Typography and Fonts

Session 803

Antonio Cavedoni Type Designer
Agenda
Agenda

San Francisco
Agenda

San Francisco
Terminology
Agenda

San Francisco
Terminology
Concepts
Agenda

San Francisco
Terminology
Concepts
Tools
Agenda

San Francisco
Terminology
Concepts
Tools
Details
San Francisco
San Francisco

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
123456789&0
Introducing the New System Fonts

Fonts lay at the intersection of design and engineering. Get introduced to typographic principles and how they apply to the San Francisco fonts. Hear what makes this family of fonts unique and how to effectively take advantage of their advanced features. Learn best practices when designing and implementing interfaces with text.

WWDC 2015 - Session 824 - iOS, OS X
Designed by Apple in California
Designed by Apple in California
Designed by Apple in California
Designed by Apple in California
Designed by Apple in California
Designed by Apple in California
Latin

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
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ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz
АБВГДЕЖЗИЙКЛМНОПРСТУФХЦЧШЩЬЮЯ
абвгдежзийклмнопрстуфхцчшщьюя
Monospaced

monospaced

monospaced
Same Widths Across Weights

monospaced

monospaced

monospaced

monospaced
Same Widths Across Weights
Coding and Small Sizes
Coding and Small Sizes

SF

SF Mono
// 1. Create a circle
let circle = Circle(radius: 3)
circle.center.y += 20

// 2. Create a rectangle
let rectangle = Rectangle(width: 10, height: 5, cornerRadius: 0.75)
rectangle.color = .purple
rectangle.center.y += 18

// 3. Create a line
let line = Line(start: Point(x: -10, y: 9), end: Point(x: 10, y: 9), thickness: 0.5)
line.center.y -= 2
line.rotation = 170 * (3.14159/180)
line.color = .yellow

// 4. Create text
let text = Text(string: "Hello world!", fontSize: 32.0, fontName: "Futura", color: .red)
text.center.y += 2

// 5. Create an image
let image = Image(name: "SwiftBird", tint: .green)
image.size.width *= 0.5
image.size.height *= 0.5
San Francisco

Applied to all our platforms
New SF Mono family
Terminology
<table>
<thead>
<tr>
<th>Writing systems</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aa</td>
<td>Яя</td>
<td>Ππ</td>
</tr>
<tr>
<td>永</td>
<td>え</td>
<td>알</td>
</tr>
<tr>
<td>क</td>
<td>ص</td>
<td>ʌ</td>
</tr>
</tbody>
</table>
Premise
Writing systems
<table>
<thead>
<tr>
<th>Course</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inclusive App Design</td>
<td>Pacific Heights</td>
<td>Tuesday 10:00AM</td>
</tr>
<tr>
<td>Internationalization Best Practices</td>
<td>Mission</td>
<td>Tuesday 9:00AM</td>
</tr>
</tbody>
</table>

**Premise**

Writing systems

<table>
<thead>
<tr>
<th>Character</th>
<th>Character</th>
<th>Character</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aа</td>
<td>Яя</td>
<td>Пп</td>
</tr>
<tr>
<td>永</td>
<td>え</td>
<td>알</td>
</tr>
<tr>
<td>क</td>
<td>ص</td>
<td></td>
</tr>
</tbody>
</table>

**Internationalization Best Practices**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
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<td>Pacific Heights</td>
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</tr>
<tr>
<td>永</td>
<td>Mission</td>
<td>Tuesday 9:00AM</td>
</tr>
</tbody>
</table>
Ap
“App”  Apparently  Apple
Character
Character

U+0041
Font
Feature
Feature
Automatic
Feature
Automatic
Feature
Automatic
Feature
Automatic
Feature
Automatic
Feature
Optional
Feature
Optional
Style
Typeface
Typeface
Typeface
Typography
Writers, Editors
Unicode
Type Designers, Font Manufacturers
Typographers
Typographers = You
Typographers
Spacing
Spacing
Spacing
Tracking

0

ABC
Tracking

-5

ABC
Tracking

0

A B C
Tracking

+20

A B C
Kerning

ALTA VILLA
Kerning

ALTAVILLA

A V −55
Leading
Leading
Leading
Spacing

Tracking

AV
Spacing

Tracking

Kerning
Embedded in the Font
Concepts
Legibility
Legibility

Designed by Apple in California
Legibility

Designed by Apple in California
Scale in Legibility

Designed by Apple in California
Designed by Apple in California
Scale

Designed by Apple in California
Legibility in Layout
Legibility in Layout
## Density

Body Level One

- Body Level Two

Body Level Four

Body Level Five
Density
Layout

Iterative UI Design

Presidio

Friday 10:00AM
Scale and Density in Glyph Design
Greenpoint Av Station

G To Church Av
Voice

Helvetica

Greenpoint Av Station

G To Church Av
Greenpoint Av Station
To Church Av
Voice

Greenpoint Av Station
G To Church Av
Voice

Noteworthy

Greenpoint Av
Station

To Church Av
Concepts

Legibility
Scale
Density
Voice
Tools
Available Tools

System Font
Dynamic Type
Custom Fonts
System Font

Native to the platform
System Font APIs

NSFont.systemFont(ofSize: 14)
UIFont.systemFont(ofSize: 14)

NSFont.systemFont(ofSize: 19, weight: NSFontWeightSemibold)
UIFont.systemFont(ofSize: 34, weight: UIFontWeightBlack)
Weights

ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789
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ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789
ABCDEFGHIJKLMNOPQRSTUVWXYZ abcdefghijklmnopqrstuvwxyz 0123456789
Size-Specific Tracking

40pt  10T  abcdefghijklmnopqrstuvwxyz
30pt  11T  abcdefghijklmnopqrstuvwxyz
20pt  19T  abcdefghijklmnopqrstuvwxyz
19pt  -25T abcdefghijklmnopqrstuvwxyz
18pt  -24T abcdefghijklmnopqrstuvwxyz
17pt  -24T abcdefghijklmnopqrstuvwxyz
16pt  -20T abcdefghijklmnopqrstuvwxyz
Size-Specific Outlines
Settings
Display & Brightness

BRIGHTNESS

Auto-Brightness

Night Shift

Text Size

Bold Text

DISPLAY ZOOM

View

Choose a view for iPhone. Zoomed shows larger controls. Standard shows more content.
Display & Brightness

BRIGHTNESS

Auto-Brightness

Night Shift

Text Size

Bold Text

DISPLAY ZOOM

View

Choose a view for iPhone. Zoomed shows larger controls. Standard shows more content.
Dynamic Type

iOS

watchOS
Dynamic Type

Text Styles: UIFont.preferredFont(forTextStyle:)

Content Size Categories
Apps that support Dynamic Type will adjust to your preferred reading size below.

Drag the slider below
Apps that support Dynamic Type will adjust to your preferred reading size below.

Drag the slider below
Apps that support Dynamic Type will adjust to your preferred reading size below.

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Apps that support Dynamic Type will adjust to your preferred reading size below.

Drag the slider below
Dynamic Type

With Text Styles APIs, Dynamic Type support is automatic
Custom Fonts
How to make them work with Dynamic Type

1. Pick or bundle a font
2. Lookup table for the Content Size Categories
3. Override `traitCollectionDidChange`
4. Update your fonts and paragraph style
5. Relayout
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5. Relayout
<table>
<thead>
<tr>
<th>Key</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Localization native development environment name</td>
<td>Dictionary</td>
<td>$(EXECUTABLE_NAME)</td>
</tr>
<tr>
<td>Executable file</td>
<td>String</td>
<td>$(PRODUCT_BUNDLE_IDENTIFIER)</td>
</tr>
<tr>
<td>Bundle identifier</td>
<td>String</td>
<td>$(PRODUCT_BUNDLE_IDENTIFIER)</td>
</tr>
<tr>
<td>InfoDictionary version</td>
<td>String</td>
<td>6.0</td>
</tr>
<tr>
<td>Bundle name</td>
<td>String</td>
<td>$(PRODUCT_NAME)</td>
</tr>
<tr>
<td>Bundle OS Type code</td>
<td>String</td>
<td>APPL</td>
</tr>
<tr>
<td>Bundle versions string, short</td>
<td>String</td>
<td>1.0</td>
</tr>
<tr>
<td>Bundle creator OS Type code</td>
<td>String</td>
<td>???</td>
</tr>
<tr>
<td>Bundle version</td>
<td>String</td>
<td>1</td>
</tr>
<tr>
<td>Application requires iPhone enviro...</td>
<td>Boolean</td>
<td>YES</td>
</tr>
<tr>
<td>Launch screen interface file base...</td>
<td>String</td>
<td>LaunchScreen</td>
</tr>
<tr>
<td>Main storyboard file base name</td>
<td>String</td>
<td>Main</td>
</tr>
<tr>
<td>Required device capabilities</td>
<td>Array</td>
<td>(1 item)</td>
</tr>
<tr>
<td>Supported interface orientations</td>
<td>Array</td>
<td>(3 items)</td>
</tr>
<tr>
<td>Supported interface orientations (i...)</td>
<td>Array</td>
<td>(4 items)</td>
</tr>
<tr>
<td>Fonts provided by application</td>
<td>Array</td>
<td>(2 items)</td>
</tr>
<tr>
<td>Item 0</td>
<td>String</td>
<td>MyCustomFont1.otf</td>
</tr>
<tr>
<td>Item 1</td>
<td>String</td>
<td>MyCustomFont2.otf</td>
</tr>
<tr>
<td>Key</td>
<td>Type</td>
<td>Value</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>-----------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>Information Property List</td>
<td>Dictionary</td>
<td>(16 items)</td>
</tr>
<tr>
<td>Localization native development region</td>
<td>String</td>
<td>en</td>
</tr>
<tr>
<td>Executable file</td>
<td>String</td>
<td>$(EXECUTABLE_NAME)</td>
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<tr>
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</tr>
</tbody>
</table>
Custom Fonts

How to make them work with Dynamic Type

1. Pick or bundle a font
2. Lookup table for the Content Size Categories
3. Override `traitCollectionDidChange`
4. Update your fonts and paragraph style
5. Relayout
let customDynamicType: [String: (pointSize: CGFloat, styleName: String, leading: CGFloat, tracking: CGFloat)] = [
    UIContentSizeCategoryExtraSmall: (10.0, "Heavy", 3.0, 0.6),
    UIContentSizeCategorySmall: (12.0, "Heavy", 2.0, 0.4),
    UIContentSizeCategoryMedium: (14.0, "Roman", 1.0, 0.2),
    UIContentSizeCategoryLarge: (16.0, "Roman", 0.0, 0.0),
    UIContentSizeCategoryUnspecified: (16.0, "Roman", 0.0, 0.0),
    UIContentSizeCategoryExtraLarge: (17.0, "Roman", 0.0, 0.0),
    UIContentSizeCategoryExtraExtraLarge: (18.0, "Light", -1.0, 0.0),
    UIContentSizeCategoryExtraExtraExtraLarge: (19.0, "Light", -2.0, -0.1),
    UIContentSizeCategoryAccessibilityMedium: (20.0, "Light", -3.0, -0.2),
    UIContentSizeCategoryAccessibilityLarge: (21.0, "Light", -4.0, -0.2),
    UIContentSizeCategoryAccessibilityExtraLarge: (22.0, "Light", -4.0, -0.2),
    UIContentSizeCategoryAccessibilityExtraExtraLarge: (23.0, "Light", -4.0, -0.2),
    UIContentSizeCategoryAccessibilityExtraExtraExtraLarge: (24.0, "Light", -4.0, -0.2),
]
Custom Fonts
How to make them work with Dynamic Type

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2. Lookup table for the Content Size Categories
3. Override `traitCollectionDidChange`
4. Update your fonts and paragraph style
5. Relayout
override func traitCollectionDidChange(_ previousTraitCollection: UITraitCollection?) {
    self.adjustFont(usedBy: self.label)
}

Custom Fonts
How to make them work with Dynamic Type

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2. Lookup table for the Content Size Categories
3. Override `traitCollectionDidChange`
4. Update your fonts and paragraph style
5. Relayout
func adjustFont(usedBy: UILabel) {
    let sizeCategory = self.traitCollection.preferredContentSizeCategory
    if let customFontForSizeCategory = self.customDynamicType[sizeCategory] {
        // ... actually adjust the fonts here ...
    }
}
func adjustFont(usedBy: UILabel) {
    let sizeCategory = self.traitCollection.preferredContentSizeCategory
    if let customFontForSizeCategory = self.customDynamicType[sizeCategory] {
        // ... actually adjust the fonts here ...
    }
}
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<table>
<thead>
<tr>
<th>Event</th>
<th>Location</th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditing Your Apps for Accessibility</td>
<td>Nob Hill</td>
<td>Wednesday 10:00AM</td>
</tr>
<tr>
<td>Making Apps Adaptive, Part 2</td>
<td>Presidio</td>
<td>Friday 9:00AM</td>
</tr>
</tbody>
</table>
Font Selection

Easier sticking with one typeface at a time
Understanding design intention helps in usage
Consider defaults and knobs you can turn
Tools

System Font
Dynamic Type
Custom Fonts
Details
Arrows
| ← | U+2190 |    | ← | U+2199 |
| ↑ | U+2191 |    | ↑ | U+2198 |
| → | U+2192 |    | → | U+2934 |
| ↓ | U+2193 |    | ↓ | U+2935 |
| ↘ | U+2197 |    | ↘ | U+2936 |
| ↘ | U+2198 |    | ↘ | U+2937 |
High-Legibility Alternates
High-Legibility Alternates

milliOnalre68
High-Legibility Alternates

m1llli0nalre68

m1II
High-Legibility Alternates

m1lll0nalre68

m1IIIIi0
High-Legibility Alternates

m1lllOnalre68

m1IIIi0nal
High-Legibility Alternates

m1Ilili0nalre68

m1IIIIi0nalre6
High-Legibility Alternates

m1llli0nalre68

m1lllii0nalre68
let pointSize: CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(
    ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()
let highLegibilityFontDesc = systemFontDesc.addingAttributes(
    [
        UIFontDescriptorFeatureSettingsAttribute: 
            [
                [
                    UIFontFeatureTypeIdentifierKey: kStylisticAlternativesType,
                    UIFontFeatureSelectorIdentifierKey: kStylisticAltSixOnSelector,
                ],
            ],
    ]
)

label.font = UIFont(descriptor: highLegibilityFontDesc, size: pointSize)
let pointSize: CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()
let highLegibilityFontDesc = systemFontDesc.addingAttributes([
  [UIFontDescriptorFeatureSettingsAttribute: [
    [UIFontFeatureTypeIdentifierKey: kStylisticAlternativesType,
     UIFontFeatureSelectorIdentifierKey: kStylisticAltSixOnSelector,
    ],
  ],
]
)

label.font = UIFont(descriptor: highLegibilityFontDesc, size: pointSize)
Small Caps
Small Caps

ABC
Small Caps

ABC   ABC   abc
Small Caps

ABC  ABC  abc
Small Caps

This HTML page
Small Caps

This HTML page → This HTML page
Small Caps

This HTML page  This HTML page

12AM
Small Caps

This HTML page ➔ This HTML page

12AM ➔ 12AM
Shaun the Sheep Movie

DIRECTOR
Mark Burton
Richard Starzak

STARRING
Justin Fletcher
John Sparkes
Omid Djalili
Richard Webber
Kate Harbour
Tim Hands

When Shaun decides to take a day off and have some fun, he gets a little more than he bargained for! Shaun's mischief inadvertently leads to The Farmer being taken away from the farm, to the Big City... Join Shaun, Bitzer, and The Flock on their hilarious, action-packed, big-screen adventure... MORE

VIEWERS ALSO WATCHED
- JACK: Back to the Future
- Maya the Bee: The Honeycomb Heist
- LEGO
- School of Rock
- Ernest & Celestine
- The Muppets Movie
- Antboy
Shaun the Sheep Movie

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STARRING
Justin Fletcher
John Sparkes
Omid Djalili
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STARRING

Justin Fletcher
John Sparkes
Omid Djalili
Richard Webber
Small Caps from Uppercase

SAN FRANCISCO
San Francisco
san francisco
Small Caps from Uppercase

SAN FRANCISCO
San Francisco
san francisco

SAN FRANCISCO
San Francisco
san francisco
Small Caps from Uppercase

SAN FRANCISCO
San Francisco
san francisco
Small Caps from Uppercase

SAN FRANCISCO
San Francisco
san francisco

SAN FRANCISCO
san Francisco
san francisco
<table>
<thead>
<tr>
<th>SAN FRANCISCO</th>
<th>SAN FRANCISCO</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Francisco</td>
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</tr>
</tbody>
</table>
let pointSize: CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()
let smallCapsFontDesc = systemFontDesc.addingAttributes([
    UIFontDescriptorFeatureSettingsAttribute: [
        [UIFontFeatureTypeIdentifierKey: kUpperCaseType, 
        UIFontFeatureSelectorIdentifierKey: kUpperCaseSmallCapsSelector, 
    ],
],)

label.font = UIFont(descriptor: smallCapsFontDesc, size: pointSize)
Small Caps from Lowercase

SAN FRANCISCO

San Francisco

san francisco
Small Caps from Lowercase

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Small Caps from Lowercase

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let pointSize: CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(
    ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()
let smallCapsFontDesc = systemFontDesc.addingAttributes([
    UIFontDescriptorFeatureSettingsAttribute: [
        [UIFontFeatureTypeIdentifierKey: kLowerCaseType,
         UIFontFeatureSelectorIdentifierKey: kLowerCaseSmallCapsSelector,]
    ],
])

label.font = UIFont(descriptor: smallCapsFontDesc, size: pointSize)
let pointSize: CGFloat = 60.0
let systemFontDesc = UIFont.systemFont(
    ofSize: pointSize, weight: UIFontWeightLight).fontDescriptor()
let smallCapsFontDesc = systemFontDesc.addingAttributes(
    [UIFontDescriptorFeatureSettingsAttribute:
        [UIFontFeatureTypeIdentifierKey: kLowerCaseType,
         UIFontFeatureSelectorIdentifierKey: kLowerCaseSmallCapsSelector,]
        ,[UIFontFeatureTypeIdentifierKey: kUpperCaseType,
         UIFontFeatureSelectorIdentifierKey: kUpperCaseSmallCapsSelector,]
    ],
)
label.font = UIFont(descriptor: smallCapsFontDesc, size: pointSize)
Small Caps Numbers and Punctuation

01234567890
Small Caps Numbers and Punctuation

01234567890 ➔ 01234567890
Small Caps Numbers and Punctuation

01234567890  →  01234567890

HAPPY 2016!
Small Caps Numbers and Punctuation

01234567890 -> 01234567890

HAPPY 2016! -> HAPPY 2016!
Details

Arrows
High-legibility alternates
Small caps
Summary
Summary

San Francisco
Terminology
Concepts
Tools
Details
More Information

https://developer.apple.com/wwdc16/803
## Related Sessions

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<th>Session</th>
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<td>Auditing Your Apps for Accessibility</td>
<td>Nob Hill</td>
<td>Wednesday 10:00AM</td>
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<td>Making Apps Adaptive, Part 1</td>
<td>Presidio</td>
<td>Thursday 11:00AM</td>
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<tr>
<td>Iterative UI Design</td>
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<td>What’s New in Auto Layout</td>
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<tr>
<td>Internationalization Best Practices</td>
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<td>Labs</td>
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<td>Text and Fonts Lab</td>
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<td>Interface Builder and Auto Layout Lab</td>
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Apple WWDC16