Web typography basics

August 2020

Design, not art

بسم الله الرحمن الرحيم

Content is king

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Fit for purpose

0. Purpose

1. Readability

2. Tone

⋮

3. Aesthetics

for cosmetics **2** : a small automobile

⁴**com·pact** \'käm-ˌpakt\ *n* : AGREEMENT, COVENANT

vice (as on a generator or motor) for changing the direction of electric current

¹**com·mute** \kə-'myüt\ *vb* **com·mut·ed**; **com·mut·ing 1** : EXCHANGE **2** : to revoke (a sentence) and impose a milder penalty **3** : to travel back and forth regularly — **com·mut·er** *n*

²**commute** *n* : a trip made in commuting

comp *abbr* **1** comparative; compare **2** compensation **3** compiled; compiler **4** composition; compositor **5** compound **6** comprehensive **7** comptroller

¹**com·pact** \kəm-'pakt, 'käm-ˌpakt\ *adj* **1** : SOLID, DENSE **2** : BRIEF, SUCCINCT **3** : occupying a small volume by efficient use of space — **com·pact·ly** *adv* — **com·pact·ness** *n*

²**compact** *vb* : to pack together — **com·press** — **com·pac·tor** \kəm-'pak-tər, 'käm-ˌpak-\ *n*

³**com·pact** \'käm-ˌpakt\ *n* **1** : a small case for cosmetics **2** : a small automobile

⁴**com·pact** \'käm-ˌpakt\ *n* : AGREEMENT, COVENANT

com·pact disc \'käm-ˌpakt-\ *n* : CD

com·pa·dre \kəm-'pä-drā\ *n* : a close friend : BUDDY

¹**com·pan·ion** \kəm-'pan-yən\ *n* [ME *compainoun*, fr. AF *cumpaing*, *cumpaignun*, fr. LL *companion-*, *companio*, fr. L *com-* together + *panis* bread] **1** : an intimate friend or associate : COMRADE **2** : one that is closely connected with something similar **3** : a celestial body that appears close to another but that may not be associated with it in space — **com·pan·ion·able** *adj* — **com·pan·ion·ship** *n*

²**companion** *n* : COMPANIONWAY

com·pan·ion·way \-ˌwā\ *n* : a ship's stairway from one deck to another

com·pa·ny \'kəm-pə-nē\ *n, pl* **-nies 1** : association with others : FELLOWSHIP; *also* : COMPANIONS **2** : GUESTS **3** : a group of persons or things **4** : an infantry unit consisting of two or more platoons and normally commanded by a captain **5** : a group of musical or dramatic performers **6** : the officers and crew of a ship **7** : an association of persons for carrying on a business ◆ *Synonyms* PARTY, BAND, TROOP, TROUPE, CORPS, OUTFIT

com·pa·ra·ble \'käm-pə-rə-bəl, -prə-\ *adj* : capable of being compared ⟨singers of ~ talent⟩ ◆ *Synonyms* PARALLEL, SIMILAR, LIKE, ALIKE, CORRESPONDING — **com·pa·ra·bil·i·ty** \ˌkäm-pə-rə-'bi-lə-tē\ *n*

¹**com·par·a·tive** \kəm-'per-ə-tiv\ *adj* **1** : of, relating to, or constituting the degree of grammatical comparison that denotes increase in quality, quantity, or relation **2** : RELATIVE ⟨a ~ stranger⟩ — **com·par·a·tive·ly** *adv*

²**comparative** *n* : the comparative degree or form in a language

¹**com·pare** \kəm-'per\ *vb* **com·pared**; **com·par·ing 1** : to represent as similar : LIKEN **2** : to examine for likenesses and differences **3** : to inflect or modify (an adjective or adverb) according to the degrees of comparison

²**compare** *n* : the possibility of comparing ⟨beauty beyond ~⟩

com·par·i·son \kəm-'per-ə-sən\ *n* **1** : the act of comparing **2** : change in the form of an adjective or adverb to show different levels of quality, quantity, or relation

com·part·ment \kəm-'pärt-mənt\ *n* **1** : a separate division **2** : a section of an enclosed space : ROOM

com·part·men·tal·ise *Brit var of* COMPARTMENTALIZE

com·part·men·tal·ize \kəm-ˌpärt-'men-tᵊl-ˌīz\ *vb* **-ized**; **-iz·ing** : to separate into compartments

¹**com·pass** \'kəm-pəs, 'käm-\ *vb* [ME, fr. AF *cumpasser* to measure, fr. VL *compassare* to pace off, fr. L *com-* + *passus* pace] **1** : CONTRIVE, PLOT **2** : ENCIRCLE, ENCOMPASS **3** : BRING ABOUT, ACHIEVE

²**compass** *n* **1** : BOUNDARY, CIRCUMFERENCE **2** : an enclosed space **3** : RANGE, SCOPE **4** : a device for determining direction by means of a magnetic needle swinging freely and pointing to the magnetic north; *also* : a nonmagnetic device that indicates direction **5** : an instrument for drawing circles or transferring measurements consisting of two legs joined by a pivot

com·pas·sion \kəm-'pa-shən\ *n* : sympathetic feeling : PITY, MERCY — **com·pas·sion·ate** \-shə-nət\ *adj* — **com·pas·sion·ate·ly** *adv*

com·pat·i·ble \kəm-'pa-tə-bəl\ *adj* : able to exist or act together harmoniously ⟨~ colors⟩ ⟨~ drugs⟩ ◆ *Synonyms* CONSONANT, CONGENIAL, SYMPATHETIC — **com·pat·i·bil·i·ty** \-ˌpa-tə-'bi-lə-tē\ *n*

com·pa·tri·ot \kəm-'pā-trē-ət, -ˌät\ *n* : a fellow countryman

com·peer \'käm-ˌpir\ *n* : EQUAL, PEER

com·pel \kəm-'pel\ *vb* **com·pelled**; **com·pel·ling** : to drive or urge with force

com·pen·di·ous \kəm-'pen-dē-əs\ *adj* : concise and comprehensive; *also* : COMPREHENSIVE ⟨a ~ almanac⟩

com·pen·di·um \kəm-'pen-dē-əm\ *n, pl* **-di·ums** *or* **-dia** \-ə\ **1** : a brief summary of a larger work or of a field of knowledge **2** : COLLECTION

com·pen·sate \'käm-pən-ˌsāt\ *vb* **-sat·ed**; **-sat·ing 1** : to be equivalent to : make up for **2** : PAY, REMUNERATE ◆ *Synonyms* BALANCE, OFFSET, COUNTERBALANCE, COUNTERPOISE — **com·pen·sa·tion** \ˌkäm-pən-'sā-shən\ *n* — **com·pen·sa·to·ry** \kəm-'pen-sə-ˌtȯr-ē\ *adj*

com·pete \kəm-'pēt\ *vb* **com·pet·ed**; **com·pet·ing** : CONTEND, VIE ⟨~ for the title⟩ ⟨~ for customers⟩

com·pe·tence \'käm-pə-təns\ *n* **1** : adequate means for subsistence **2** : FITNESS, ABILITY ⟨trusted his doctor's ~⟩

com·pe·ten·cy \-tən-sē\ *n, pl* **-cies** : COMPETENCE

com·pe·tent \-tənt\ *adj* : CAPABLE, FIT, QUALIFIED ⟨a ~ mechanic⟩ ⟨a ~ juror⟩

com·pe·ti·tion \ˌkäm-pə-'ti-shən\ *n* **1** : the act of competing : RIVALRY **2** : CONTEST, MATCH; *also* : one's competi-

Some specific issues.

BIO_snprintf - it's not normal, and "normal" use in the library is wrong!

BIO_strdup - it's not normal either (ignores NULL)

ERR_add_error_data
   Induces horrible hacks
    Replace with asprintf

char buf[288 + 1], tmp[20], str[128 + 1];

Slide from OpenBSD on OpenSSL code quality

Typography ⊂ Visual design

Humans are flawed?

Not the focus, but text is for human consumption

CAUTION

MAINTENANCE AND REPLACEMENT INSTRUCTIONS

(1) SELF TEST EXPLOSIVE BOLTS PER INST 14 PARA 3 SEC 6D AFTER EACH EVA.

(2) REPLACE DEFECTIVE BOLTS BY OOL UNITS ONLY INV CONT N° 2D 496.

(3) BOLTS SUBJECTED TO TYPE 2 ENVIRONMENTAL CONDITIONS MUST UNDERGO STANDARD SIMULATED IGNITION TESTS.

(4) PERFORM ACT - DEACT CONTROL TESTS AND CFM CLEANING UNDER EXTERNAL POWER CONDITIONS ONLY.

EXPLOSIVE BOLTS

Coffee Table

MARKOR

£299
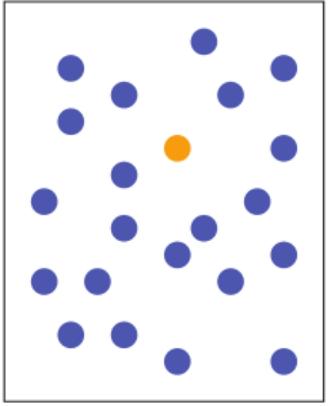
Before (Futura)

Coffee Table

MARKOR

£299
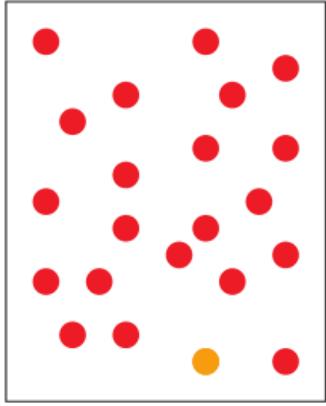
After (Verdana)

Feature level tuning can allow us to attend to different layers of information
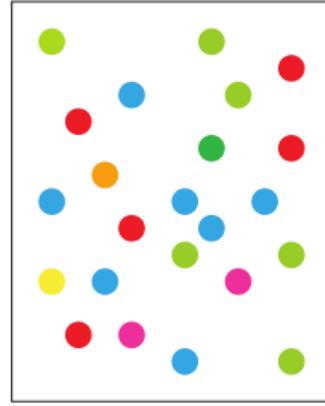
3.14159265358979
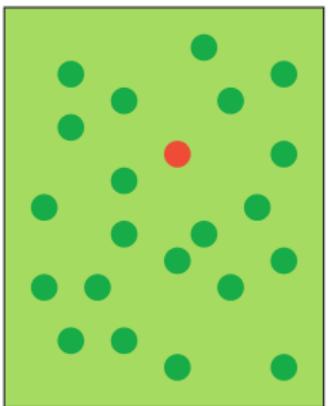
The larger the chromatic difference between the target symbol and the other symbols, the easier the search.
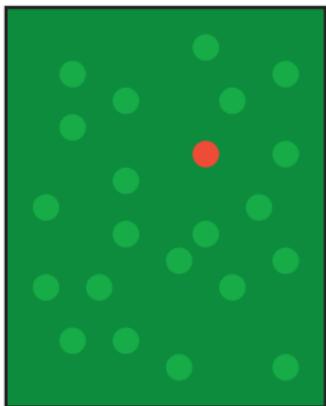
When there is only a small color difference from non-target symbols, the search is difficult.
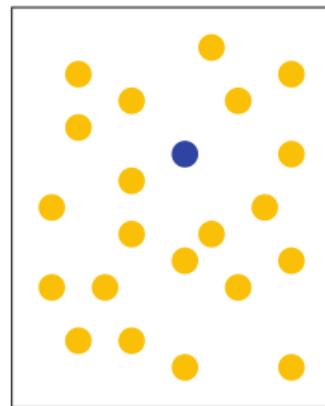
When there are many non-target symbol colors, the search is the most difficult.

If non-target symbols are similar to the background, they are easy to exclude from the visual search.
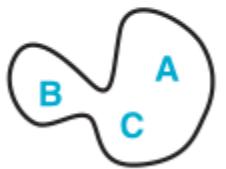
A luminance difference plus a chromatic difference from other symbols and the background leads to the easiest search.

A dark target on a light background with light non-target symbols can be as effective as the reverse.
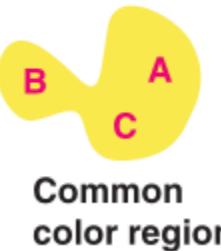
Connecting contour
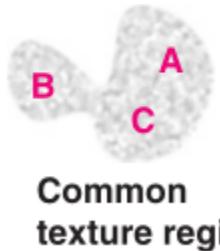
Enclosing contour
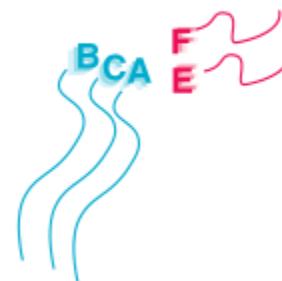
Common color region

Common texture region

Proximity grouping

Alignment

Common movement

Web typography

- Latin/English focus
- Focus on the web

- Hierarchy
- Spacing
- Colour
- Weights
- Typefaces
- Alignment
- Kerning
- Letter spacing
- Rhythm
- Widows
- Orphans
- Rivers
- Justification
- Punctuation
- Tables

The boring stuff

- `<html lang="en">`
- quotation marks `<q>quoted</q>`
- line breaks `<wbr>` `word-break` `whitespace` ` `
- dashes `—` `–`
- ellipsis `…`
- `h1` `h2` `h3` `...` `p` `small`
- `widows` `orphans` `columns` `unicode-range`

Fonts

```css
@font-face {
  font-family: "Noto Sans";
  src: url("fonts/subset-NotoSans-Bold.woff2") format("woff2");
  font-weight: 700;
  font-style: normal;
}

@font-face {
  font-family: "Noto Sans";
  src: url("fonts/subset-NotoSans-BoldItalic.woff2") format("woff2");
  font-weight: 700;
  font-style: italic;
}
```

```html
<link href="https://fonts.googleapis.com/css2?family=Open+Sans:wght@300;400&display=swap" rel="stylesheet">
```

Font vs Typeface

In simple terms for the digital age

> Typeface: design
> Font: implementation

Font sizes

CSS `<length>`

Unit	
px	CSS pixel
pt, pt	1pt usually 1/72in
cm, mm, in	
%	
rem	font size of the root element, usually `html`
em	font size of the element, compounding

Font sizes (part 2)

CSS `<length>`

Unit	
ch	width of `0`
vw	viewport width
vh	viewport height
vmin	min of viewport width, height
vmax	max of viewport width, height
ex	x-height of the font, usually ≈ 0.5em

CSS Static vs. Relative Units

Kittens heading px

Cat ipsum, good morning sunshine. Wake up human for food at 4am intently stare, this human feeds me.

These paragraphs are using **font-size: 16px, line-height: 24px**

Kittens heading rem

Cat ipsum, good morning sunshine. Wake up human for food at 4am intently stare, this human feeds me.

These paragraphs are using **font-size: 1rem, line-height: 24px**

Kittens heading rem

Cat ipsum, good morning sunshine. Wake up human for food at 4am intently stare, this human feeds me.

These paragraphs are using **font-size: 1rem, line-height: 1.5**

Pixel values for font-size and line-height don't scale with browser font size adjustments.

#1 Use relative units by default

em, rem

#2 Avoid viewport units

- Especially `vh` as it changes on scroll (especially on mobile).
- Fixes to viewport size, hard to zoom

Font formats

- Bitmap

- TTF

- PS

- OTF

- SVG

- WOFF

- WOFF2

- EOT

In general, go for OTF wrapped in WOFF2

Font stack

- Pick a good font stack

  - `MyFont, SystemFont, serif;`

- This has to be part of the design

The paragraph below is set using a JavaScript implementation of the classic Knuth and Plass algorithm as used in TeX. The numbers on the right of each line are the stretching or shrinking ratio compared to the optimal line width. This example uses a default space of 1/3 em, with a stretchability and shrink-ability of 1/6 em and 1/9 em respectively.

In olden times when wishing still helped one, there lived a   0.950
king whose daughters were all beautiful; and the youngest was   -0.250
so beautiful that the sun itself, which has seen so much, was   0.500
astonished whenever it shone in her face. Close by the king's   0.350
castle lay a great dark forest, and under an old lime-tree in the   -0.188
forest was a well, and when the day was very warm, the king's   -0.250
child went out to the forest and sat down by the fountain; and   0.042
when she was bored she took a golden ball, and threw it up on   -0.173
high and caught it; and this ball was her favorite plaything.   0.001

The following paragraph is set by a browser using `text-align: justify` . Notice the lines in the paragraph have, on average, greater inter-word spacing than the Knuth and Plass version, which is successful at minimizing the inter-word spacing over all lines.

In olden times when wishing still helped one, there lived a   1.150
king whose daughters were all beautiful; and the youngest   1.500
was so beautiful that the sun itself, which has seen so much,   0.636
was astonished whenever it shone in her face. Close by the   1.050
king's castle lay a great dark forest, and under an old lime-tree   0.045
in the forest was a well, and when the day was very warm, the   0.077
king's child went out to the forest and sat down by the   2.182
fountain; and when she was bored she took a golden ball, and   0.273
threw it up on high and caught it; and this ball was her   1.875
favorite plaything.   0.000

Text justification

`text-align` `text-justify`

- Avoid `text-align: justified` in CSS, leave it ragged right (ie. unjustified)
- Especially for narrow columns

`font-display`

- Controls swapping in fonts as they load, or whether fonts should even load
- Avoid flash-of-unstyled-text when possible.
- Avoid content reflow.

`font-feature-settings` and friends

- Some OTF fonts have features you can turn on or off
- Most importantly
  - Standard ligatures `liga`
  - Tabular figures `tnum`
  - Kerning `kern`

Ligatures

- Combined characters
- Turn off for monospace `font-variant-ligatures: none;`
- Turn off if letter spacing has been adjusted

```
[
  {
    "test": "ffi fi fl ffl st ct"
  }
]




[
  {
    "test": "ffi fi fl ffl st ct"
  }
]
```

Kerning

- Automatic (optical spacing)

- `font-feature-settings: kern` to use (metrics spacing, font-supplied)

- Control only when needed with `letter-spacing`

nunontitenb
nunontitenb

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Font hinting

- Instructions on how to scale down or up a font

- Check for rendering bugs across platforms

evaluate | asm | ir | format | share | -O2 ▾ | master ▾ | hello world ▾ | Ace ▾

```
1  fn main() {
2      println!("Hello, world!")
3      let x = true && true;
4  }
```

`font-smooth`

- Avoid
- Let the OS control it
- Higher density screens are reducing need for this

Self-host vs Google Fonts

	Self-host	Web service
Good	Content on your server	Content on their server
Bad	Content on your server	Content on their server

Self-host

Noto Sans		DOWNLOAD
72 styles · 582 languages · 237 regions		16.8 MB
Noto Serif		DOWNLOAD
72 styles · 582 languages · 237 regions		20.4 MB
Noto Sans Display		DOWNLOAD
72 styles · 582 languages · 237 regions		16.9 MB

- Optimise (Noto is 500KB per weight!)
  - glyphhanger, fontmin
- Subset fonts
- Add `rel="preload"` to font `<link>` tags

Variable fonts

Upright
0

-7.50

-15
Slanted

ital: 0 (off)   ital: 0.5 (auto)   ital: 1 (on)

Reduces number of font variant files to download

```
font-size: 9.23vw;                ━━━━●━━━━━━━━━━

/* set variation axis values */

--mono: "MONO" 0;        ●━━━━━━━━━━━━━━━━      /* Monospace: Sans (natural-width) or Mono (fixed-width) */

--casl: "CASL" 0;        ●━━━━━━━━━━━━━━━━      /* Casual: Linear to Casual */

--wght: "wght" 800;      ━━━━━━━━━━●━━━━━━      /* Weight: Light to ExtraBlack; usually set with 'font-weight' */

--slnt: "slnt" 0;        ━━━━━━━━━━━━━━━━●      /* Slant: 0 to -15 degrees, auto cursive at -14 */

--CRSV: "CRSV" 0.5;        ○ off ◉ auto ○ on   /* Cursive: always roman, auto substitution, or always cursive */
```
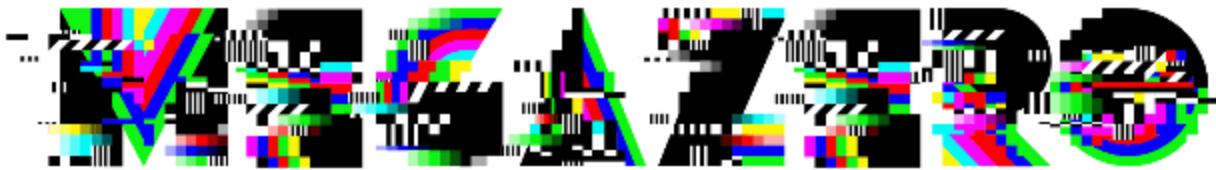
Colour fonts

Gilbert by Type With Pride

Popsky by Igor Petrovic

MEGAZERO by Alex Trochut

Tables

Director	Film	Released	Budget	Gross	Rating
John Ford	The Informer	May 1935	$243,000	$950,000	8.3/10
	The Grapes of Wrath	Jan 1940	$800,000	$2,500,000	9/10
	How Green Was My Valley	Oct 1941	$800,000	$2,800,000	7.9/10
	The Quiet Man	Jul 1952	$1,750,000	$3,200,000	8/10
William Wyler	Mrs. Miniver	Jun 1942	$1,340,000	$8,878,000	7.8/10
	The Best Years of Our Lives	Nov 1946	$2,100,000	$23,700,000	8.6/10
	Ben-Hur	Nov 1959	$15,200,000	$146,900,000	7.9/10
Frank Capra	It Happened One Night	Feb 1934	$325,000	$2,500,000	8.9/10
	Mr. Deeds Goes to Town	Apr 1936	$845,710	$1,000,000	8.4/10
	You Can't Take It With You	Aug 1938	$1,644,736	$5,295,526	7.6/10
Billy Wilder	The Lost Weekend	Nov 1945	$1,250,000	$11,000,000	8.2/10
	The Apartment	Jun 1960	$3,000,000	$24,600,000	8.5/10
David Lean	The Bridge on the River Kwai	Oct 1957	$2,800,000	$30,600,000	9.2/10
	Lawrence of Arabia	Dec 1962	$15,000,000	$70,000,000	9/10
Steven Spielberg	Schindler's List	Nov 1993	$22,000,000	$321,200,000	9/10
	Saving Private Ryan	Jul 1998	$70,000,000	$481,800,000	8.6/10
Fred Zinnemann	From Here to Eternity	Aug 1953	$2,500,000	$30,500,000	8.2/10
	A Man for All Seasons	Dec 1966	$2,000,000	$28,400,000	7.8/10

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- Left-align text, right-align numbers, align decimals

- Easy way out is to use fixed-precision decimals

Director	Film	Released	Budget ($)	Gross ($)	Rating
John Ford	The Informer	May 1935	243,000	950,000	8.3
	The Grapes of Wrath	Jan 1940	800,000	2,500,000	9.0
	How Green Was My Valley	Oct 1941	800,000	2,800,000	7.9
	The Quiet Man	Jul 1952	1,750,000	3,200,000	8.0
William Wyler	Mrs. Miniver	Jun 1942	1,340,000	8,878,000	7.8
	The Best Years of Our Lives	Nov 1946	2,100,000	23,700,000	8.6
	Ben-Hur	Nov 1959	15,200,000	146,900,000	7.9
Frank Capra	It Happened One Night	Feb 1934	325,000	2,500,000	8.9
	Mr. Deeds Goes to Town	Apr 1936	845,710	1,000,000	8.4
	You Can't Take It With You	Aug 1938	1,644,736	5,295,526	7.6
Billy Wilder	The Lost Weekend	Nov 1945	1,250,000	11,000,000	8.2
	The Apartment	Jun 1960	3,000,000	24,600,000	8.5
David Lean	The Bridge on the River Kwai	Oct 1957	2,800,000	30,600,000	9.2
	Lawrence of Arabia	Dec 1962	15,000,000	70,000,000	9.0
Steven Spielberg	Schindler's List	Nov 1993	22,000,000	321,200,000	9.0
	Saving Private Ryan	Jul 1998	70,000,000	481,800,000	8.6
Fred Zinnemann	From Here to Eternity	Aug 1953	2,500,000	30,500,000	8.2
	A Man for All Seasons	Dec 1966	2,000,000	28,400,000	7.8

- Align numbers to decimal if possible

- Add spacing between groups

Tables

- Use tabular figures `font-feature-settings: tnum`

	Lining	Old-style
Proportional	409,280	409,280
	367,112	367,112
	155,068	155,068
	171,792	171,792
Tabular	409,280	409,280
	367,112	367,112
	155,068	155,068
	171,792	171,792

Emoji

- Replace with image (Twitter)
- Let OS render
- Use an emoji font

Print stylesheets
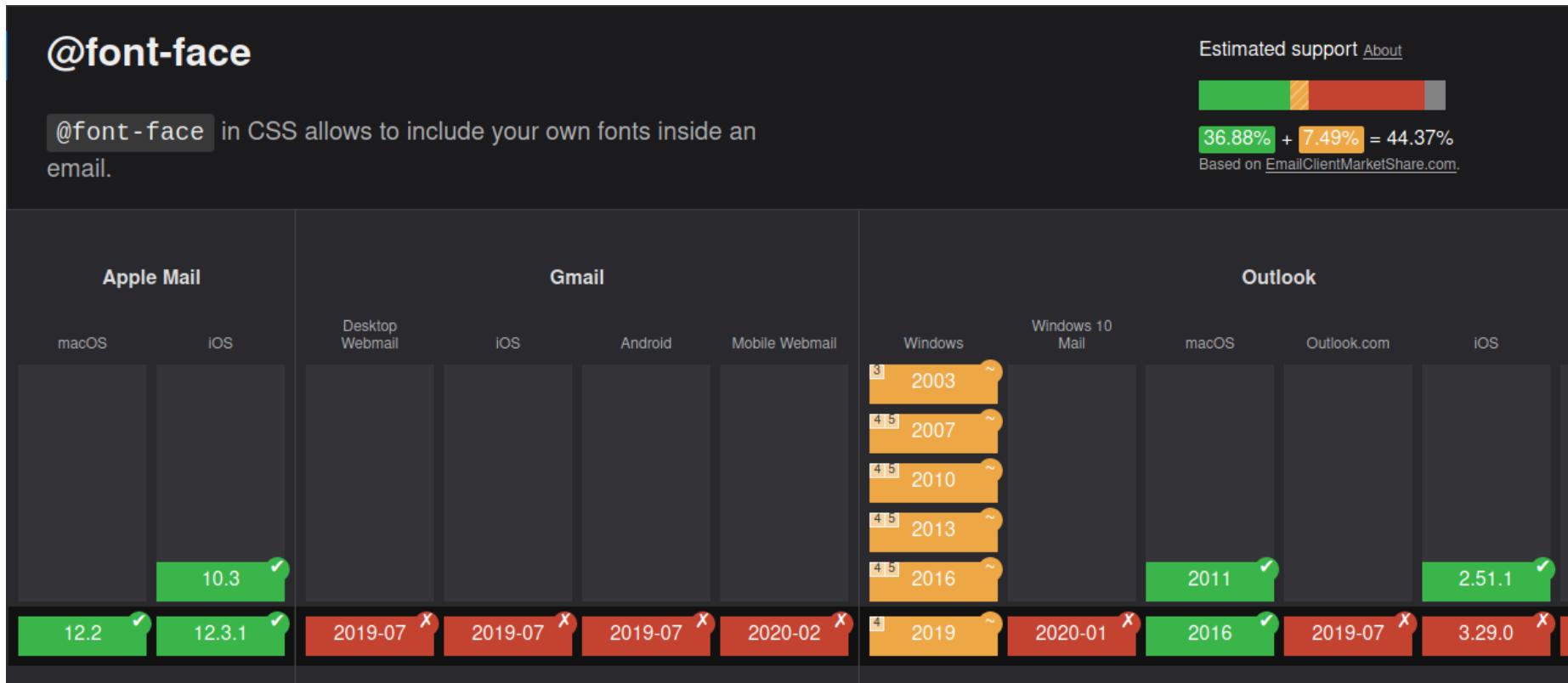
Add URL to links

```css
a[href]:after {
  content: " (" attr(href) ")";
}
```

Set verso (left) page styling

```css
@page :left {
  margin-right: 200pt;
}
```

Emails

- Keep it simple, avoid custom fonts

- Personally, I prefer plain text emails

- Check https://www.caniemail.com/

Font weights and interaction

```
button:hover {
  font-weight: bold;
}
```

- Avoid changing font widths with interactivity
- This causes content sizes to change and causes a content shift

Secret technique: `font` shorthand

```css
.text {
  --my-font: "Fira Sans", sans-serif
  font: 1.2em var(--my-font);
}
```

Language and culture

Stick to convention, use appropriate punctuation

Statement of Cash Flow - Simple Example *for the period 1 Jan 2006 to 31 Dec 2006*	
Cash flow from operations	$4,000
Cash flow from investing	($1,000)
Cash flow from financing	($2,000)
Net cash flow	**$1,000**
Parentheses indicate negative values	

たな卸資産の増減額（△は増加）	△15	△505
ゲームソフト仕掛品の増減額（△は増加）	△3,412	△536
仕入債務の増減額（△は減少）	△2,805	△1,886
その他	△147	△3,500

Consider language density and adjust font sizes if needed

LANGUAGE	"SHARE"	EXPANSION FACTOR
English	Share	1.0
German	Freigeben	1.8
French	Partager	1.5
Spanish	Compartir	1.8
Italian	Condividi	1.7
Japanese	共有	0.8
Chinese	共享	0.8
Korean	공유	0.7

(Salesforce Lightning design system)

CJK fonts

- Unicode Han unification
- Use the right font
- Set `lang` attribute

- Pick a good font stack, especially for mixed-languages
  Electron apps (Slack, Discord) are notoriously bad for this

Multilanguage (CJK) Font Support

Follow | 11

astrum
10 months ago · Edited

↑
14
↓

Discord uses the correct fallback fonts in each language's style sheet when the client is set to the respective language. However, with the client set to English, Discord does not define the font used for glyphs outside of the Whitney font (or the English fallback fonts listed: Helvetica Neue, Helvetica, Arial). For CJK characters, this causes the operating system to display the glyphs using its default fonts, which is fine in macOS, Linux, Android, and iOS. On Windows, depending on the languages and fonts active, it can lead to a jarring display of text.

Using my system as an example (English, Traditional Chinese, and Japanese are active), Han-unified characters (hanzi from Chinese and kanji from Japanese) are displayed with the font SimSun, an outdated Simplified Chinese bitmap font. Kana are displayed with Meiryo, an antialiased Japanese font. This is especially problematic with Japanese text, as both fonts will be used within the same sentence. For example: "Skype、TeamSpeakの時代は終わりを告げた…! "

- Skype, TeamSpeak displayed using Whitney (as intended)
- の, は, わり, を, げた displayed using Meiryo
- 時代, 終, 告 displayed using SimSun (時 and 終 are not even Simplified Chinese characters)

Vertical, RTL, Ruby

NEWS WEB EASY|アニメの文化を

2 minutes

NEWS WEB EASY について

アニメの文化を伝える　「東京アニメセンター」

[10月31日 11時30分]

通常のニュース原稿はこちら

28日、東京の市ヶ谷に「東京アニメセンター」がオー

ニメの会社の団体だんたいと印刷いんさつ会社が日本のア

ほしいと考えてつくりました。

このセンターでは、アニメのキャラクターと一緒に写真を

す。　昔人気にんきがあったアニメを作るときに使った絵

Everyone is disabled

- Or will soon be…

- Astigmatism (30–60%)
- Presbyopia (25%, definite with age)
- Myopia (22%, higher in Asians)
- Cataract (17%)
- Hyperopia (7.5%)
- Colour-blindness (♂ 8%, ♀ 0.5%)
- Dyslexia (3–7%)
- Blind (2–8%, depending on age)
- Small screen
- Away from screen
- Can't view screen (eg, driving)
- Death (100%, depending on age)

(Wikipedia)

Original	Compromise
Horizontal Focus	Vertical Focus

Contrast

- Fonts should be high contrast (black on white is the best)

- Use colours sparingly

- When using pictures of text or SVGs, make them accessible

Font sizes

- Prefer larger sizes when designing

- Support browser zoom

- Support screen readers

Accessibility

Many countries have this in law

In the US, you need to adhere to US accessibility law (ADA)

Use Chrome's Lighthouse or Firefox's audit tool to check

Takeaways

- Typography has a purpose
- Typography is subservient to human biology and culture
- Use relative units
- Make things readable
- Good web typography takes a lot of time to implement

- MDN
- Elements of Typographic Style, Robert Bringhurst
- Visual Thinking, Colin Ware
- https://practicaltypography.com
- https://alistapart.com/article/flexible-typesetting/
- https://alistapart.com/article/web-typography-tables/
- https://www.smashingmagazine.com/2018/05/print-stylesheets-in-2018/
- https://www.24a11y.com/2019/pixels-vs-relative-units-in-css-why-its-still-a-big-deal/
- https://github.com/bramstein/typeset
- https://vistaserv.net/blog/90s-fonts-modern-browsers
- https://www.zachleat.com/web/font-smooth/
- https://alistapart.com/article/cross-cultural-design/
- https://typesetinthefuture.com/