HCI 2022

Visual Design and Fluid Navigation

Human Computer Interaction

Luigi De Russis

Academic Year 2022/2023

Hall of Fame or Shame?

Visual Design

Aesthetics for helping users in understanding and navigating the UI

Visual Design

- **Guiding**: conveying structure, relative importance, relationships
- **Pacing**: drawing people into your app, orienting them, and showing where to go, providing hooks to dive deeper
- **Messaging**: expressing meaning and style, breathing life into your content
- Both at the conscious and sub-conscious levels

- And also…
  - Making everything look aesthetically beautiful (but this is not the goal)

Visual Design vs. Art and Artistic Skills

- A.k.a. «Help, I'm not an artist!»

- Artistic skills help a bit but are neither necessary nor sufficient
- Art does not need to be practical; design does

- Real design skills take years to master
- Widely-accepted heuristics are a good and easy start

The Basics of Visual Design

Basic visual design involves text, layout, and colors. First let's start with text. Gracefully using whitespace helps separate out logical chunks of content. Next, font size and style differences convey hierarchy. Finally, alignment is crucial for helping readers scan quickly.

Whitespace

Basic visual design involves text, layout, and colors. First let's start with text.

Gracefully using whitespace helps separate out logical chunks of content.

Next, font size and style differences convey hierarchy.

Finally, alignment is crucial for helping readers scan quickly.

Hierarchy

Basic visual design involves …

Text

Gracefully using whitespace helps separate out logical chunks of content.

Next, font size and style differences convey hierarchy.

Finally, alignment is crucial for helping readers scan quickly.

Layout

Colors

Alignment

BASIC VISUAL DESIGN

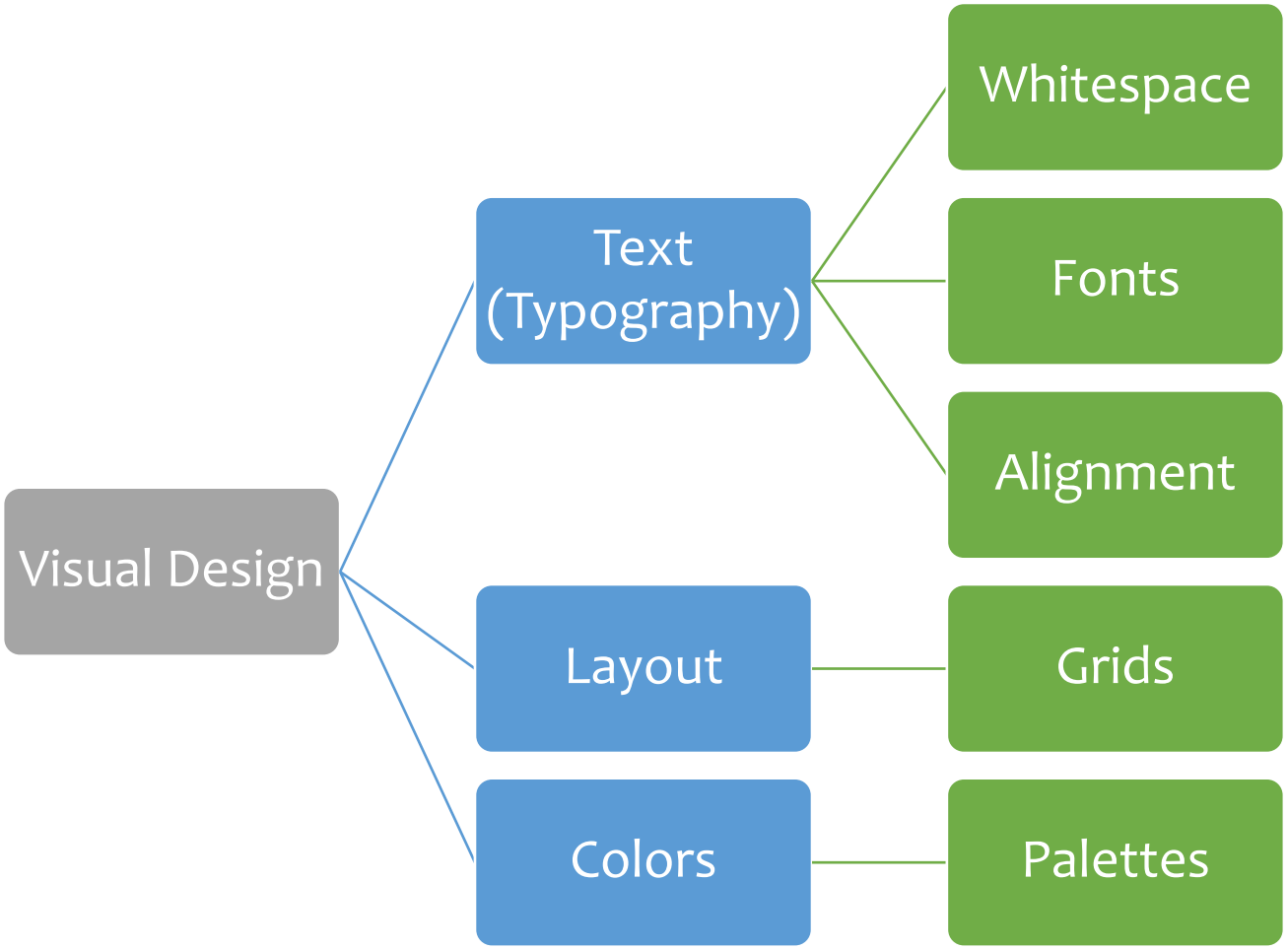
Text

- ***Whitespace***: helps separate out logical chunks of content
- ***Font***: size and style differences convey hierarchy
- ***Alignment***: crucial for helping readers scan quickly

Layout

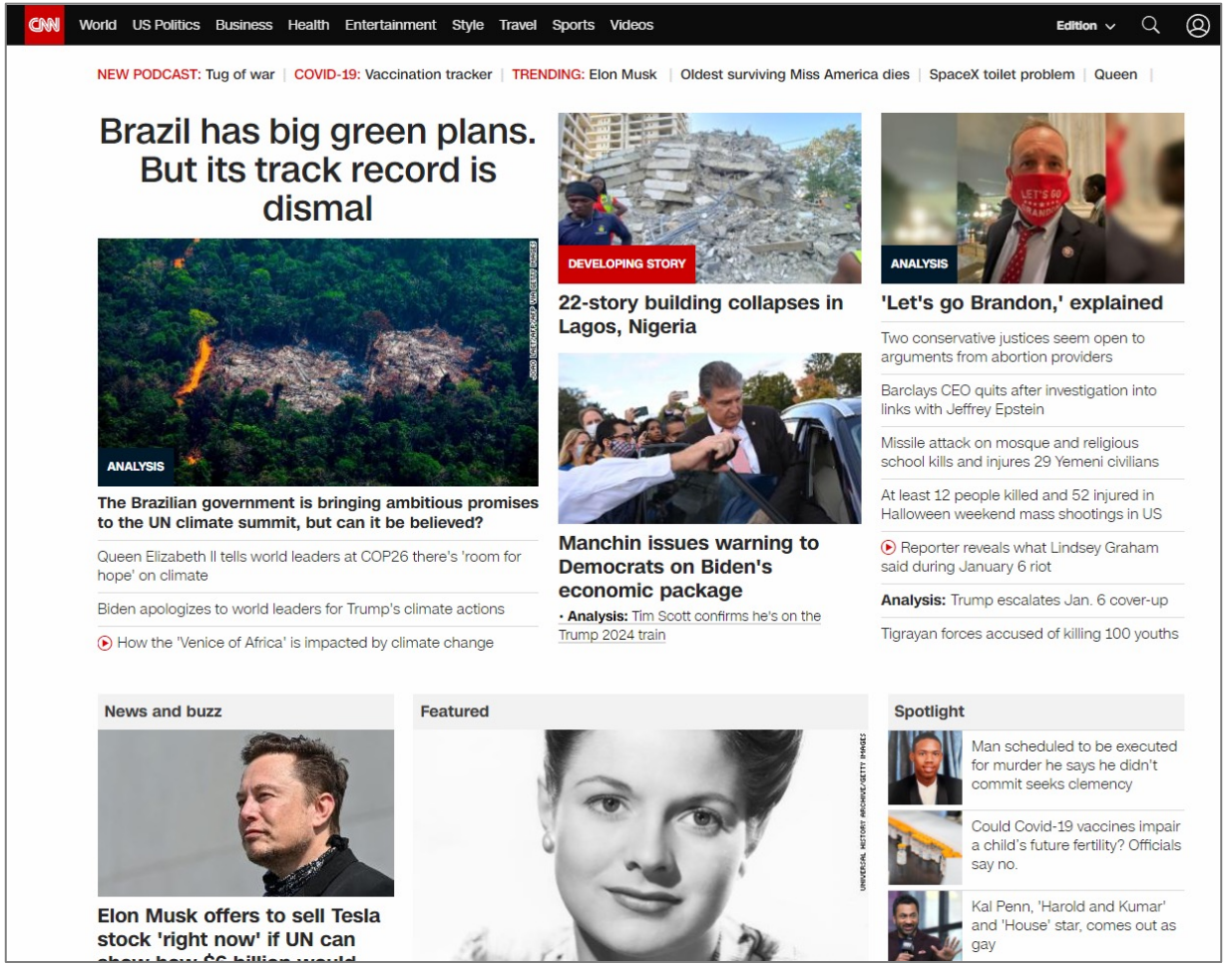
Colors

Key Ingredients

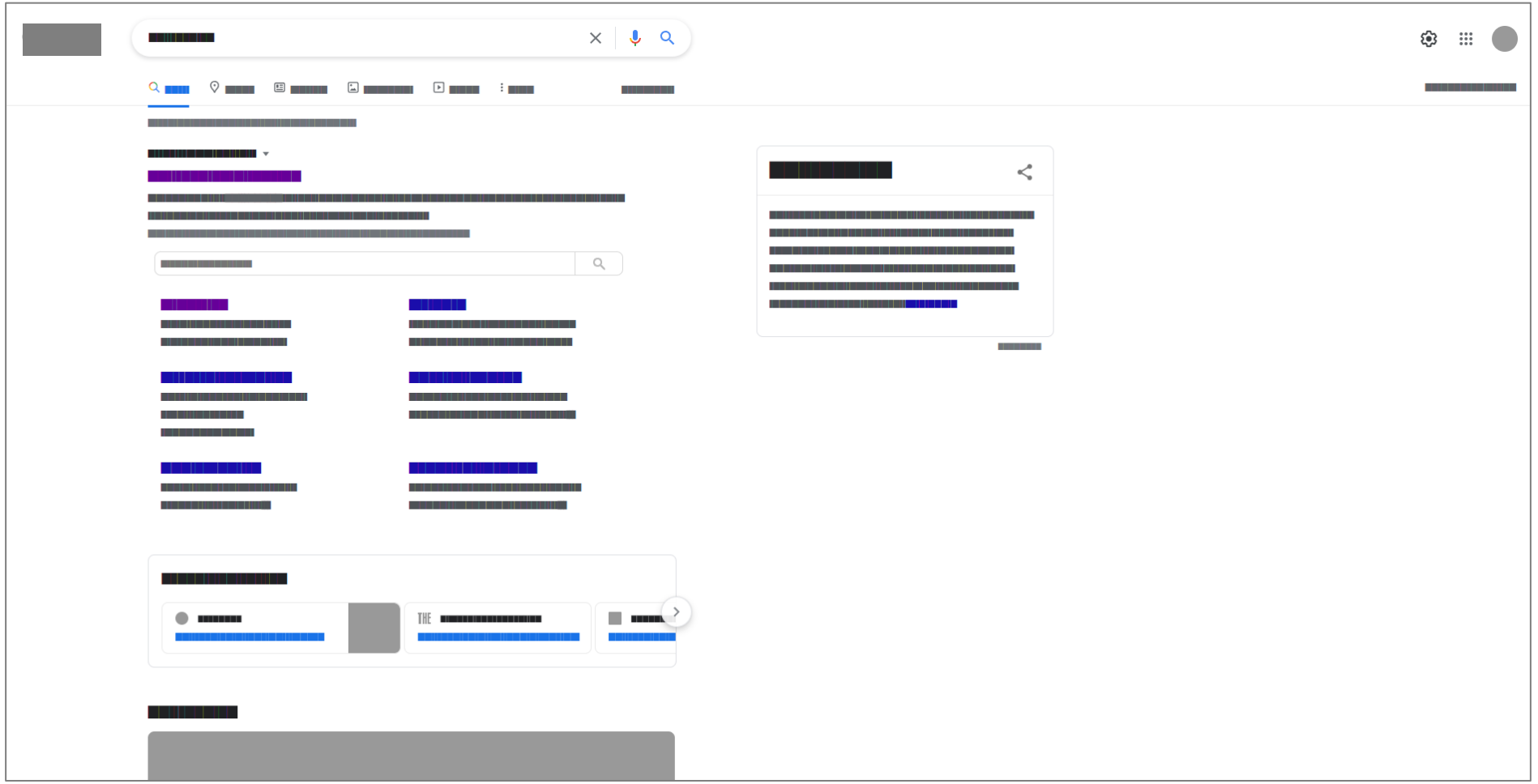


Recognizable Page Structure

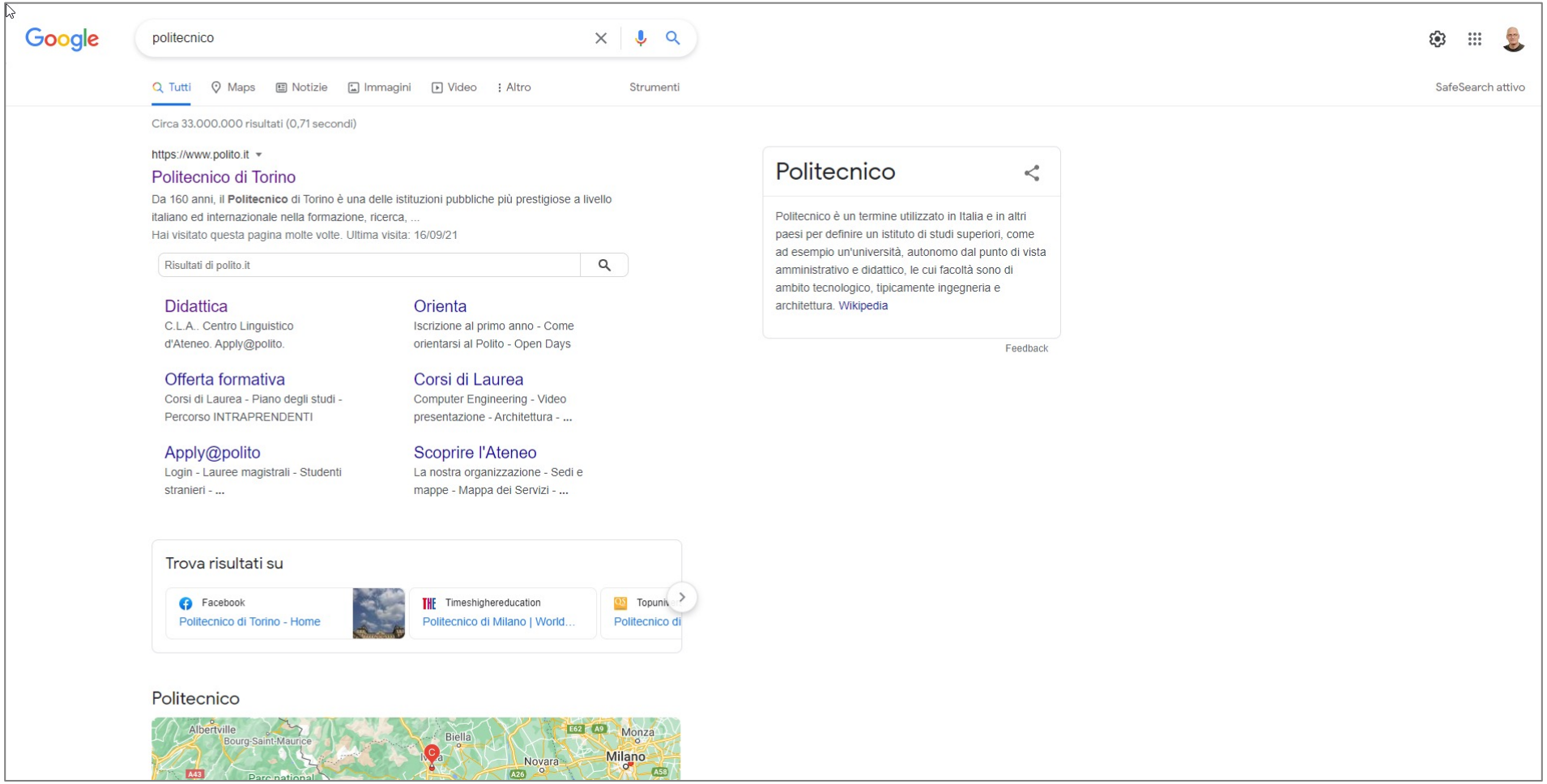
Recognizable Page Structure



Recognizable Page Structure

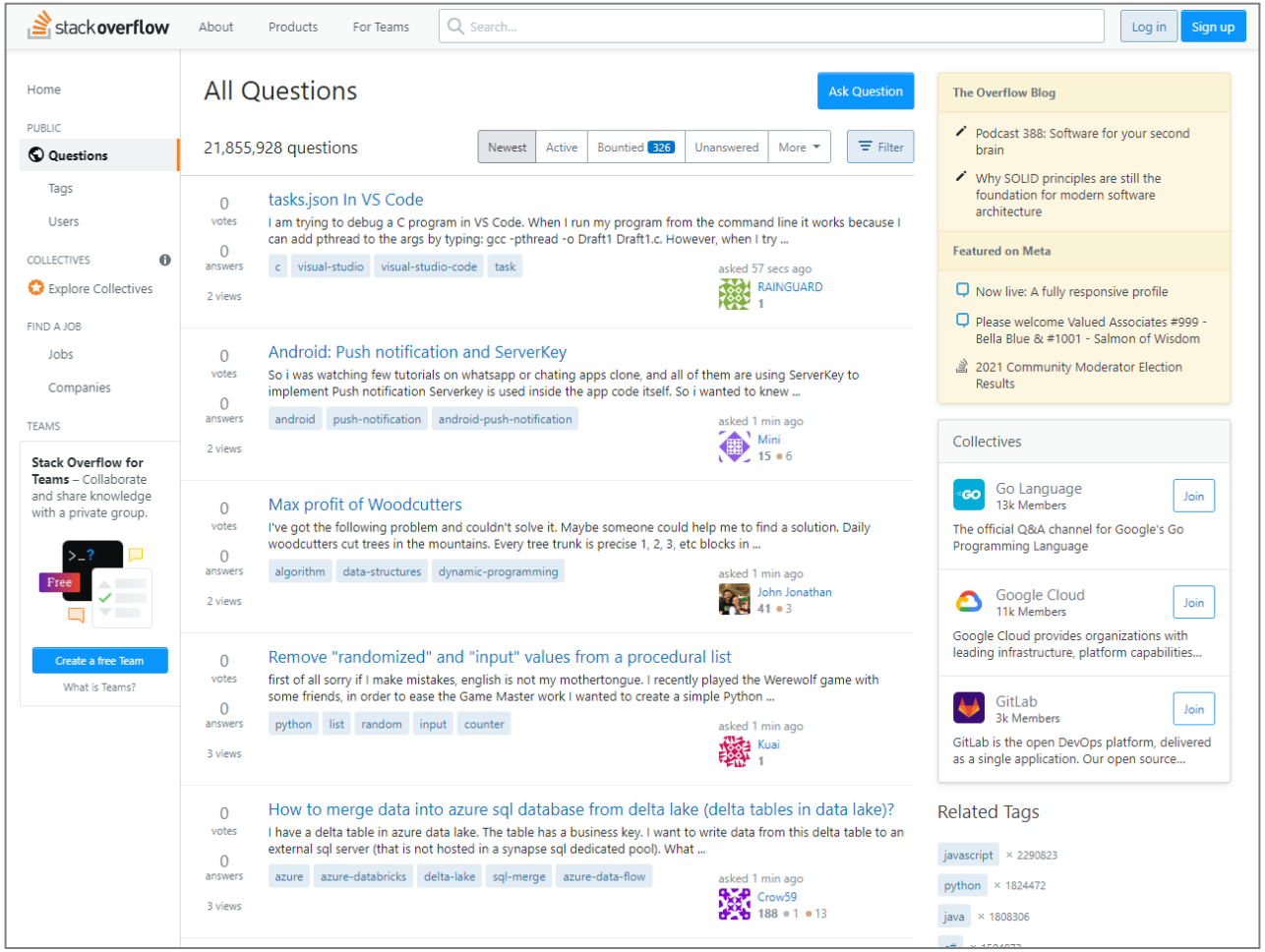


Recognizable Page Structure



Recognizable Page Structure

Recognizable Page Structure



Recognizable Page Structure

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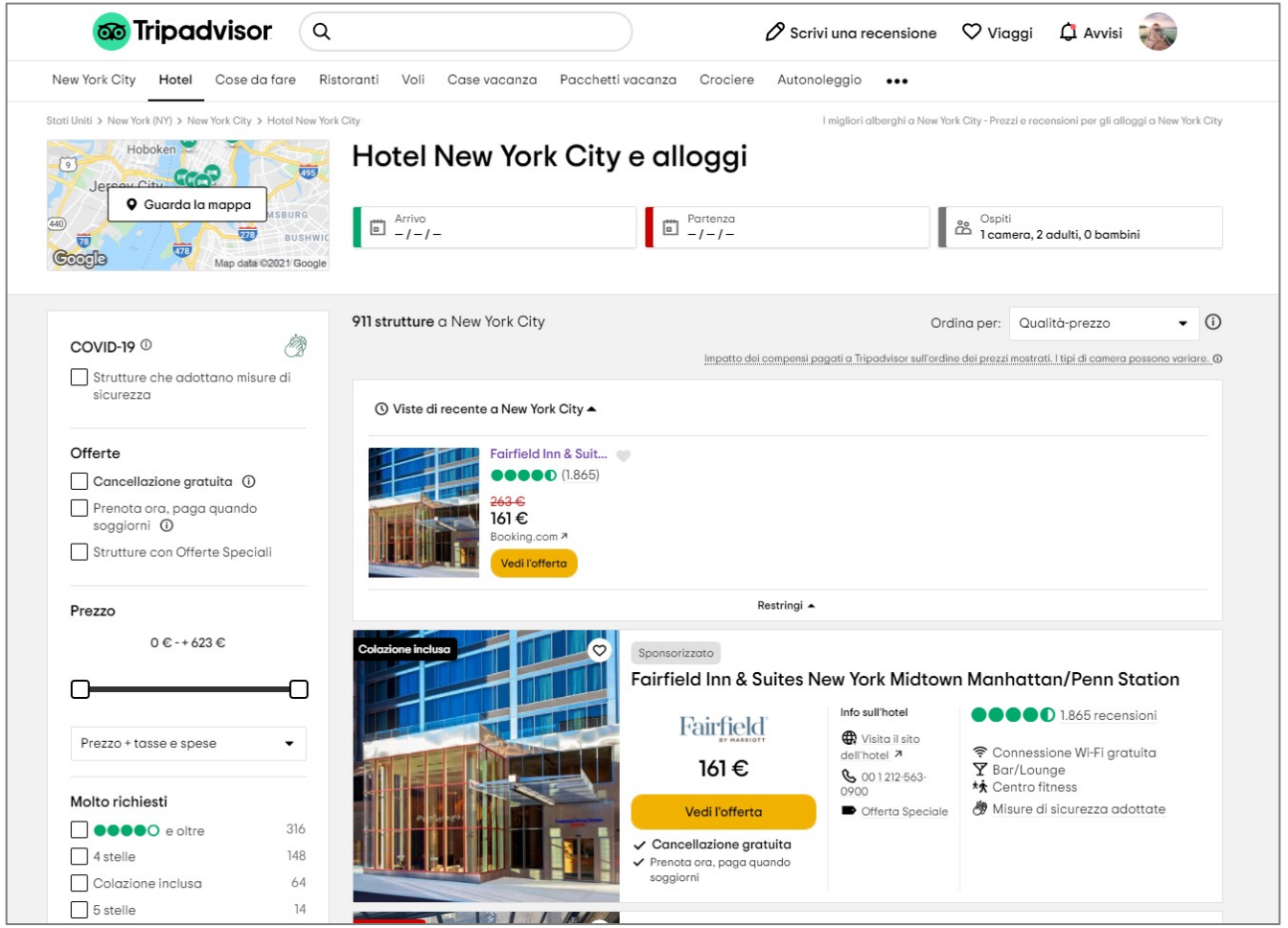
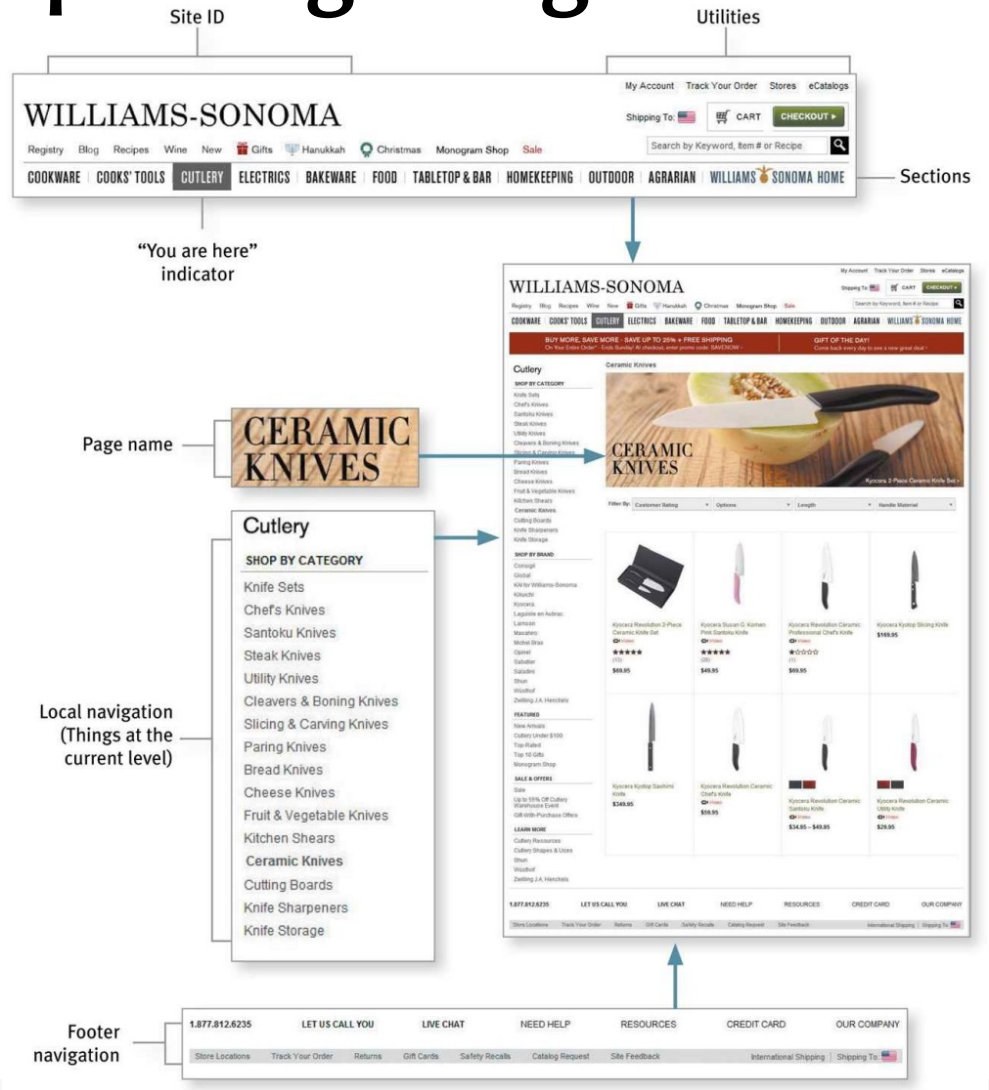


Recognizable Page Structure

Conventions Help Recognizing Structure



‘Gestalt’ principles

Hints from the psychology of Shapes and of Representation

Gestalt principles

- Laws from 1920s' psychology: how humans typically see objects by grouping similar elements, recognizing patterns and simplifying complex images
- Designers use these to engage users via powerful -yet natural- "tricks" of perspective and best practice design standards
- *"The whole is other than the sum of the parts" - Kurt Koffka*

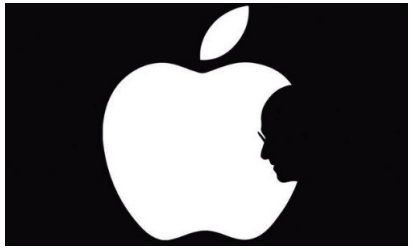
https://www.interaction-design.org/literature/topics/gestalt-principles

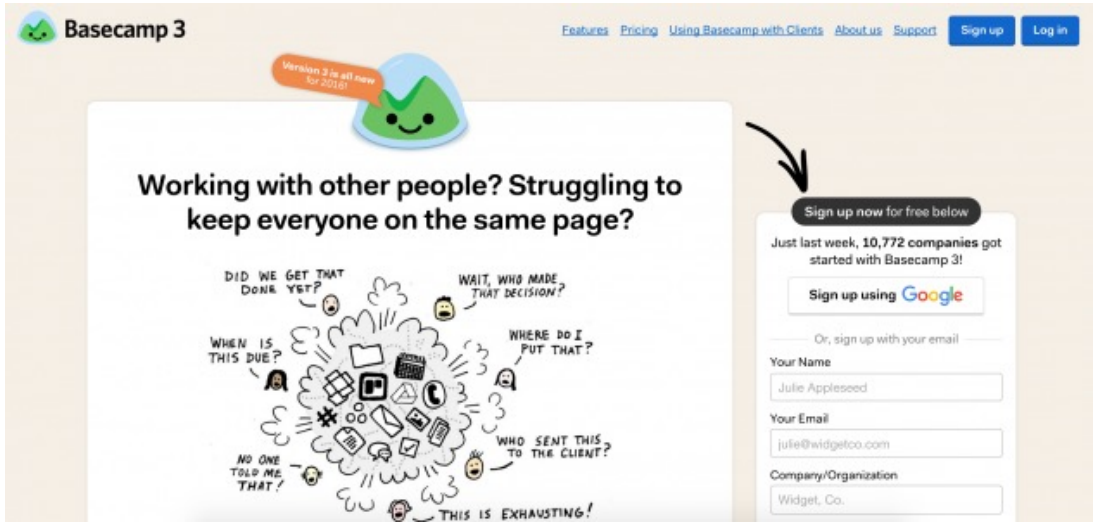
https://www.usertesting.com/blog/gestalt-principles/

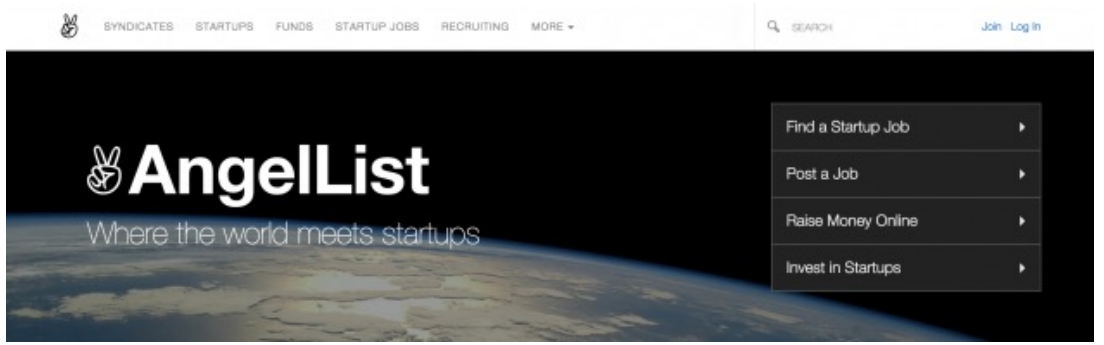
Some Gestalt Principles

- **Figure/Ground**: Disliking uncertainty, we look for solid, stable items. Foreground catches the eye first
- **Closure**: Preferring complete shapes, we automatically fill in gaps to perceive a complete image; we see the whole first
- **Common Region**: We group elements that are in the same closed region
- **Element Connectedness**: We group elements linked by other elements
- **Continuation**: We follow and "flow with" lines
- **Proximity (Emergence)**: We group closer-together elements, separating them from those farther apart.
- **Good Form**: We differentiate elements that are similar in color, form, pattern, etc. and cluster them together
- **Meaningfulness (Familiarity)**: We group elements if they form a meaningful or personally relevant image.
- **Prägnanz**: We perceive complex images as simple ones.
- **Convexity**: We perceive convex shapes ahead of concave ones
- **Regularity**: Sorting items, we tend to group some into larger shapes, and connect elements that form a pattern.
- **Similarity (Invariance)**: We seek differences and similarities in an image and link similar elements.
- **Symmetry**: We seek balance and order in designs, struggling to do so if they aren't readily apparent.
- **Common Fate**: We group elements that move in the same direction
- **Synchrony**: We group static visual elements that appear at the same time.

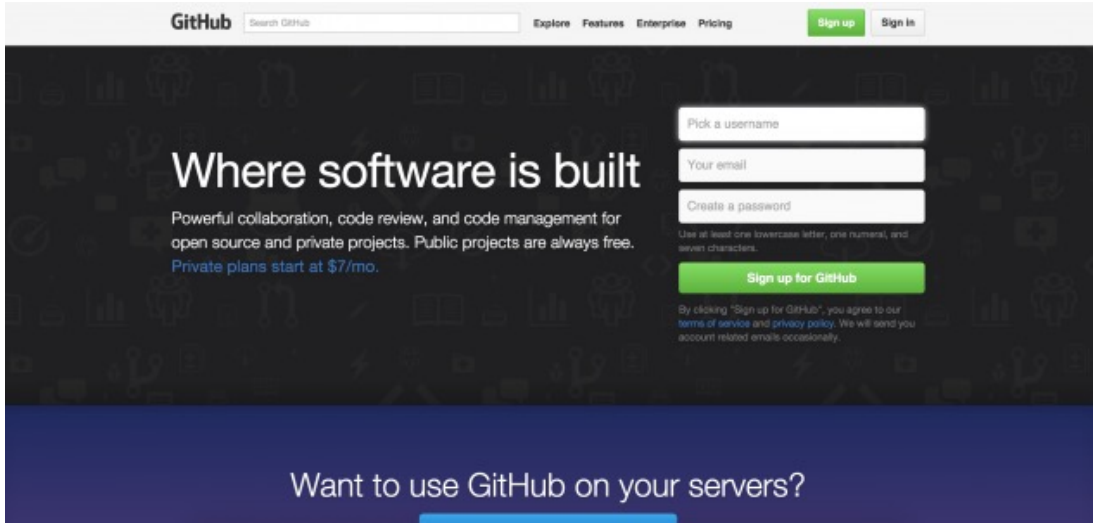
Examples: Figure-ground



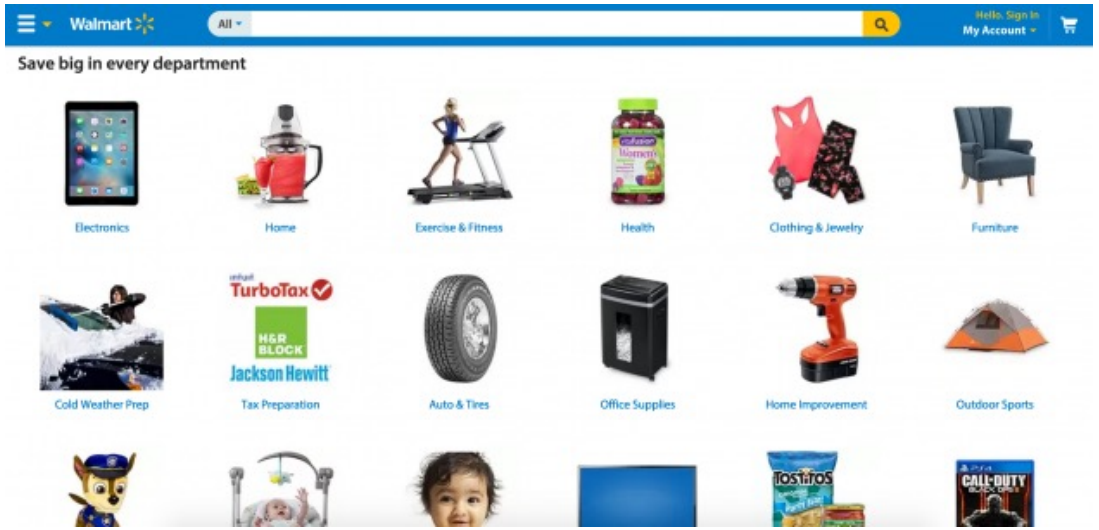


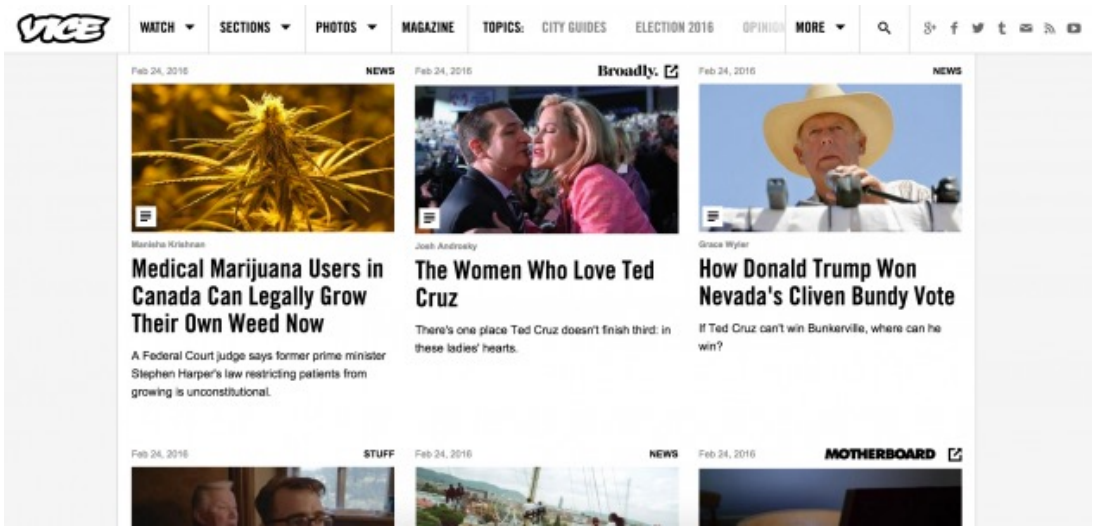


Examples: Similarity



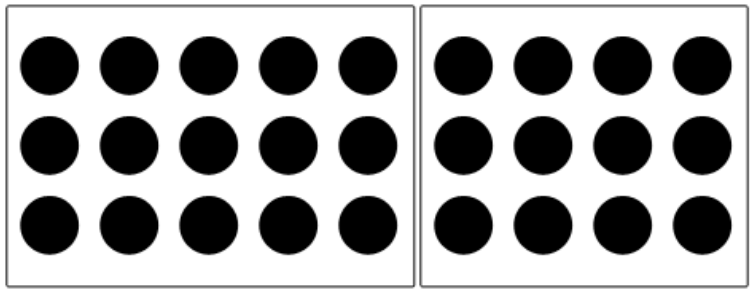
Examples: Proximity

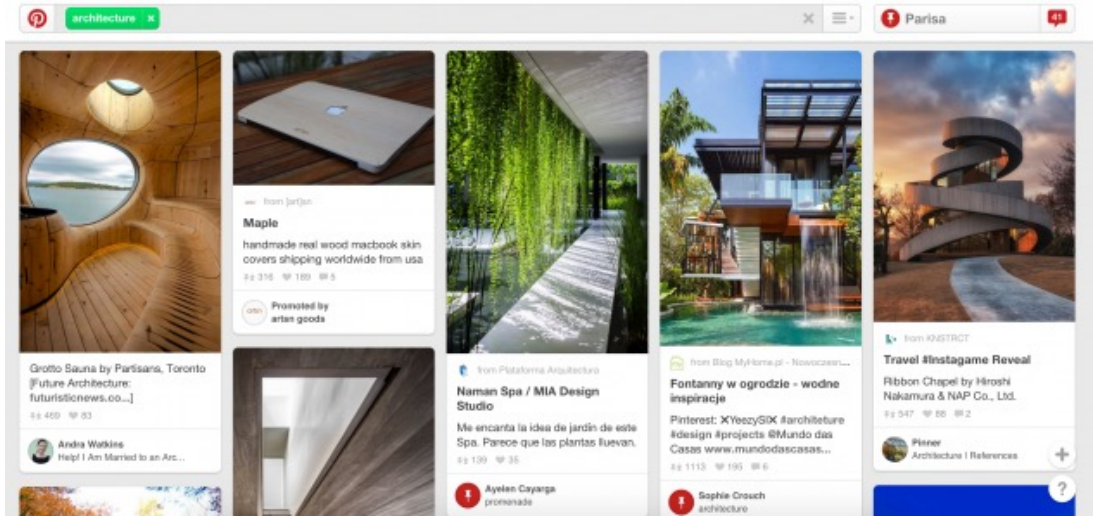


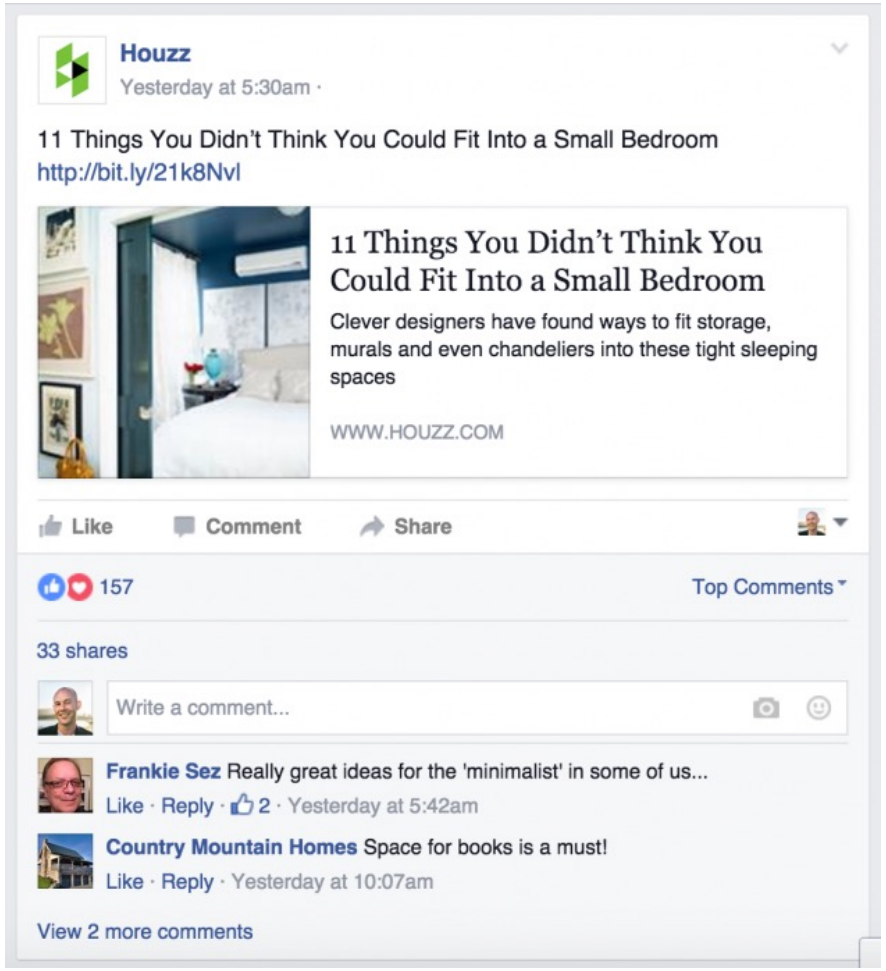


https://www.usertesting.com/blog/gestalt-principles/

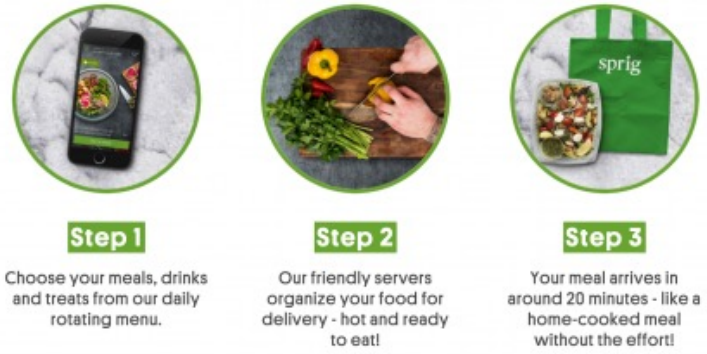
Examples: Common Region



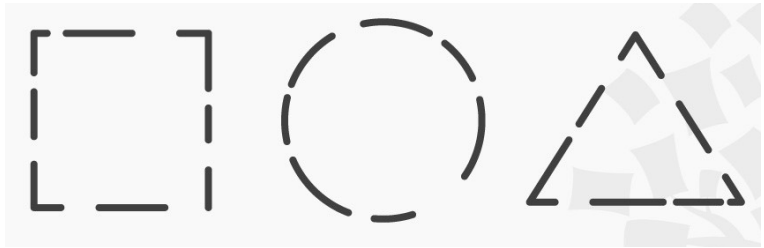




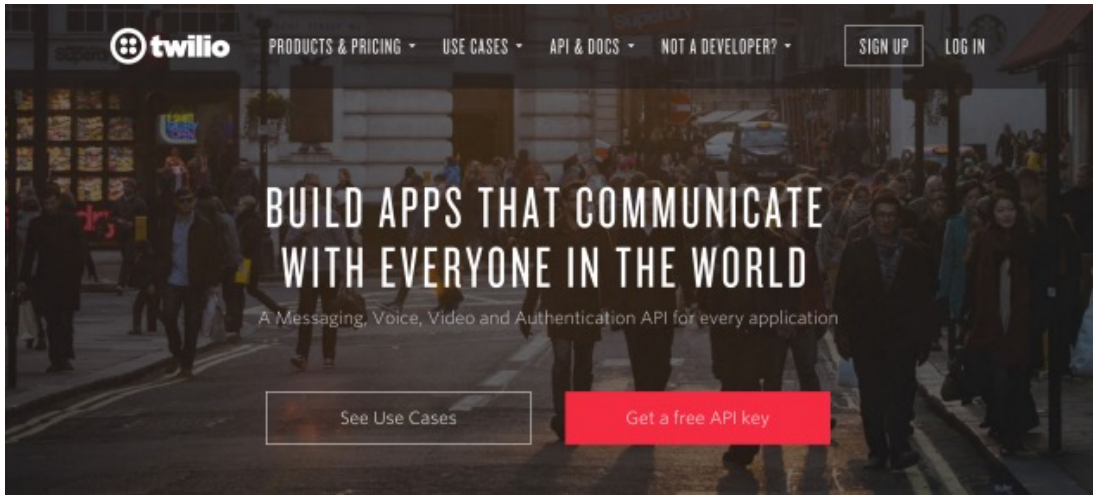
Examples: Continuity

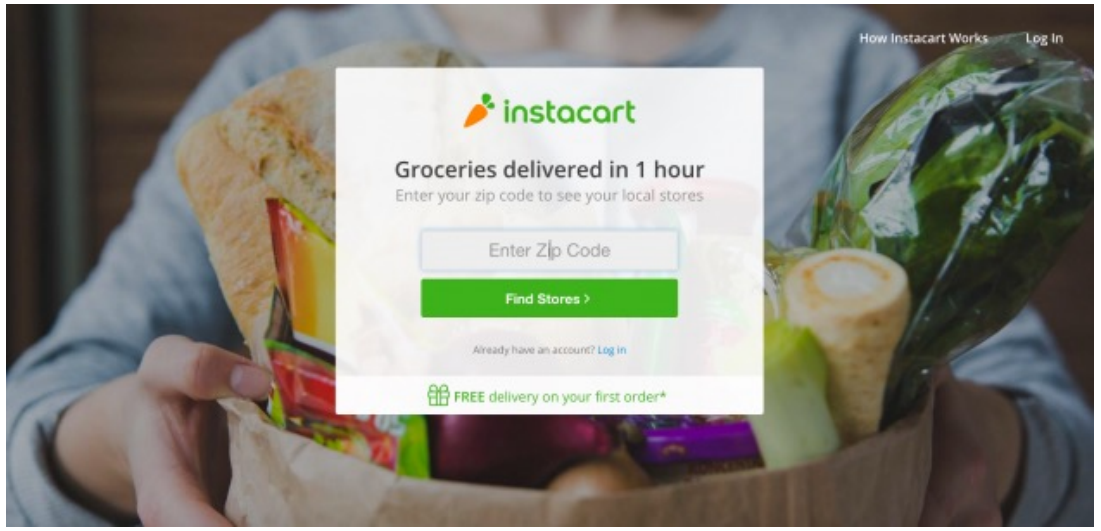


Examples: Closure



Examples: Focal Point



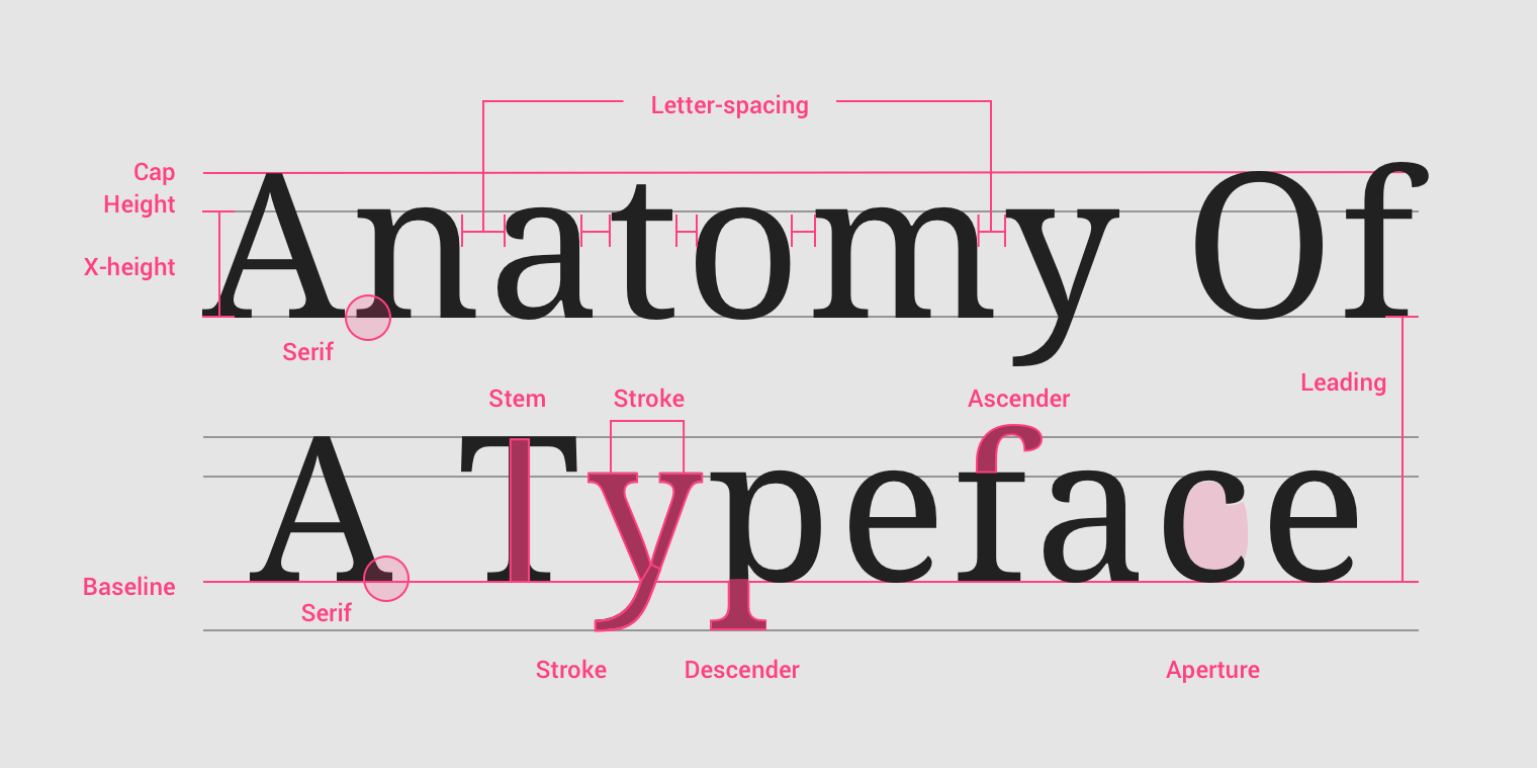


Typography

Property of text

Characteristics of Text

- Point Size
- Leading
- Cap Height, x-height
- Ascenders, Descenders
- Weight
- Serifs



https://material.io/design/typography/understanding-typography.html

Example: Material Design Type Scale

A combination of 13 styles that are supported by the type system

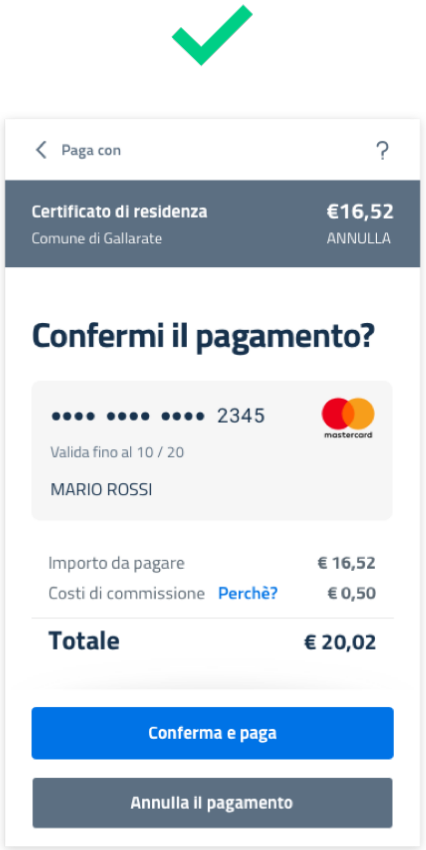
Reusable categories of text, each with an intended application and meaning

Scale Category	Typeface	Font	Size	Case	Letter spacing
H1	Roboto	Light	96	Sentence	-1.5
H2	Roboto	Light	60	Sentence	-0.5
H3	Roboto	Regular	48	Sentence	0
H4	Roboto	Regular	34	Sentence	0.25
H5	Roboto	Regular	24	Sentence	0
H6	Roboto	Medium	20	Sentence	0.15
Subtitle 1	Roboto	Regular	16	Sentence	0.15
Subtitle 2	Roboto	Medium	14	Sentence	0.1
Body 1	Roboto	Regular	16	Sentence	0.5
Body 2	Roboto	Regular	14	Sentence	0.25
BUTTON	Roboto	Medium	14	All caps	1.25
Caption	Roboto	Regular	12	Sentence	0.4
OVERLINE	Roboto	Regular	10	All caps	1.5

https://material.io/design/typography/the-type-system.html#type-scale

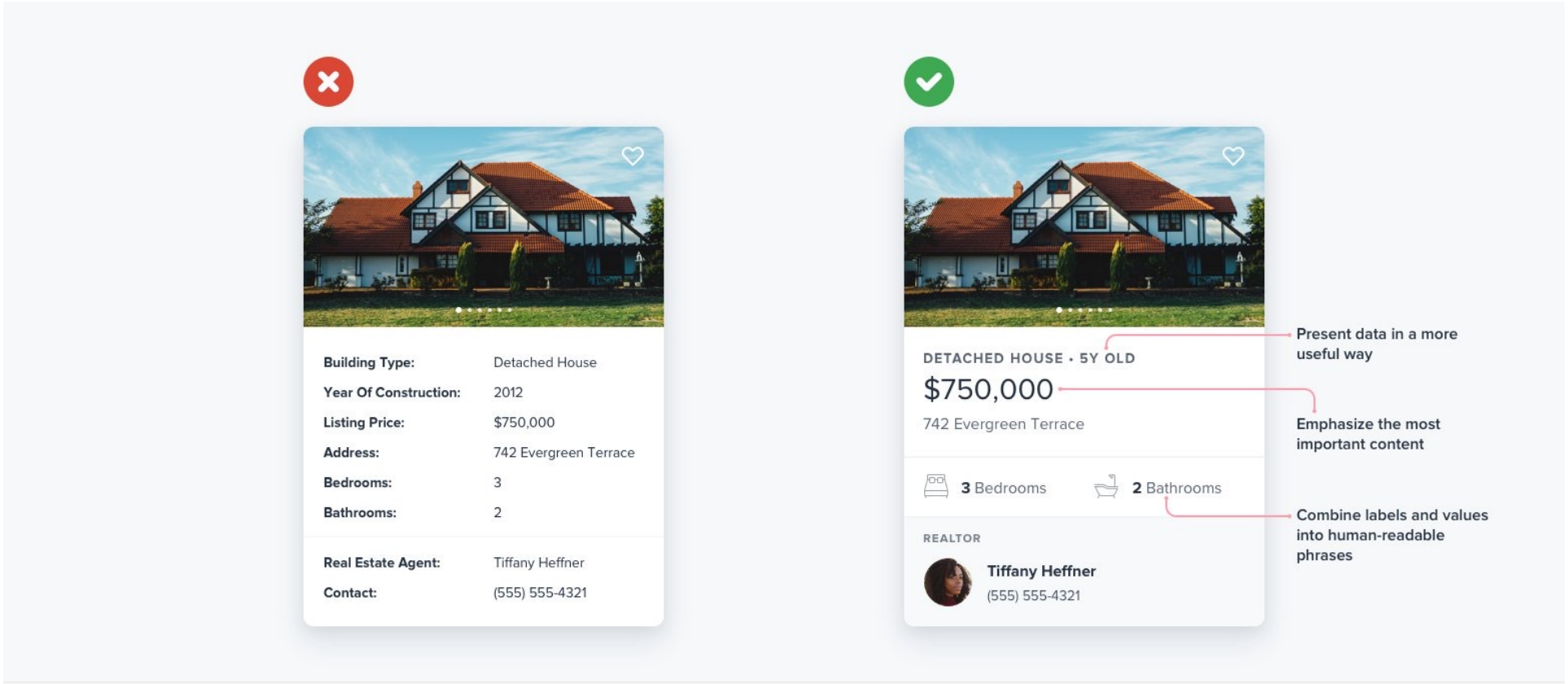
Text

- Font size, color and spacing define a hierarchy of visibility and attention
- The visual hierarchy should match the relative importance of the information content



https://docs.italia.it/italia/designers-italia/design-linee-guida-docs/it/stabile/doc/user-interface/il-disegno-di-un-interfaccia-e-lo-ui-kit.html

Text and Layout Convey Meaning



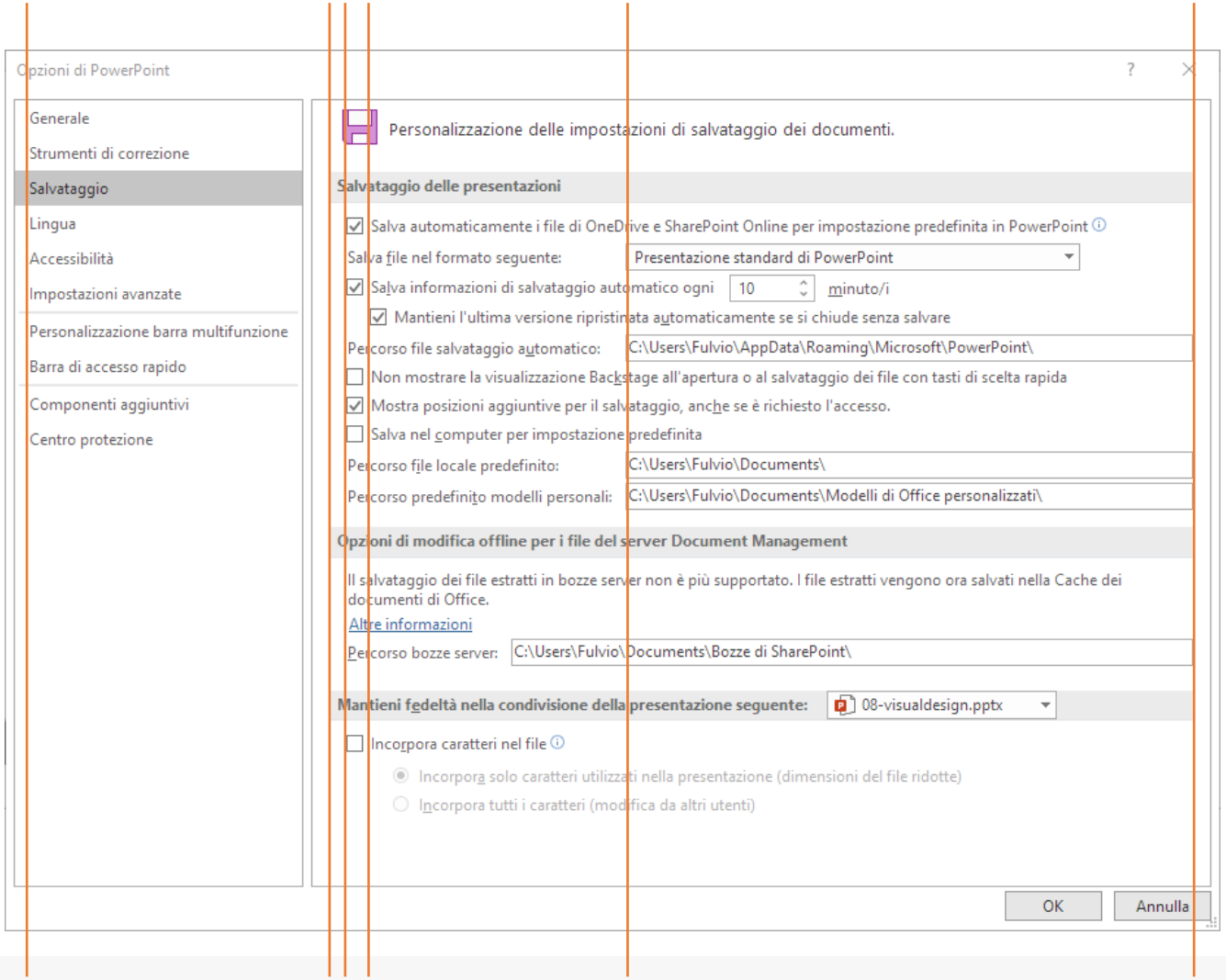
Grids and Alignment

Exploiting grouping and alignment to convey content, at different levels

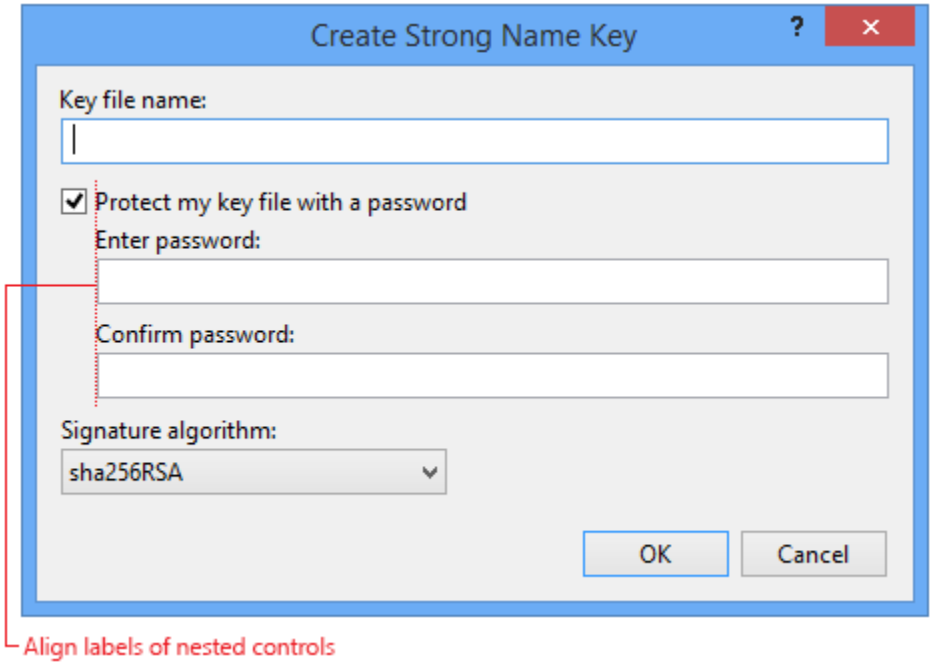
Alignment

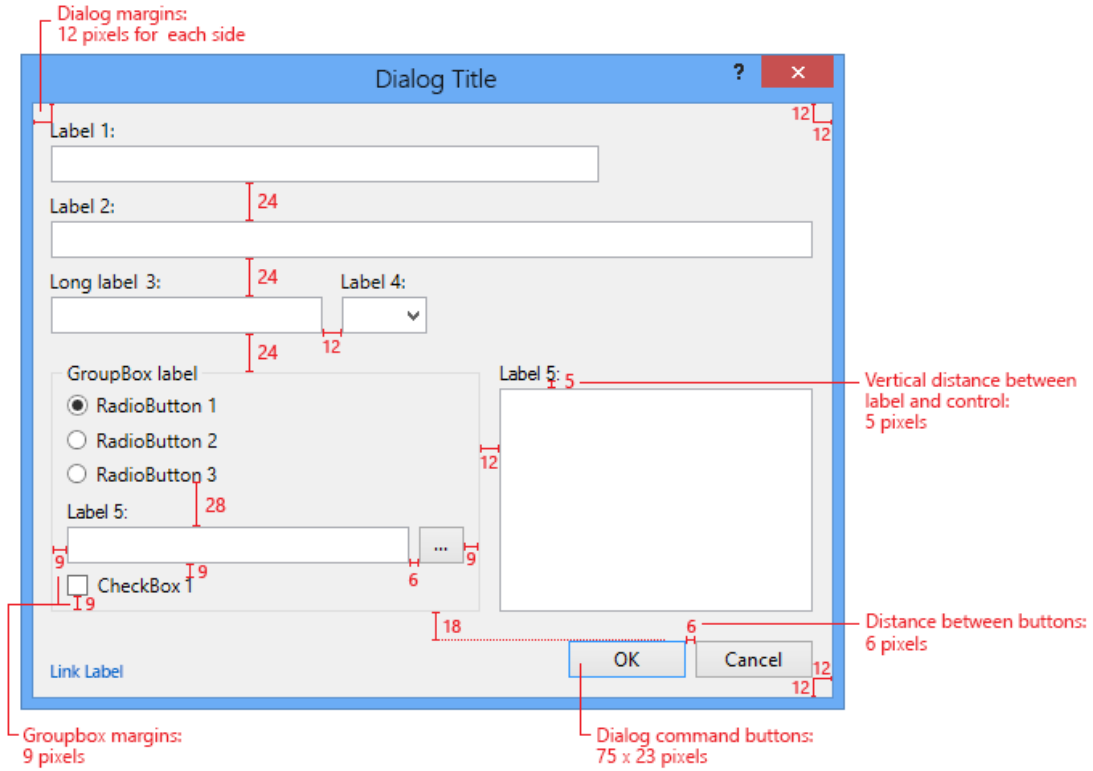
- Invisible lines that run through the interface and “attract” the left- or right-edge of a widget control
  - Vertical
  - Horizontal

Example


Opzioni di PowerPoint
Generale
Strumenti di correzione
Salvataggio
Lingua
Accessibilità
Impostazioni avanzate
Personalizzazione barra multifunzione
Barra di accesso rapido
Componenti aggiuntivi
Centro protezione
Personalizzazione delle impostazioni di salvataggio dei documenti.
Salvataggio delle presentazioni
Salva automaticamente i file di OneDrive e SharePoint Online per impostazione predefinita in PowerPoint
Salva file nel formato seguente:
Presentazione standard di PowerPoint
Salva informazioni di salvataggio automatico ogni
10
minuto/i
Mantieni l'ultima versione ripristinata automaticamente se si chiude senza salvare
Percorso file salvataggio automatico:
C:\Users\Fulvio\AppData\Roaming\Microsoft\PowerPoint\
Non mostrare la visualizzazione Backstage all'apertura o al salvataggio dei file con tasti di scelta rapida
Mostra posizioni aggiuntive per il salvataggio, anche se è richiesto l'accesso.
Salva nel computer per impostazione predefinita
Percorso file locale predefinito:
C:\Users\Fulvio\Documents\
Percorso predefinito modelli personali:
C:\Users\Fulvio\Documents\Modelli di Office personalizzati\
Opzioni di modifica offline per i file del server Document Management
Il salvataggio dei file estratti in bozze server non è più supportato. I file estratti vengono ora salvati nella Cache dei documenti di Office.
Altre informazioni
Percorso bozze server:
C:\Users\Fulvio\Documents\Bozze di SharePoint\
Mantieni fedeltà nella condivisione della presentazione seguente:
08-visualdesign.pptx
Incorpora caratteri nel file
Incorpora solo caratteri utilizzati nella presentazione (dimensioni del file ridotte)
Incorpora tutti i caratteri (modifica da altri utenti)
OK
Annulla

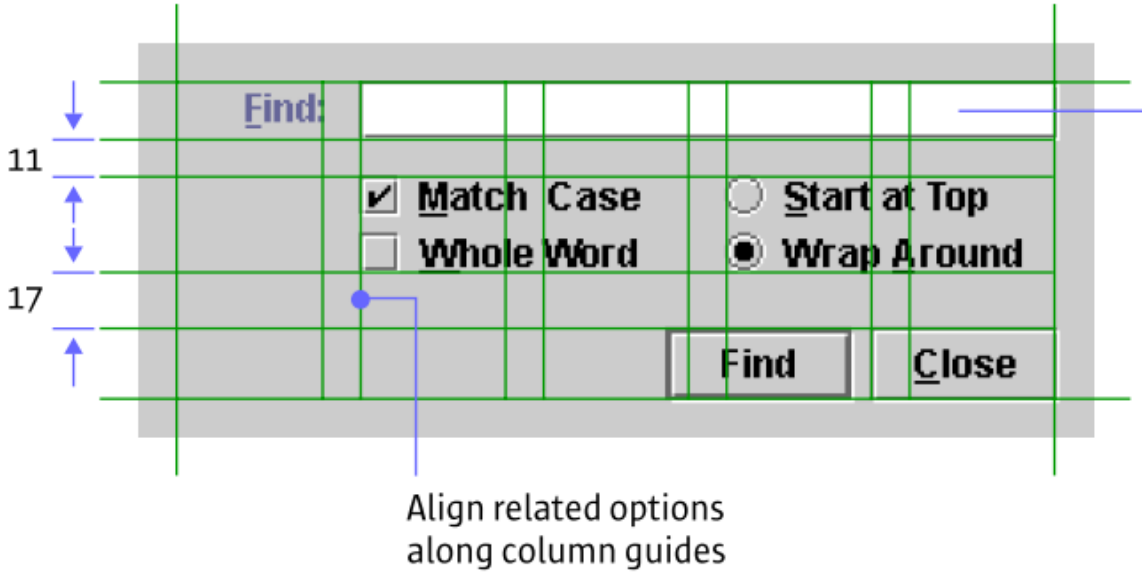
Examples

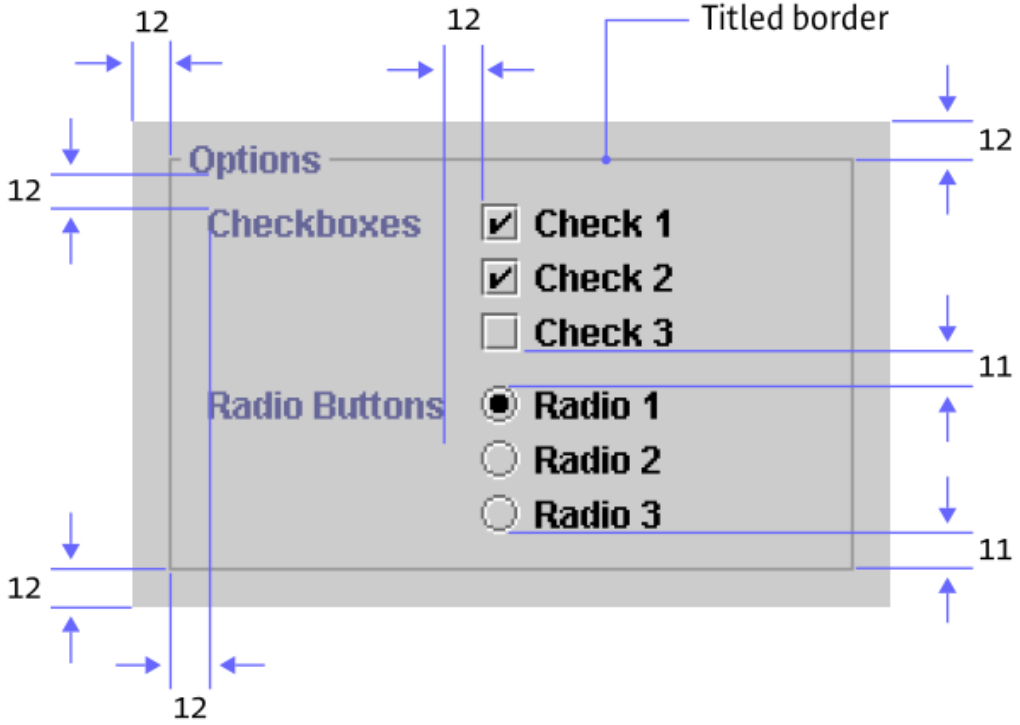




https://docs.microsoft.com/en-us/visualstudio/extensibility/ux-guidelines/layout-for-visual-studio?view=vs-2019

Examples





Java Look and Feel Design Guidelines, Sun Microsystems, **1999**

Grid Layout Ingredients

- **Guides:** The edge which you choose to align content with
- **Column:** A vertical division of content
- **Row:** A horizontal division of content
- **Margins:** The area surrounding your content
- **Gutters:** The margins between columns
- **Hang-line:** A horizontal guide to align content to hang off of
- **Baseline:** The horizontal guide for an element to sit on top of
- **Rhythm:** Proportion systems that can help define the sizing frequency and spacing of each of the above elements.

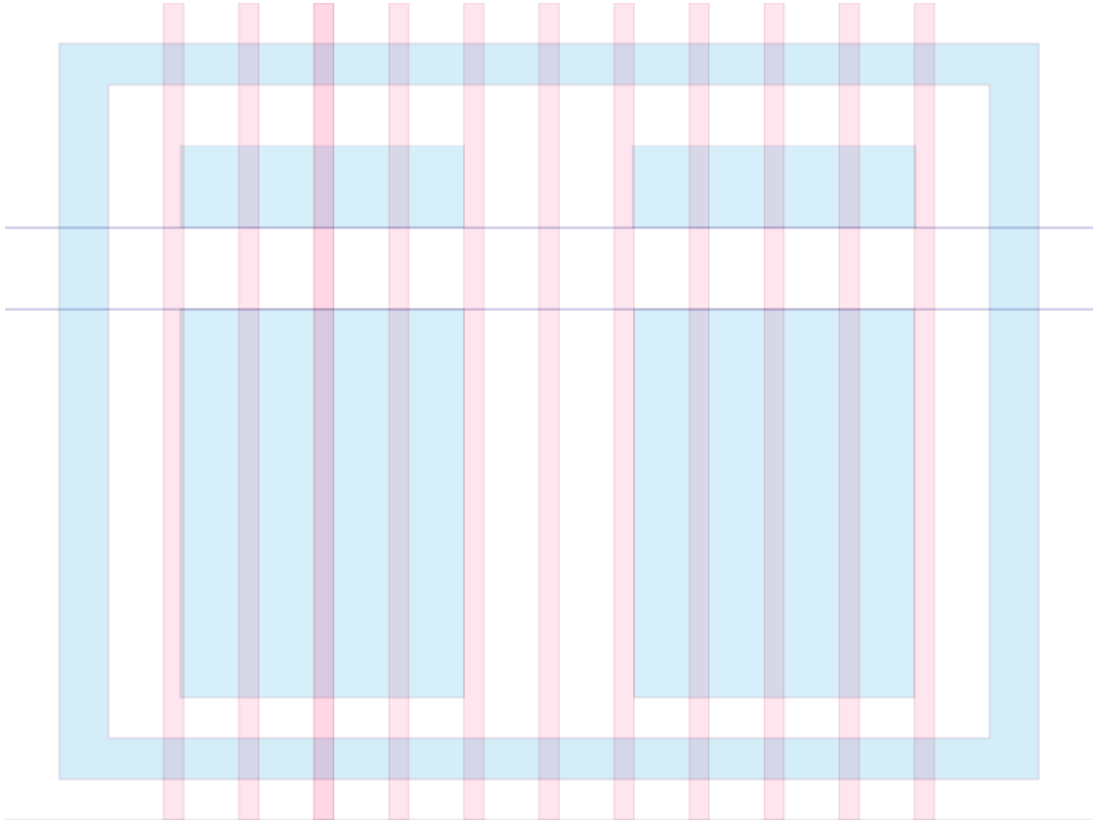
Grid Layout Ingredients

Margins

Columns & Gutters

Grid Layout Ingredients

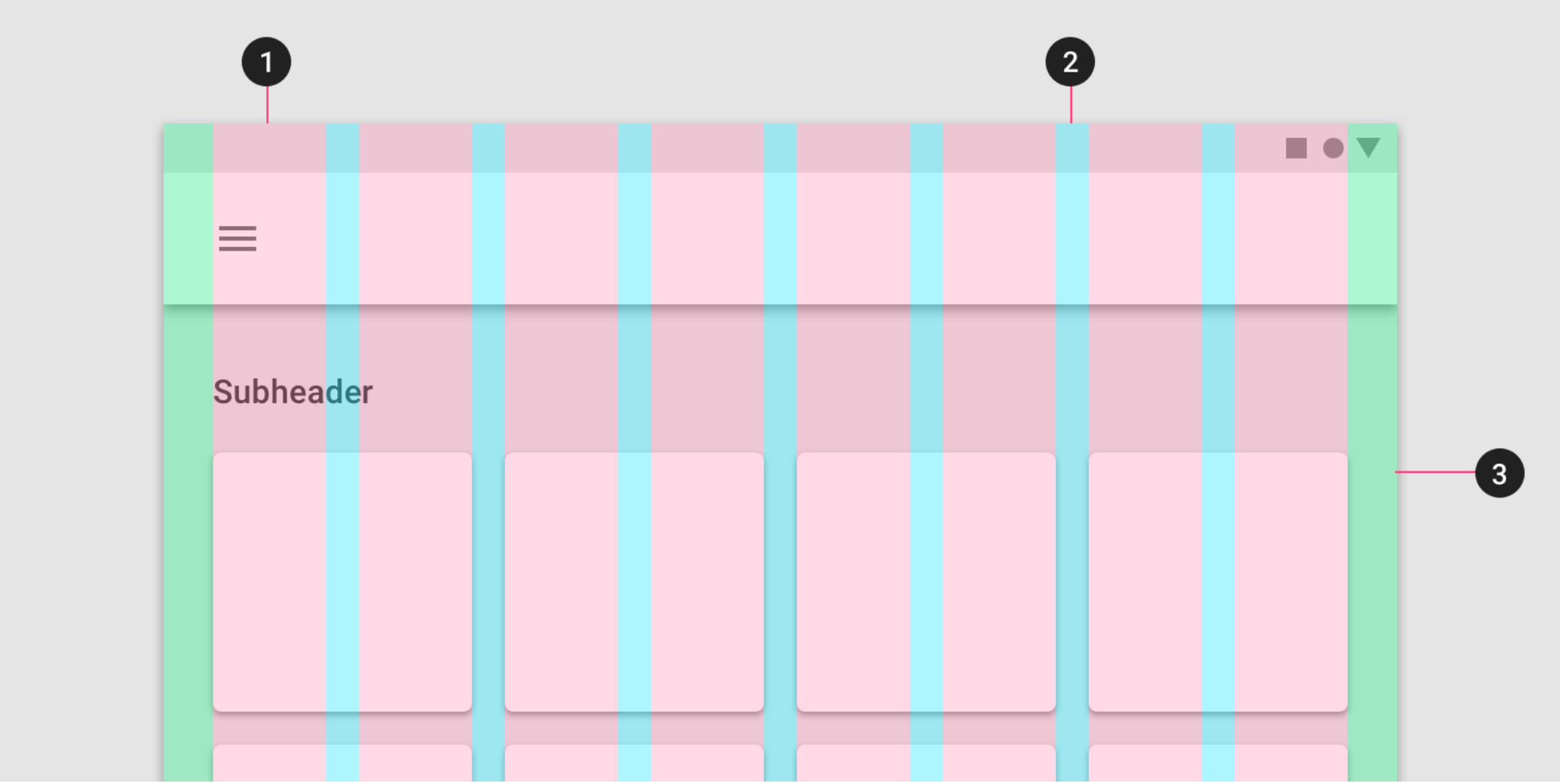
Hanglines and Baselines



Baseline Grids

Example Grid-based layout

1. Columns
2. Gutters
3. Margins



https://material.io/design/layout/responsive-layout-grid.html#columns-gutters-margins

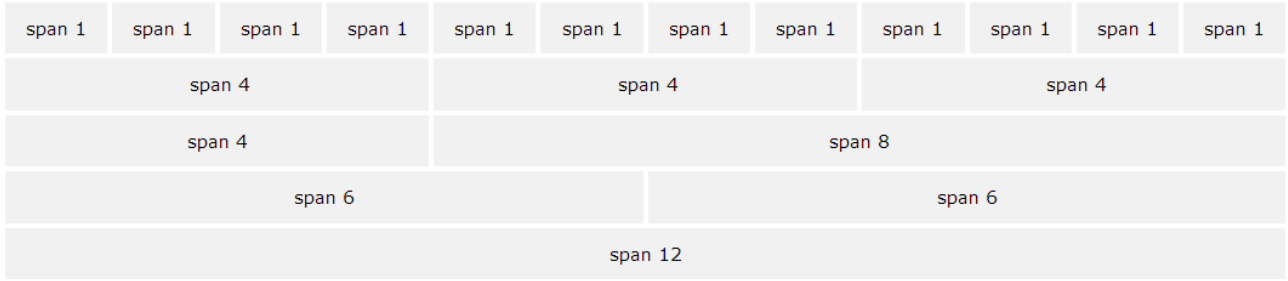
Example: Bootstrap grid

Always 12 columns in total

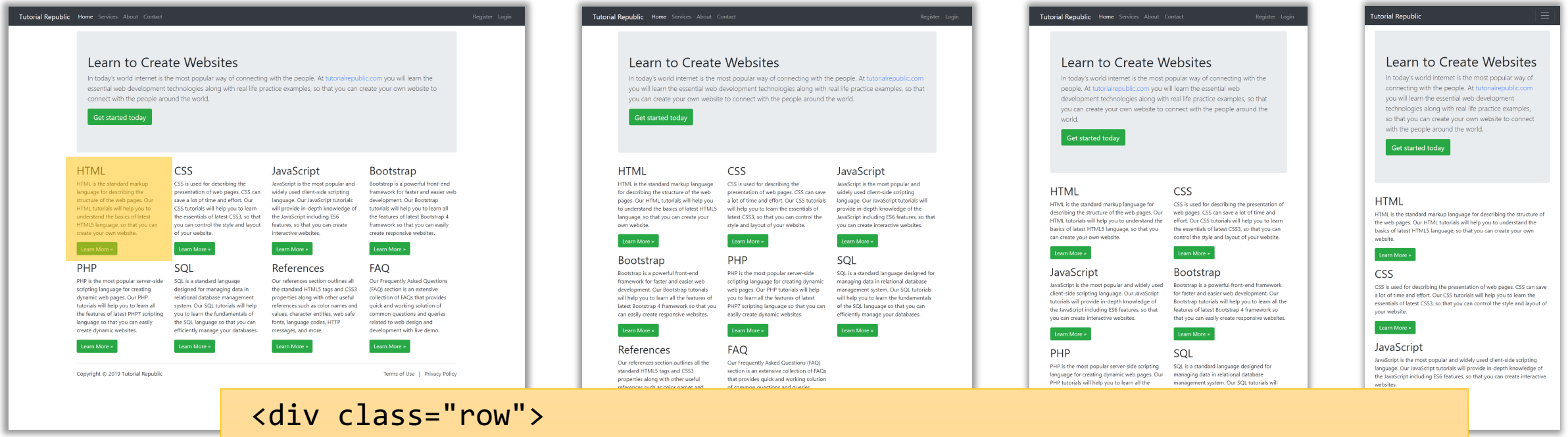
May choose to span a group of columns

Each column is tagged according to the screen size:

- xs (phones - <768px)
- sm (tablets - >=768px)
- md (small laptops - >=992px)
- lg (laptops and desktops - >1200px)



Responsive Grid Layout




```
<div class="row">
        <div class="col-md-6 col-lg-4 col-xl-3">
            <h2>HTML</h2>
            <p>...</p>
            <p><a href="..." class="btn btn-success">...</a></p>
        </div>
```

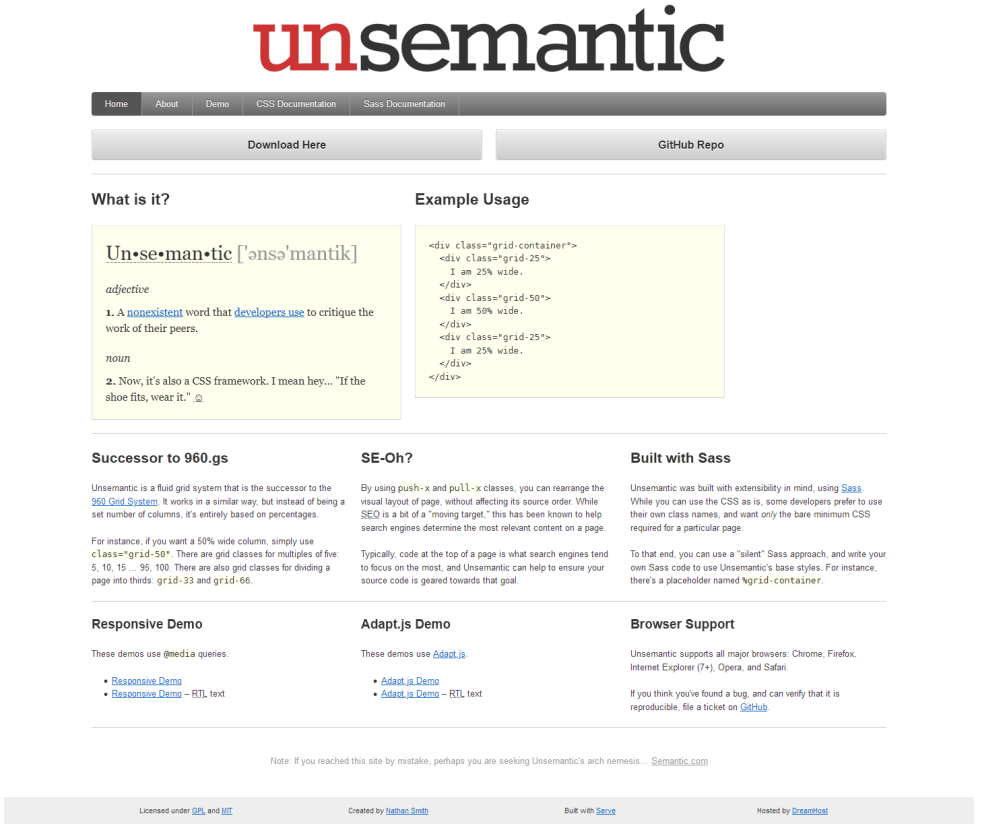
https://www.tutorialrepublic.com/twitter-bootstrap-tutorial/bootstrap-responsive-layout.php

Other Grid Systems

960 grid (fixed width, 12 or 16 col)

https://960.gs/

Unsemantic (responsive, based on %)



https://unsemantic.com/

Grid Structure

Main body:
Mix of 2x and 3x columns

Alternating row types

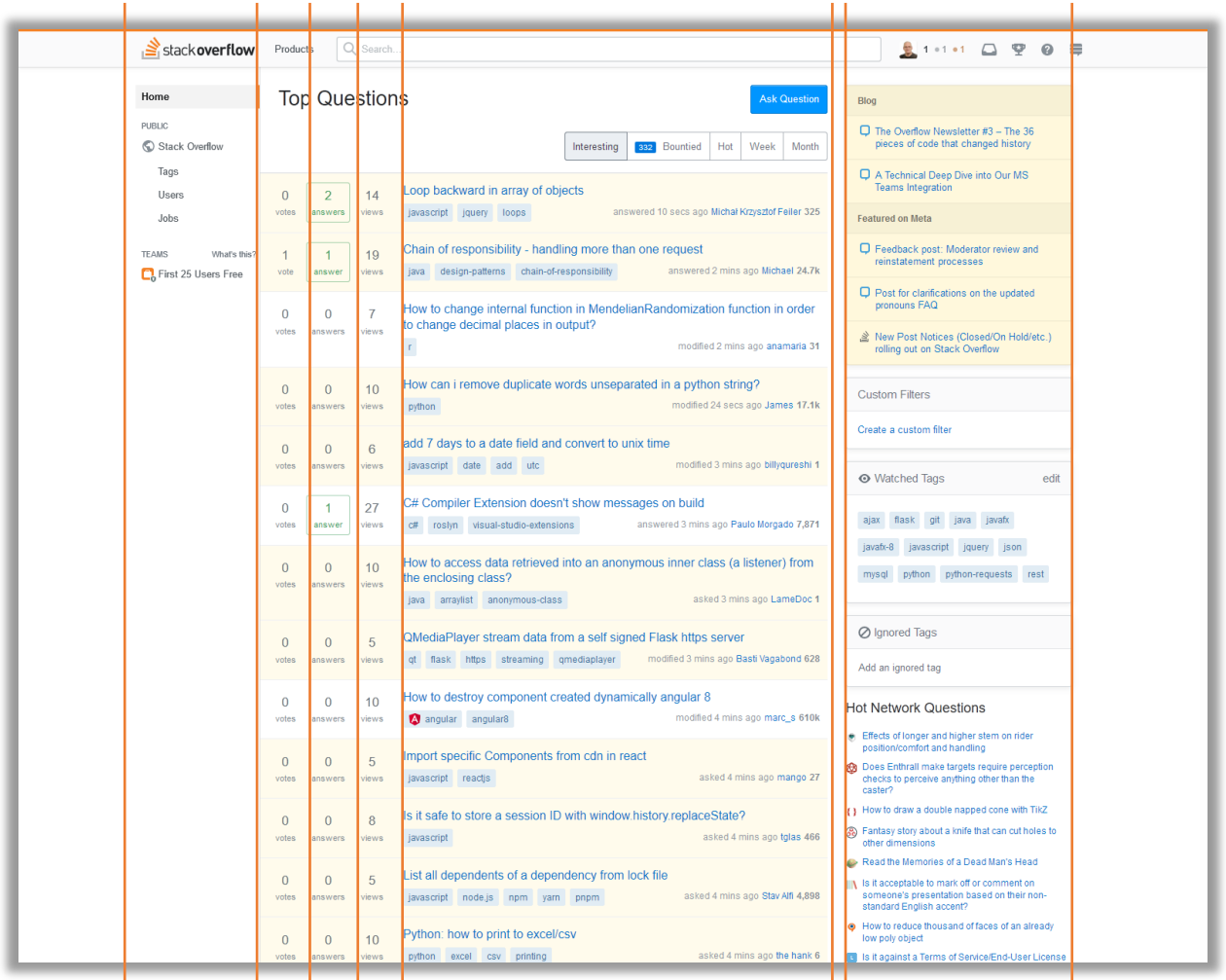
Title area outside the grid

Right column for other types of articles

Grid Structure

Main content
(center, wide)

Navigation
(left, smaller)



Related content
(right, smaller)

Example (2019)

Software Top

1° anno

Periodo	Codice	Lingua	Insegnamento	Crediti	Docente	Note	Vincoli
1	01PDWOV		Information systems ING-INF/05 (6)	6	M. Morisio		
1	02GOLOV		Architetture dei sistemi di elaborazione ING-INF/05 (10)	10	P. Bernardi E. Sanchez Sanchez		
			Oppure				
1	02LSEOV		Computer architectures ING-INF/05 (10)	10	P. Montuschi		
1	01SQJOV		Data Science and Database Technology ING-INF/05 (8)	8	S. Chiusano		
			Oppure				
1	01SQMOV		Data Science e Tecnologie per le Basi di Dati ING-INF/05 (8)	8	E. Baralis		
1	01OTWOV		Computer network technologies and services ING-INF/05 (6)	6	M. Baldi		
			Oppure				
1	02KPNOV		Tecnologie e servizi di rete ING-INF/05 (6)	6	G. Marchetto		
2	02JEUOV		Formal languages and compilers ING-INF/05 (6)	6	R. Sisto		
2	05BIDOV		Ingegneria del software ING-INF/05 (8)	8	G. Bruno		
			Oppure				
2	04GSPOV		Software engineering ING-INF/05 (8)	8	M. Morisio		
2	01UDFOV		Applicazioni Web I ING-INF/05 (6)	6	E. Masala		
			Oppure				
2	01TXYOV		Web Applications I ING-INF/05 (6)	6	F. Corno		
2	02GRSOV		Programmazione di sistema ING-INF/05 (10)	10	G. Cabodi		
			Oppure				
2	01NYHOV		System and device programming ING-INF/05 (10)	10	S. Quer		

2° anno

Periodo	Codice	Lingua	Insegnamento	Crediti	Docente	Note	Vincoli
1			Insegnamento a scelta 1	6			
1	01TYMOV		Information systems security ING-INF/05 (6)	6			
			Oppure				
1	01UDUOV		Sicurezza dei sistemi informativi ING-INF/05 (6)	6			
1	01SQNOV		Software Engineering II ING-INF/05 (6)	6			
1,2			Crediti liberi	6			
1,2	29EBHOV		Tesi	30			
2			Insegnamento a scelta 2	6			

Insegnamento a scelta 1

Periodo	Codice	Lingua	Insegnamento	Crediti	Docente	Note	Vincoli
1	01TYDOV		Cloud Computing ING-INF/05 (6)	6			
1	01PDCOV		Digital control technologies and architectures ING-INF/04 (6)	6			
1	01TXZOV		Distributed systems programming ING-INF/05 (6)	6			Si
1	01NWPOV		Elaborazione dell'audio digitale ING-INF/05 (6)	6			
1	01UDGOV		Energy management for IoT ING-INF/05 (6)	6			Si
1	02JSKOV		Human Computer Interaction ING-INF/05 (6)	6			
1	01SQIOV		Machine Learning and Artificial Intelligence ING-INF/05 (6)	6			
1	01PDXOV		Modern design of control systems ING-INF/04 (6)	6			
1	01OUVOV		Optimization methods and algorithms MAT/09 (6)	6			

Example (same page in 2020)

Software

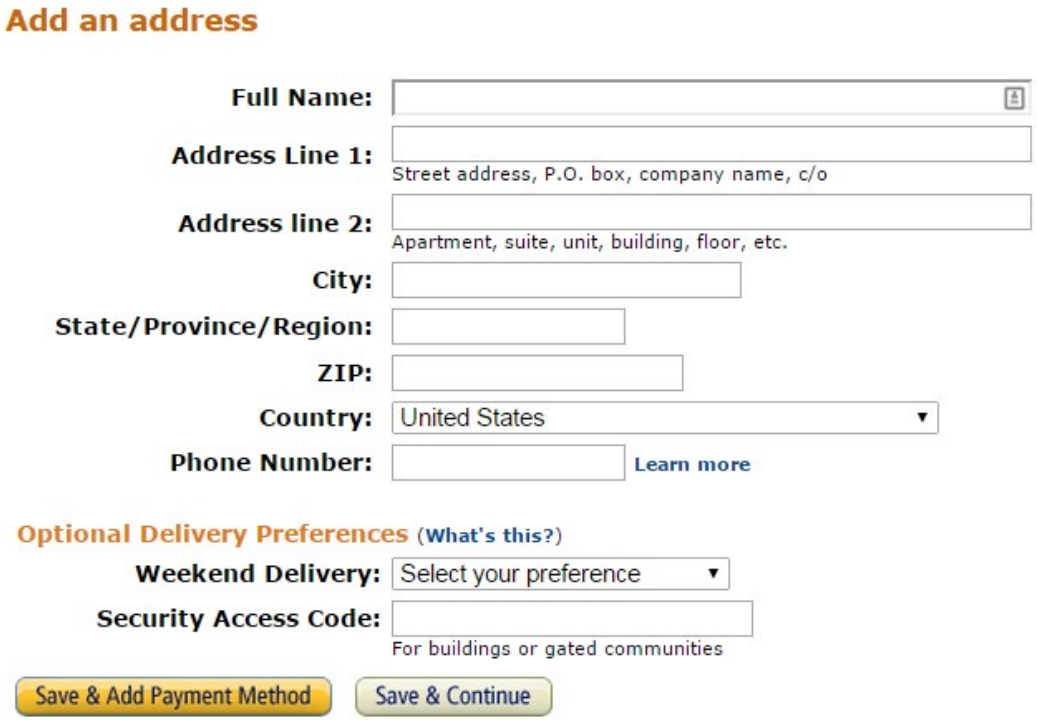
1° anno 2020/2021

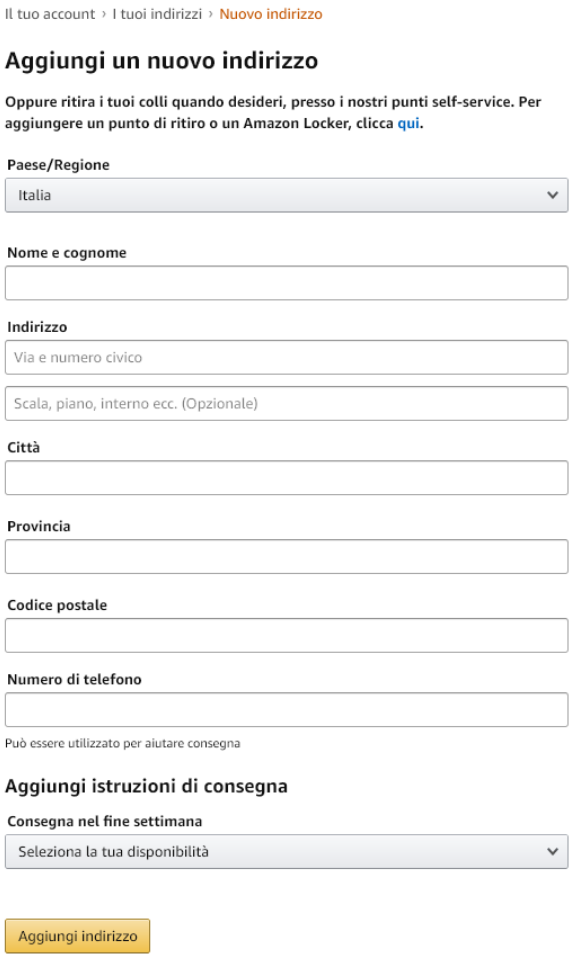
Periodo	Codice	SSD	Insegnamento	Lingua	Crediti	Docente	Note	Orario
1	**01PDWOV**	ING-INF/05 (6)	Information systems		6	M. Morisio *(118 iscr.)*		
1	**02GOLOV**	ING-INF/05 (10)	Architetture dei sistemi di elaborazione		10	P. Bernardi *(150 iscr.)* E. Sanchez Sanchez *(159 iscr.)*		
			oppure					
1	**02LSEOV**	ING-INF/05 (10)	Computer architectures		10	P. Montuschi *(207 iscr.)*		
1	**01SQJOV**	ING-INF/05 (8)	Data Science and Database Technology		8	S. Chiusano *(172 iscr.)*		
			oppure					
1	**01SQMOV**	ING-INF/05 (8)	Data Science e Tecnologie per le Basi di Dati		8	E. Baralis *(254 iscr.)*		
1	**01OTWOV**	ING-INF/05 (6)	Computer network technologies and services		6	G. Marchetto *(161 iscr.)*		
			oppure					
1	**02KPNOV**	ING-INF/05 (6)	Tecnologie e servizi di rete		6	G. Marchetto *(253 iscr.)*		
2	**02JEUOV**	ING-INF/05 (6)	Formal languages and compilers		6	R. Sisto *(60 iscr.)*		
2	**05BIDOV**	ING-INF/05 (8)	Ingegneria del software		8	G. Bruno *(132 iscr.)*		
			oppure					
2	**04GSPOV**	ING-INF/05 (8)	Software engineering		8	M. Morisio *(202 iscr.)*		
2	**01UDFOV**	ING-INF/05 (6)	Applicazioni Web I		6	E. Masala *(91 iscr.)* L. De Russis *(57 iscr.)*		
			oppure					
2	**01TXYOV**	ING-INF/05 (6)	Web Applications I		6	F. Corno *(185 iscr.)*		
2	**02GRSOV**	ING-INF/05 (10)	Programmazione di sistema		10	G. Cabodi *(100 iscr.)* A. Savino *(112 iscr.)*		
			oppure					
2	**01NYHOV**	ING-INF/05 (10)	System and device programming		10	S. Quer *(108 iscr.)*		

2° anno 2021/2022

Periodo	Codice	SSD	Insegnamento	Lingua	Crediti	Docente	Note	Orario
1			Insegnamento a scelta 1		6			
1	**01TYMOV**	ING-INF/05 (6)	Information systems security		6			
			oppure					
1	**01UDUOV**	ING-INF/05 (6)	Sicurezza dei sistemi informativi		6			
1	**01SQNOV**	ING-INF/05 (6)	Software Engineering II		6			
1,2			Crediti liberi		6			
1,2	**29EBHOV**		Tesi		30			
2			Insegnamento a scelta 2		6			

Example (2015 vs. 2019)





Some Best Practices

- When designing a template, start from the longest block of text
- Left-aligned text is (usually) faster to skim
- Alignment guides the eye and reduces clutter
  - Avoid slight misalignments
  - Patterns and deviations are “automatically” detected
    - Deviate form a pattern for strategic reasons
  - Use visual proximity and scale to convey semantic information

Colors

The most dangerous weapon in your toolset


I live inside my car leasing website all day Monday to Friday 9am-6pm. I lease the cheapest PCP and contract hire cars in the UK! - I am Ling, accept no substitutes
LINGsCARS.com
Leader of the Pack - The UK's favorite car leasing website!
Contract hire cars from Ling Valentine, LINGsCARS is the UK's favourite car leasing website - On 2016 I leased over £85 million in cars!
I AM LING YOU CAN TRUST ME
Menu
Home
Cars
Vans
Customers
About Ling
Fun stuff
Free stuff
Live staff
CARS A-Z
ABARTH
124 Spider
Convertible
595 Convertible
595 Hatchback
695 Convertible
ALFA ROMEO
Giulia Saloon
Giulietta
Stelvio Estate
AUDI
Stop
BETTY
"Believe it or not, this Gateshead-based website, featuring Mrs Ling jigging on her motorbike, is one of the biggest online drivers of car sales in Great Britain" 25th July 2017
4 News
Leader of the Pack
"[Ling Valentine is] Britain's BIGGEST individual seller of new cars."
BREXIT RISK FREE!
February 2017 theguardian
LING'S BREXIT BORIS PROMISE: If the UK leaves the EU with "no deal", tariffs may apply to EU built cars landing in the UK after Brexit day (31st Jan?). If this is the case with YOUR car, and IF the price increases due to tariffs, YOU will be able to cancel the car order at NO COST to you. YOU can order a new car from me, with NO BREXIT RISK. - Ling
MY BEST SELLING CAR LEASING DEALS!
Facebook
Twitter
500 IDEAS!
Fiat 500
1.2 Pop 8v (69bhp) (4 seats) Hatchback 3dr 1242cc Petrol Manual (5 Speed)
RENT NEW £127/mth including VAT
3 year cheap car leasing
9+35
NICOLE...PAPA!
Renault Clio
0.9 TCE Iconic 12v (90bhp) Hatchback 5dr 898cc Petrol Manual (5 Speed)
RENT NEW £152/mth including VAT
3 year cheap car leasing
6+35
MEGA-HATCH!
Citroen C3
1.2 PureTech 12v (83bhp) Flair Hatchback 5dr Manual 1199cc
RENT NEW £157/mth including VAT
2 year cheap car leasing
6+23
Petrol
Car Leasing Online Service Response Times
Quote > Proposal > Order > Delivery
73 CUSTOMERS IN 'PROPOSAL'
Ling replies in... 0:03 07
129 CUSTOMERS IN 'ORDER'
Ling replies 0:05 03
1 DELIVERY TODAY
Ford Ka+
Arthur
ATTLEBOROUGH,NR17
21 DELIVERIES IN LAST WEEK
Renault Captur
Cath
PONTEFRACT , WF81
Mercedes GLC Coupe
Bill
BEDLINGTON, NE22
BMW 2 Series Convert...
Pingu
DERBY, DE56
Nissan Qashqai
Arlene
GLASGOW , G11
Volvo XC60 Estate
Saif
MILTON KEYNES, MK8
Seat Leon
Ben
BARNSLEY, S70
Skoda Kodiaq Estate
Hannah
HAY-ON-WYE , HR3
Renault Clio
Paul
MIDDLEBROUGH , TS7
Renault Clio
Paul
MIDDLEBROUGH , TS7
Seat Arona
Steve
LONDON, SE18
Seat Leon
Adam
HATFIELD, AL10
Audi A3 Sportback
Chris
WYMONDHAM , NR18

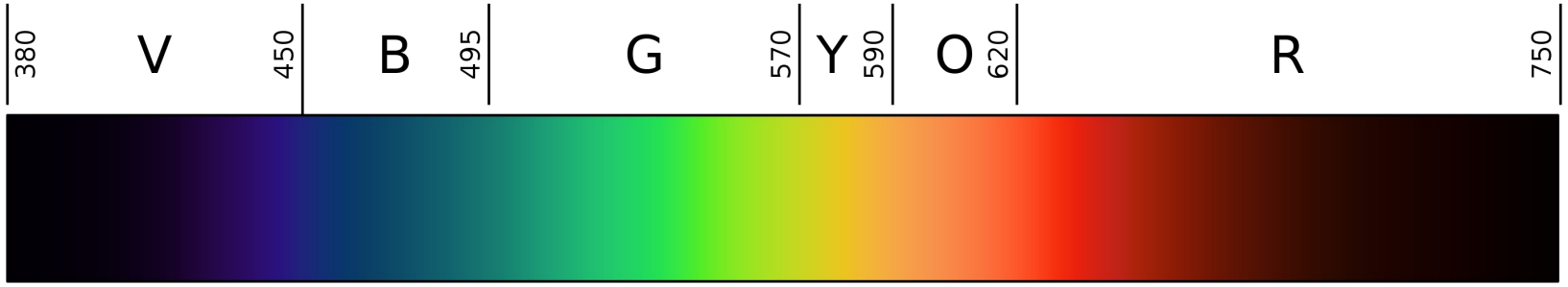
Colors

- A powerful tool to improve interfaces by communicating **key information**
- Inappropriate use of colors can severely **reduce the performance** of an interactive system

Colors: Suggestions

- Be careful, do not exaggerate
- Design in grayscale, first
  - Ensure information is conveyed by text and layout
- When adding colors, try to conserve the same luminance of the grayscale design
- Assign meaning to color
- Use a limited and consistent palette and use slight variations
- Avoid simultaneous display of pure (highly-saturated), spectrally extreme colors
  - e.g., no blue at the same time as red
  - desaturated combinations (pastels) are better

Visible Spectrum

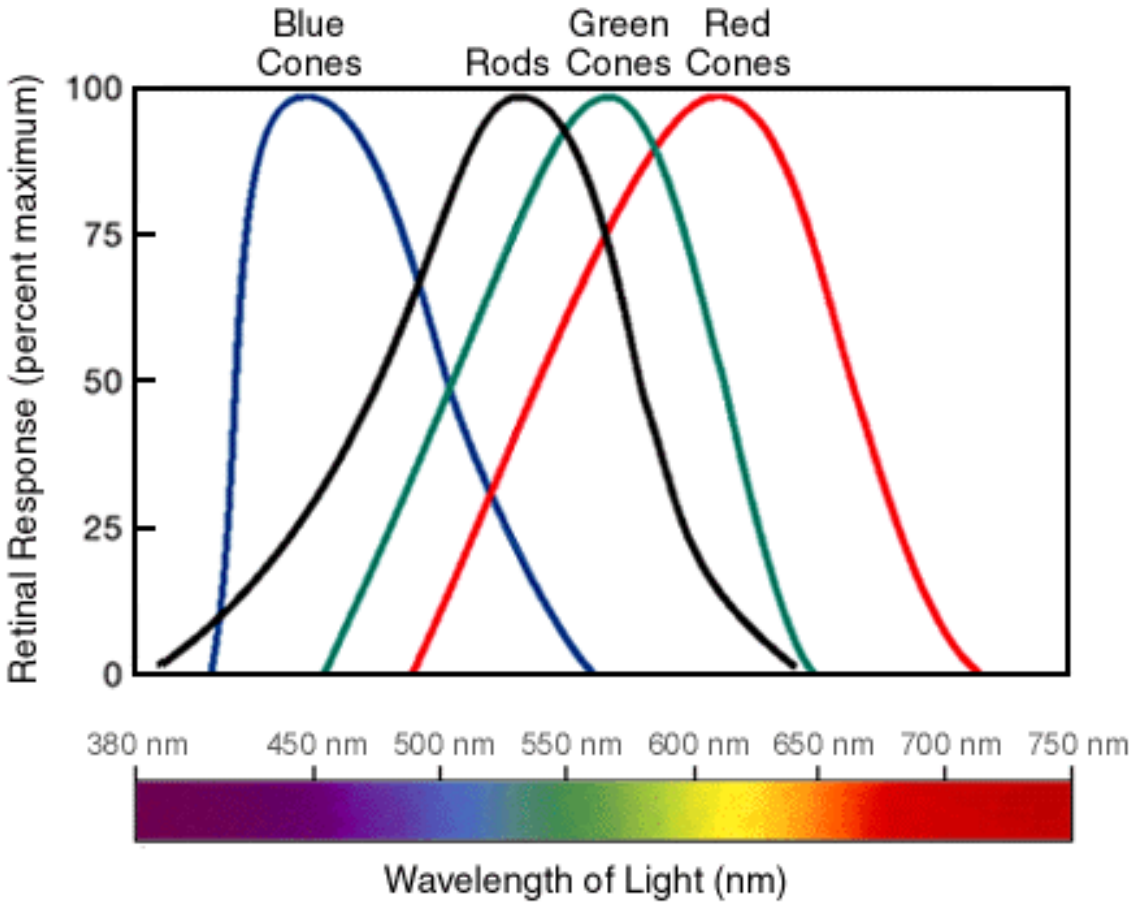


- UV spectrum ends on the left, IR starts on the right
- Wavelenghts are in nm
- Source: https://commons.wikimedia.org/wiki/File:Linear_visible_spectrum.svg

Human Vision

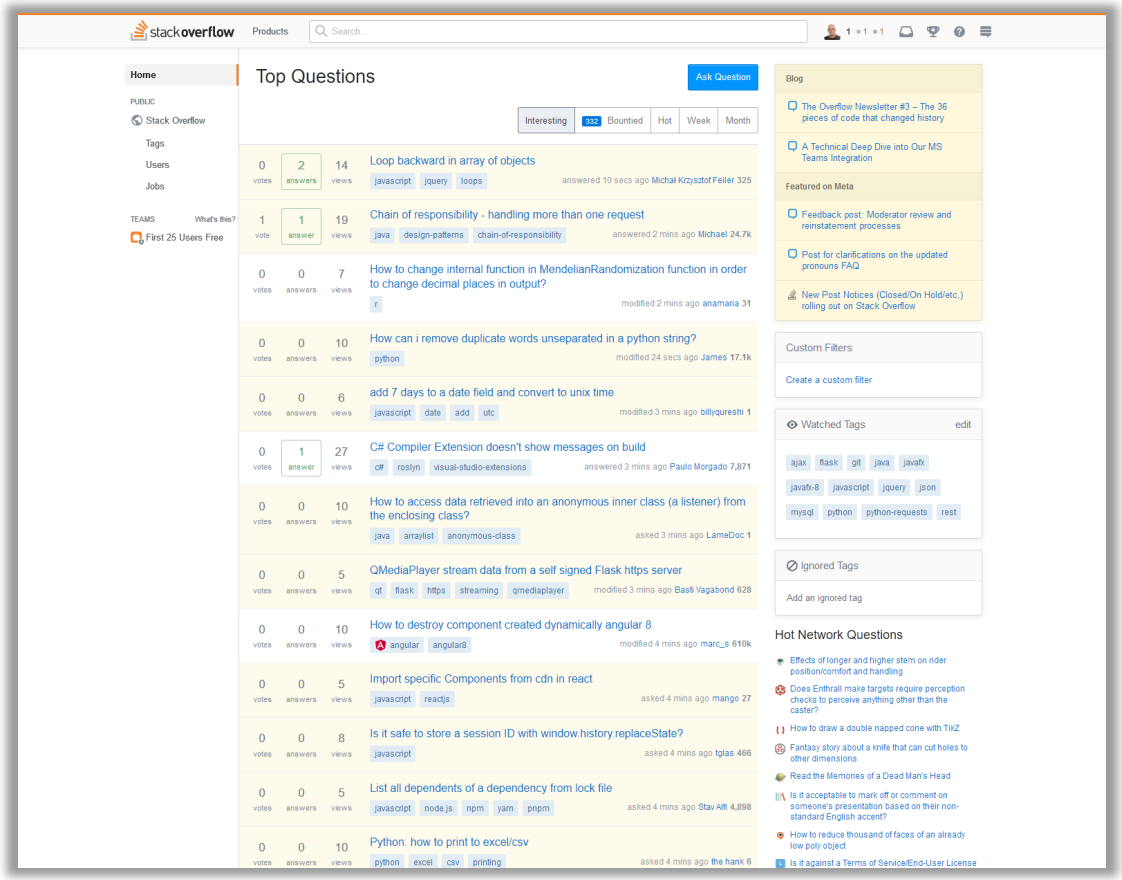
- **Human vision:** a highly complex activity, often the main source of information about the world
- The **eye:** a mechanism for receiving light and transforming it into electrical energy
  - light reflected from objects in the world and their image is focused upside down on the back of the eye
  - then, the receptors in the eye transform it intro electrical signal which are passed to the brain
  - the brain detects, finally, pattern and movements

Color Sensitivity of the Eyes



source: https://askabiologist.asu.edu/rods-and-cones

Example


stackoverflow
Products
Search...
Home
PUBLIC
Stack Overflow
Tags
Users
Jobs
TEAMS
What's this?
First 25 Users Free
Top Questions
Ask Question
Interesting
332
Bountied
Hot
Week
Month
0 votes 2 answers 14 views
Loop backward in array of objects
javascript jquery loops
answered 10 secs ago Michał Krzysztof Feiler 325
1 vote 1 answer 19 views
Chain of responsibility - handling more than one request
java design-patterns chain-of-responsibility
answered 2 mins ago Michael 24.7k
0 votes 0 answers 7 views
How to change internal function in MendelianRandomization function in order to change decimal places in output?
r
modified 2 mins ago anamaria 31
0 votes 0 answers 10 views
How can i remove duplicate words unseparated in a python string?
python
modified 24 secs ago James 17.1k
0 votes 0 answers 6 views
add 7 days to a date field and convert to unix time
javascript date add utc
modified 3 mins ago billyqureshi 1
0 votes 1 answer 27 views
C# Compiler Extension doesn't show messages on build
c# roslyn visual-studio-extensions
answered 3 mins ago Paulo Morgado 7,871
0 votes 0 answers 10 views
How to access data retrieved into an anonymous inner class (a listener) from the enclosing class?
java arraylist anonymous-class
asked 3 mins ago LameDoc 1
0 votes 0 answers 5 views
QMediaPlayer stream data from a self signed Flask https server
qt flask https streaming qmediaplayer
modified 3 mins ago Basti Vagabond 628
0 votes 0 answers 10 views
How to destroy component created dynamically angular 8
angular angular8
modified 4 mins ago marc_s 610k
0 votes 0 answers 5 views
Import specific Components from cdn in react
javascript reactjs
asked 4 mins ago mango 27
0 votes 0 answers 8 views
Is it safe to store a session ID with window.history.replaceState?
javascript
asked 4 mins ago tglas 466
0 votes 0 answers 5 views
List all dependents of a dependency from lock file
javascript node.js npm yarn pnpm
asked 4 mins ago Stav Alfi 4,898
0 votes 0 answers 10 views
Python: how to print to excel/csv
python excel csv printing
asked 4 mins ago the hank 6
Blog
The Overflow Newsletter #3 – The 36 pieces of code that changed history
A Technical Deep Dive into Our MS Teams Integration
Featured on Meta
Feedback post: Moderator review and reinstatement processes
Post for clarifications on the updated pronouns FAQ
New Post Notices (Closed/On Hold/etc.) rolling out on Stack Overflow
Custom Filters
Create a custom filter
Watched Tags
edit
ajax flask git java javafx
javafx-8 javascript jquery json
mysql python python-requests rest
Ignored Tags
Add an ignored tag
Hot Network Questions
Effects of longer and higher stem on rider position/comfort and handling
Does Enthrall make targets require perception checks to perceive anything other than the caster?
How to draw a double napped cone with TikZ
Fantasy story about a knife that can cut holes to other dimensions
Read the Memories of a Dead Man's Head
Is it acceptable to mark off or comment on someone's presentation based on their non-standard English accent?
How to reduce thousand of faces of an already low poly object
Is it against a Terms of Service/End-User License

Example


ITA | ENG
Login
argomenti o persone
POLITECNICO DI TORINO
SCOPRIRE L'ATENEO
DIDATTICA E STUDENTI
IL MONDO DELLA RICERCA
INNOVAZIONE PER LE IMPRESE
CAMPUS INTERNAZIONALE
festival della TECNOLOGIA
TORINO, 7-10 NOV 2019
Tecnologia è Umanità
È online il programma del Festival della Tecnologia
EVENTI
Tutti gli eventi
Dal 14.06
Walking Beyond: camminate urbane attraverso la città contemporanea
Giugno - Dicembre 2019
Dal 23.10
The Polar oceans and global climate change
23 October - 18 November 2019
Dal 04.11
Network dynamics in the social, economic and financial sciences
4-8 November 2019
Dal 05.11
OptArch2019
5 - 7 November 2019
AVVISI E SCADENZE
Tutti gli avvisi
10 settembre 2019
Comitato Leonardo: nuovi bandi per i Premi di Laurea
Scadenza presentazione abstract 15 novembre 2019
AI4CH - Artificial Intelligence in geomatics for cultural heritage
Scadenza Call for participation: 15 novembre 2019
Progetti resilienti di natura in città in Francia e in Italia
Deadline online registration: 18 November 2019
Wireless charging of vehicles (WCV2019)
ACCESSO RAPIDO
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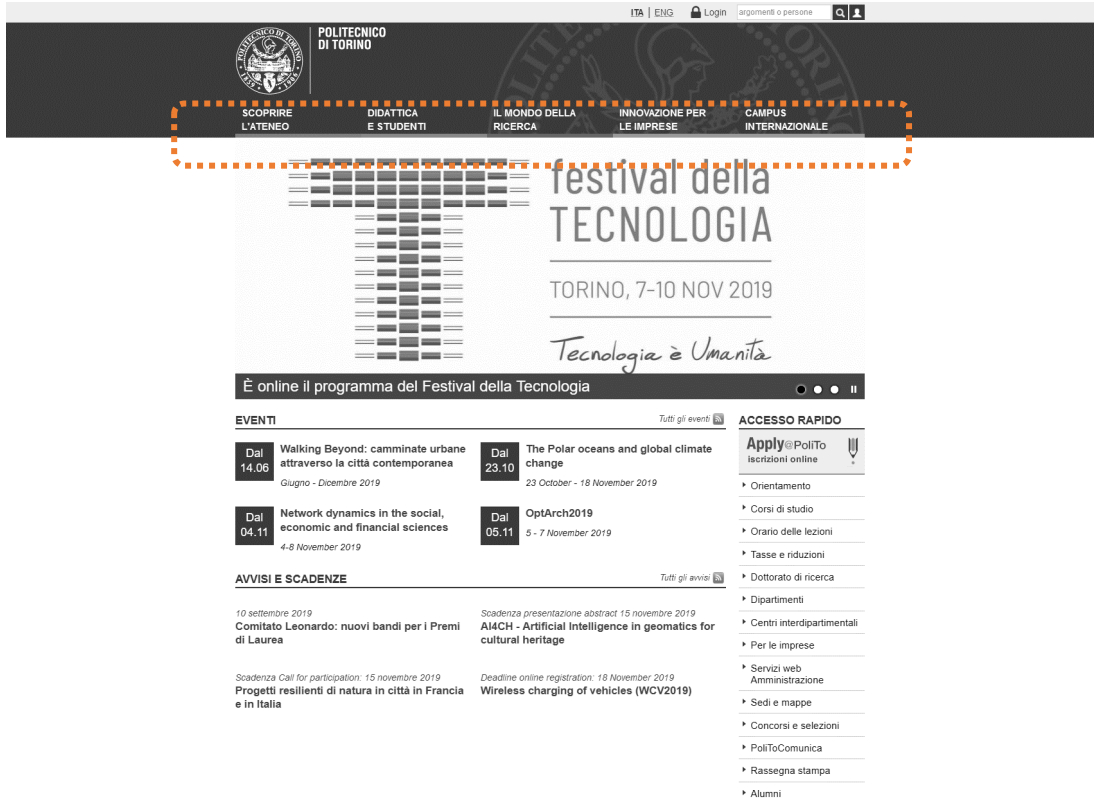
Orientamento
Corsi di studio
Orario delle lezioni
Tasse e riduzioni
Dottorato di ricerca
Dipartimenti
Centri interdipartimentali
Per le imprese
Servizi web Amministrazione
Sedi e mappe
Concorsi e selezioni
PoliToComunica
Rassegna stampa
Alumni


ITA | ENG
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POLITECNICO DI TORINO
SCOPRIRE L'ATENEO
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Sedi e mappe
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PoliToComunica
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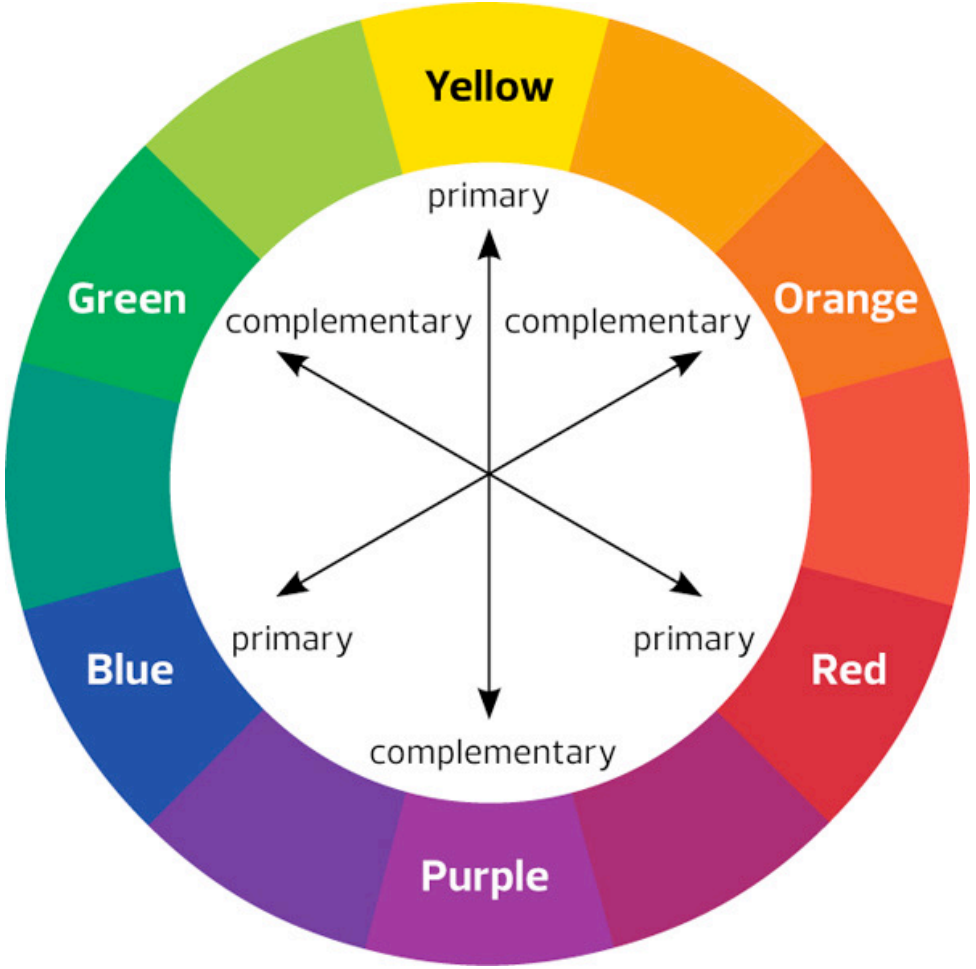
The Color Weel

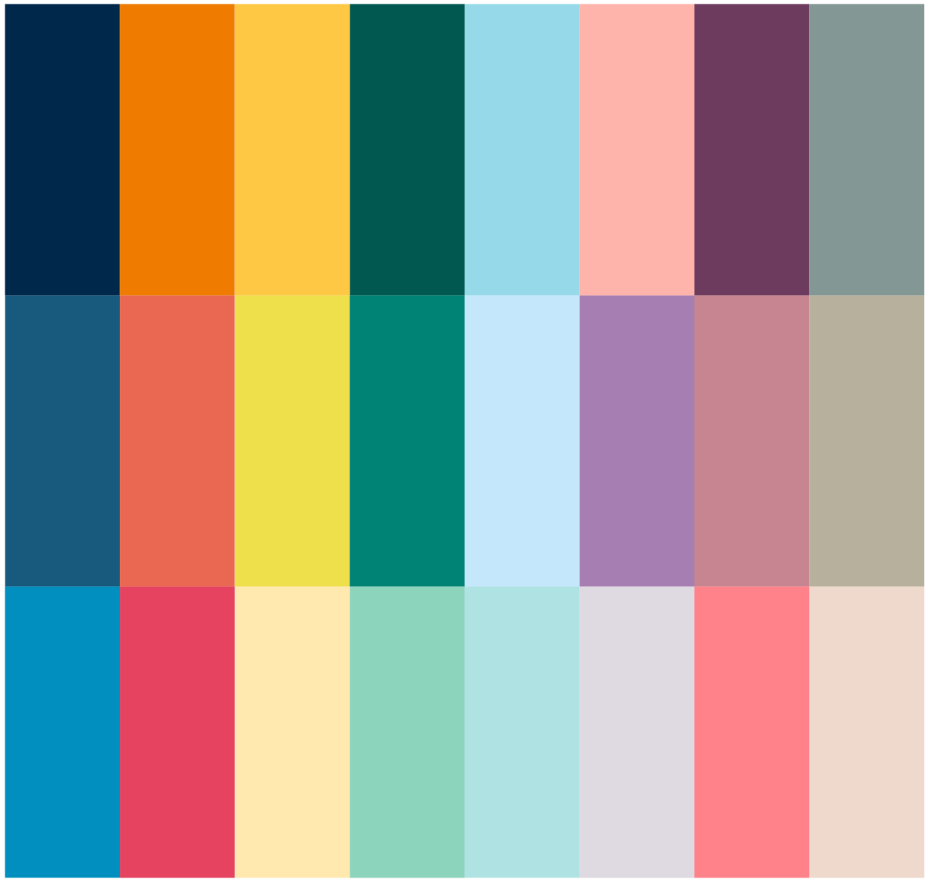
- Aka the Hue Circle
- Pick non-adjacent colors
- Opponent colors go well together
  - Complementary colors



- Read more at https://www.canva.com/colors/color-wheel/

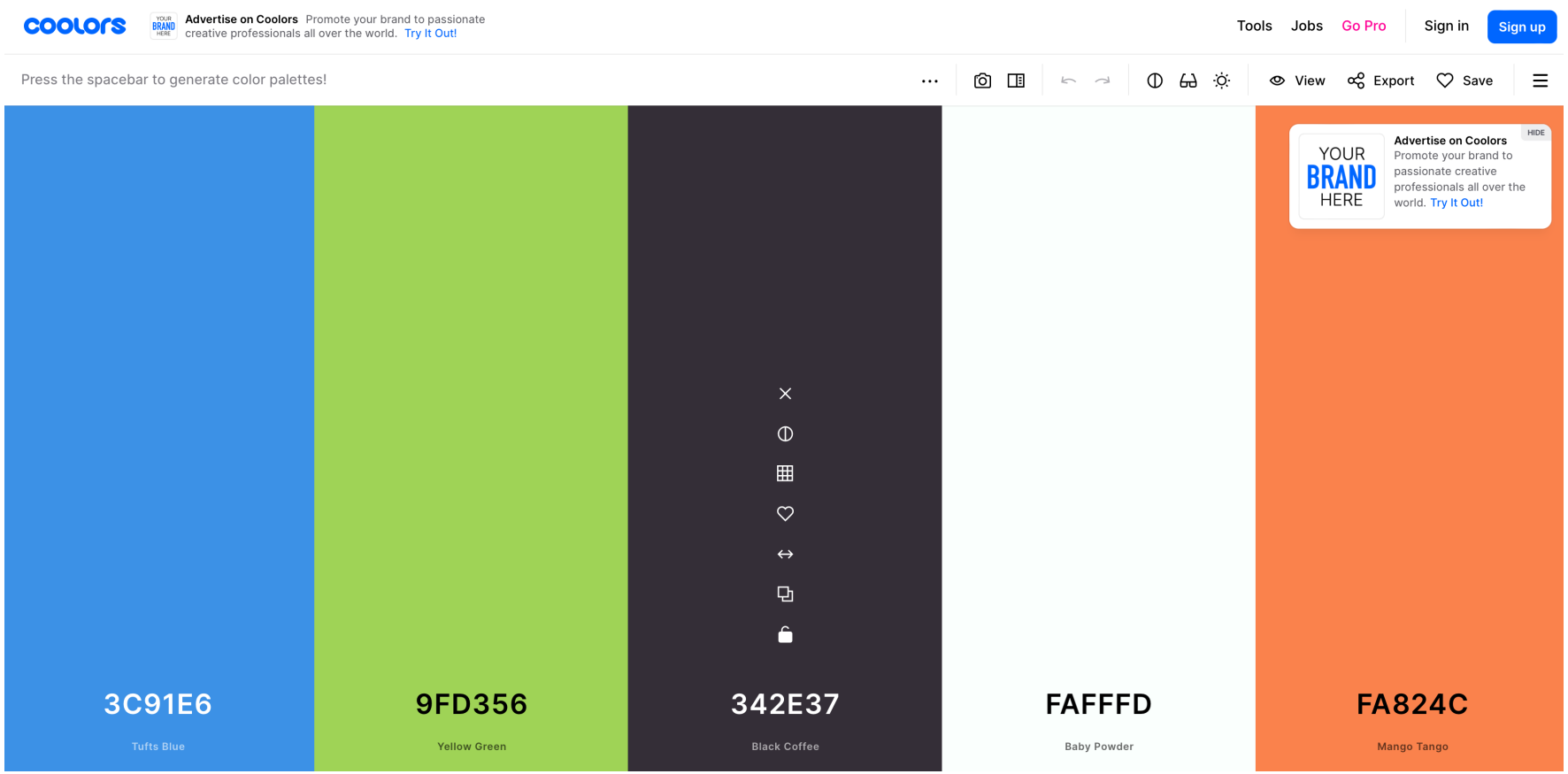
Palettes - PoliTo

GERARCHIA COLORI



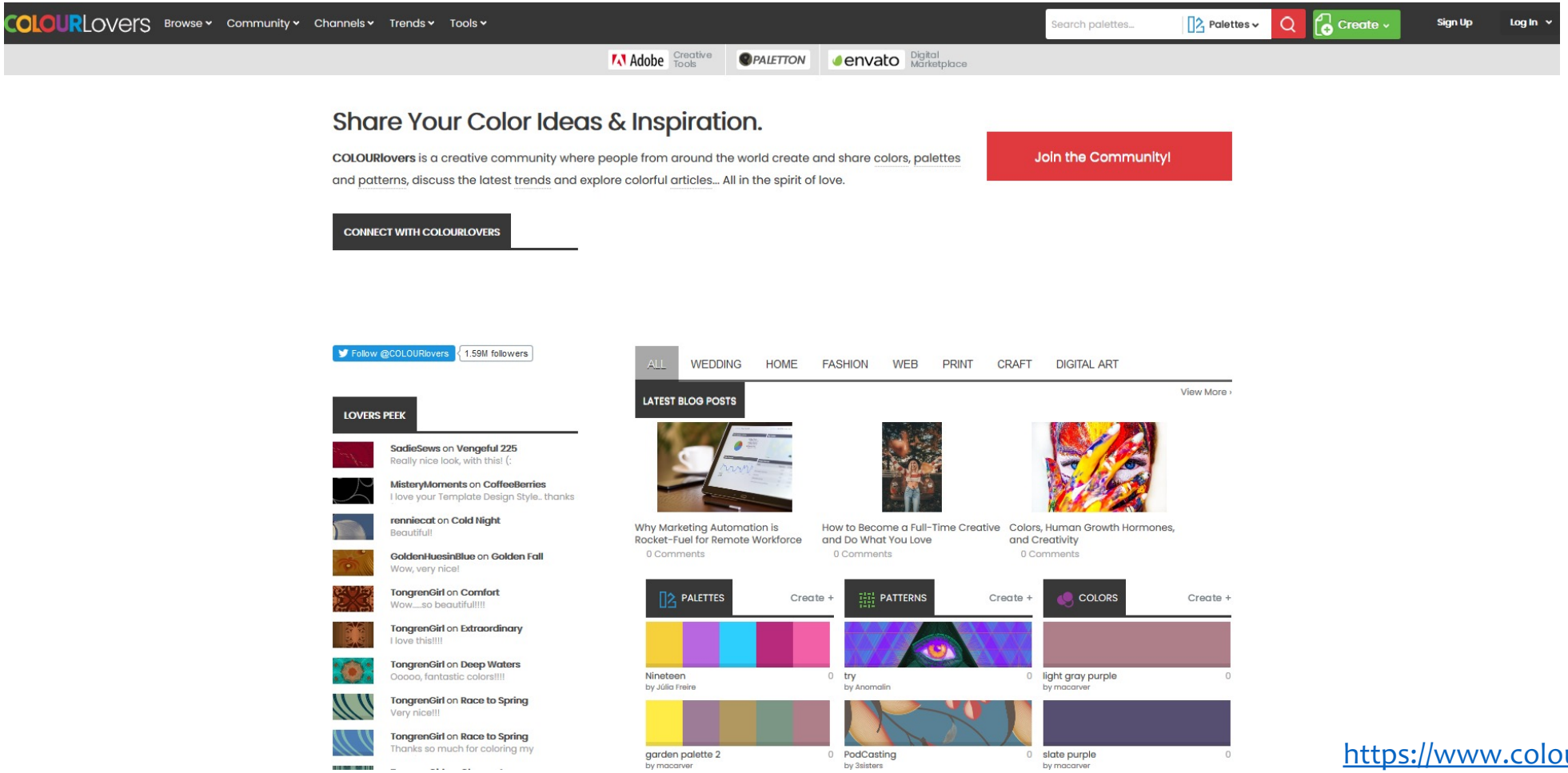
https://www.politocomunica.polito.it/en/corporate_image/brand_and_visual_identity

Palettes Generator



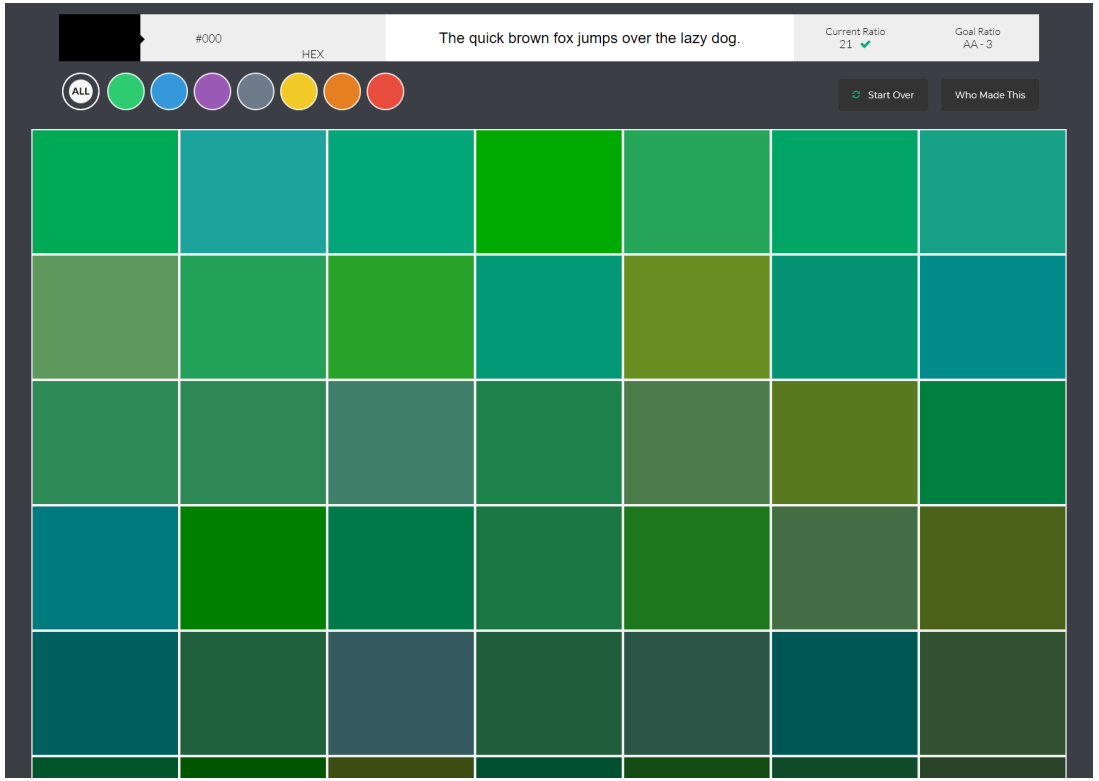
https://coolors.co

ColourLovers

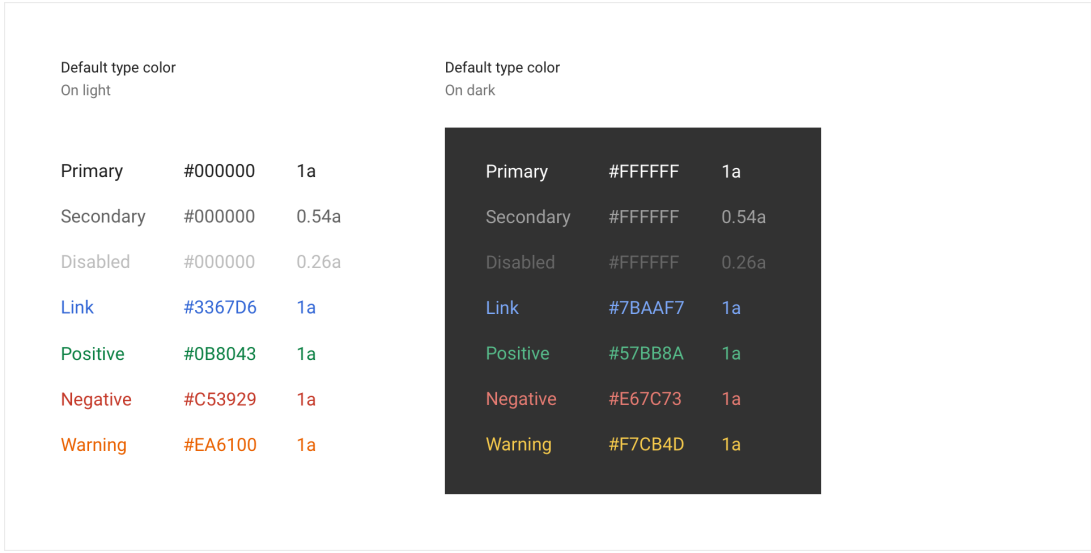


https://www.colourlovers.com/

Color Contrast



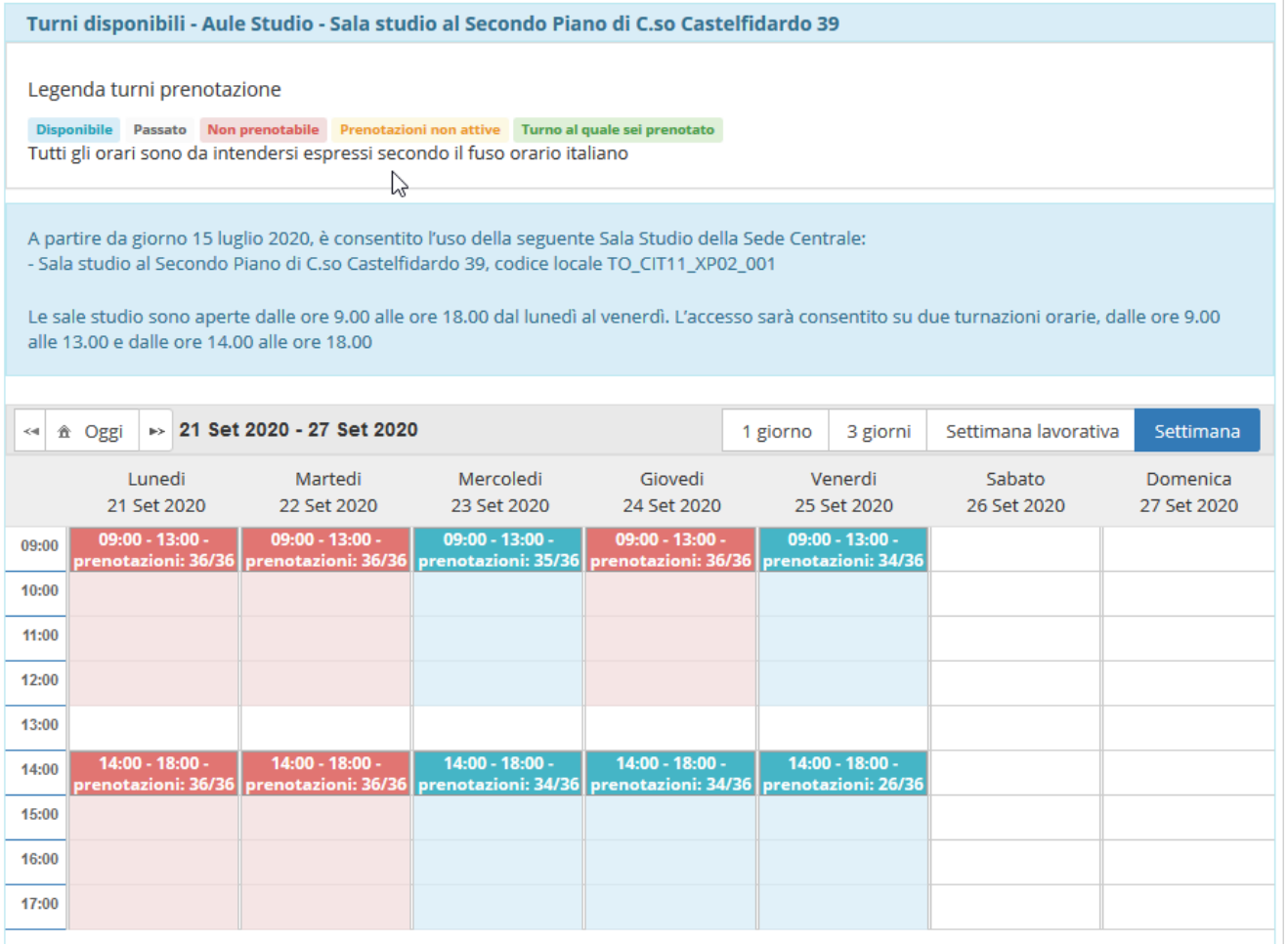
http://colorsafe.co/



Google Chrome Palette

Example

- Colors needing an explanation legend
- Time intervals are shaded with two different colors
  - “why is the first hour filled with a different color?”
- No indication of the “fill level”



Reading and Navigating

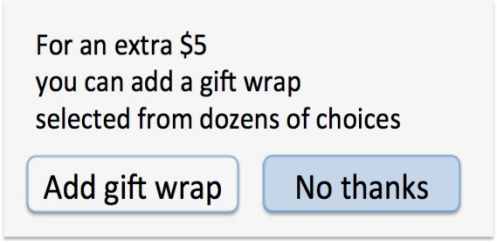
«Informavores» must quickly find the information they need

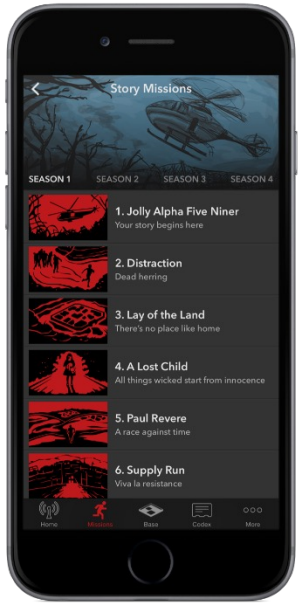
Navigation

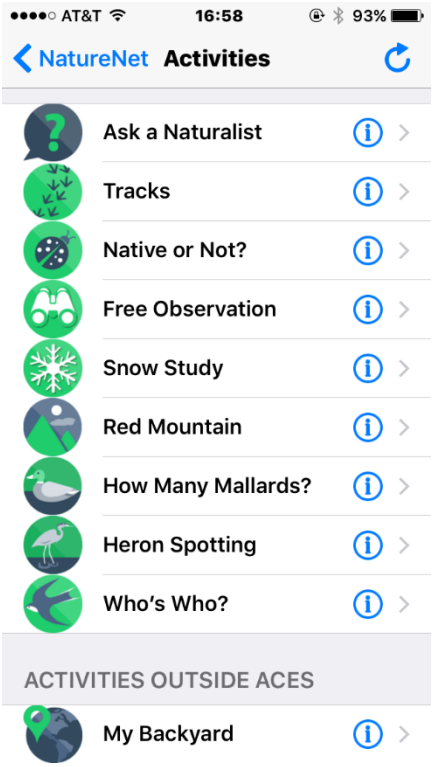
- Enables users to know where they are and to steer themselves to their intended destination
- Is about getting work done (or having fun) through a series of actions
- May consist of
  - ***Task*** *navigation*: successfully operating interactive applications, such as installing a mobile app, completing an on-line survey, or purchasing a ticket
  - ***Web*** *navigation*: finding information on a website or browsing social media
  - *Command* ***menu*** *navigation*: finding the action needed in a desktop application
- Has nothing to do with visual elegance / graphic shininess

Navigation By Selection

- Menu bars, pop-up menus, toolbars, palettes and ribbons
- Shortcuts and gestures for rapid interaction
- Long lists
- Linear versus simultaneous presentation



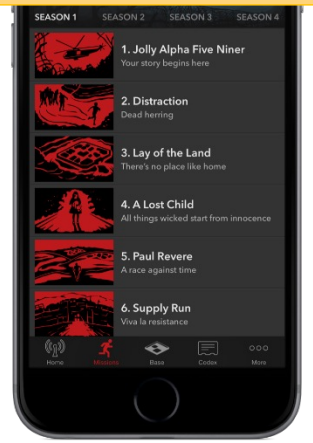


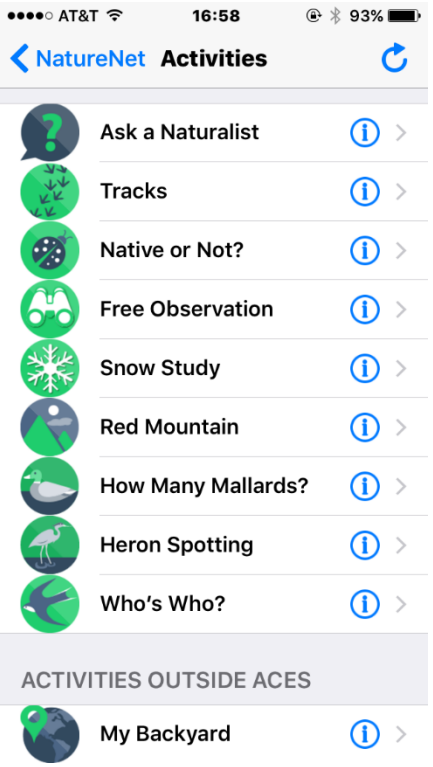


Navigation By Selection

- Menu bars, pop-up menus, toolbars, palettes and ribbons
- **Shortcuts and gestures for rapid interaction**
- Long lists
- Linear versus simultaneous presentation

- Tap
- Long press
- Double tap
- Small swipe
- Large swipe
- Rapid swipe (fling)
- Pinch and spread
- 2-finger swipe
- …

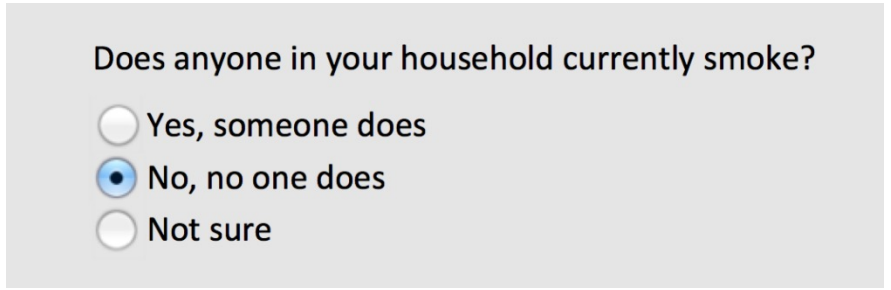


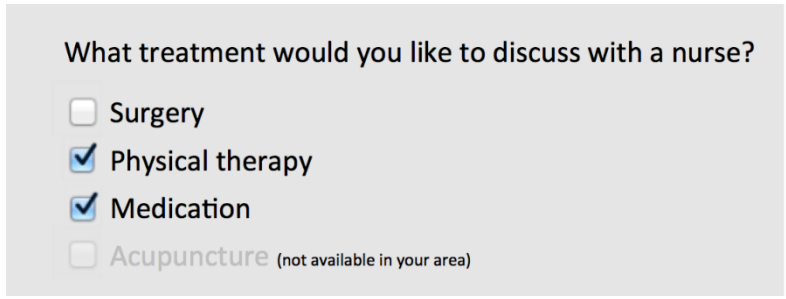


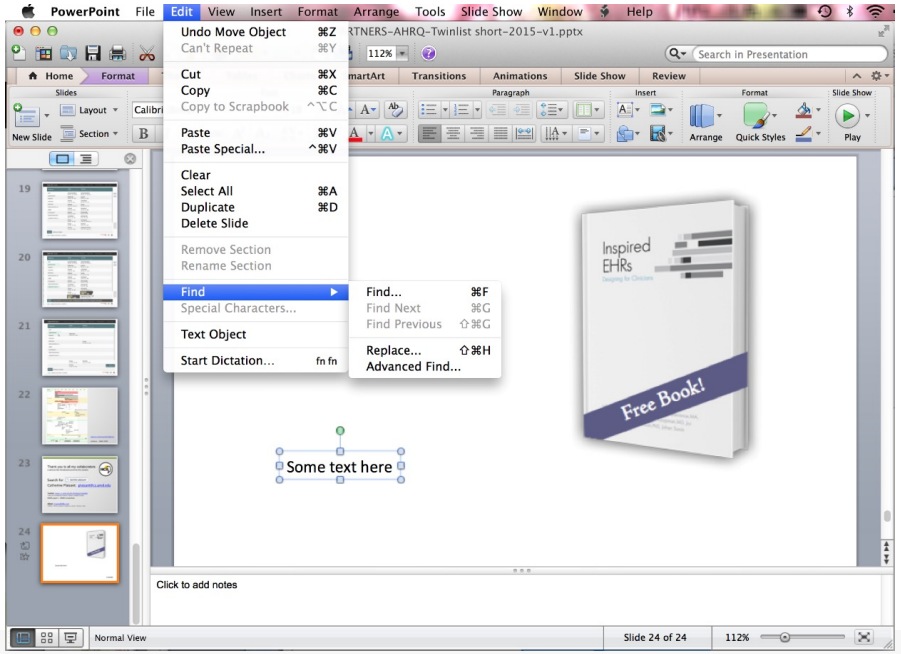
Navigation By Selection

- Radio Buttons and Checkboxes

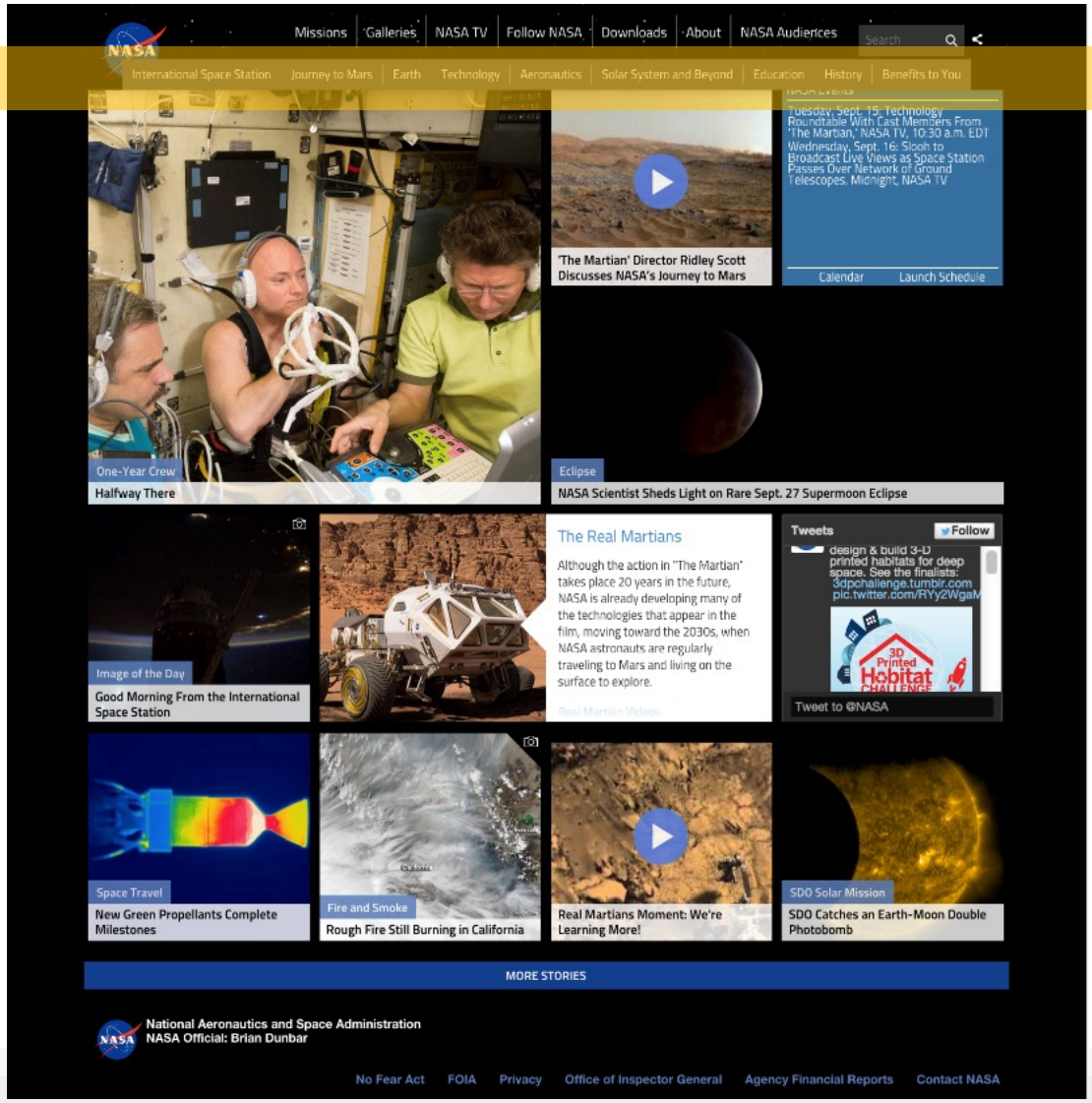
- Menu bars, pop-up menus, toolbars, palettes and ribbons

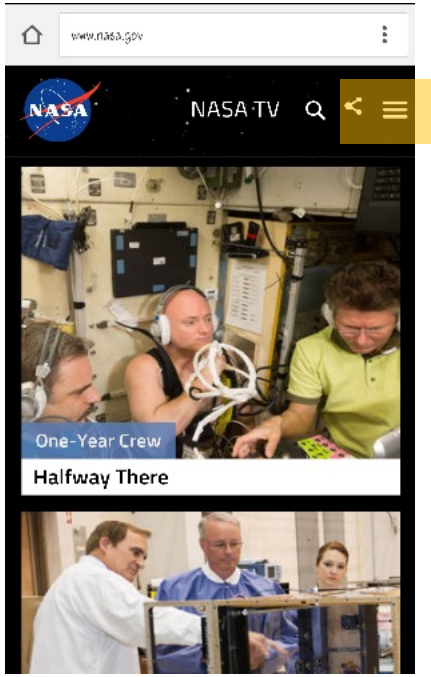






Menus


Missions
Galleries
NASA TV
Follow NASA
Downloads
About
NASA Audiences
Search
International Space Station
Journey to Mars
Earth
Technology
Aeronautics
Solar System and Beyond
Education
History
Benefits to You
'The Martian' Director Ridley Scott Discusses NASA's Journey to Mars
Tuesday, Sept. 15: Technology Roundtable With Cast Members From 'The Martian,' NASA TV, 10:30 a.m. EDT
Wednesday, Sept. 16: Slooh to Broadcast Live Views as Space Station Passes Over Network of Ground Telescopes, Midnight, NASA TV
Calendar
Launch Schedule
One-Year Crew
Halfway There
Eclipse
NASA Scientist Sheds Light on Rare Sept. 27 Supermoon Eclipse
Image of the Day
Good Morning From the International Space Station
The Real Martians
Although the action in "The Martian" takes place 20 years in the future, NASA is already developing many of the technologies that appear in the film, moving toward the 2030s, when NASA astronauts are regularly traveling to Mars and living on the surface to explore.
Tweets
Follow
design & build 3-D printed habitats for deep space. See the finalists:
3dpchallenge.tumblr.com
3D Printed Habitat CHALLENGE
Tweet to @NASA
Space Travel
New Green Propellants Complete Milestones
Fire and Smoke
Rough Fire Still Burning in California
Real Martians Moment: We're Learning More!
SDO Solar Mission
SDO Catches an Earth-Moon Double Photobomb
MORE STORIES
National Aeronautics and Space Administration
NASA Official: Brian Dunbar
No Fear Act
FOIA
Privacy
Office of Inspector General
Agency Financial Reports
Contact NASA

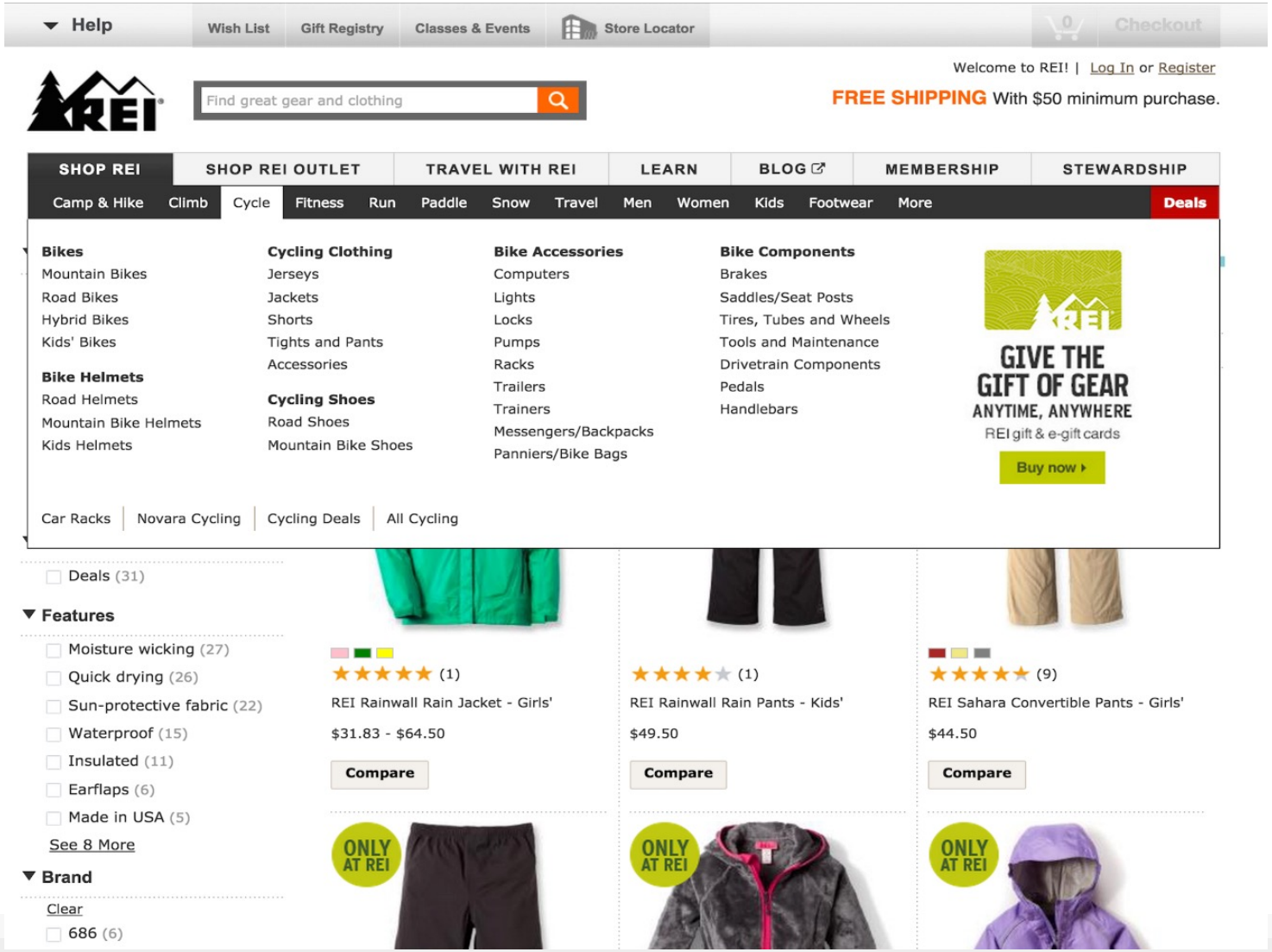

www.nasa.gov
NASA TV
One-Year Crew
Halfway There

Content Organization

- Organizing menus in a meaningful structure results in faster selection time and higher user satisfaction

- Approaches:
  - Linear sequence (e.g., in a wizard or survey)
  - Hierarchical structure (tree) that is natural and comprehensible (e.g., a store split into departments)
  - Network structure when choices may be reachable by more than one path (e.g., websites)

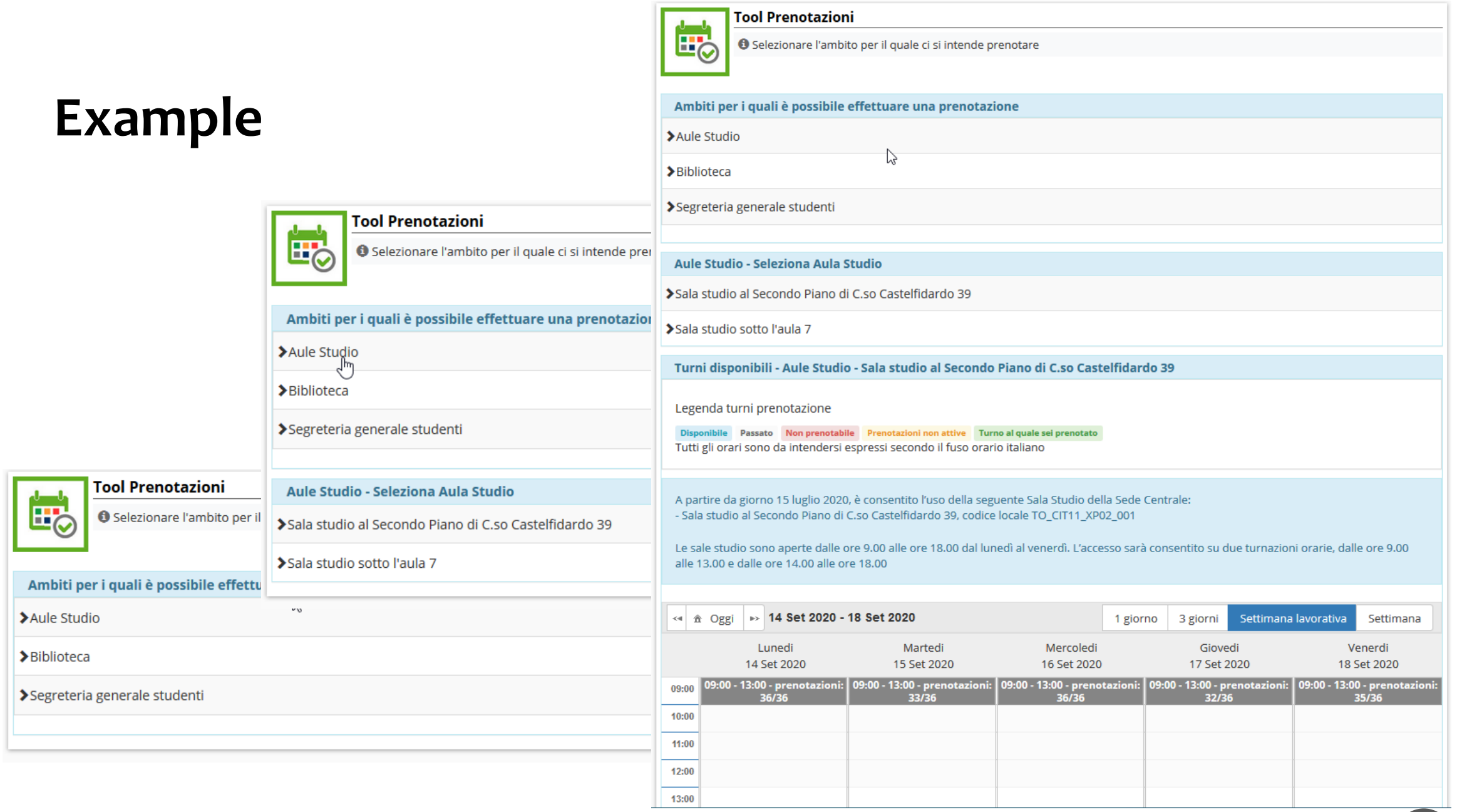
Tree-like Content Organization



Rules for Tree-like Organization

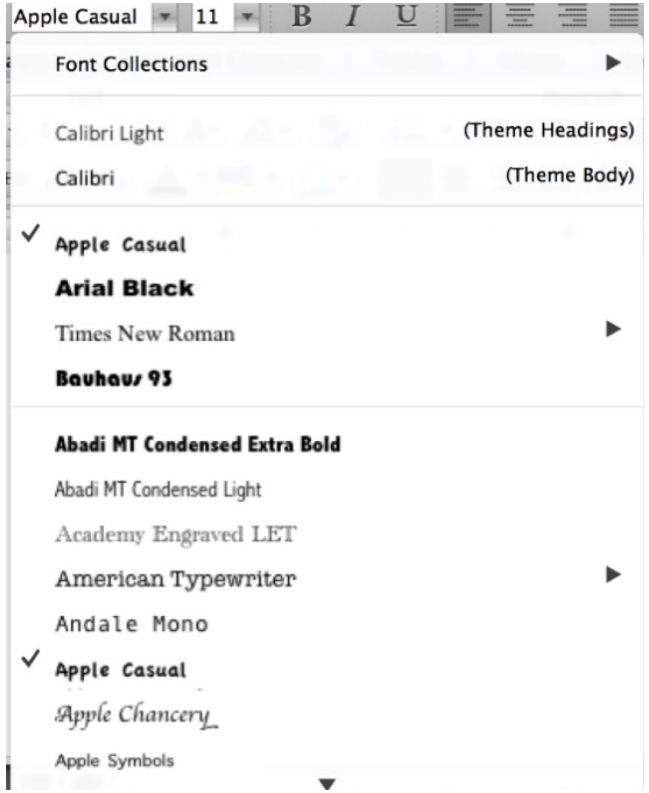
- Use **task semantics** to organize menus
- Limit the **number of levels** (i.e., prefer broad–shallow to narrow–deep)
- Create groups of **logically similar** items: e.g., Level 1: countries, Level 2: states, Level 3: cities
- Form groups that **cover all possibilities**: e.g., Age ranges: [0–9] [10–19] [20–29] and [>= 30]
- Make sure that items are **non-overlapping**: e.g., use "Concerts" and "Sports." over "Entertainment" and "Events"
- Arrange items in each branch by **natural sequence** (not alphabetically) or **group** related items
- Keep **ordering** of items **fixed** (or possibly duplicate frequent items in dedicated section of the menu)

Example


Tool Prenotazioni
Selezionare l'ambito per il quale ci si intende prenotare
Ambiti per i quali è possibile effettuare una prenotazione
Aule Studio
Biblioteca
Segreteria generale studenti
Aule Studio - Seleziona Aula Studio
Sala studio al Secondo Piano di C.so Castelfidardo 39
Sala studio sotto l'aula 7
Turni disponibili - Aule Studio - Sala studio al Secondo Piano di C.so Castelfidardo 39
Legenda turni prenotazione
Disponibile
Passato
Non prenotabile
Prenotazioni non attive
Turno al quale sei prenotato
Tutti gli orari sono da intendersi espressi secondo il fuso orario italiano
A partire da giorno 15 luglio 2020, è consentito l'uso della seguente Sala Studio della Sede Centrale:
- Sala studio al Secondo Piano di C.so Castelfidardo 39, codice locale TO_CIT11_XP02_001
Le sale studio sono aperte dalle ore 9.00 alle ore 18.00 dal lunedì al venerdì. L'accesso sarà consentito su due turnazioni orarie, dalle ore 9.00 alle 13.00 e dalle ore 14.00 alle ore 18.00
Oggi
14 Set 2020 - 18 Set 2020
1 giorno
3 giorni
Settimana lavorativa
Settimana
Lunedi 14 Set 2020
Martedi 15 Set 2020
Mercoledi 16 Set 2020
Giovedi 17 Set 2020
Venerdi 18 Set 2020
09:00
10:00
11:00
12:00
13:00
09:00 - 13:00 - prenotazioni: 36/36
09:00 - 13:00 - prenotazioni: 33/36
09:00 - 13:00 - prenotazioni: 36/36
09:00 - 13:00 - prenotazioni: 32/36
09:00 - 13:00 - prenotazioni: 35/36

Menu Grouping: example

- 3 groups
  - Template styles
  - Frequently used fonts
  - All fonts
- Alphabetical order within each group
  - Lack of a semantic ordering
- Preview for recognition
- Scrollable list



Information Scent

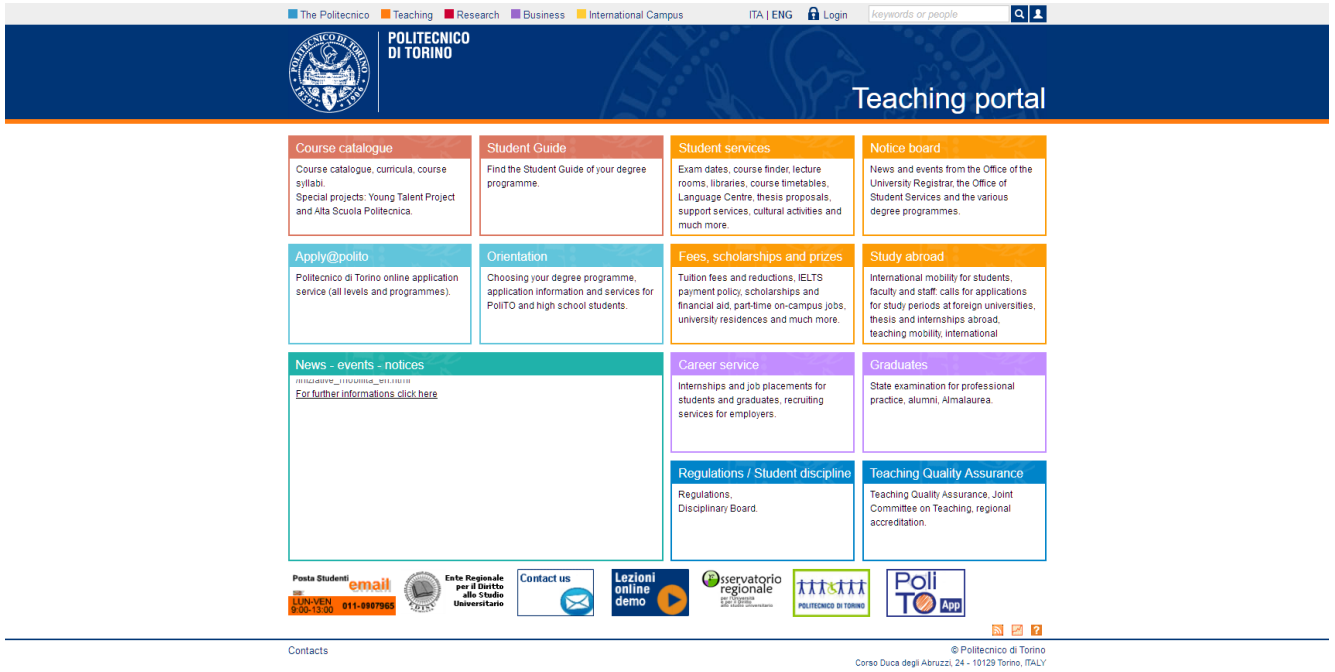
- Informavores orient themselves using *information scent*
- How can we figure out how to get the information we want?
- Do we realize what options are available to us?
- Web pages (and UIs general) provide *cues* to suggest where to find information
  - Icons, Menus, Breadcrumbs, Color coding, …

Informavore, an organism that consumes information

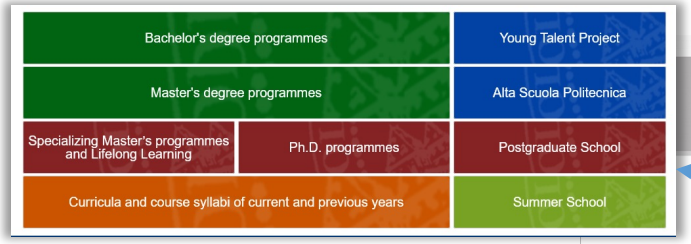
Poor Information Scent

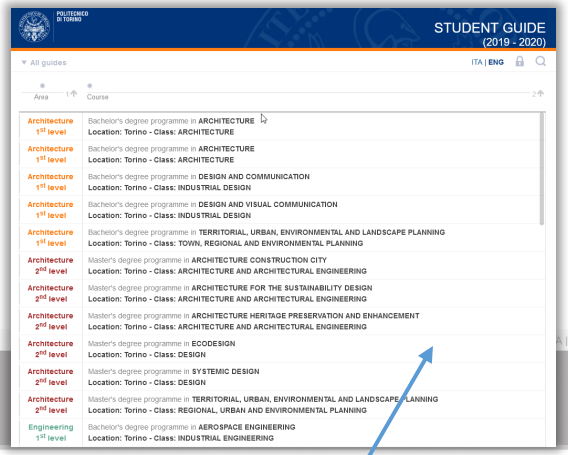
- Users flailing around…
  - Do not know where to go
- Low confidence
  - Users are not sure of their actions, both before executing it and after they see its effects
- Back button
  - When it’s used too often…

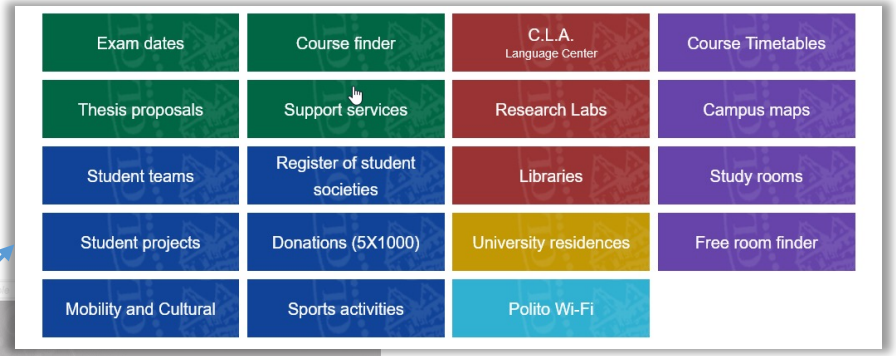
Example

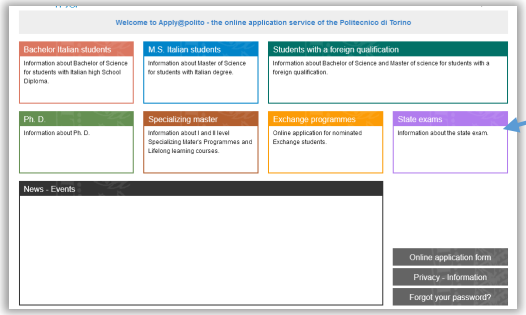

The Politecnico
Teaching
Research
Business
International Campus
ITA | ENG
Login
keywords or people
POLITECNICO
DI TORINO
Teaching portal
Course catalogue
Course catalogue, curricula, course syllabi.
Special projects: Young Talent Project and Alta Scuola Politecnica.
Student Guide
Find the Student Guide of your degree programme.
Student services
Exam dates, course finder, lecture rooms, libraries, course timetables, Language Centre, thesis proposals, support services, cultural activities and much more.
Notice board
News and events from the Office of the University Registrar, the Office of Student Services and the various degree programmes.
Apply@polito
Politecnico di Torino online application service (all levels and programmes).
Orientation
Choosing your degree programme, application information and services for PoliTO and high school students.
Fees, scholarships and prizes
Tuition fees and reductions, IELTS payment policy, scholarships and financial aid, part-time on-campus jobs, university residences and much more.
Study abroad
International mobility for students, faculty and staff, calls for applications for study periods at foreign universities, thesis and internships abroad, teaching mobility, international
News - events - notices
For further informations click here
Career service
Internships and job placements for students and graduates, recruiting services for employers.
Graduates
State examination for professional practice, alumni, Almalaurea.
Regulations / Student discipline
Regulations,
Disciplinary Board.
Teaching Quality Assurance
Teaching Quality Assurance, Joint Committee on Teaching, regional accreditation.
Posta Studenti email
LUN-VEN 9.00-13.00 011-0907965
Ente Regionale per il Diritto allo Studio Universitario
Contact us
Lezioni online demo
Osservatorio regionale
POLITECNICO DI TORINO
Poli TO App
Contacts
© Politecnico di Torino
Corso Duca degli Abruzzi, 24 - 10129 Torino, ITALY

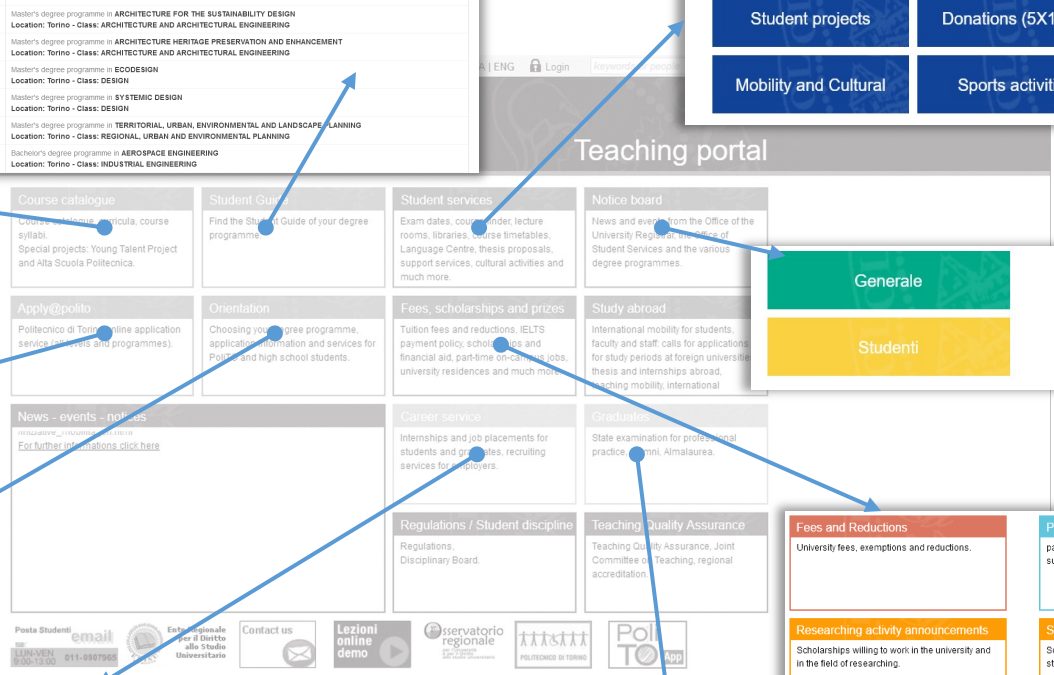
Example


Bachelor's degree programmes
Young Talent Project
Master's degree programmes
Alta Scuola Politecnica
Specializing Master's programmes and Lifelong Learning
Ph.D. programmes
Postgraduate School
Curricula and course syllabi of current and previous years
Summer School


STUDENT GUIDE
(2019 - 2020)

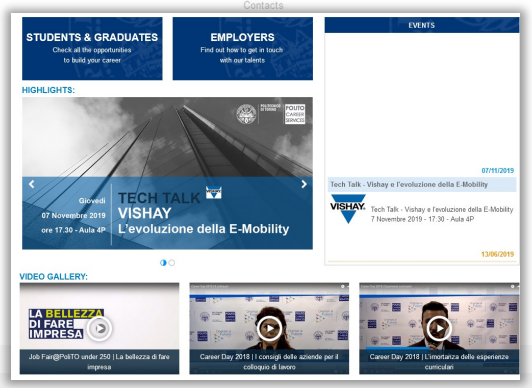

Exam dates
Course finder
C.L.A.
Language Center
Course Timetables
Thesis proposals
Support services
Research Labs
Campus maps
Student teams
Register of student societies
Libraries
Study rooms
Student projects
Donations (5X1000)
University residences
Free room finder
Mobility and Cultural
Sports activities
Polito Wi-Fi

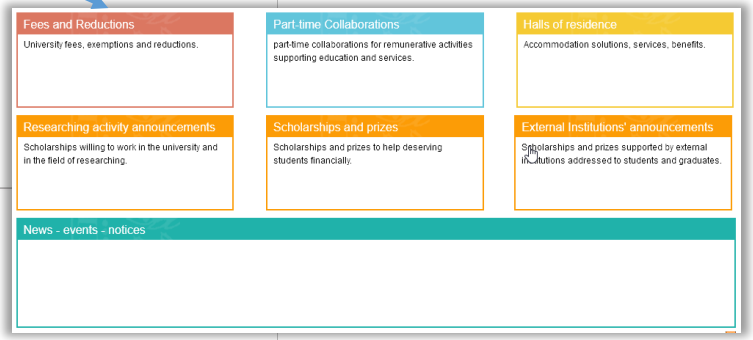

Welcome to Apply@polito - the online application service of the Politecnico di Torino
Bachelor Italian students
M.S. Italian students
Students with a foreign qualification
Ph. D.
Specializing master
Exchange programmes
State exams
News - Events
Online application form
Privacy - Information
Forgot your password?

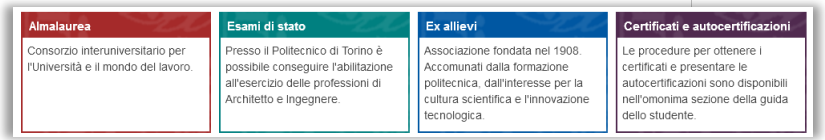

Teaching portal
Course catalogue
Student Guide
Student services
Notice board
Apply@polito
Orientation
Fees, scholarships and prizes
Study abroad
News - events - notices
Career service
Graduation
Regulations / Student discipline
Teaching Quality Assurance
Contact us
Lezioni online demo
Contacts


Generale
Studenti
Area dell'Architettura
Corsi di Laurea di 1° livello
Area dell'Architettura
Corsi di Laurea Magistrale
Area dell'Ingegneria
Corsi di Laurea di 1° livello
Area dell'Ingegneria
Corsi di Laurea Magistrale


Home
Come orientarsi al Polito
Iscrizione al primo anno
Materiale informativo
Attività con le scuole medie superiori
Registrazione ad apply@polito
Consulta le graduatorie per l'ammissione all'a.a. 2019/20


STUDENTS & GRADUATES
EMPLOYERS
EVENTS
HIGHLIGHTS:
TECH TALK
VISHAY
L'evoluzione della E-Mobility
VIDEO GALLERY:


Fees and Reductions
University fees, exemptions and reductions.
Part-time Collaborations
part-time collaborations for remunerative activities supporting education and services.
Halls of residence
Accommodation solutions, services, benefits.
Researching activity announcements
Scholarships willing to work in the university and in the field of researching.
Scholarships and prizes
Scholarships and prizes to help deserving students financially.
External Institutions' announcements
Scholarships and prizes supported by external institutions addressed to students and graduates.
News - events - notices


Almalaurea
Consorzio interuniversitario per l'Università e il mondo del lavoro.
Esami di stato
Presso il Politecnico di Torino è possibile conseguire l'abilitazione all'esercizio delle professioni di Architetto e Ingegnere.
Ex allievi
Associazione fondata nel 1908. Accomunati dalla formazione politecnica, dall'interesse per la cultura scientifica e l'innovazione tecnologica.
Certificati e autocertificazioni
Le procedure per ottenere i certificati e presentare le autocertificazioni sono disponibili nell'omonima sezione della guida dello studente.

Example


Survey@Polito
Administration -- Logged in as: corno
Surveys: Smart Home Survey
Survey Smart Home Survey (ID:365355)
Question groups: Please choose...
Title: Smart Home Survey (ID 365355)
Survey URL (English): https://survey.polito.it/365355/lang-en
Description: This very short survey aims at exploring the future and expected user interaction between user and smart environments, in particular smart homes. The research goal is to update, and compare, the research findings of a similar survey held in year 2010 (5 years ago). The expected completion time for this survey is 5 minutes or less.
Welcome: Thank you for agreeing to take part in this survey. All the answers you give are anonymous, and the data-set will be released as open data after the survey ends. You may choose to reply in any of the supported languages, preferably your mother toungue.
End message: Thanks for completing the survey. The results will be available on the website http://elite.polito.it The paper describing the previous survey (in 2010) is available at: http://porto.polito.it/2380988/
Administrator: Fulvio Corno (fulvio.corno@polito.it)
Start date/time: -
Expiry date/time: -
Template: default
Base language: English
Additional languages: French
German
Italian
Portuguese
Spanish
End URL: e-Lite research group webpage
Number of questions/groups: 11/3
Survey currently active: Yes
Survey table name: beta_survey_365355
Hints: Answers to this survey are anonymized.
It is presented group by group.
Participants can save partially finished surveys
Basic email notification is sent to: fulvio.corno@gmail.com
Regenerate question codes: [Straight] [By group]
LimeSurvey
Version 1.92+ Build 120919
Like it? Donate to LimeSurvey

Common Problems

- Unexpected categories
- Short links
- Hidden navigation
- Icons are too generic, or not easily recognizable

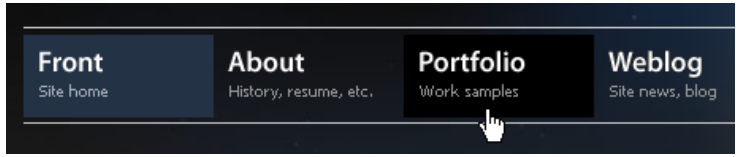
Icons

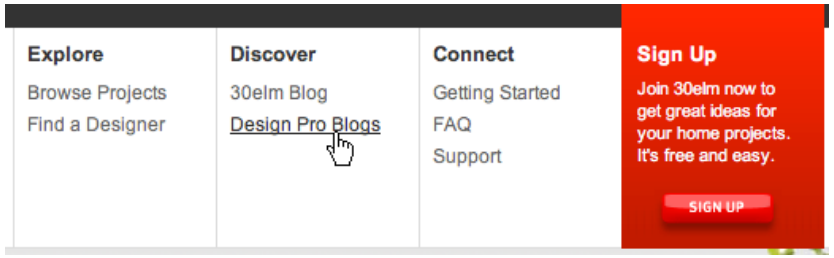
- Icons facilitate recognition over recall
  - When they are consistently used, and frequently visible
- Redundant coding helps recognition and memorization
  - Icon + Text + Tooltip + Context

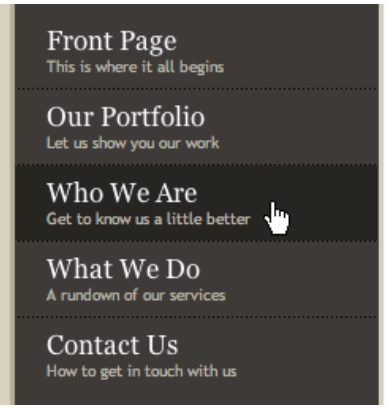
Links

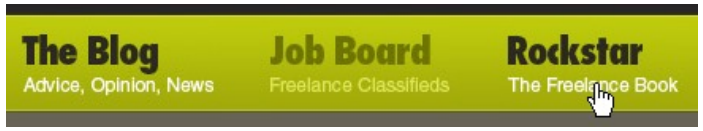
- Always use multi-word links
  - Download the next assignment template
  - Assignment template: click here
- Straight language, not jargon
  - Scor-o-matic download
  - Download the spreadsheet for computing scores

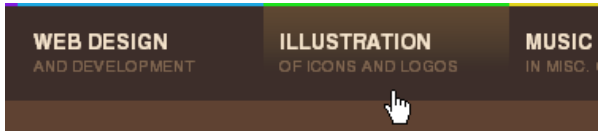
“Speaking” block navigation

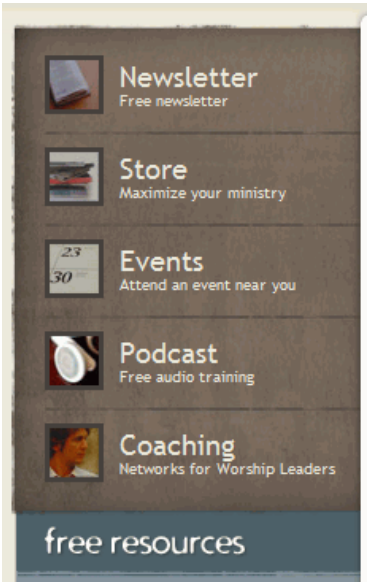


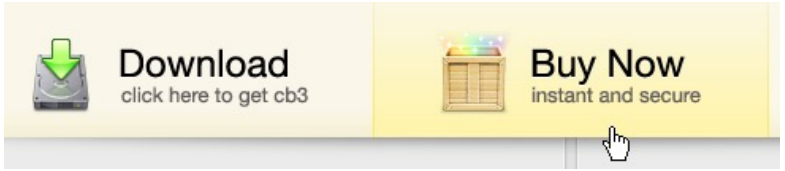








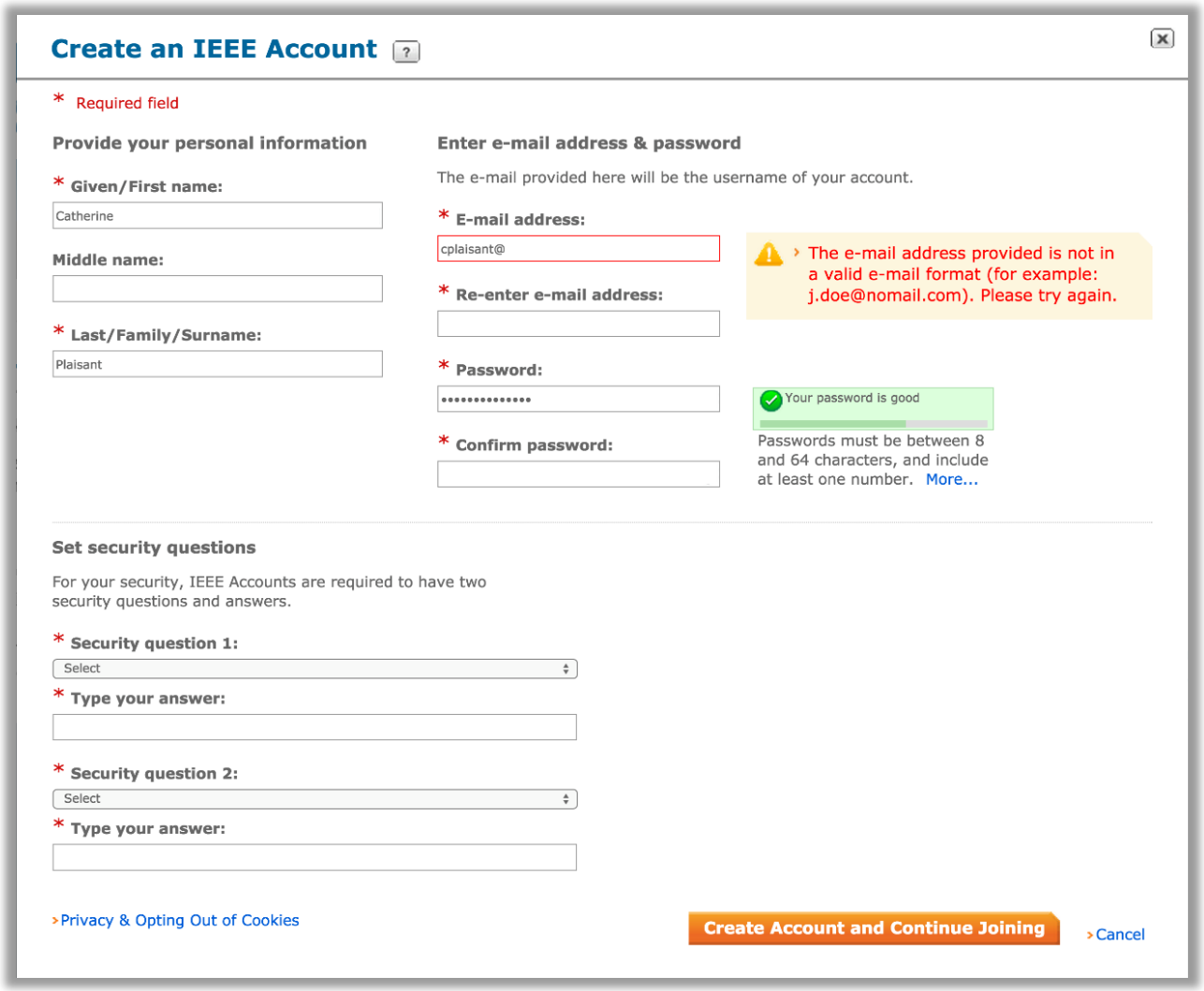




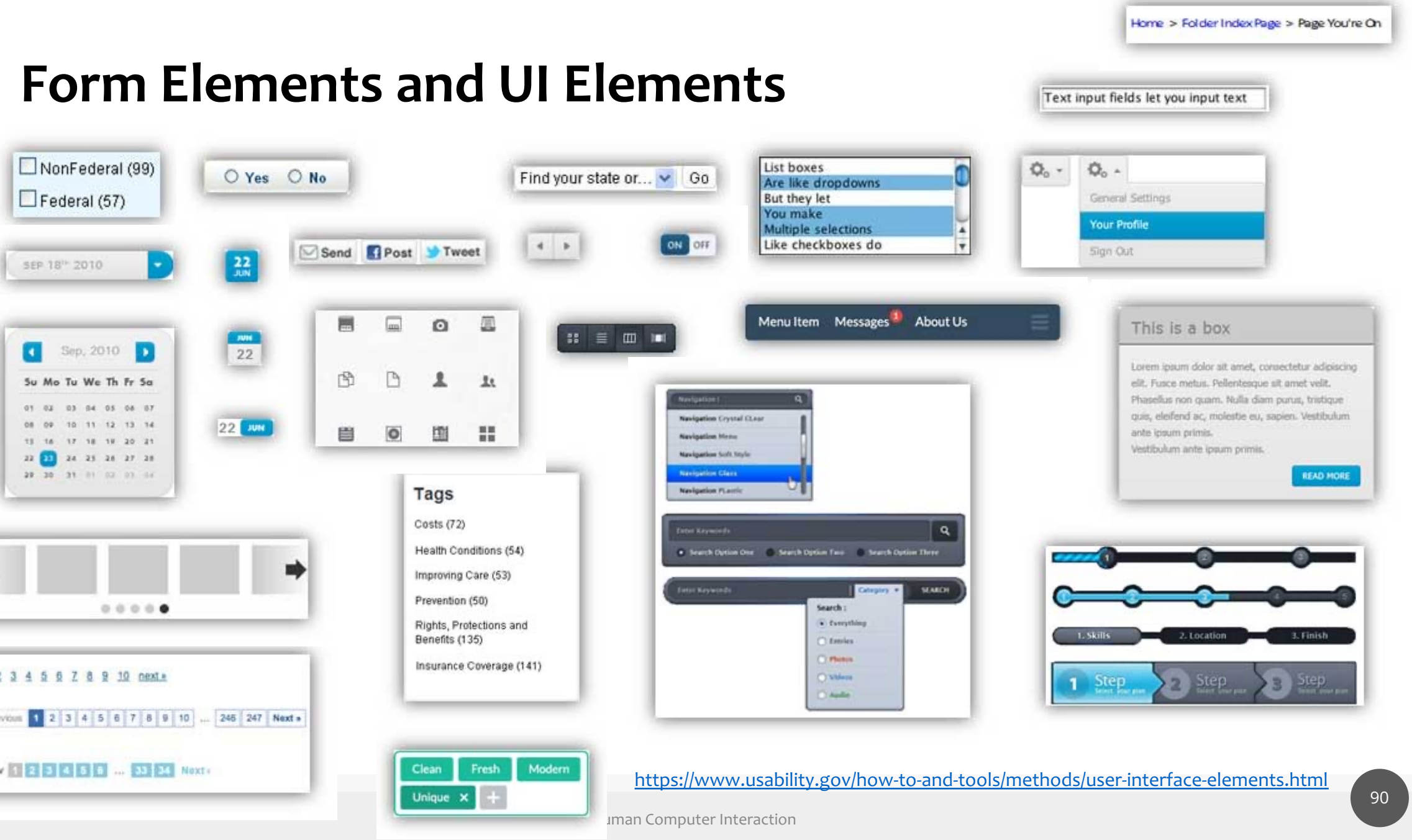
https://www.smashingmagazine.com/2008/02/navigation-menus-trends-and-examples/

Forms

- Logical field grouping
  - Sections
    - Dividers
    - Columns (spacing)
  - Titles
- Real-time error checking and validation feedback
  - Suggestions for correction
- Explicit submit button

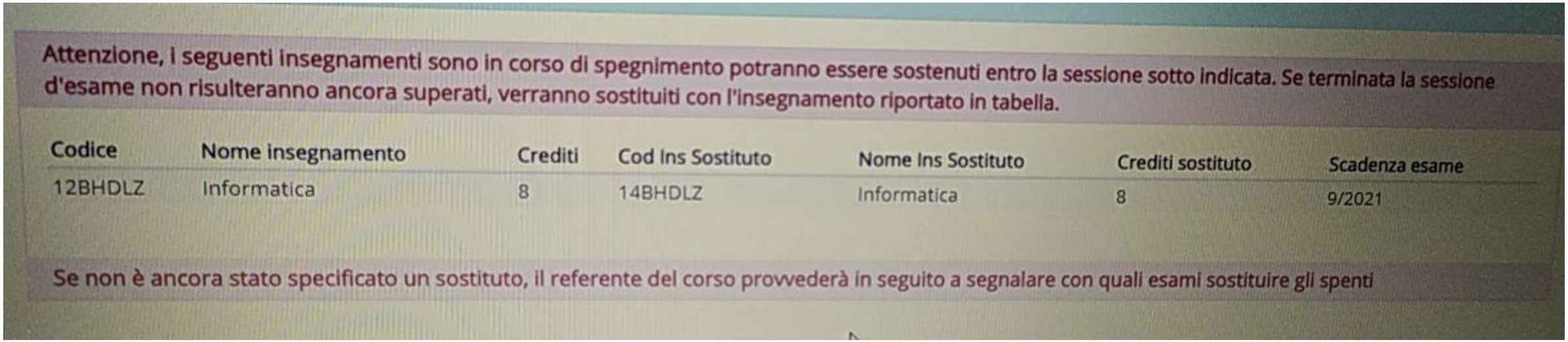


Form Elements and UI Elements



https://www.usability.gov/how-to-and-tools/methods/user-interface-elements.html

Example: Redesign This



Attenzione, i seguenti insegnamenti sono in corso di spegnimento potranno essere sostenuti entro la sessione sotto indicata. Se terminata la sessione d'esame non risulteranno ancora superati, verranno sostituiti con l'insegnamento riportato in tabella.

Codice	Nome insegnamento	Crediti	Cod Ins Sostituto	Nome Ins Sostituto	Crediti sostituto	Scadenza esame
12BHDLZ	Informatica	8	14BHDLZ	Informatica	8	9/2021

Se non è ancora stato specificato un sostituto, il referente del corso provvederà in seguito a segnalare con quali esami sostituire gli spenti

Reading Content

Organizing text and content for maximum visibility

Reading Content

“How people read on-line?”

“They don’t”

How Users Read on the Web
by Jakob Nielsen on September 30, 1997
https://www.nngroup.com/articles/how-users-read-on-the-web/

Eye Tracking

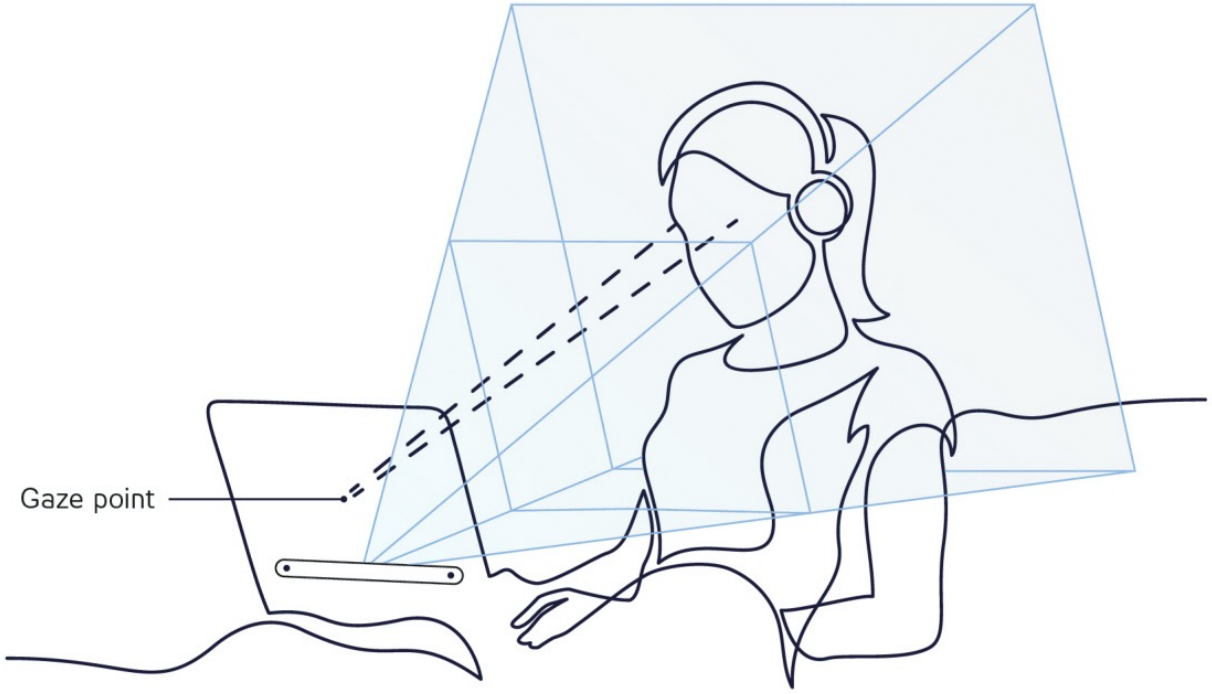
- Observe eye movements
  - One or more cameras
  - Usually in infra-red
- Infer where the user was looking (on the screen)
- Record the positions where your gaze will go
- Combine observations from many users

Eye Trackers

source: https://www.tobii.com

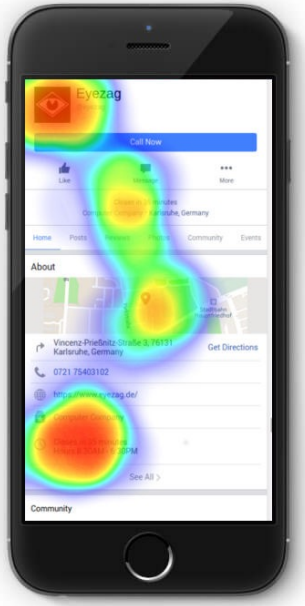
Eye Tracker: How It Works

1. An eye tracker consists of cameras, projectors and algorithms.
2. The projectors create a pattern of near-infrared light on the eyes.
3. The cameras take high-resolution images of the user's eyes and the pattern.
4. Machine learning, image processing and mathematical algorithms are used to determine the eyes' position and gaze point.

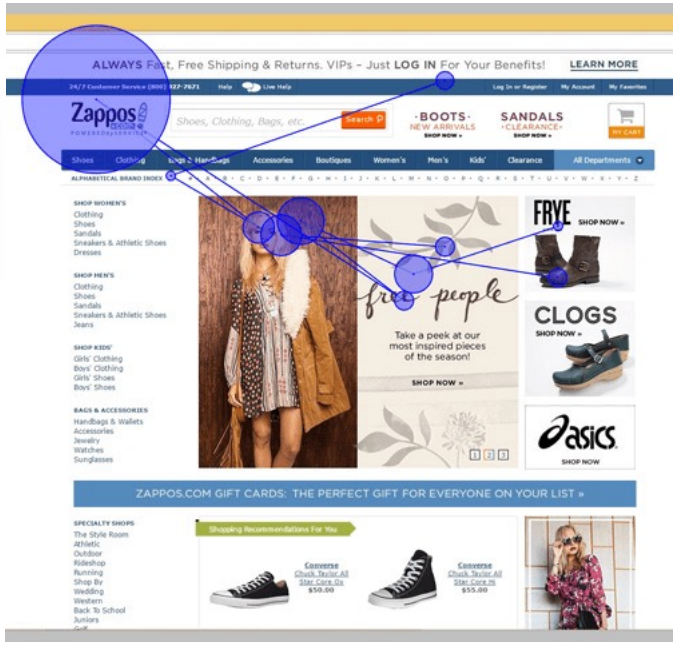


source: https://www.tobii.com/group/about/this-is-eye-tracking/

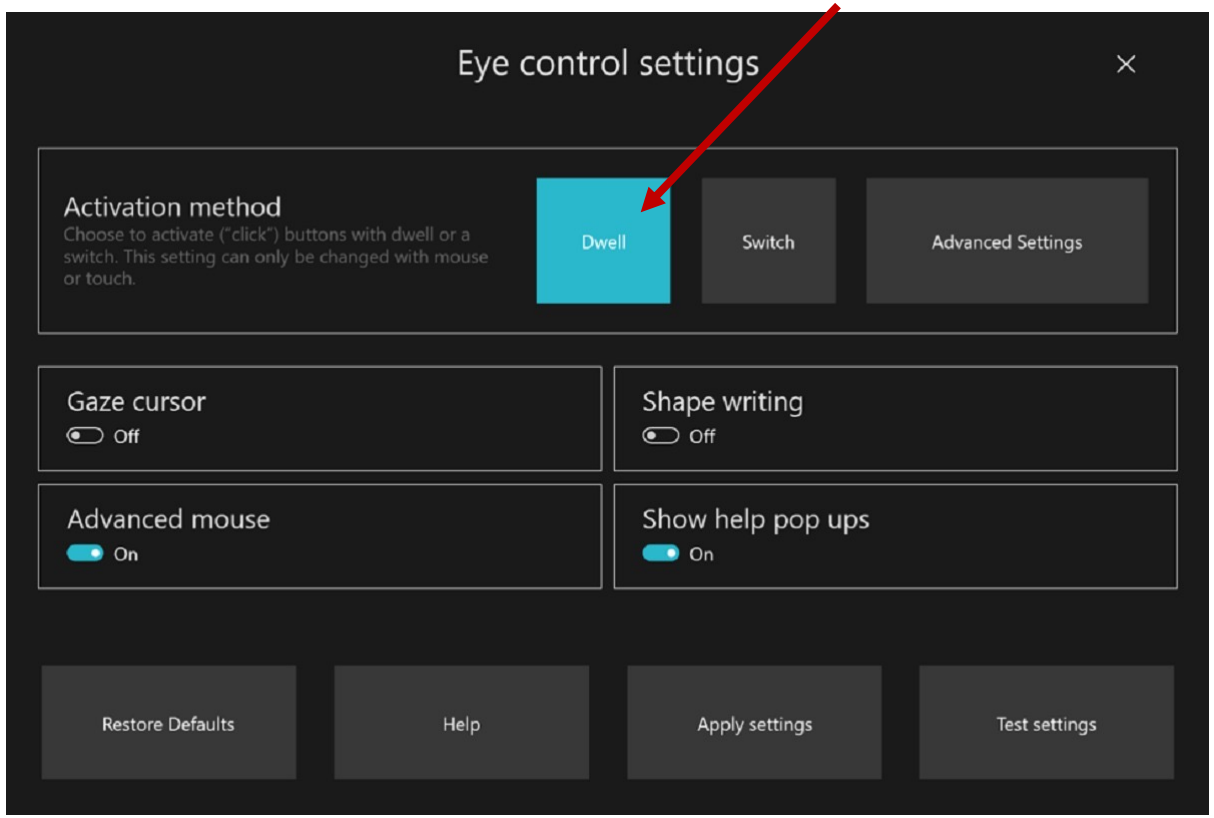
Eye Tracker: Examples



Heatmap and
scan path analysis



Beware the Midas' Touch!



Windows 10 Eye Control Settings

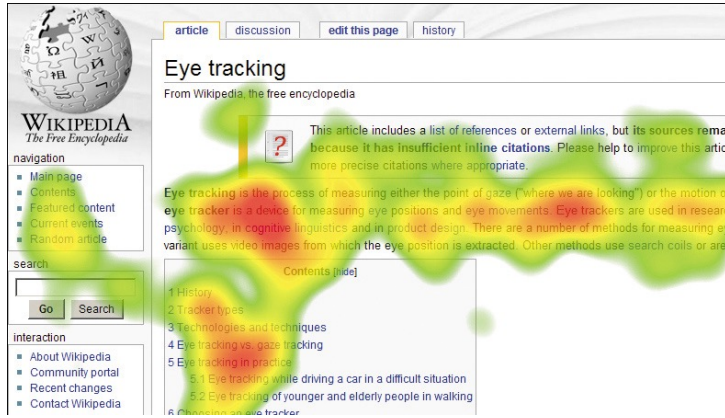
Location on the Page

Eye tracking studies show where the users actually *look* on the page

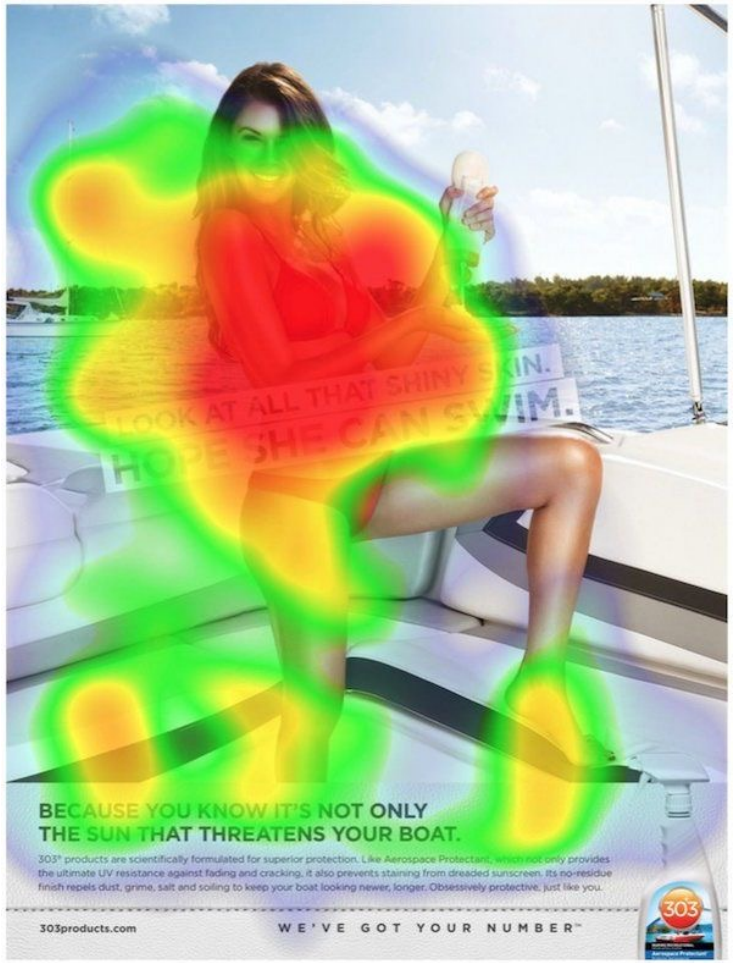
Search “eye tracking heat map” and see the major patterns

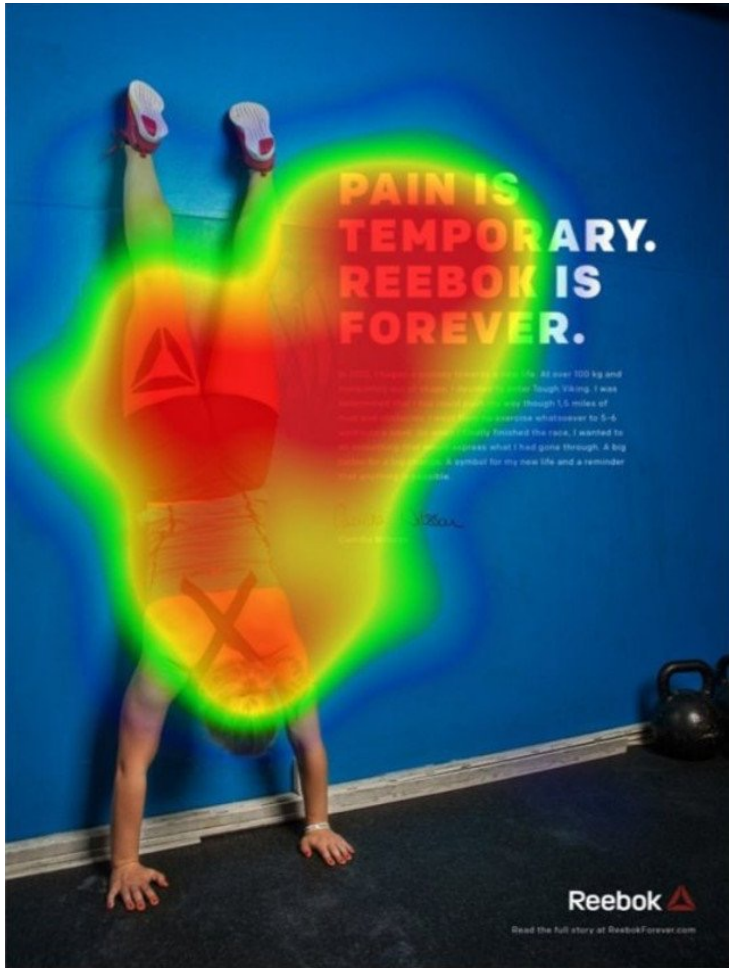
Users “glance” and spend limited amount of time on each page.

F-shaped pattern



Did Anyone Ever Look at the Product Name?





Scanning


WHAT DESIGNERS BUILD...
WHAT USERS SEE...
biztravel.com
Join Biztravel.com Now!
Book A Trip
Track My Miles
Book A Vacation
Plan A Meeting
Charter A Flight
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Experiment

Site Version	Sample Paragraph	Usability Improvement (relative to control condition)
Promotional writing (control condition) using the "marketese" found on many commercial websites	Nebraska is filled with internationally recognized attractions that draw large crowds of people every year, without fail. In 1996, some of the most popular places were Fort Robinson State Park (355,000 visitors), Scotts Bluff National Monument (132,166), Arbor Lodge State Historical Park & Museum (100,000), Carhenge (86,598), Stuhr Museum of the Prairie Pioneer (60,002), and Buffalo Bill Ranch State Historical Park (28,446).	0% (baseline)
Concise text with about half the word count as the control condition	In 1996, six of the best-attended attractions in Nebraska were Fort Robinson State Park, Scotts Bluff National Monument, Arbor Lodge State Historical Park & Museum, Carhenge, Stuhr Museum of the Prairie Pioneer, and Buffalo Bill Ranch State Historical Park.	**+58%**
Scannable layout using the same text as the control condition in a layout that facilitated scanning	Nebraska is filled with internationally recognized attractions that draw large crowds of people every year, without fail. In 1996, some of the most popular places were: •Fort Robinson State Park (355,000 visitors) •Scotts Bluff National Monument (132,166) •Arbor Lodge State Historical Park & Museum (100,000) •Carhenge (86,598) •Stuhr Museum of the Prairie Pioneer (60,002) •Buffalo Bill Ranch State Historical Park (28,446).	**+47%**
Objective language using neutral rather than subjective, boastful, or exaggerated language (otherwise the same as the control condition)	Nebraska has several attractions. In 1996, some of the most-visited places were Fort Robinson State Park (355,000 visitors), Scotts Bluff National Monument (132,166), Arbor Lodge State Historical Park & Museum (100,000), Carhenge (86,598), Stuhr Museum of the Prairie Pioneer (60,002), and Buffalo Bill Ranch State Historical Park (28,446).	**+27%**
Combined version using all three improvements in writing style together: concise, scannable, and objective	In 1996, six of the most-visited places in Nebraska were: •Fort Robinson State Park •Scotts Bluff National Monument •Arbor Lodge State Historical Park & Museum •Carhenge •Stuhr Museum of the Prairie Pioneer •Buffalo Bill Ranch State Historical Park	**+124%**

Best Locations to Put Content

- Above the fold
  - Prioritize, do not cram
- Where people expect
  - Where other pages put similar content
  - **Not** where the ads usually go
- Users will scroll down if the first content is interesting

Banner Blindness

- The brain learns to avoid uninteresting content
- Banners and Advertisements are recognized subconsciously (by their appearance) and are never considered
  - Ads also “poison” adjacent elements
- Lesson learned: never create a message / title / warning / etc. that might look like an ad. (Faux ads)

References and Acknowledgment

- Scott MacKenzie: Human-Computer Interaction -
  An Empirical Research Perspective, Morgan Kaufmann
  - Chapter 3: Interaction Elements
- Ben Shneiderman, Catherine Plaisant, Maxine S. Cohen, Steven M. Jacobs, and Niklas Elmqvist, Designing the User Interface: Strategies for Effective Human-Computer Interaction
  - Chapter 8: Fluid Navigation
- COGS120/CSE170: Human-Computer Interaction Design, videos by Scott Klemmer, https://www.youtube.com/playlist?list=PLLssT5z_DsK_nusHL_Mjt87THSTlgrsyJ
- Thanks to Fulvio Corno, past teacher of the course, for his work on some of these slides

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