability not too cluttered but navigable to find info needed
 - Good information hierarchy
- Checkout process breadcrumbs
- Design guidelines
- Short-cuts for expert users

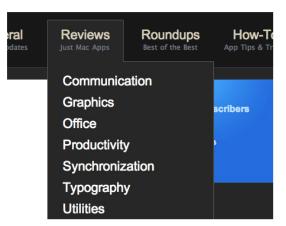
Hamburger menu





https://medium.com/@sachinrekhi/don-normans-principles-of-interaction-design-51025a2c0f33

Tab-bar menu



https://www.zivtech.com/blog/ux-principles-constraints-discoverability-feedback-and-more



https://jadepuma.com/blogs/shopify-tutorials/custom-breadcrumbs-in-a-shopify-plus-checkout

2. Feedback

Confirmation that an action has been performed successfully or not

Activational feedback

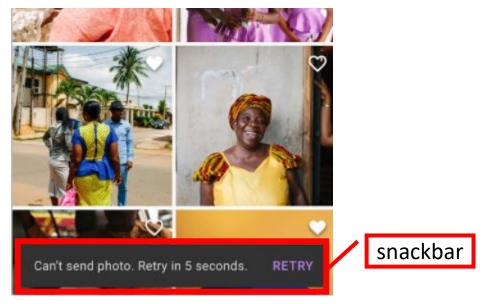
- Progress bar/spinner
- Button press
 - Visual animated button, tactile, audio
 - Toast, snackbars notice responding to user action

Behavioural feedback:

- Button press
 - Move to next screen
- System changes e.g. email sent
 - Confirmation message and sent folder



https://uxdesign.cc/button-design-user-interface-components-series-85243b6736c7



https://material.io/components/snackbars#anatomy

More information on notifications:

https://uxdesign.cc/toasts-or-snack-bars-design-organic-system-notifications-1236f2883023

3. Affordance

- Door
- Visible affordance:
 - Raised button
 - Login screen
 - Call to action button
- Hidden affordance
 - Mouse pointer changes from cursor to tooltip.
 - Object is clickable on a hover
 - Blue underlined text weblink (standard convention)
 - Object that can be dragged and dropped?
- Standard widgets used by the OS or platform make it recognisable.

https://datacloud.design/2017/05/10/donald-normans-design-principles-for-usability/





iOS/macOS icons

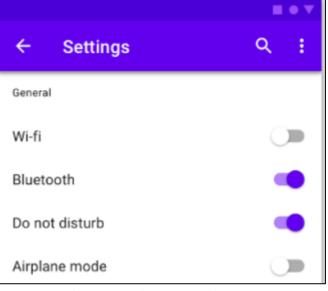
ios





https://dribbble.com/shots/3408321-Strava-App-Iconography

Material design switches



https://material.io/components/switches#usage

4. Mapping/Metaphors



https://xd.adobe.com/ideas/perspectives/leadership-insights/designers-create-change-visual-metaphors/

Indicators

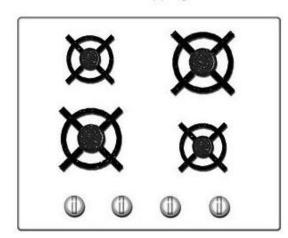


Natural scrolling on mac

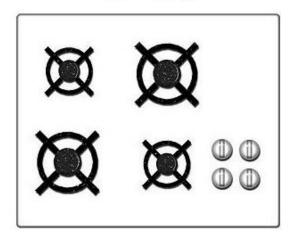


Natural Scrolling vs Reverse Scrolling

Poor mapping



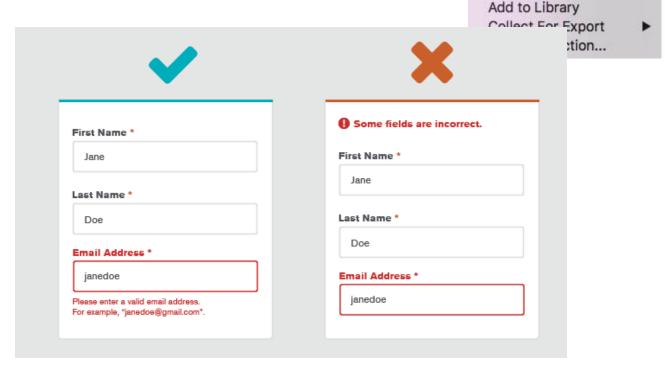
Good mapping



5. Constraints

Restrictions so the system doesn't go into invalid state

- Online form restricts what values are entered. Error checking
- Grey out options
- Remove options e.g copy and paste removed when they are not available.
- Bad design all options shown when they are not available.



Make Pixel Perfect

Isolate Selected Group

Perspective

Crop Image

Ungroup

Arrange Select

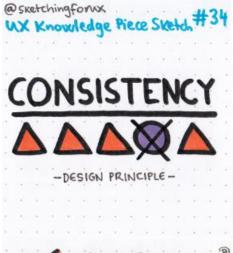
Transform

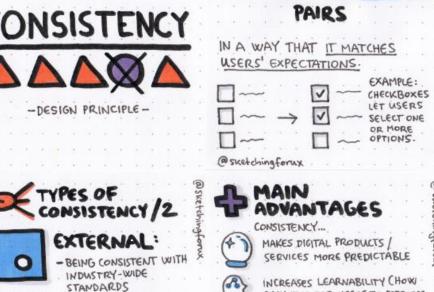
https://www.seerinteractive.com/blog/ux-checklist-series-form-design/

6. Consistency

- Components look and behave in a certain way
- Control, familiarity, reliability, learnability
- Less errors, less confusion
- Buttons, Headers, colours

- Guidelines:
 - Google' Material Design Guidelines
 - iOS's Human Interaction Guidelines







INTERNAL:

NJAKOB'S LAW

- PRODUCT(S) BELONGING TO ONE COMPANY / BRAND

- WITHIN ONE WEBSITE OR APPLICATION



USER GOALS & CONTEXT

DON'T BE TOO RIGID

DON'T BE CONSISTENT FOR THE SAKE OF CONSISTENCY

CONDUCT RESEARCH

TAKE INTO ACCOUNT YOUR USERS' PREVIOUS EXPERIENCES & KNOWLEDGE

HELP USERS REACH THEIR GOALS! @sketchingforux.



INCREASES LEARNABILITY CHOW EASY IT IS FOR USERS TO PERFORM A TASK FOR THE FIRST TIME)



MIGHT RESULT IN A MORE INTUITIVE

ADDITIONALLY, HAVING E.G. A DESIGN SYSTEM AND APPLYING REUSABLE COMPONENTS LOWERS DEVELOPMENT & MAINTENANCE COSTS.

CONSISTENCY IS ABOUT USING

USAGE/ MEANING

SINCE THE USERS' GOALS & CONTEXT SHOULD DETERMINE OUR DESIGN DECISIONS CAND NOT BEING CONSISTENT NO MATTER WHAT") : IN MANY SITUATIONS,

BEING INCONSISTENT IS THE RIGHT CHOICE.



BUT IT SHOULD ALWAYS BE THE RESULT OF

A DELIBERATE DESIGN DECISION ! IDEALLY, BASED ON RESEARCH.

@sketchingforux



IT MIGHT BE UNCONSCIOUS (UNNOTICED) OR CONSCIOUS ...

EITHER WAY, IT MIGHT CAUSE **■**COGNITIVE LOAD MENTAL EFFORT



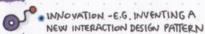
CONFUSION > FRUSTRATION

@sketchingforux



WHEN SHOULD YOU BREAK CONSISTENCY ? SOME EXAMPLES:

· PUSHING PAST YOUR LOCAL



. IF RESEARCH SHOWS THAT IT. BETTER SUPPORTS YOUR USERS (E.G. BASED ON THEIR BEHAVIOR PATTERNS)

· ERROR PREVENTION

https://uxknowledgebase .com/consistency-designprinciple-ux-knowledgepiece-sketch-34-4d1fa815e5c3

5 Visual-Design Principles in UX

Inform how design elements such a line, shape, colour, grid, or space go together to create good visuals. Improve engagement and increase usability

SCALE

The principle of scale refers to using relative size to signal importance and rank in a composition.



VISUAL HIERARCHY

The principle of visual hierarchy refers to guiding the eye on the page so that it attends to design elements in the order of their importance.



GESTALT PRINCIPLES

Gestalt principles capture our tendency to perceive the whole as opposed to the individual elements.



Balance occurs when there is an equally

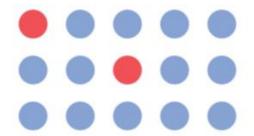
distributed amount of visual signal on

both sides of an imaginary axis.

BALANCE

CONTRAST

The principle of contrast refers to the juxtaposition of visually dissimilar elements in order to convey the fact that these elements are different.





https://www.nngroup.com/articles/principles-visual-design/

Figma - Free UI/UX kits/templates (Be careful!)

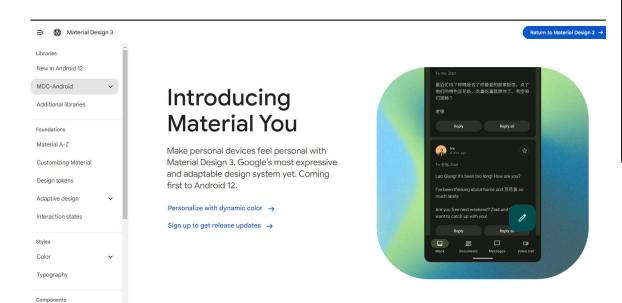
- Figma community
- Figma Crush
- Dribbble
- **Envato elements**

- Definition of UI/UX kit/template is fuzzy
- Use own colour scheme
- OK to use generic layouts
- Use components (icons, textboxes)
- Don't use templates (components together that have been created by others)



Google Material Design Guidelines

- https://material.io/design
- Material Design 3.0
- Used this in MAD??





iOS human interface guidelines

https://developer.apple.com/design/human-interface-guidelines/

Human Interface Guidelines

Get in-depth information and UI resources for designing great apps that integrate seamlessly with Apple platforms.











iOS Design Themes

As an app designer, you have the opportunity to deliver an extraordinary product that rises to the top of the App Store charts. To do so, you'll need to meet high expectations for quality and functionality.

Three primary themes differentiate iOS from other platforms:

- Clarity. Throughout the system, text is legible at every size, icons are precise and lucid, adornments are subtle and appropriate, and a sharpened focus on functionality motivates the design. Negative space, color, fonts, graphics, and interface elements subtly highlight important content and convey interactivity.
- Deference. Fluid motion and a crisp, beautiful interface help people understand and
 interact with content while never competing with it. Content typically fills the entire
 screen, while translucency and blurring often hint at more. Minimal use of bezels,
 gradients, and drop shadows keep the interface light and airy, while ensuring that content
 is paramount.

Visual design fundamentals

- Layout
- Hierarchy
- Colour
- Typography

Fundamentals of Layout

Fundamentals of Layout

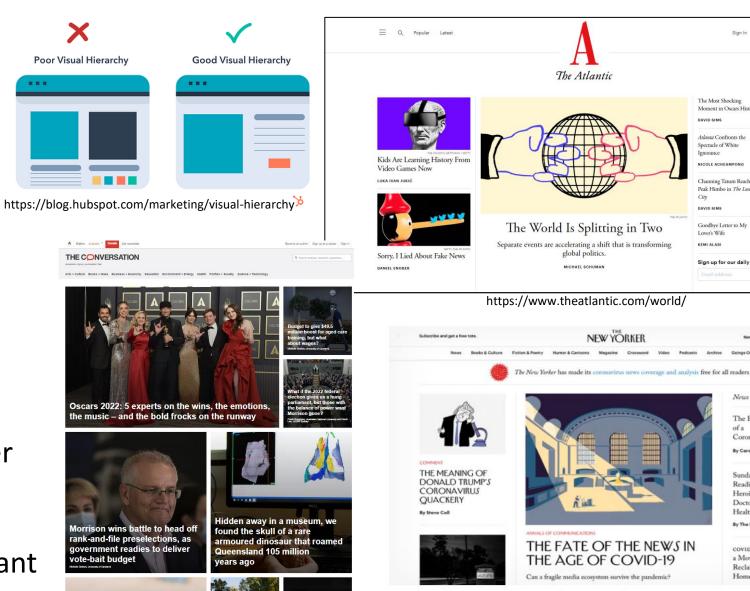
- Structure of visual components
- Sight shifts to group, rank, and understand info.
- Importance of data
- Scan-ability
- Reduce distractions
- Categorises
- Logical meaning
- Aesthetics



In figure 1, the background and the elements are equal. In figure 2, the background does not exist so the elements become a solid block. In figure 3, two lines are removed making the negative space very evident to the eye. This spacing of the elements is the base for the construction of a layout.

Layout: Size

- Informs user what is important on a site
- Hierarchical block on a home page
- Navigation scheme to interface to content:
 - 1. Navigation to discover content
 - 2. Consume content hierarchies less relevant



The Most Shocking

Channing Tatum Reaches Peak Himbo in The Lost

Goodbye Letter to My Lover's Wife

News & Culture

Doctors and Health Workers

Reclaim Vacant

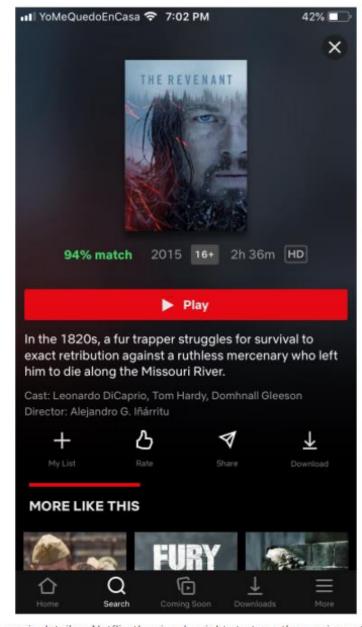
In this screenshot from The New Yorker, the size hierarchy is revealed in several of the blocks that make up the layout. The title "The fate of the news ..." is the point that the user will perceive as main, followed by the blocks on the left and then on the right.

https://theconversation.com

https://uxdesign.cc/fundamentals-of-layout-in-interface-design-ui-3a9dba31f1

Layout: visual journey

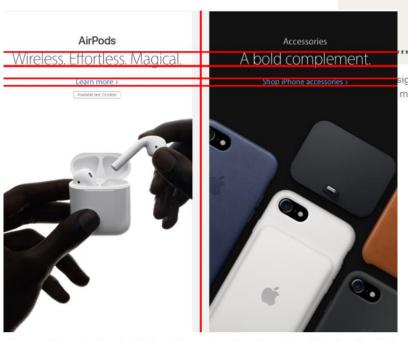
- Guide user through a visual journey
- Rather than forcing items to be scanned.
- Reduce noise
- Design your visual journey:
 - Understand priority of information, goal of page
 - Wireframe the layout and alternatives.
 - Verify your design



In this screenshot of a movie detail on Netflix, the visual weight starts on the movie poster, then the view ju to the red Play button. For users who need more, the view receives the description of the film and the for actions represented in iconographies. The tour ends with the actors, information under the poster, and recommendations from other films.

Layout: Asymmetry

- Dynamism and movement
- Composition and balance
- Text, icons, images, spaces
- Negative space
- Tension, emotion



⑤ CSSDesignAwards

AWARDED 2020 MAR 28

You can see information about the AirPods and Accessories are in two boxes of equal dimensions. I've added red lines to emphasize the perfect alignment of text from each box. Using the same colors on each side further balances the design.

Human

Machine

Machine

Machine

Aphabete is a lea in ATR (larged about a referred to the screen, several higher contrast elements are used on

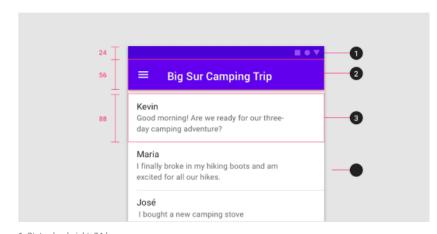
WONDR

https://uxdesign.cc/fundamentals-of-layout-in-interface-design-ui-3a9dba31f1

the right.

Layout: spacing

- Spacing defines layout
- Grouping of related elements
- Composition
- Connected/disconnected



- 1. Status bar height: 24dp
- 2. App bar height: 56dp
- 3. List item height: 88dp



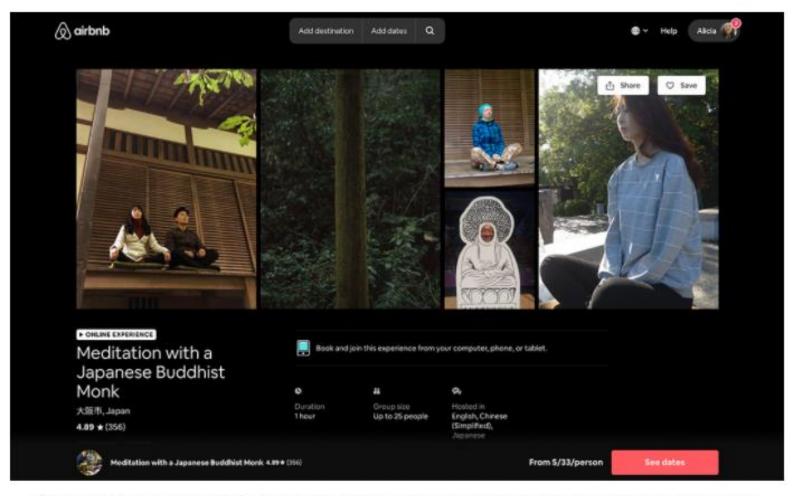
In the Mimo application you can see the grouping of elements that can make up a layout, the space between the first group (spot illustration and texts) and the second group (the plans) works as a support for the structure.

The same happens with the space between the plans, and between the plans and the continue button. In this subtle way, the negative space makes up a layout.

https://uxdesign.cc/fundamentals-of-layout-in-interface-design-ui-3a9dba31f1

Layout: break

- Visual journey
- Hold user attention
- Memorable
- Movement
- Break rules



On this airbnb page, the photo gallery is displayed in such a way that creates a break in the user's reading. Photos 1, 2 and 5 have the same dimension, but photos 3 and 4 break the format to make the visual journey more dynamic.

https://uxdesign.cc/fundamentals-of-layout-in-interface-design-ui-3a9dba31f1

Layout: Superposition

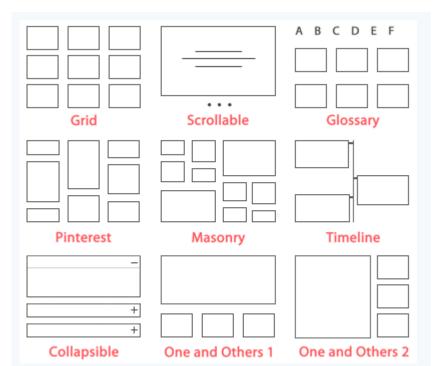
- Overlapping creates depth and realism.
- 2D 3D composition
- Stage
- Interest
- Avoid low contrast for readability



This screenshot from the WWF application shows the overlay of the texts: "Sharks", "Diversity," "Enter" and the (+) button on the shark image, balancing the flat world of user interface design and the three-dimensional style that graphic design could have.

Layout: Grids

- Grids pleasing layout
- Ease location of elements
- Consistency
- Proportional distribution



https://www.contentviewspro.com/



Fundamentals of Hierarchy

Hierarchy: Size

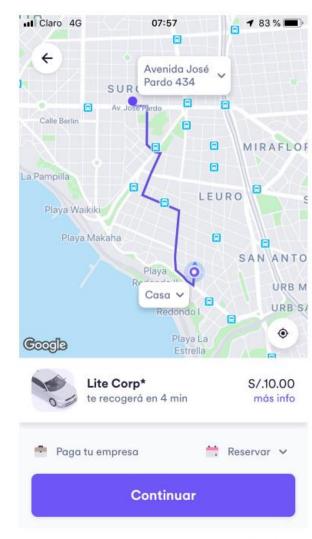
- Larger object attracts attention
- Text and images
- Visual journey
- Jump in text size difficult
- Text too big imbalance



In this snapshot of the Google Arts & Culture application, the title "Pawtraits: Our Changing Relationship ..." is much larger in size than the subtitle "How do we really feel ...". By separating these scores considerably, the reading order avoids any confusion.

Hierarchy: Colour

- Bright colours stand out
- Separate elements
- Prioritise /deprioritise
- Strong colour interaction (action/feedback)

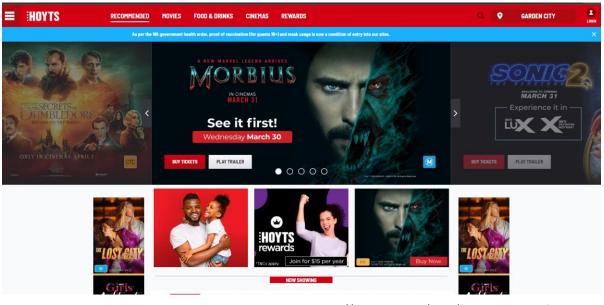


In this Cabify app screenshot, the use of purple color acts as the primary color. Both, the route of the trip and the "Continue" button are first hierarchy, followed by the map and the car in second hierarchy. The harmonic use of hue and saturation separates these elements from a more unsaturated and less important background.

Hierarchy: Proximity

- Close elements more attention
- Categorise/group elements
- Associations/connections
- Dissociations
- Reading order
- Interruptions
- Text short blocks, grouping sentences, whitespace

The Tesla (TSLA) CEO tweeted a meme about a couple breaking up along with the bitcoin hashtag and a broken heart emoji. The post included lyrics from a song by rock band Linkin Park titled "In the end." Bitcoin fell by over 6% to hit \$35,814 at around 8 am ET, according to CoinDesk. It was last trading at \$36,410, having dropped about 5% over the past 24 hours. Other digital currencies lost ground, with ethereum 5.6% weaker in mid-morning US trade at \$2,637 and dogecoin tumbling 10% to around 36 cents. Musk recently told customers that the electric car giant would no longer accept bitcoin as payment for its vehicles because of concerns about the environmental impact of bitcoin mining, which is extremely energy intensive.



https://medium.com/swlh/fundamentals-of-hierarchy-in-interface-design-ui-ba8e3017dceb

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Easy to scan

Hard to scan

Hierarchy: Alignment

- Coherence
- Patterns
- Symmetry
- Asymmetry call out attention



Unique Architecture Cave House

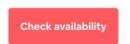
Oia, South Aegean, Greece Hosted by Laskarina



↑ Cycladic house 4 guests · 2 bedrooms · 4 beds · 1 bath

Great location 100% of recent guests gave the location a 5-star rating.

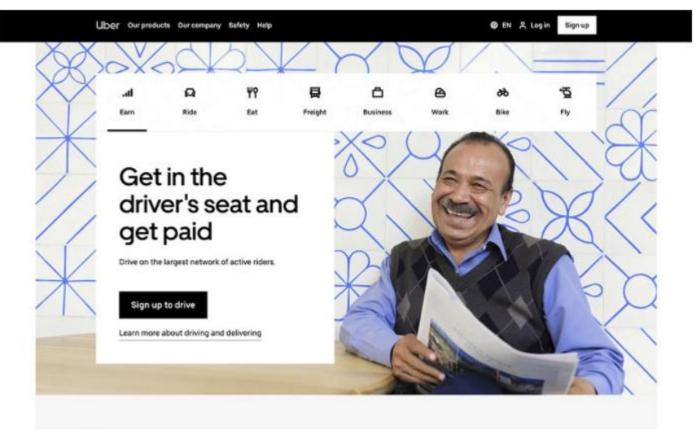
\$/906 / NIGHT *4.93(217)



On the page of an Airbnb accommodation, the title, location and name host belong to one alignment, while the description of the apartment, accompanied by iconography, belong to another. This rupture of an invisible straight line creates hierarchy on two levels.

Hierarchy: Repitition

Importance



In the white menu of the Uber website, an icon and a label are placed 8 times for their categories. This, balanced with a smaller size, places the menu second in the hierarchy, after the main title "Get in the driver's seat ...". It is important to know that repetitions are very good for creating second or third level relevancies.

https://medium.com/swlh/fundamentals-of-hierarchy-in-interface-design-ui-ba8e3017dceb

Hierarchy: Negative Spaces

- White space
- More attention

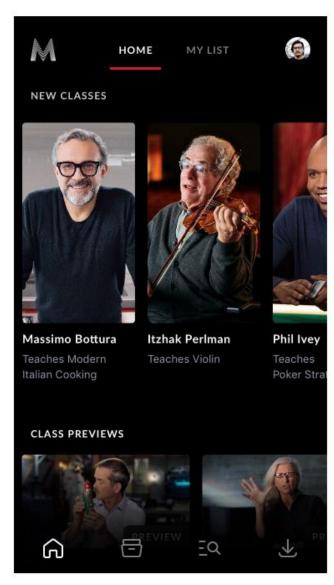




In this example of the web Design Better, both the number "01" and the title "Motion's purpose" are remarkably surrounded by negative space. Although the illustration has a greater hierarchical weight due to its variety of textures, the well applied negative space can make a balance that prevents the other elements from being relegated.

Hierarchy: Texture

- High resolution photos
- Style
- Atmosphere
- Flat
- Complex



Analyse these websites:

What design principles are being used?

- https://www.airbnb.com.au/
- https://www.airtasker.com/au
- https://www.spotify.com/au/
- https://www.canva.com/
- https://www.nike.com/
- https://www.netflix.com/au/
- https://www.curtin.edu.au/

Next week

- More design principles:
 - Colour
 - Typography
 - Copy
 - Imagery
- Evaluation of mobile and web apps using the DECIDE framework