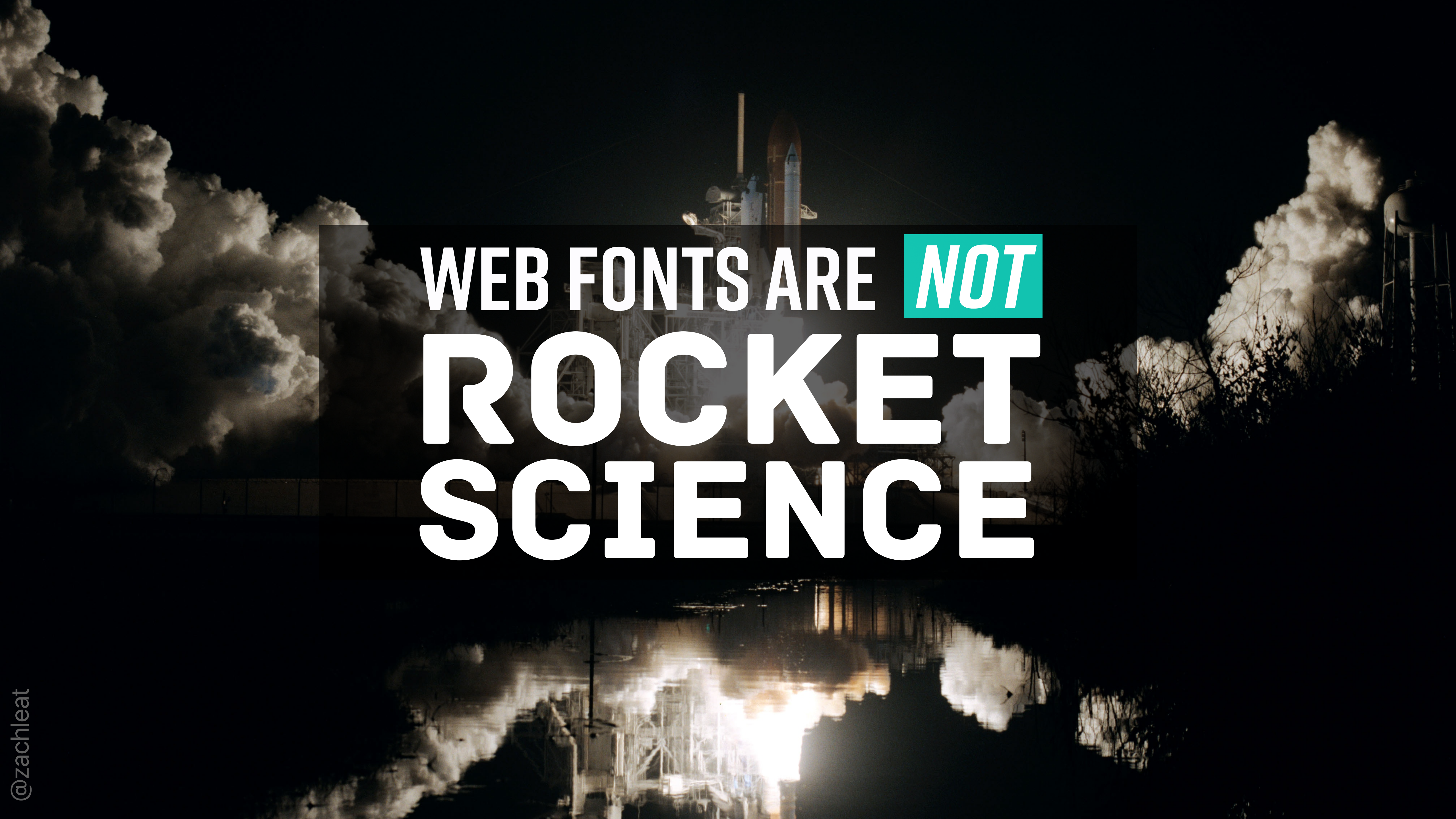




@zachleat
zachleat.com

Web Developer,
Web Fonts,
Professional Helper

 filament group



WEB FONTS ARE **NOT**
ROCKET
SCIENCE

1 *MITT*

2 INVISIBLE
UNSTYLED

3 @FONT-FACE

4 STRATEGIES

JANUARY 2015





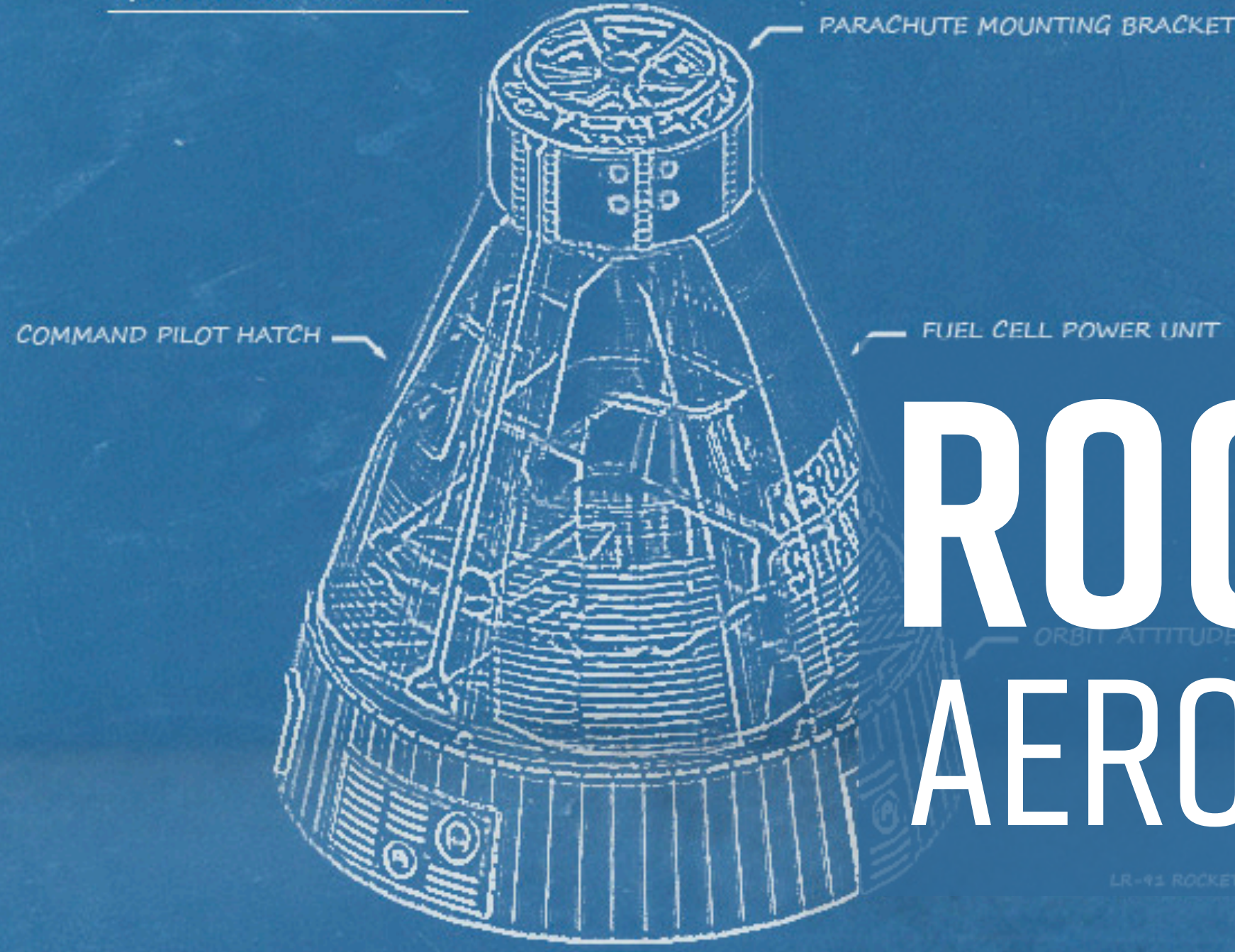
●○○○○ T-Mobile 📶 ✨ 12:06 PM 🔒 📶 100% 🔋
slate.com

Mitt Romney Is Officially Running for President

By Betsy Woodruff

<https://twitter.com/jmuspratt/status/561239961924403200>

GEMINI CAPSULE V2

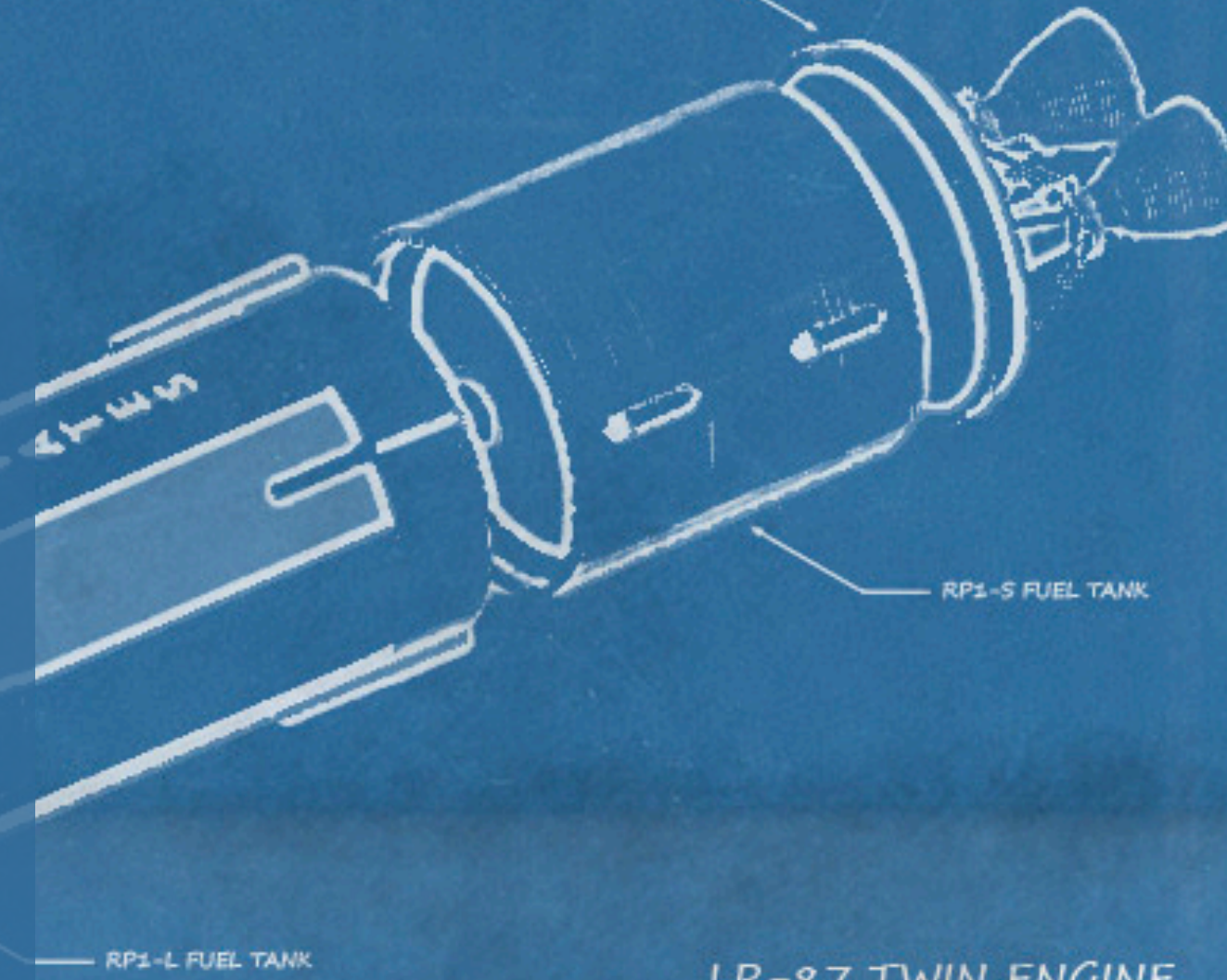


TOTAL FLIGHT SPECIFICATIONS

MASS	95,095 kg
HEIGHT	25 m
RANGE	3,200 km
THRUST	1300 mn
DELTA V	15,644
ISP	1005

ROCKET SCIENCE AEROSPACE ENGINEERING

LR-87 ROCKET ENGINE



LR-87 TWIN ENGINE

AERONAUTICAL

ASTRONAUTICAL

DX-2 STAGE DECOUPLER



ORBIT ATTITUDE AND MANEUVERING SYSTEM

AS-15 GUIDANCE COMPUTER

GEMINI CAPSULE

HEAT SHIELD

RCS THRUSTERS

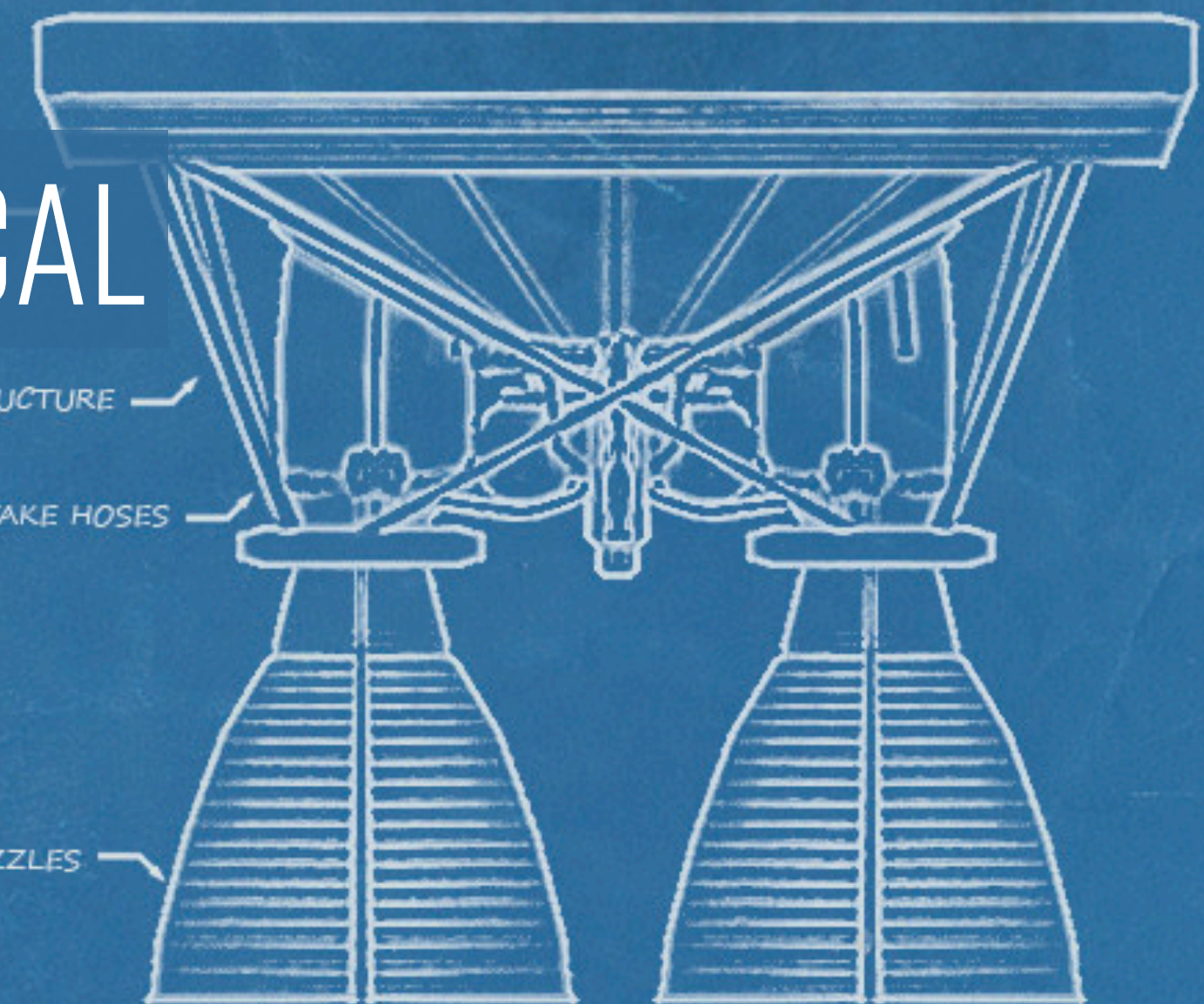
DR1 AND SR1 PARACHUTES

DOCKING NOSE CONE

TITANIUM SUPPORT STRUCTURE

RP1 FUEL INTAKE HOSES

LR-87 ENGINE NOZZLES



PART NUMBER	DESCRIPTION	MATERIAL	POLYCOUNT
00000001	FRIZZANK AERONAUTICS & SPACE ADMINISTRATION		

1 MITT

2 *INVISIBLE*
UNSTYLED

3 @FONT-FACE

4 STRATEGIES

INTENTIONALLY LEFT BLANK

FOIT

FLASH OF
INVISIBLE TEXT



Aanand

@aanand

Follow



Remember when the text used to load before
the images did?

12:32 PM - 10 May 2014

FOUNT

FOUT

FLASH OF
UNSTYLED TEXT

FOIT

DESIGNERS

FOUT

DEVELOPERS



~~@FONT FACE~~

FOUT

FOIT

1997

2003

2004

2008

2009

2011

2012

2013

2014

2015

2016



~~@FONT FACE~~

FOUT

FOIT

2003

1997

2004

2008

2009

2011

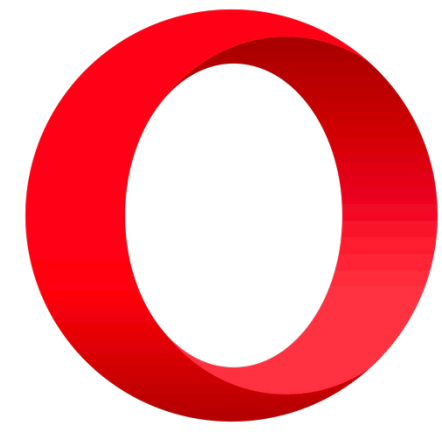
2012

2013

2014

2015

2016



~~@FONT FACE~~

FOUT

FOIT

2004

1997

2003

2008

2009

2011

2012

2013

2014

2015

2016



~~@FONT FACE~~

FOUT

FOIT



2008

1997

2003

2004

2009

2011

2012

2013

2014

2015

2016



~~@FONT FACE~~

FOUT

FOIT



2008

1997

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2016



~~@FONT FACE~~

FOUT

FOIT



2009

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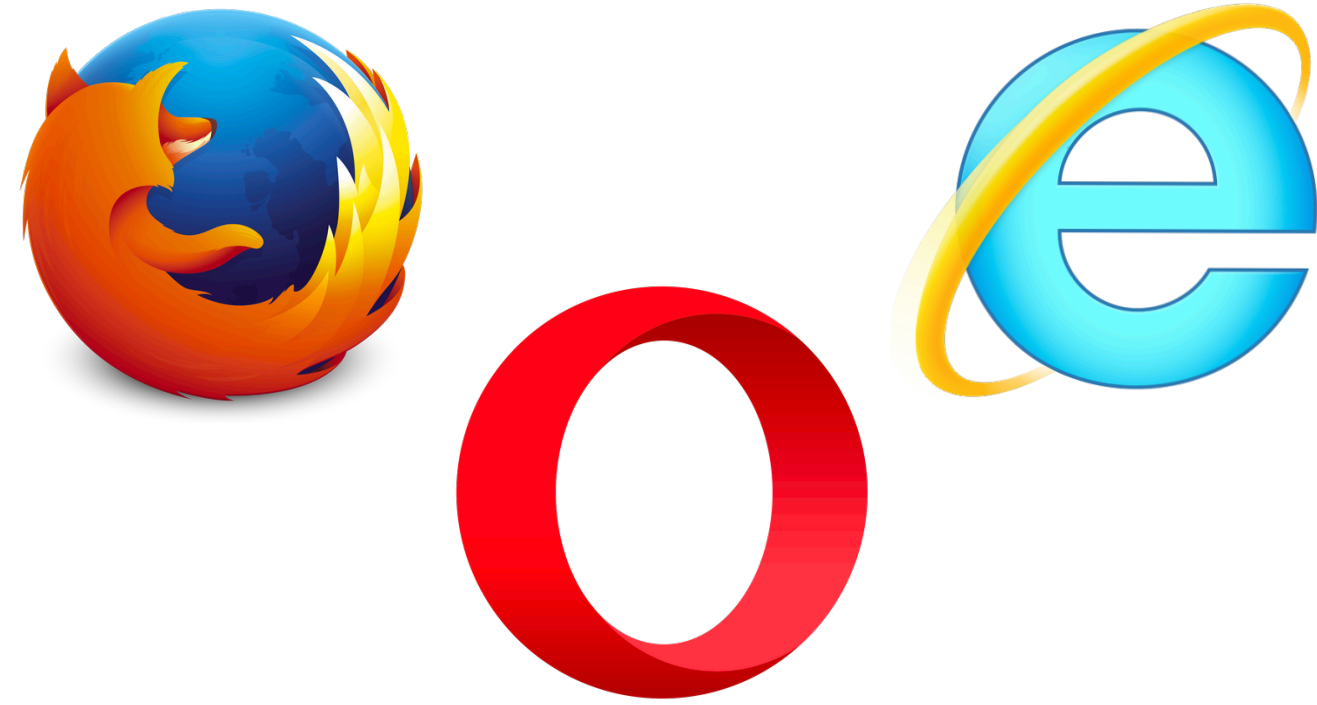
2012

2013

2014

2015

2016



~~@FONT FACE~~

FOUT

FOIT



2009

1997

2003

2004

2008

2011

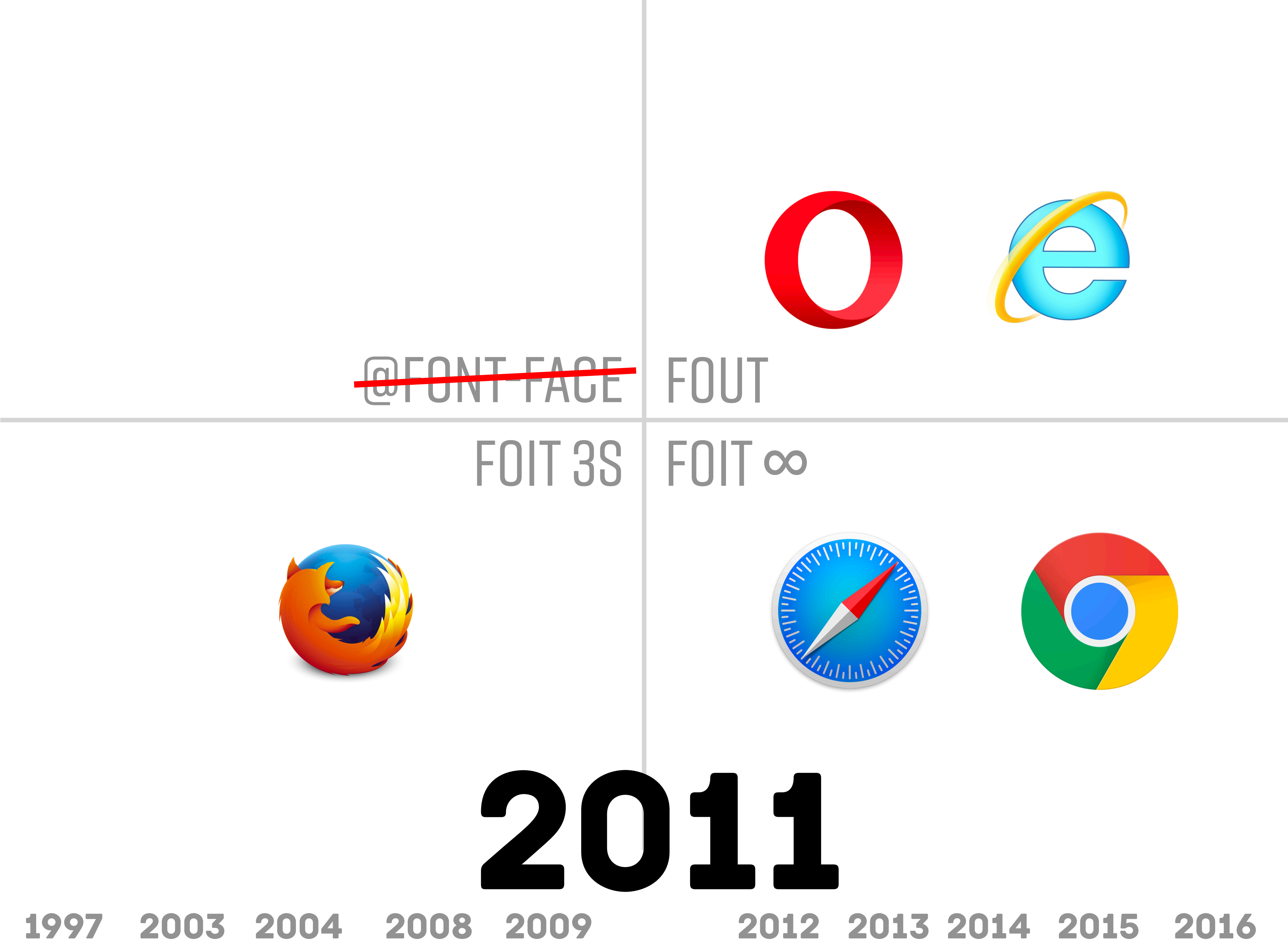
2012

2013

2014

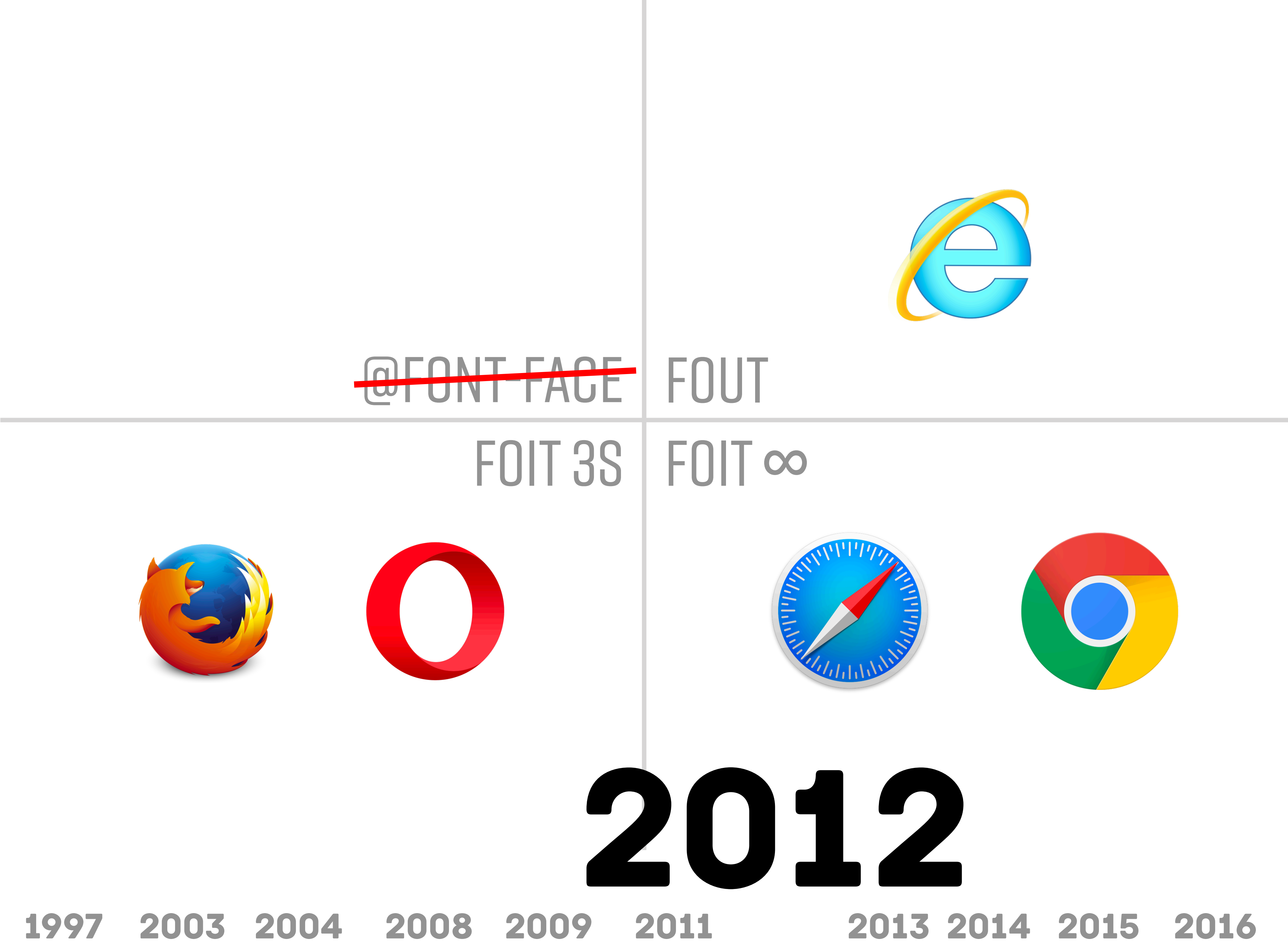
2015

2016



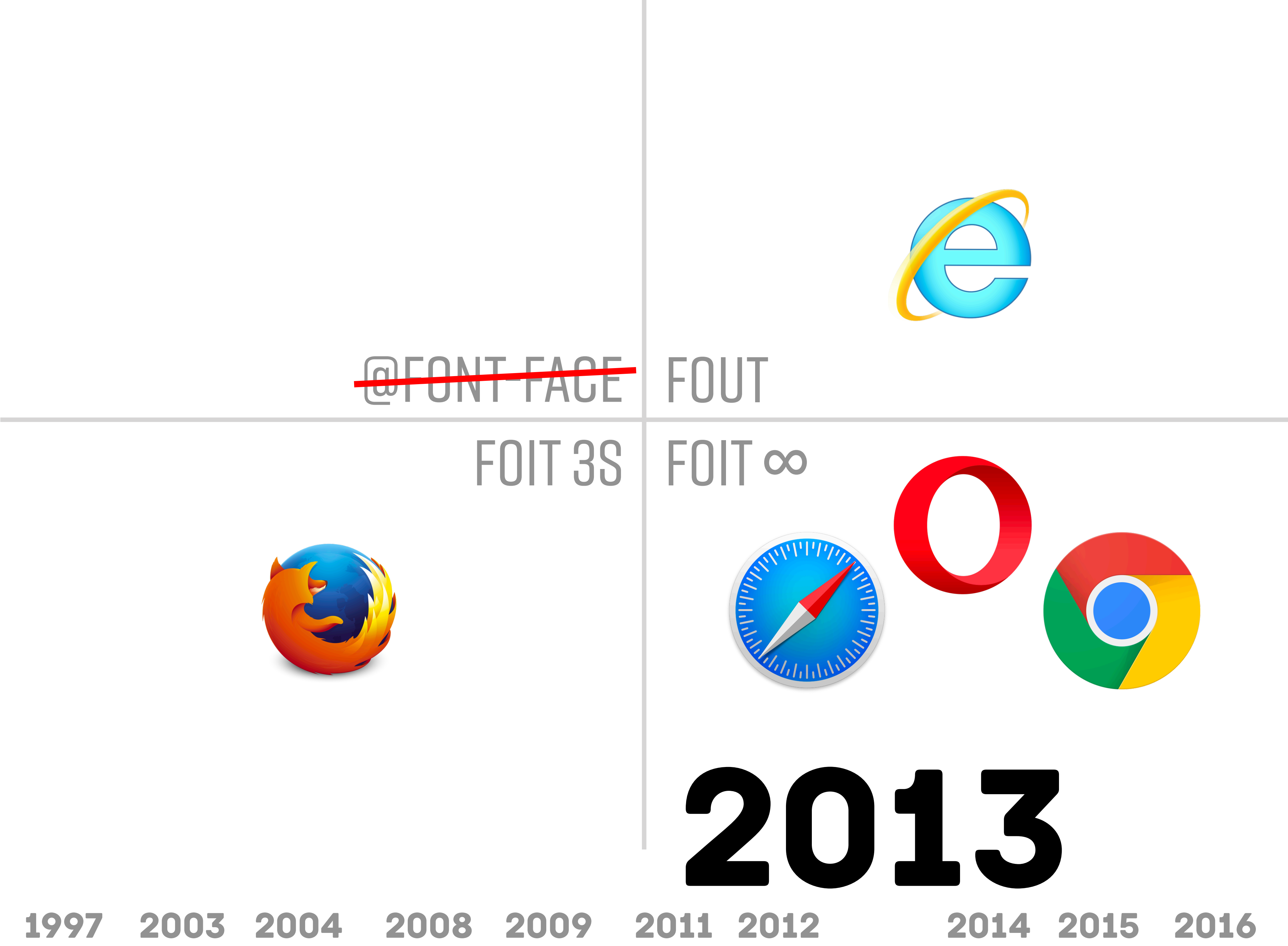
2011

1997 2003 2004 2008 2009 2012 2013 2014 2015 2016



2012

1997 2003 2004 2008 2009 2011 2013 2014 2015 2016



~~@FONT FACE~~

FOUT



FOIT 3S

FOIT ∞



2013

1997

2003

2004

2008

2009

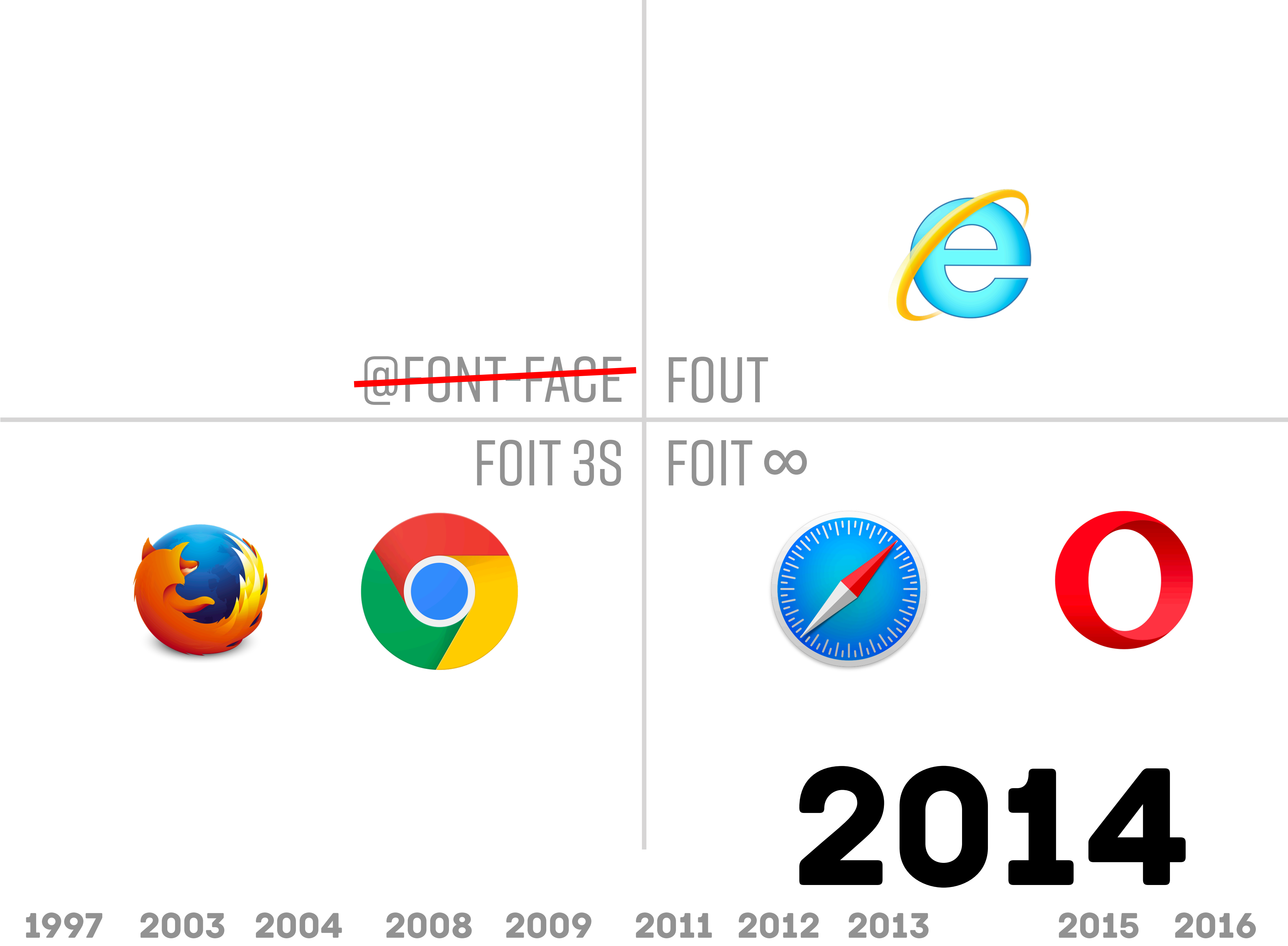
2011

2012

2014

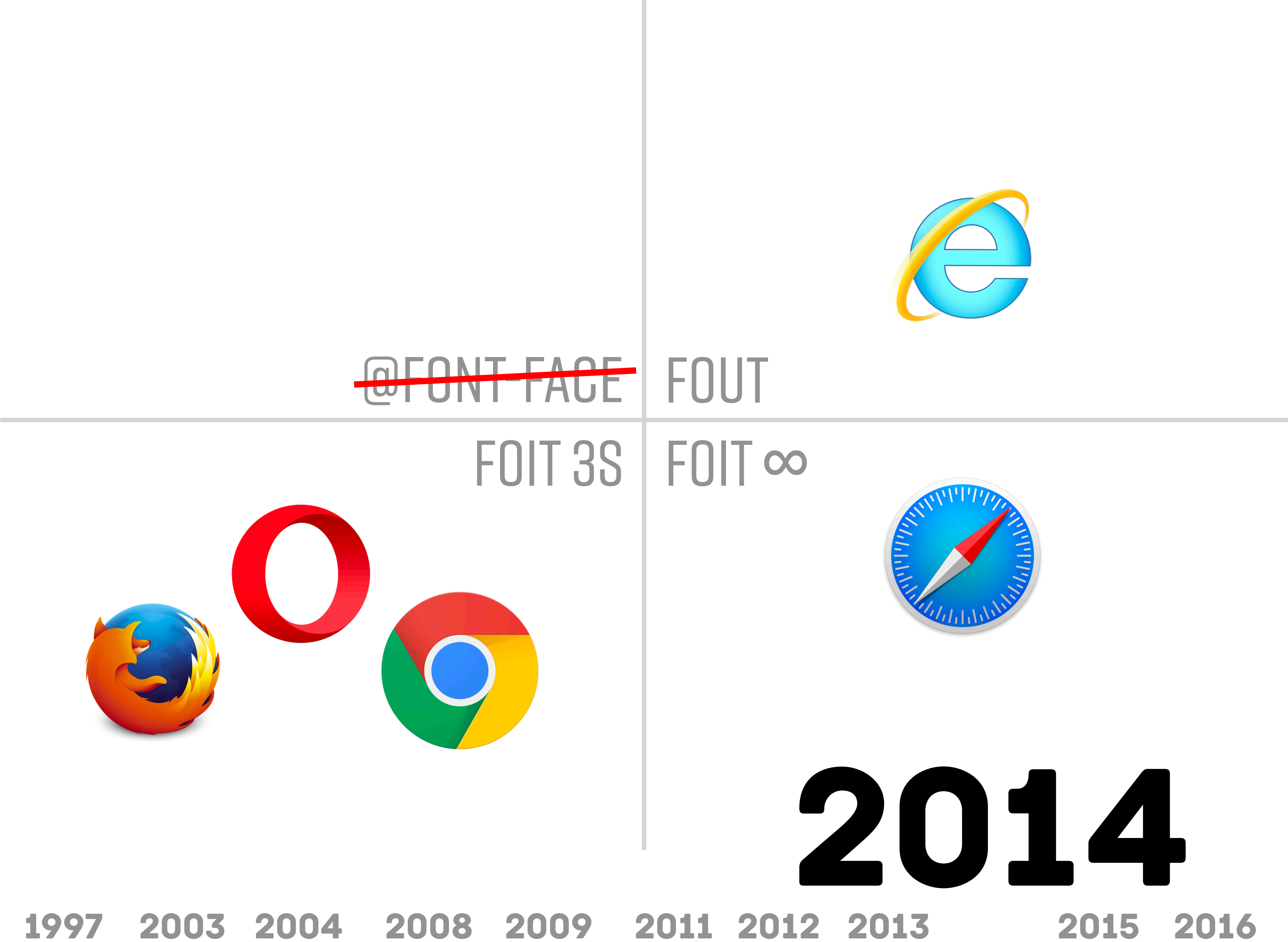
2015

2016



2014

1997 2003 2004 2008 2009 2011 2012 2013 2015 2016



1997

2003

2004

2008

2009

2011

2012

2013

2015

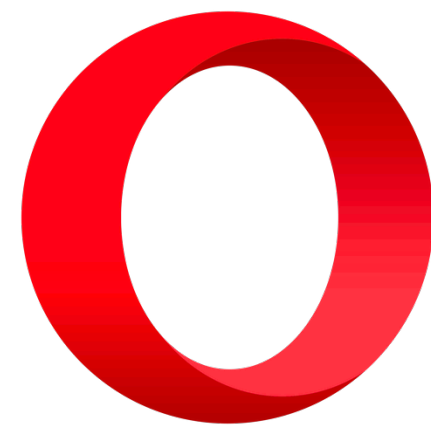
2016

2014

1997



2003



2004



2008

2009

2011

2012

2013

2014

2016

~~@FONT FACE~~

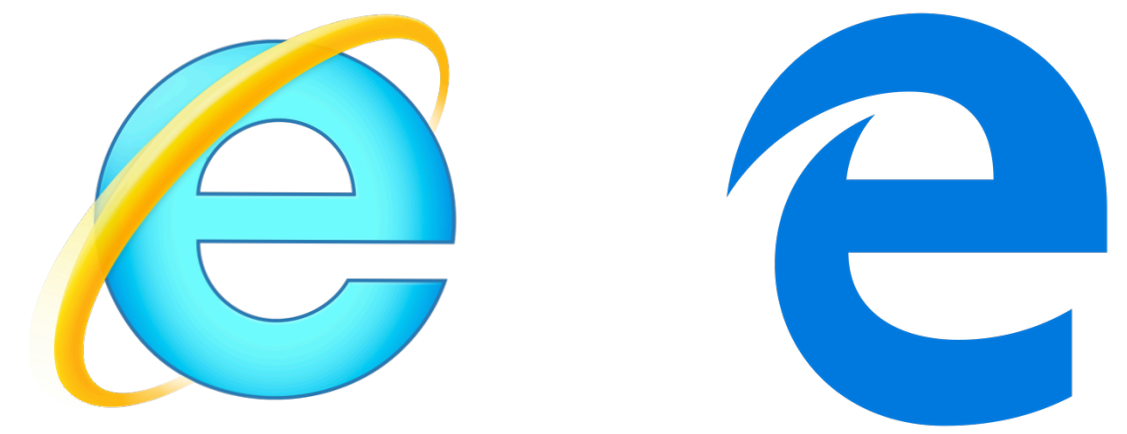
FOUT

FOIT 3S

FOIT ∞



2015



~~@FONT FACE~~

FOUT

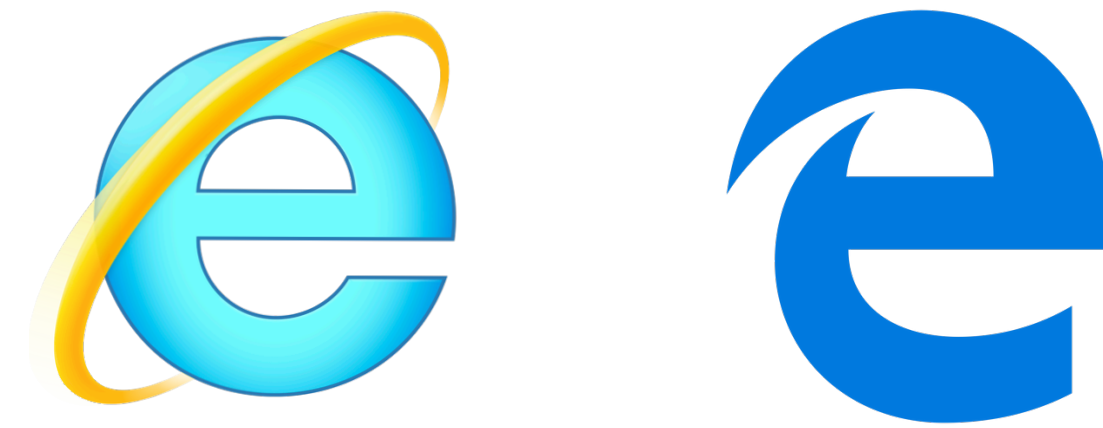
FOIT 3S

FOIT ∞



2016

1997 2003 2004 2008 2009 2011 2012 2013 2014 2015



~~@FONT FACE~~

FOUT

FOIT 3S

FOIT ∞



1997

2003

2004

2008

2009

2011

2012

2013

2014

2015

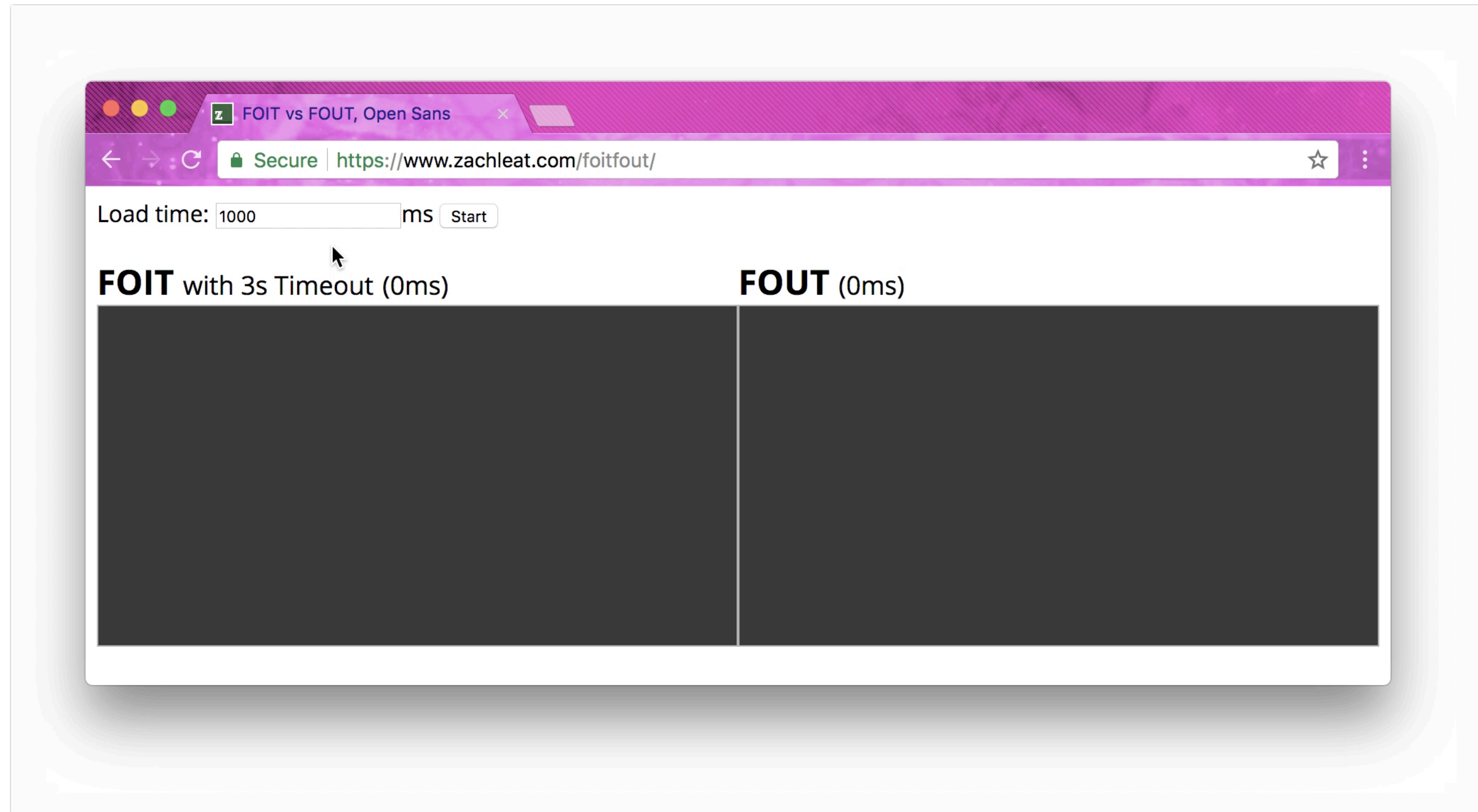
2016



FOIT

FOUT

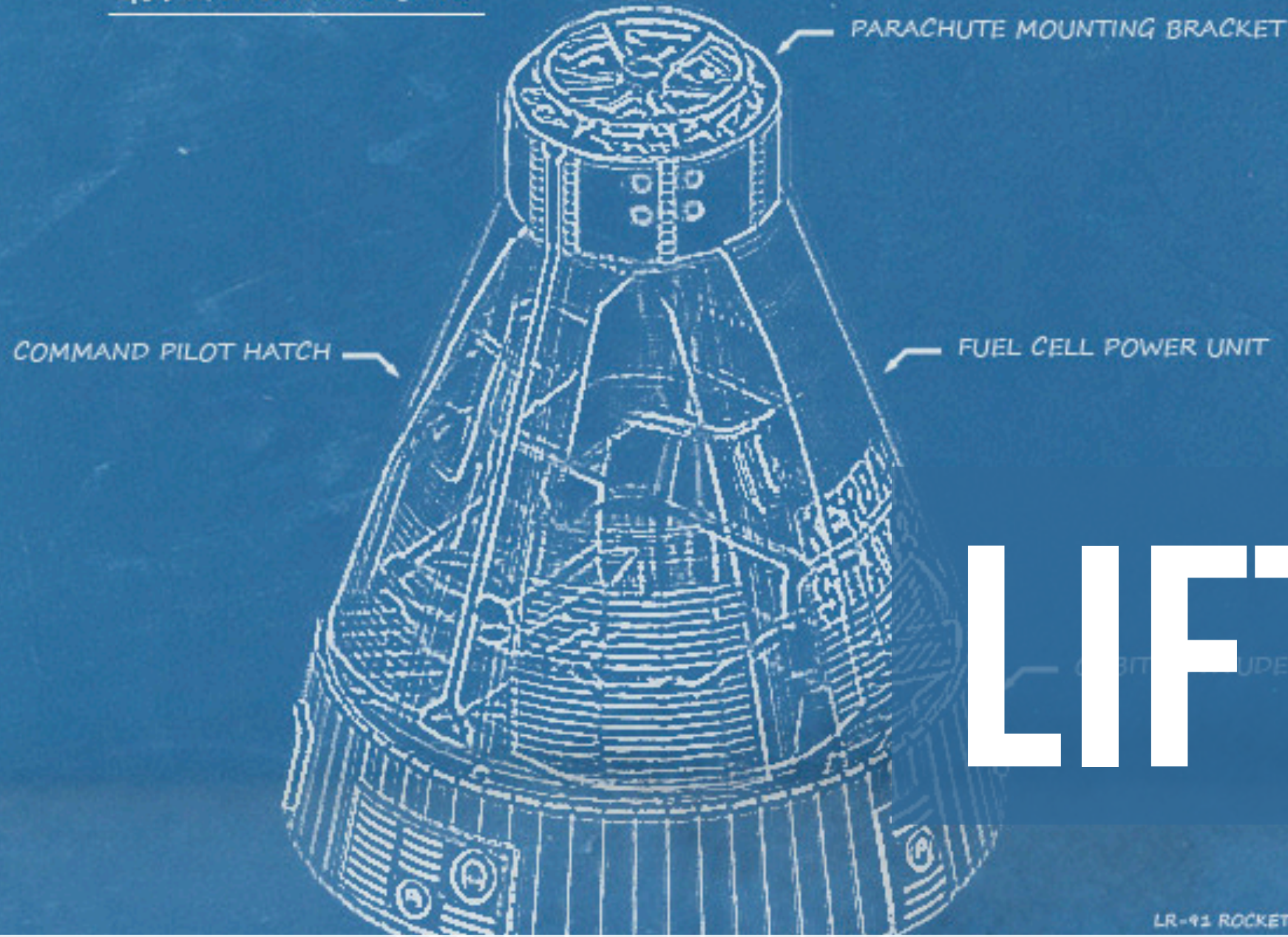




FOIT FOUT COMPARISON

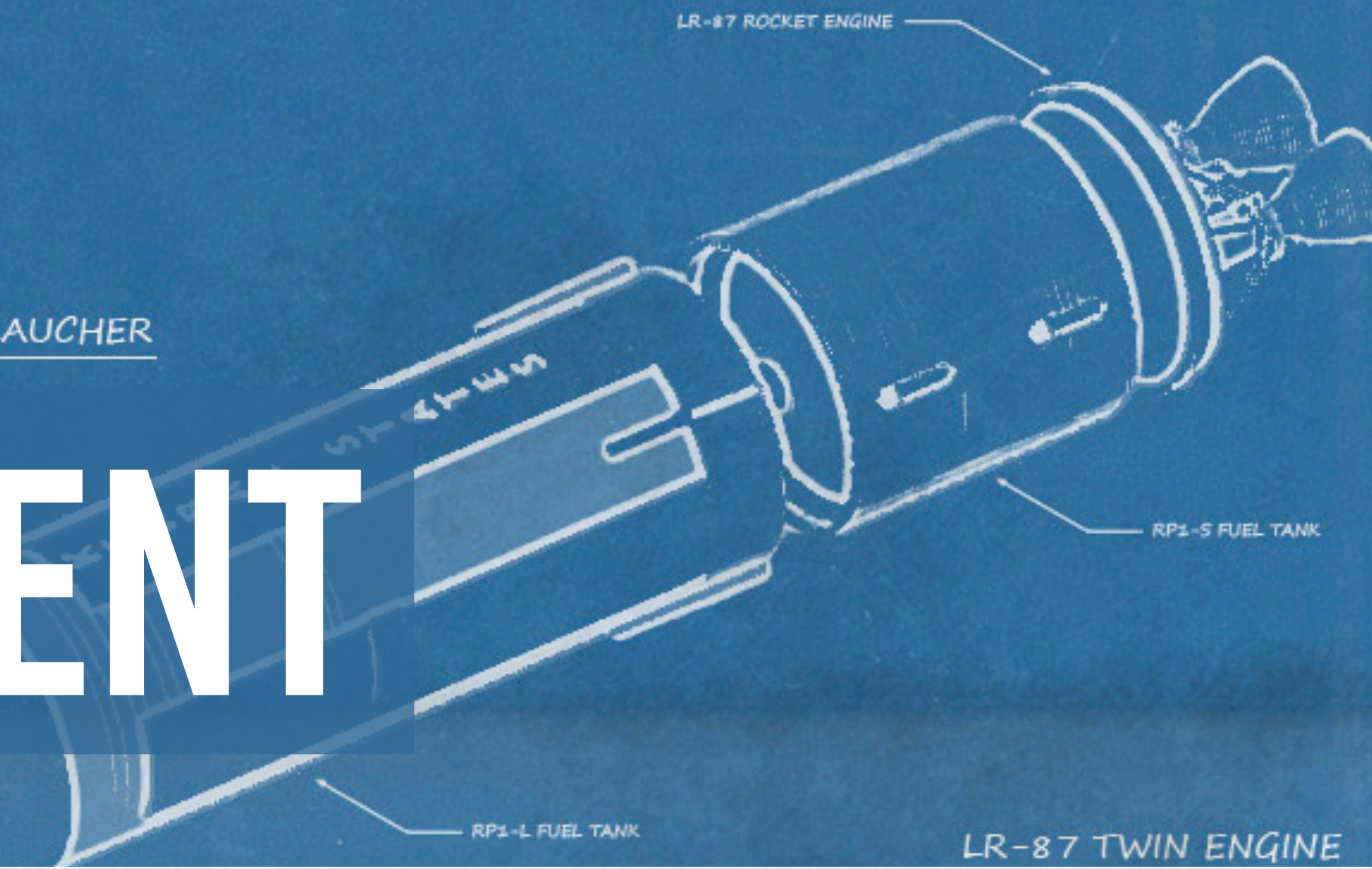
<https://zachleat.com/foitfout/>

GEMINI CAPSULE V2



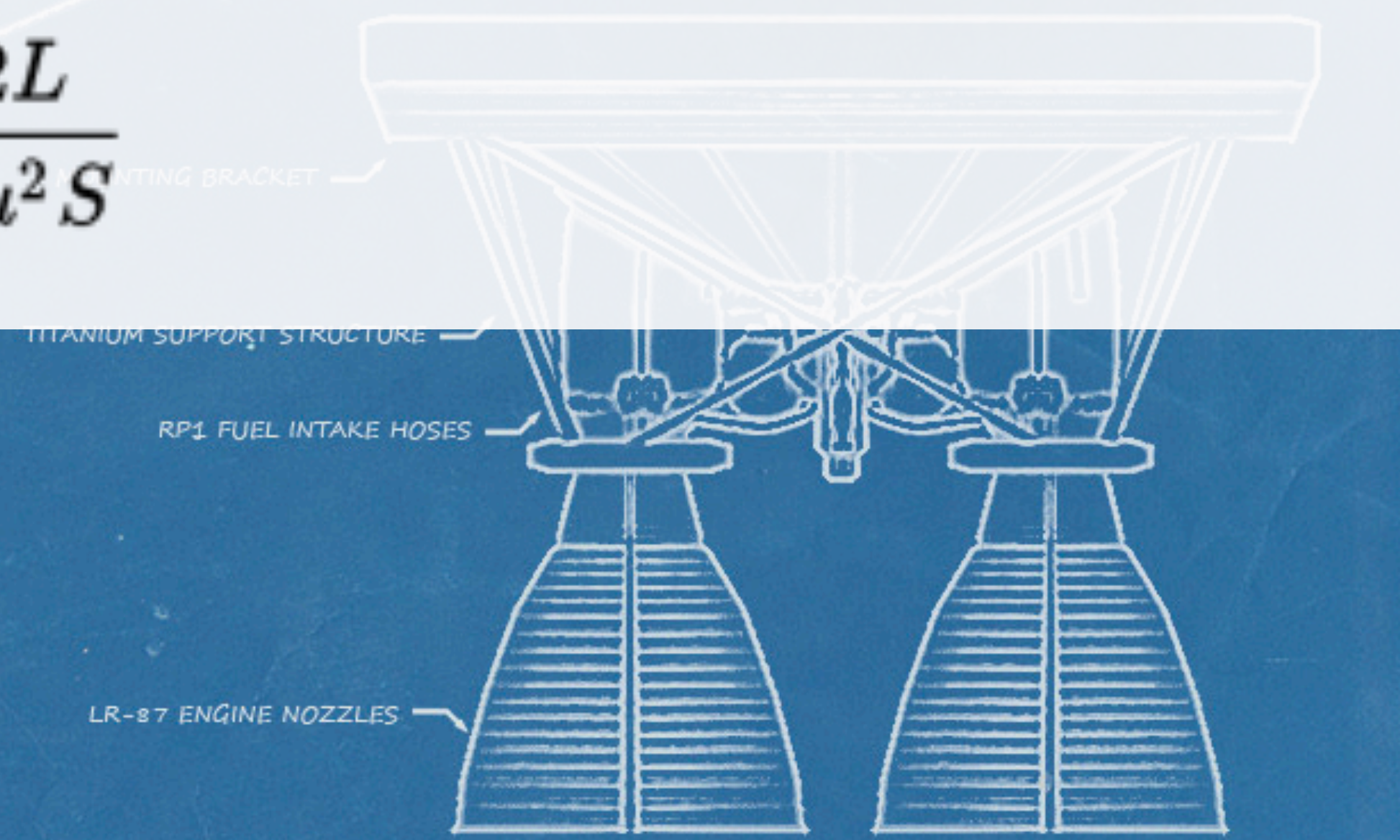
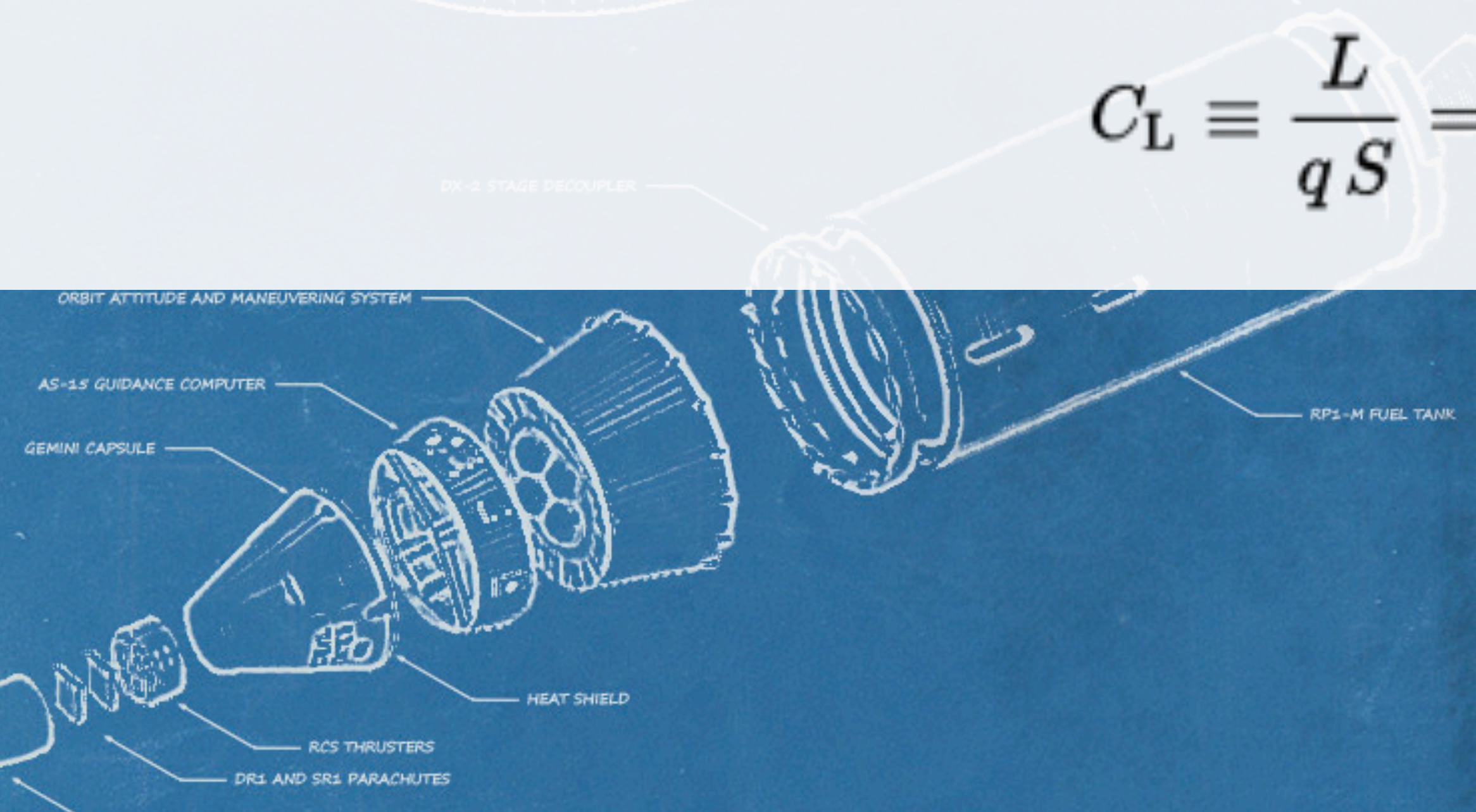
TOTAL FLIGHT SPECIFICATIONS	
MASS	95,095 kg
HEIGHT	25 m
RANGE	3,200 km
THRUST	1,300 MN
DELTA V	15,644
ISP	1005
TWR	1.39

TITAN II LAUNCHER



LIFT COEFFICIENT

$$C_L \equiv \frac{L}{qS} = \frac{L}{\frac{1}{2}\rho u^2 S} = \frac{2L}{\rho u^2 S}$$



1 MITT

2 INVISIBLE
UNSTYLED

3 ***@FONT-FACE***

4 STRATEGIES

```
@font-face {  
  font-family: Open Sans;  
  src: url('opensans.eot'),  
  src: url('opensans.eot?#iefix') format('embedded-opentype'),  
  url('opensans.woff') format('woff'),  
  url('opensans.ttf') format('truetype'),  
  url('opensans.svg#font-face') format('svg');  
}
```



RETIRE

**BULLETPROOF
@FONT-FACE**

**WEB FONTS ARE
PROGRESSIVE ENHANCEMENT**

```
@font-face {  
  font-family: Open Sans;  
  src: url('opensans.woff2') format('woff2'),  
       url('opensans.woff') format('woff');  
}
```

2 FORMATS

WOFF

WOFF2

~30% SMALLER*

WOFF	11	17	61	68	11.1	53	11.4	all	67	10	46	67	60	11	11.8	7.2	1.2	7.12
WOFF2	11	17	61	68	¹ 11.1	53	11.4	all	67	10	46	67	60	11	11.8	7.2	1.2	7.12

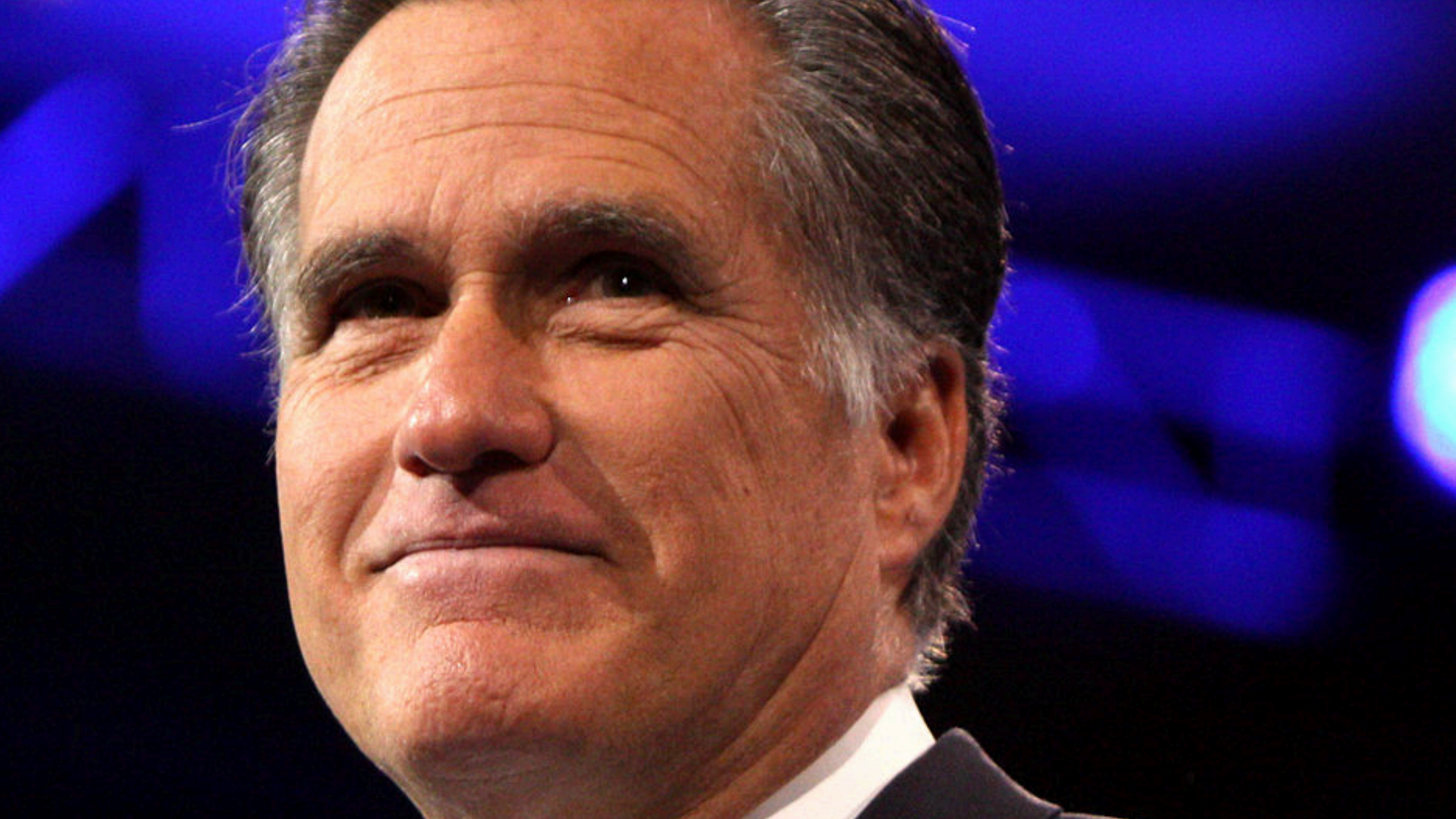
* <https://www.w3.org/TR/WOFF20ER/>

1 MITT

2 INVISIBLE
UNSTYLED

3 @FONT-FACE

4 ***STRATEGIES***




```
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic.woff2') format('woff2'),  
       url('tgothic.woff') format('woff');  
}
```

```
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic-italic.woff2') format('woff2'),  
       url('tgothic-italic.woff') format('woff');  
  font-style: italic;  
}
```



●○○○○ T-Mobile 12:06 PM 100%
slate.com

Mitt Romney Is Officially Running for President

By Betsy Woodruff

<https://twitter.com/jmuspratt/status/561239961924403200>

```
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic.woff2') format('woff2'),  
       url('tgothic.woff') format('woff');  
  font-display: swap;  
}
```

```
@font-face {  
  font-family: Titling Gothic;  
  src: url('tgothic-italic.woff2') format('woff2'),  
       url('tgothic-italic.woff') format('woff');  
  font-style: italic;  
  font-display: swap;  
}
```



CONGRATULATIONS

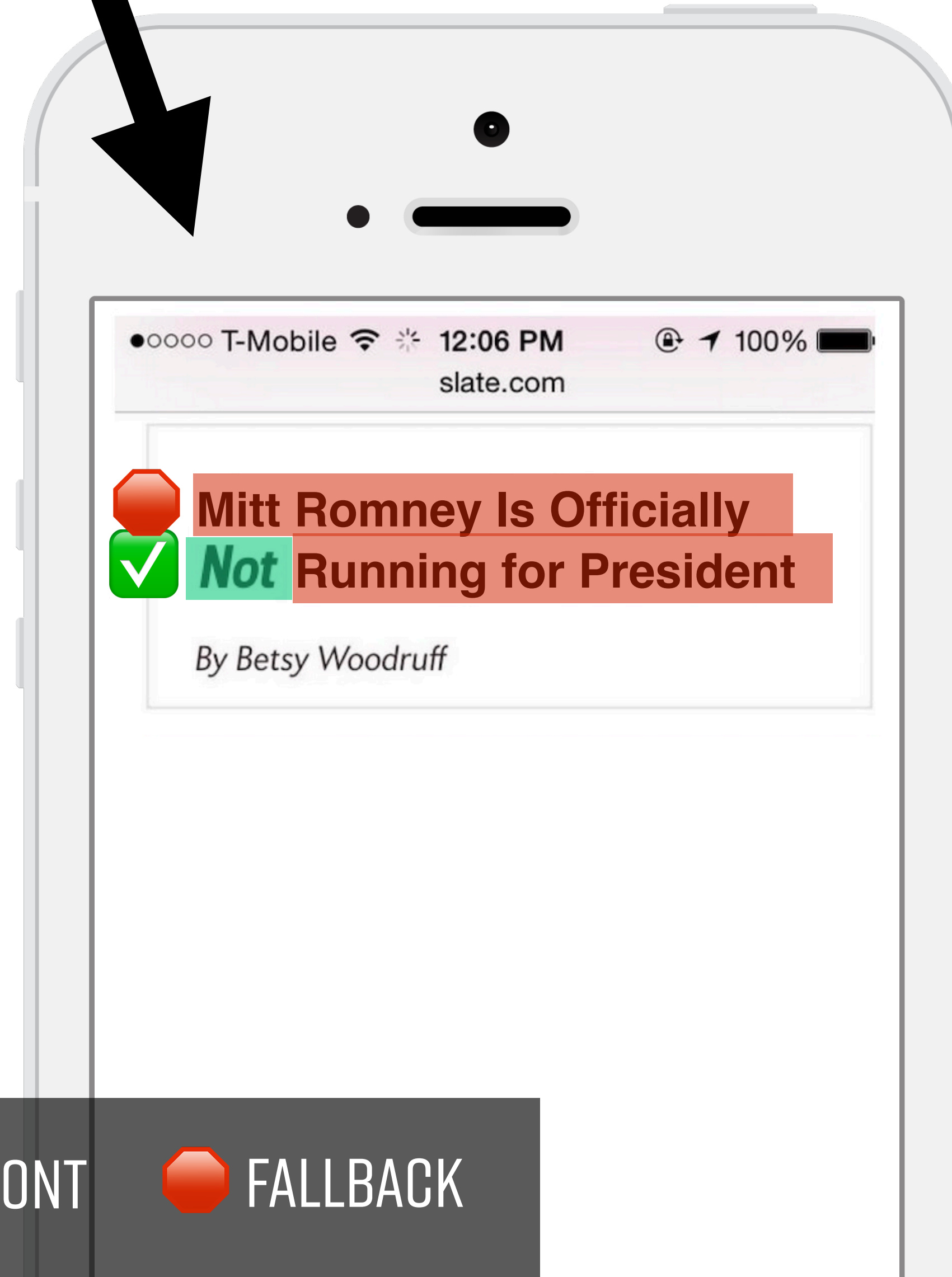
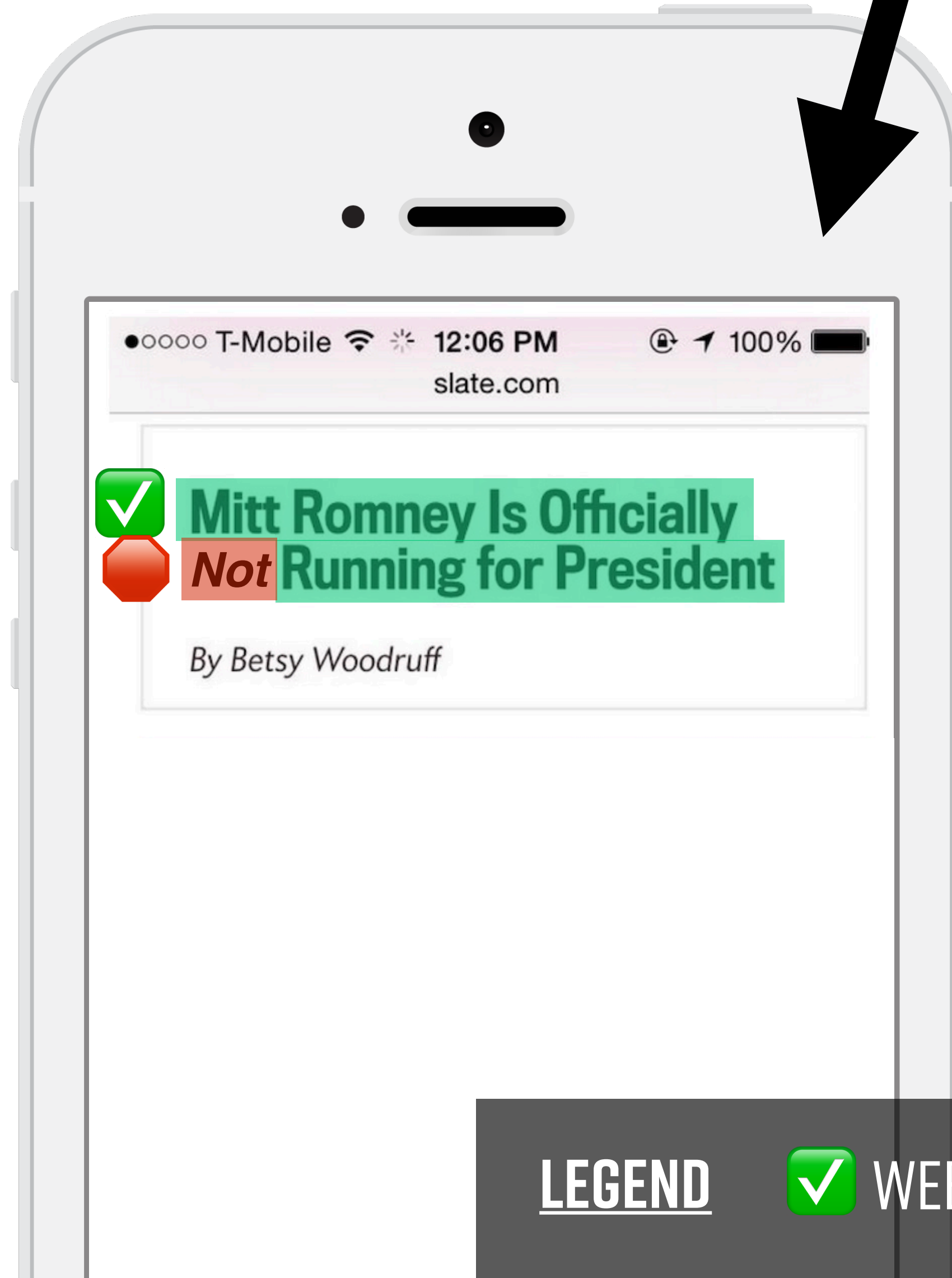
YOU COMPLETED YOUR FIRST
FONT LOADING STRATEGY

FONT-DISPLAY



font-display: swap;
REGULAR LOADED FIRST

font-display: swap;
ITALIC LOADED FIRST



LEGEND



WEB FONT



FALLBACK

**I ADDED FONT-DISPLAY
BUT MY WEB FONTS
STILL SEEM SLOW**



DOWNLOAD CHECKLIST

- ✓ CSS PARSED, @FONT-FACE FOUND
- ✓ A NODE IN THE DOCUMENT:
 - MATCH ON FONT-FAMILY
 - HAS TEXT CONTENT
 - UNICODE-RANGE MATCHES TEXT CONTENT



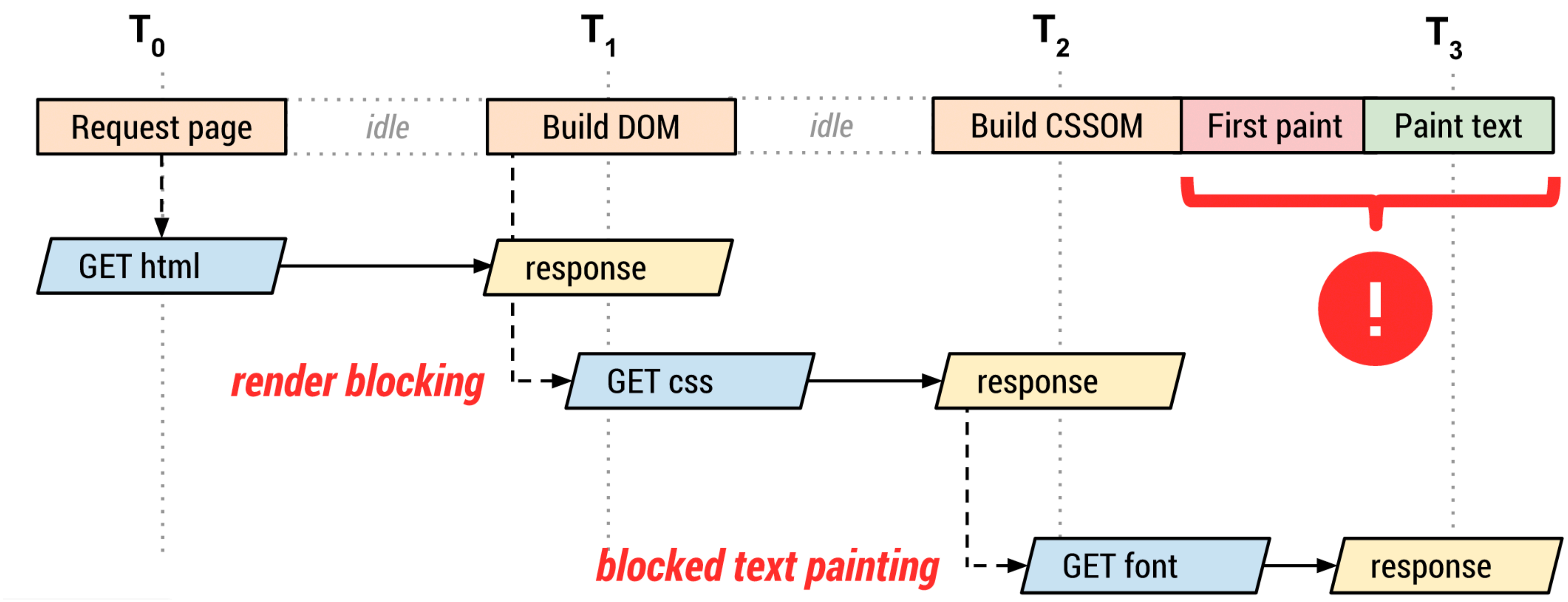
Zach Leatherman

@zachleat



nytimes.com is still the undefeated web font
champion with **@font-face** rules.

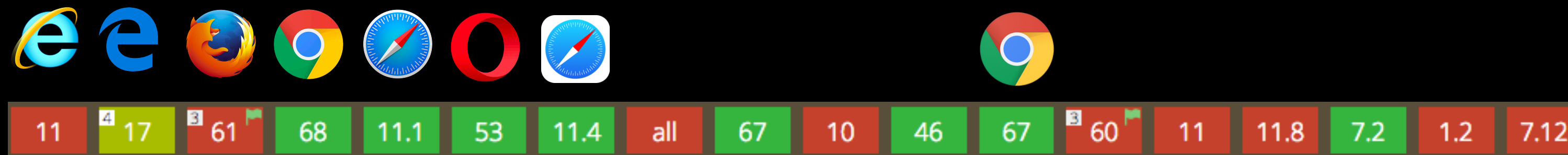




WEB FONT REQUESTS
OFTEN DON'T START
UNTIL *FIRST RENDER*



PRELOAD



PAIRS WITH FONT-DISPLAY

```
<head>
```

```
<!-- ... -->
```

```
<link rel="preload"  
      href="opensans.woff2"  
      as="font"  
      type="font/woff2"  
      crossorigin>
```

FOOT



WITH CLASS

```
@font-face {  
  font-family: Lato;  
  src: url('lato.woff2') format('woff2'),  
       url('lato.woff') format('woff');  
}
```

```
@font-face {  
  font-family: Lato;  
  src: url('lato-bold.woff2') format('woff2'),  
       url('lato-bold.woff') format('woff');  
  font-weight: 700;  
}
```

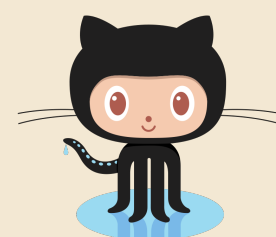
```
body {  
  font-family: sans-serif;  
}  
.fonts-loaded body {  
  font-family: Lato, sans-serif;  
}
```

```
Promise.all([  
  document.fonts.load("1em Lato"),  
  document.fonts.load("700 1em Lato")  
]).then(function () {  
  var docEl = document.documentElement;  
  docEl.classList.add("fonts-loaded");  
});
```

CSS FONT LOADING API

IE	Edge *	Firefox	Chrome	Safari	iOS Safari *	Opera Mini *	Chrome for Android	UC Browser for Android	Samsung Internet
			49						
			63						
			66		10.3				
			67		11.2				4
11	17	61	68	11.1	11.4	all	67	11.8	7.2
	18	62	69	12	12				
		63	70	TP					
			71						

FONTFACEOBSERVER



github.com/bramstein/fontfaceobserver/

NO FOIT 🙄

WORKS WITH THIRD PARTY HOSTS

ONE GROUPED REPAINT

~~REQUIRES METICULOUS SCRUTINY
OF FONT-FAMILY USE~~

POSTCSS-FOFT-CLASSES

<https://github.com/zachleat/postcss-foft-classes>



based on:

<https://github.com/netlify/postcss-fout-with-a-class>

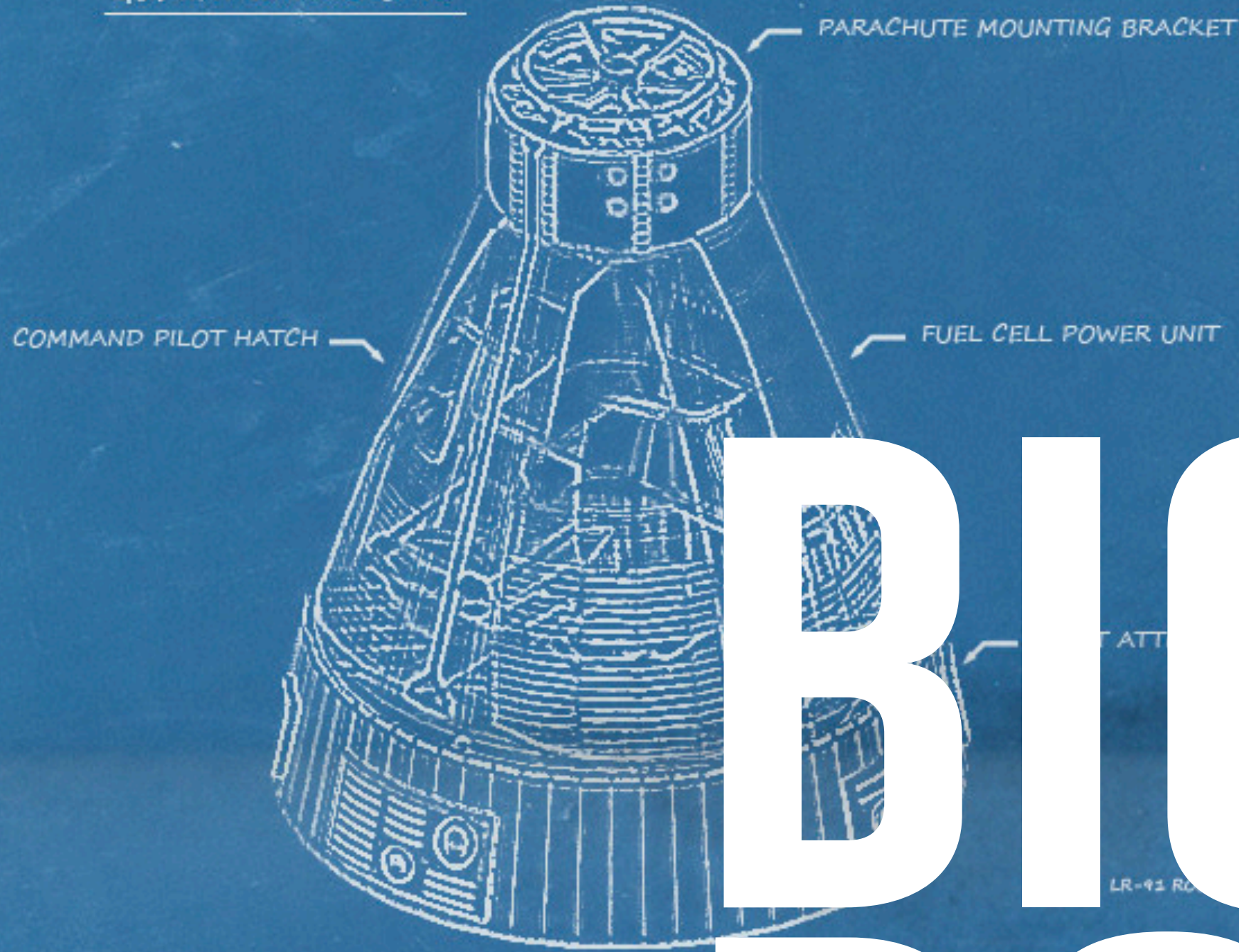
```
body {  
  font-family: Lato, sans-serif;  
}
```

/****** is processed into *****/

```
body {  
  font-family: sans-serif;  
}
```

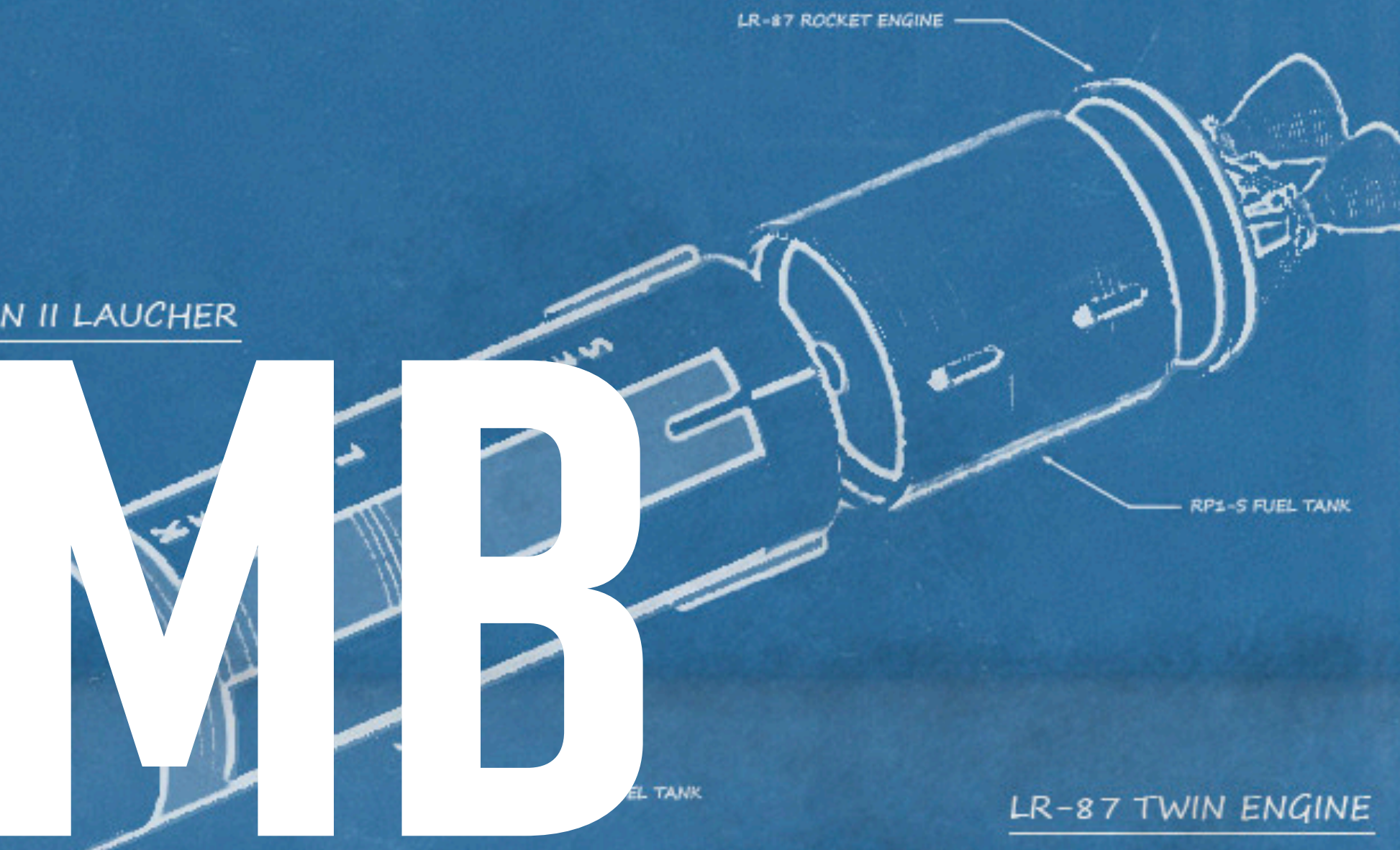
```
.fonts-loaded body {  
  font-family: Lato;  
}
```

GEMINI CAPSULE V2

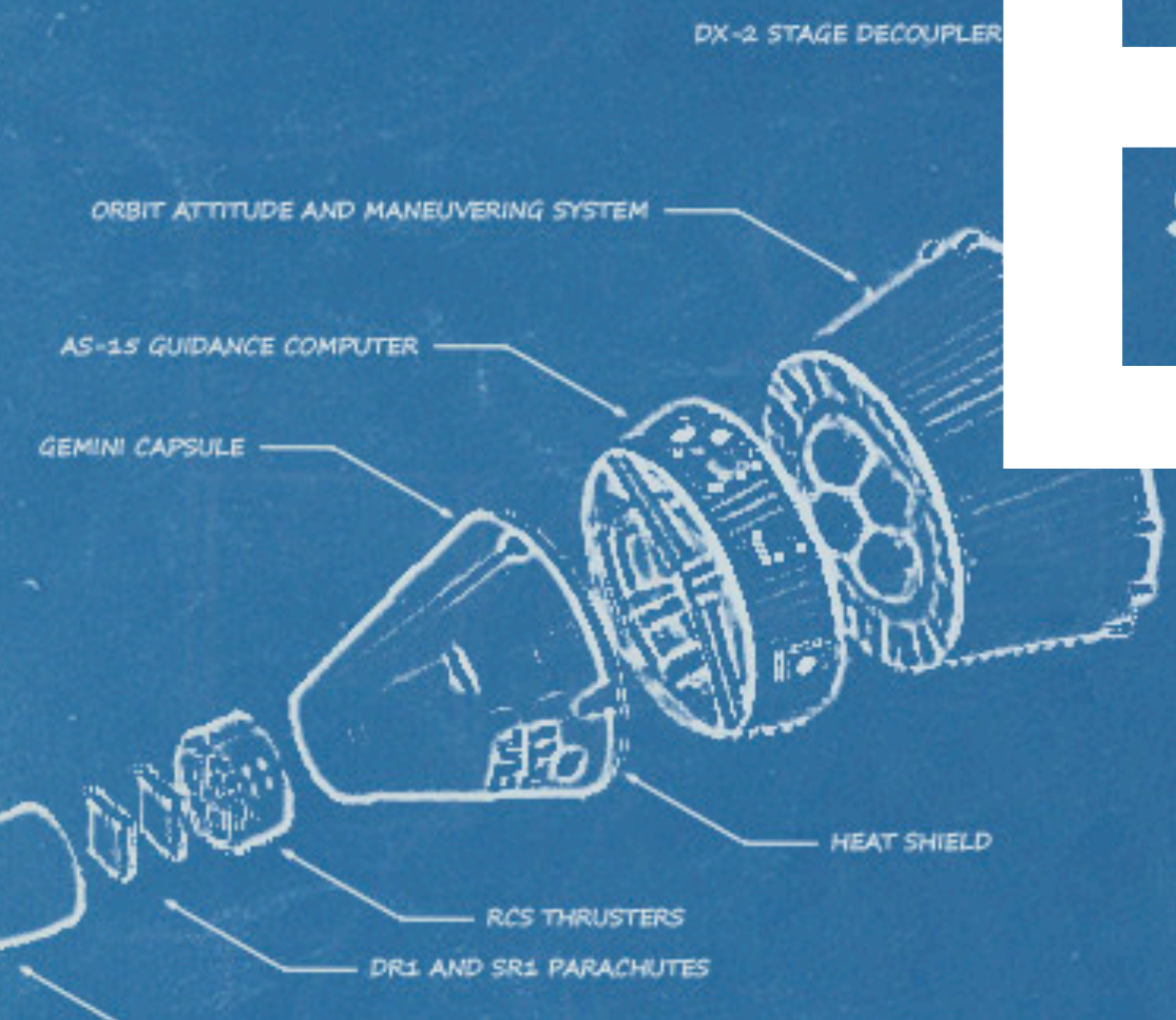


TOTAL FLIGHT SPECIFICATIONS	
MASS	95,095 kg
HEIGHT	25 m
RANGE	3,200 km
THRUST	13,000 kN
DELTA V	15,600 m/s
ISP	300 s
TWR	1.39

TITAN II LAUNCHER



THE BIG DUMB BOOSTER



PART NUMBER	DESCRIPTION	MATERIAL	POLYCOUNT
10000000000000000000	FRIZZANK AERONAUTICS & SPACE ADMINISTRATION		

SUBSET

EVERYTHING



* INTERNATIONALIZATION AND LICENSING REQUIREMENTS

GLYPHHANGER

<https://github.com/filamentgroup/glyphhanger>




> glyphhanger <https://zachleat.com/>

U+20-7E, U+BB, U+2013, U+2014, U+2019, U
+201C, U+201D, U+2605, U+27A1, U+1F525

> glyphhanger <https://zachleat.com/>

U+20-7E, U+BB, U+2013, U+2014, U+2019, U+201C, U+201D, U+2605, U+27A1, U+1F525

!"#\$%&'()*+,-./0123456789:;<=>?
@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_`abc
defghijklmnopqrstuvwxyz{|}~»-

– ’ “ ” ★ → 


```
> glyphhanger https://zachleat.com/ --subset=* .ttf
```

using pyftsubset:
<https://github.com/fonttools/fonttools>

```
~/Code/glyphhanger/test/fonts/lato (master x)★▶ glyphhanger --US_ASCII --subset=*.ttf
Subsetting LatoLatin-Black.ttf to LatoLatin-Black-subset.ttf (was 140.85 KB, now 24.18 KB)
Subsetting LatoLatin-Black.ttf to LatoLatin-Black-subset.zopfli.woff (was 140.85 KB, now 13.75 KB)
Subsetting LatoLatin-Black.ttf to LatoLatin-Black-subset.woff2 (was 140.85 KB, now 11.22 KB)
Subsetting LatoLatin-BlackItalic.ttf to LatoLatin-BlackItalic-subset.ttf (was 147.19 KB, now 24.47 KB)
Subsetting LatoLatin-BlackItalic.ttf to LatoLatin-BlackItalic-subset.zopfli.woff (was 147.19 KB, now 14.09 KB)
Subsetting LatoLatin-BlackItalic.ttf to LatoLatin-BlackItalic-subset.woff2 (was 147.19 KB, now 11.48 KB)
Subsetting LatoLatin-Bold.ttf to LatoLatin-Bold-subset.ttf (was 142.73 KB, now 24.11 KB)
Subsetting LatoLatin-Bold.ttf to LatoLatin-Bold-subset.zopfli.woff (was 142.73 KB, now 14.02 KB)
Subsetting LatoLatin-Bold.ttf to LatoLatin-Bold-subset.woff2 (was 142.73 KB, now 11.35 KB)
Subsetting LatoLatin-BoldItalic.ttf to LatoLatin-BoldItalic-subset.ttf (was 146.25 KB, now 25.14 KB)
Subsetting LatoLatin-BoldItalic.ttf to LatoLatin-BoldItalic-subset.zopfli.woff (was 146.25 KB, now 14.86 KB)
Subsetting LatoLatin-BoldItalic.ttf to LatoLatin-BoldItalic-subset.woff2 (was 146.25 KB, now 12.06 KB)
Subsetting LatoLatin-Italic.ttf to LatoLatin-Italic-subset.ttf (was 150.09 KB, now 25.21 KB)
Subsetting LatoLatin-Italic.ttf to LatoLatin-Italic-subset.zopfli.woff (was 150.09 KB, now 14.88 KB)
Subsetting LatoLatin-Italic.ttf to LatoLatin-Italic-subset.woff2 (was 150.09 KB, now 12.18 KB)
Subsetting LatoLatin-Regular.ttf to LatoLatin-Regular-subset.ttf (was 145.06 KB, now 24 KB)
Subsetting LatoLatin-Regular.ttf to LatoLatin-Regular-subset.zopfli.woff (was 145.06 KB, now 13.97 KB)
Subsetting LatoLatin-Regular.ttf to LatoLatin-Regular-subset.woff2 (was 145.06 KB, now 11.37 KB)
Subsetting LatoLatin-Semibold.ttf to LatoLatin-Semibold-subset.ttf (was 147.38 KB, now 24.07 KB)
Subsetting LatoLatin-Semibold.ttf to LatoLatin-Semibold-subset.zopfli.woff (was 147.38 KB, now 14 KB)
Subsetting LatoLatin-Semibold.ttf to LatoLatin-Semibold-subset.woff2 (was 147.38 KB, now 11.4 KB)
Subsetting LatoLatin-SemiboldItalic.ttf to LatoLatin-SemiboldItalic-subset.ttf (was 149.25 KB, now 25.18 KB)
Subsetting LatoLatin-SemiboldItalic.ttf to LatoLatin-SemiboldItalic-subset.zopfli.woff (was 149.25 KB, now 14.86 KB)
Subsetting LatoLatin-SemiboldItalic.ttf to LatoLatin-SemiboldItalic-subset.woff2 (was 149.25 KB, now 12.14 KB)
```

as 140.85 KB, now 13.75 KB)

.85 KB, now 11.22 KB)

f (was 147.19 KB, now 24.47 KB)

pfli.woff (was 147.19 KB, now 14.09 KB)

ff2 (was 147.19 KB, now 11.48 KB)

KB, now 24.11 KB)

142.73 KB, now 14.02 KB)

3 KB, now 11.35 KB)

8 VARIATIONS

BEFORE TTF

1.14 MB

AFTER TTF

196 KB

AFTER WOFF2

93 KB

```
> glyphhanger --whitelist="ABCD" --subset=*.ttf
```

```
> glyphhanger --whitelist="U+41-44" --subset=*.ttf
```

using pyftsubset:

<https://github.com/fonttools/fonttools>

SMALLER FONT FILES LOAD FASTER

REDUCE FOIT

REDUCE FOUT

VARIABLE FONTS

San Francisco Black

SF-PRO-DISPLAY-BLACK.OTF

San Francisco Heavy

SF-PRO-DISPLAY-HEAVY.OTF

San Francisco Bold

SF-PRO-DISPLAY-BOLD.OTF

San Francisco Semibold

SF-PRO-DISPLAY-SEMIBOLD.OTF

San Francisco Medium

SF-PRO-DISPLAY-MEDIUM.OTF

San Francisco Regular

SF-PRO-DISPLAY-REGULAR.OTF

San Francisco Light

SF-PRO-DISPLAY-LIGHT.OTF

San Francisco Ultralight

SF-PRO-DISPLAY-ULTRALIGHT.OTF

SF-PRO-DISPLAY-BLACK.OTF

SF-PRO-DISPLAY-HEAVY.OTF

SF-PRO-DISPLAY-BOLD.OTF

SF-PRO-DISPLAY-SEMIBOLD.OTF

SF-PRO-DISPLAY-MEDIUM.OTF

SF-PRO-DISPLAY-REGULAR.OTF

SF-PRO-DISPLAY-LIGHT.OTF

SF-PRO-DISPLAY-ULTRALIGHT.OTF

**One Variable
Font File**

@zachleat

Introduction

MY SPECIMENS

Old Default

SPECIMENS

- 文鼎晶熙黑
- 晶熙ゴシック体
- Amstelvar
- Avenir Next
- BitCount
- Buffalo Gal
- Compressa
- Decovar
- DIN 2014
- Dunbar
- Fit
- Gingham
- Grade

Axis-Praxis is a website for playing with OpenType Variable Fonts

Discover 30+ variable fonts. Experiment with the typographic controls in the right panel on this default layout, or choose a typeface specimen from the left column. Every textbox is fully editable: change font, font size, alignment, line-spacing as well as the variation sliders. And type your own text, of course.



Font makers can try out their own variable fonts. Just drag any variable TTF to the right panel, the current textbox gets set to that font, and its axes show up right away in the Font Variation section.

TEXTBOX

Textbox: heading1

Font: Zeitung Pro Regular

Drag & drop fonts here

Font size: [Slider]

Line-height: [Slider]

Alignment: [Left] [Center] [Right] [Justified]

CSS New textbox Delete textbox

FONT VARIATIONS

Instance: Thin

Weight: [Slider]

Optical Size: [Slider]

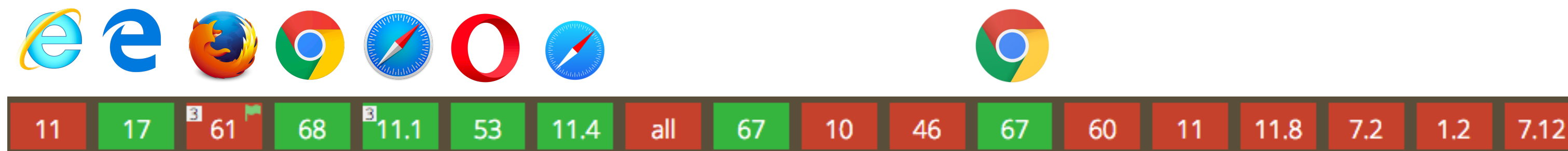
FONT FEATURES

- c2sc calt case dnom frac liga lnum locl
- numr onum pnum sinf smcp ss01 subs
- sups tnum zero

COLOUR



VARIABLE FONTS



YOU PAY WITH KB

SOURCE SANS PRO

39_{KB} ROMAN

39_{KB} LIGHT

38_{KB} BOLD


116KB

SOURCE SANS PRO


VARIABLE

115KB

 [adobe-fonts / source-sans-pro](#)

 Watch ▾

145

 Star

2,153

 Fork

156

 Code

 Issues **39**

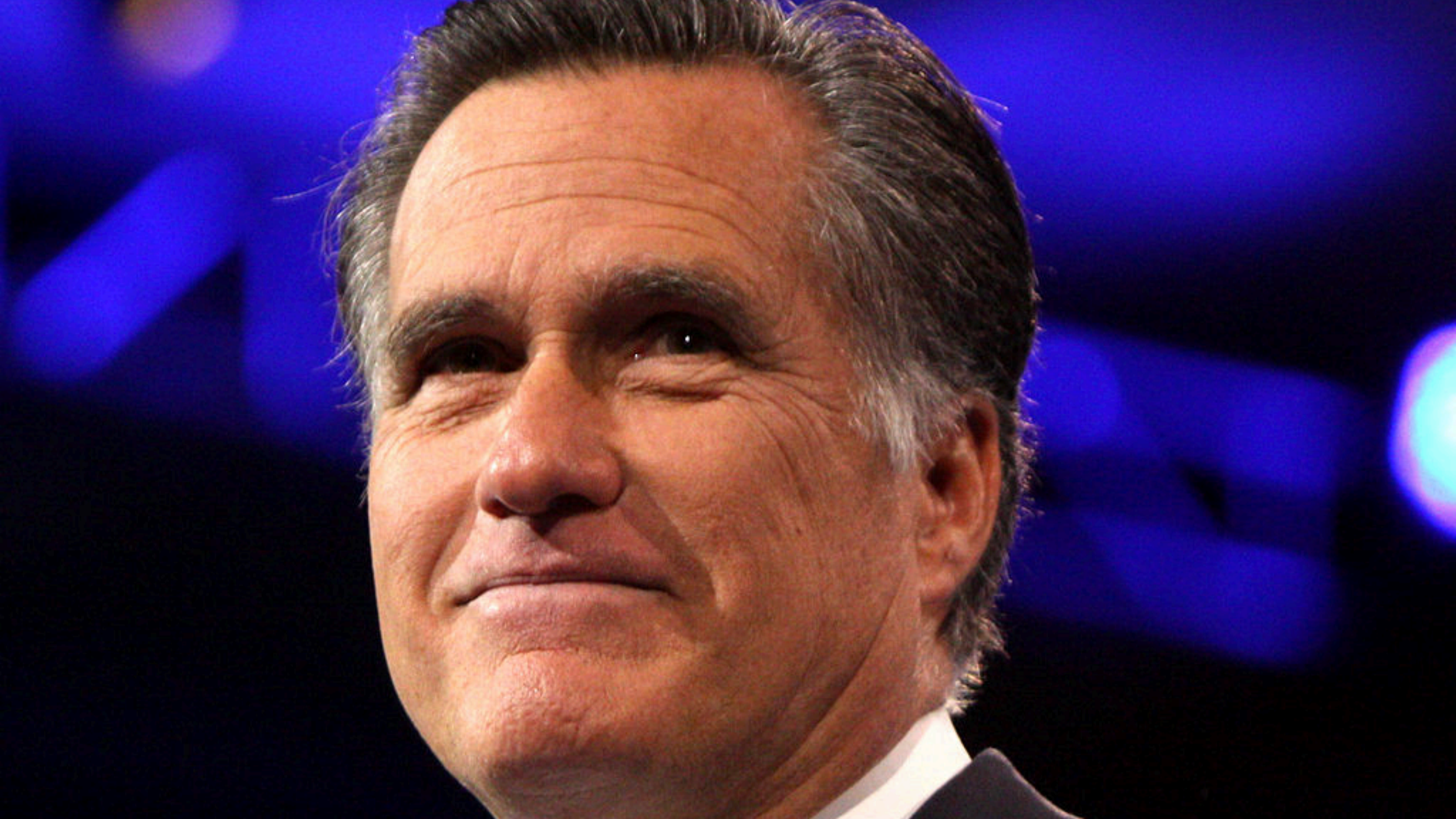
 Pull requests **0**

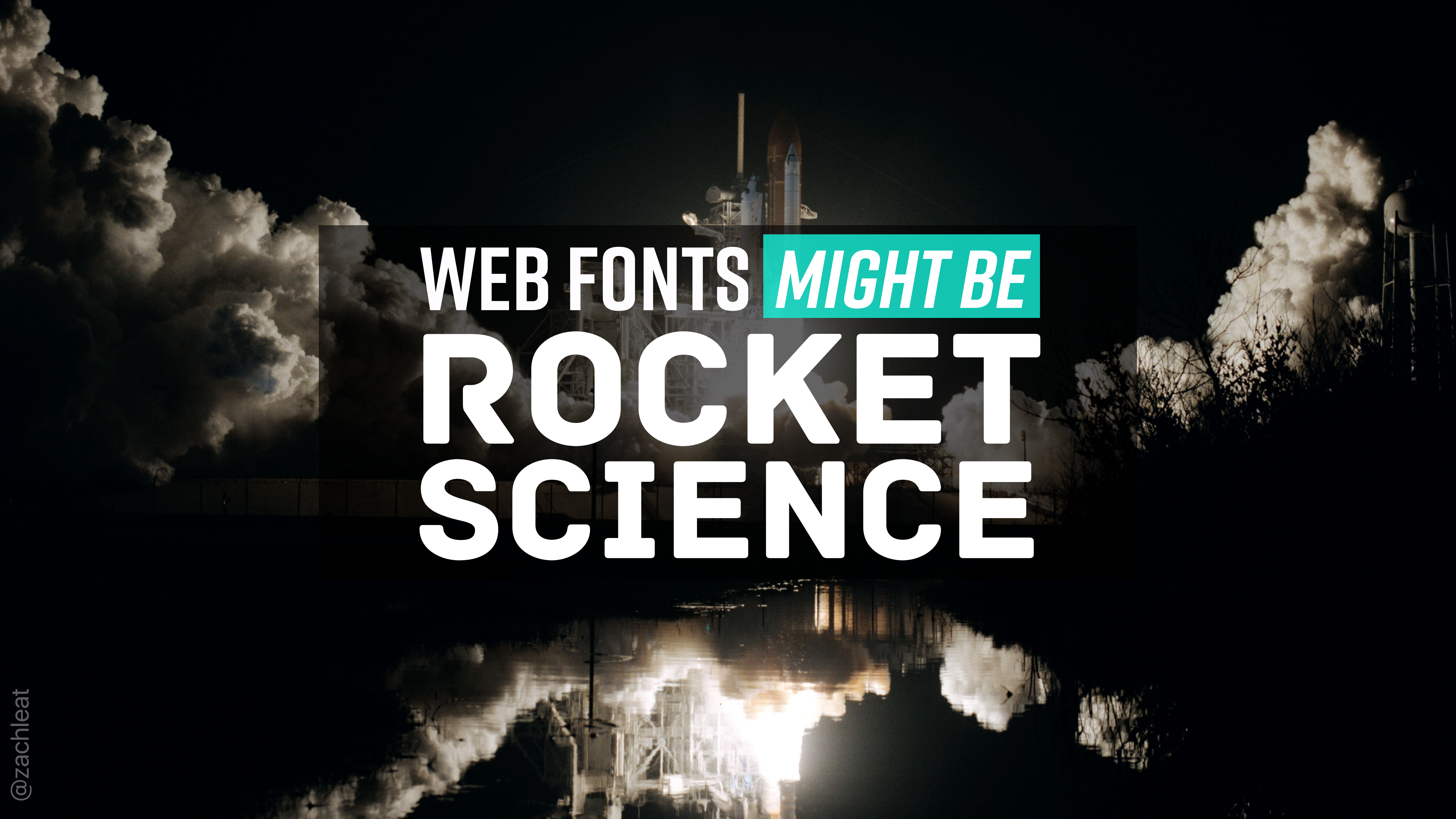
 Projects **0**

 Insights

WOFF2 SIZES SHOWN

VARIABLE FONTS FORCE
GROUPED REPAINTS





WEB FONTS *MIGHT BE*
ROCKET
SCIENCE

CHECKLIST

NO INVISIBLE TEXT:

* USE **FOUT**

REFLOW AS LITTLE AS POSSIBLE, AS SOON AS POSSIBLE

* **FEWER REPAINTS (GROUP THEM)**

* **TRIGGER DOWNLOAD SOONER**

* **MAKE FONT FILES SMALLER**

CHECKLIST SOLUTIONS

NO INVISIBLE TEXT

FONT-DISPLAY

CSS FONT LOADING API

GROUPED REPAINTS

CSS FONT LOADING API

VARIABLE FONTS

TRIGGER DOWNLOAD SOONER

PRELOAD

FONT FILES SMALLER

WOFF2

SUBSETS

**A COMPREHENSIVE GUIDE TO
FONT LOADING
STRATEGIES**

zachleat.com/web/comprehensive-webfonts/

WEB FONT LOADING RECIPES

<https://github.com/zachleat/web-font-loading-recipes>



INSPIRED BY



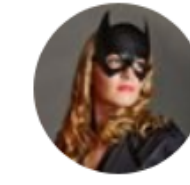
Bram Stein
@bram_stein



Roel Nieskens
@pixelambacht



Andrew Johnson
@Aetherpoint



Mandy Michael
@Mandy_Kerr



Monica Dinculescu
@notwaldorf



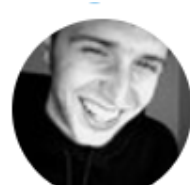
Marcin Wichary
@mwichary



Ilya Grigorik ✓
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Jeremy Wagner
@malchata



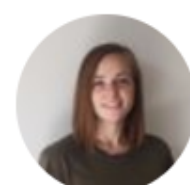
David Jonathan Ross
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Jason Pamental
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Mathias Bynens ✓
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THANK YOU



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