Hi!

• • •
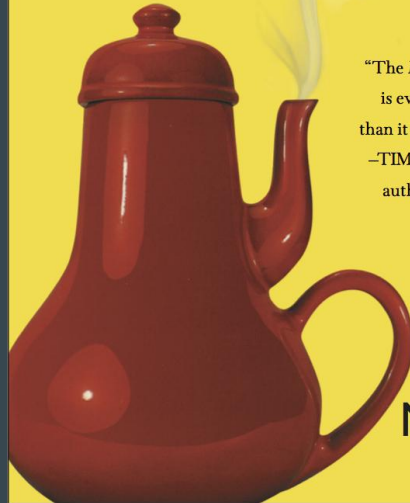
Rachel Bobbins

The DESIGN of EVERYDAY THINGS

"The *Design of Everyday Things* is even more relevant today than it was when first published."
—TIM BROWN, CEO of IDEO, author of *Change by Design*

DON NORMAN

The Design of Everyday Swift

•••

Users

Let's build this!

Carrier 📶   4:08 PM   🔋

Welcome
ようこそ

Let's build this!

Welcome
ようこそ

Carrier 4:08 PM

- Goal
- Plan
- Specify
- Perform

```swift
import UIKit

class ViewController: UIViewController {
    override func viewDidLoad() {
        let welcomeLabel = UILabel()
        welcomeLabel.text = "Welcome\nようこそ"
        welcomeLabel.textAlignment = .Center
        welcomeLabel.numberOfLines = 0
        welcomeLabel.font = UIFont.systemFontOfSize(48.0)

        view.addSubview(welcomeLabel)
        welcomeLabel.centerXAnchor.constraintEqualToAnchor(view.centerXAnchor).active = true
        welcomeLabel.centerYAnchor.constraintEqualToAnchor(view.centerYAnchor).active = true

        welcomeLabel.textColor = UIColor.lightTextColor()
        welcomeLabel.backgroundColor = UIColor.clearColor()
        view.backgroundColor = UIColor.darkGrayColor()
    }
}
```

WelcomeApp   iPhone 6s Plus   Running WelcomeApp on iPhone 6s Plus

WelcomeApp > WelcomeApp > ViewController.swift > viewDidLoad()

```swift
1  import UIKit
2
3  class ViewController: UIViewController {
4      override func viewDidLoad() {
5          let welcomeLabel = UILabel()
6          welcomeLabel.text = "Welcome\nようこそ"
7          welcomeLabel.textAlignment = .Center
8          welcomeLabel.numberOfLines = 0
9          welcomeLabel.font = UIFont.systemFontOfSize(48.0)
10
11         view.addSubview(welcomeLabel)
12         welcomeLabel.centerXAnchor.constraintEqualToAnchor(view.centerXAnch
13         welcomeLabel.centerYAnchor.constraintEqualToAnchor(view.centerYAnch
14
15         welcomeLabel.textColor = UIColor.lightTextColor()
```

iPhone 6s Plus - iPhone 6s Plus / i...

Carrier   4:08 PM

WelcomeApp

```
ようこそ'.centerX == UIView:0x7fbaa3c15340.centerX>

Make a symbolic breakpoint at UIViewAlertForUnsatisfiableConstraints to catch this in the debugger.
The methods in the UIConstraintBasedLayoutDebugging category on UIView listed in <UIKit/UIView.h> may also be helpful.
2016-02-20 16:08:36.954 WelcomeApp[57457:7209972] Unable to simultaneously satisfy constraints.
        Probably at least one of the constraints in the following list is one you don't want.
    Try this:
        (1) look at each constraint and try to figure out which you don't expect;
        (2) find the code that added the unwanted constraint or constraints and fix it.
    (Note: If you're seeing NSAutoresizingMaskLayoutConstraints that you don't understand, refer to the documentation for the
translatesAutoresizingMaskIntoConstraints)
(
    "<NSAutoresizingMaskLayoutConstraint:0x7fbaa500b860 h=--& v=--& UILabel:0x7fbaa500afc0'Welcome\n\U3088\U3046\U3053\U305d'.mi
    "<NSLayoutConstraint:0x7fbaa503d1e0 UILabel:0x7fbaa500afc0'Welcome\n\U3088\U3046\U3053\U305d'.centerY == UIView:0x7fbaa3c153
    "<NSLayoutConstraint:0x7fbaa503bfa0 'UIView-Encapsulated-Layout-Height' V:[UIView:0x7fbaa3c15340(736)]>",
    "<NSAutoresizingMaskLayoutConstraint:0x7fbaa503c1d0 h=&- v=&- 'UIView-Encapsulated-Layout-Top' V:|-(0)-[UIView:0x7fbaa3c15340]   (Names: '|':UIWindow:0x7fbaa3c15380 )>"
)

Will attempt to recover by breaking constraint
<NSLayoutConstraint:0x7fbaa503d1e0 UILabel:0x7fbaa500afc0'Welcome
ようこそ'.centerY == UIView:0x7fbaa3c15340.centerY>

Make a symbolic breakpoint at UIViewAlertForUnsatisfiableConstraints to catch this in the debugger.
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```
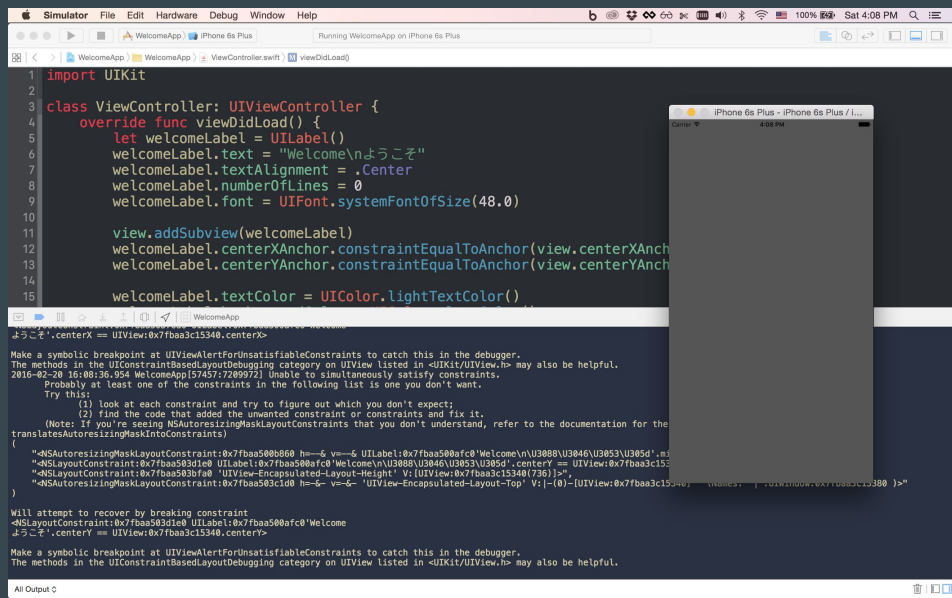
All Output

```
import UIKit

class ViewController: UIViewController {
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        welcomeLabel.textColor = UIColor.lightTextColor()
```

- ~~Goal~~
- ~~Plan~~
- ~~Specify~~
- ~~Perform~~
- Perceive
- Interpret
- Compare
- New Goal

WelcomeApp iPhone 6s Plus

Running WelcomeApp on iPhone 6s Plus

WelcomeApp WelcomeApp ViewController.swift viewDidLoad()

```swift
1   import UIKit
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3   class ViewController: UIViewController {
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iPhone 6s Plus - iPhone 6s Plus / i...

Carrier 🔋   4:08 PM

WelcomeApp

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    "<NSAutoresizingMaskLayoutConstraint:0x7fbaa503c1d0 h=&- v=&- 'UIView-Encapsulated-Layout-Top' V:|-(0)-[UIView:0x7fbaa3c15340]   (Names: '|':UIWindow:0x7fbaa5c15380)>"
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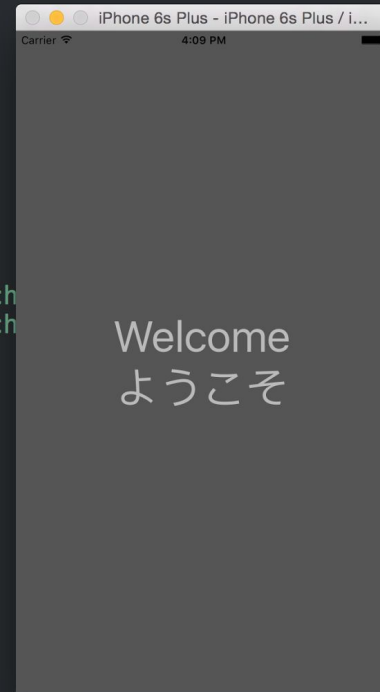ようこそ'.centerY == UIView:0x7fbaa3c15340.centerY>

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All Output

WelcomeApp ⟩ WelcomeApp ⟩ ViewController.swift ⟩ ViewController

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```

Carrier 🗢   4:09 PM

Welcome
ようこそ

iPhone 6s Plus - iPhone 6s Plus / i...

The 7 Stages
of Action

- Goal
- Plan
- Specify
- Perform
- Perceive
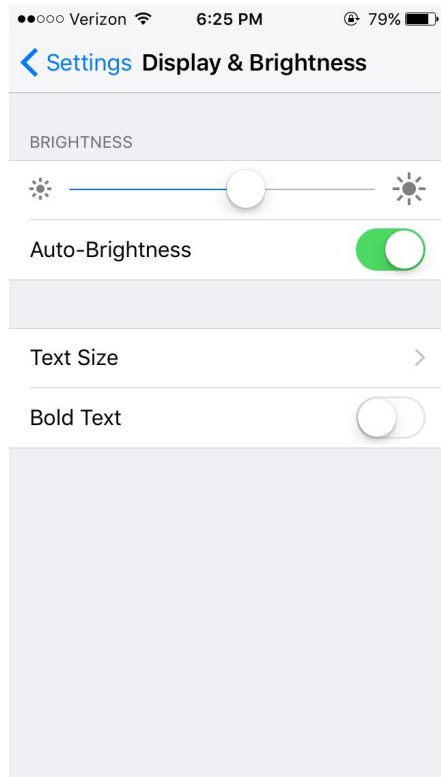- Interpret
- Compare

___

7 Principles of Design

- Discoverability
- Feedback
- Conceptual model
- Affordances
- Signifiers
- Mappings
- Constraints
  - (Entirely separate from auto-layout)

7 Stages of Action

- Goal
- Plan
- Specify
- Perform
- Perceive
- Interpret
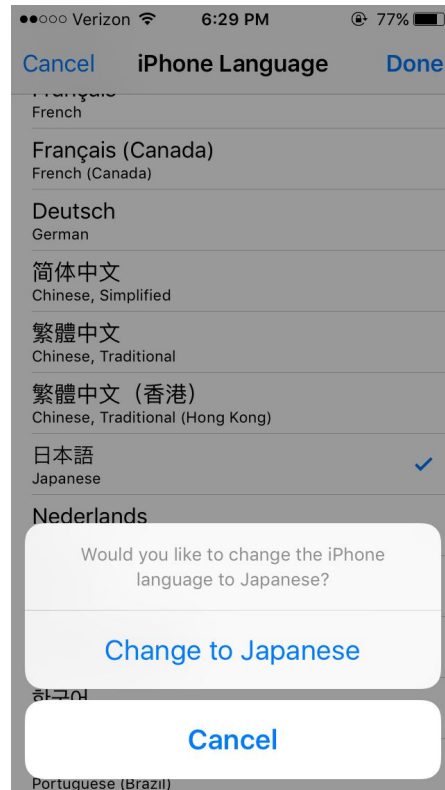- Compare

___

Discoverability

#1

Discoverability

#1

- Public, private, internal
- Tests
- Sensible method/variable names that trigger autocomplete
  - Not "numberOfSectionsInTableView"
- Comments & documentation

Feedback

#2

Automated:

- Compiler errors
- Compiler warnings
- Test failures
- Runtime crashes
- Runtime experience

Human:

- Pair-programming
- Code reviews
- Bug reports
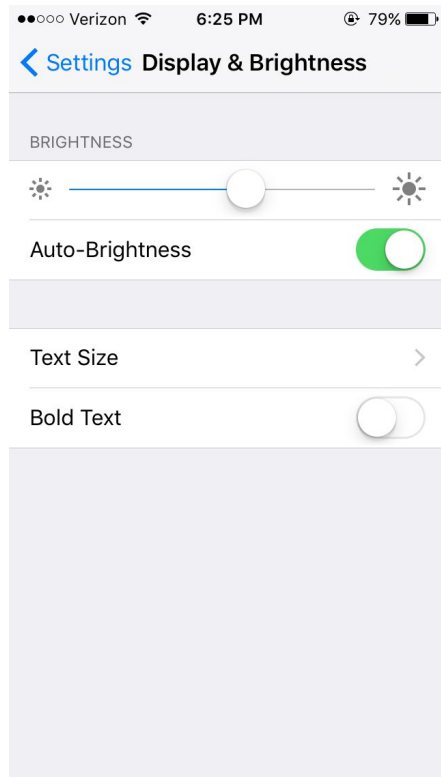- App Store reviews

Conceptual Model

#3

Conceptual Model

#3

- People always form their own conceptual models.
- Conceptual models are heavily influenced by a user's own experience/background/culture.
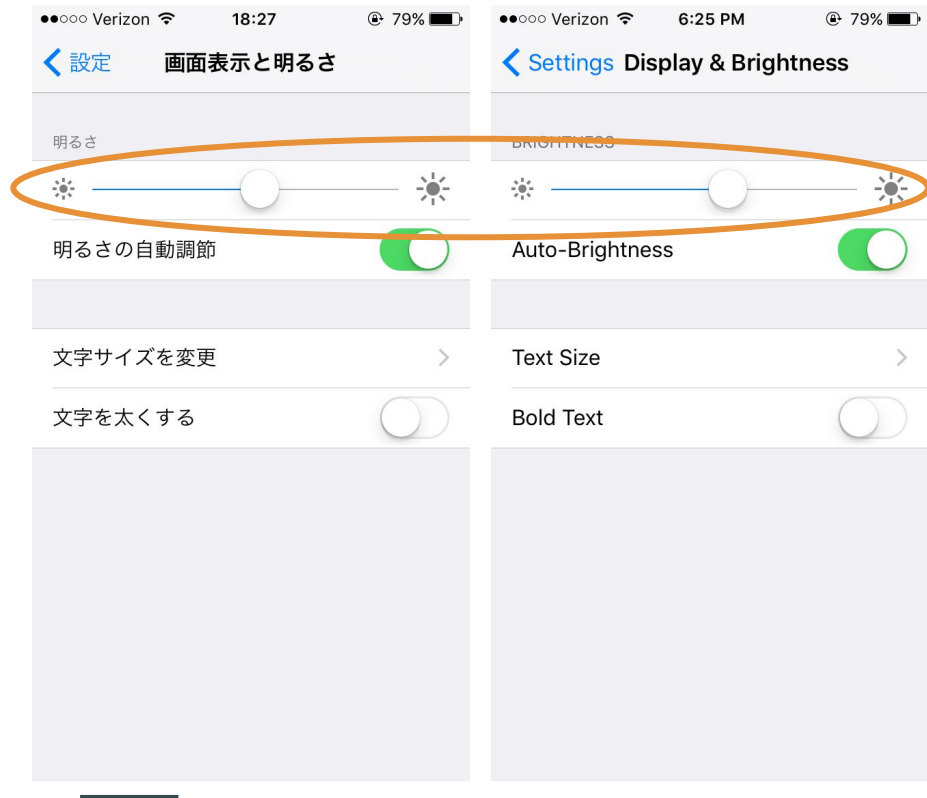
Affordances

#4

Affordances

#4

- Methods *afford* calling
- Variables *afford* getting/setting
  - `var` variables *afford* resetting
- Private helper functions *afford* readability
- Protocols *afford* decoupled object graphs
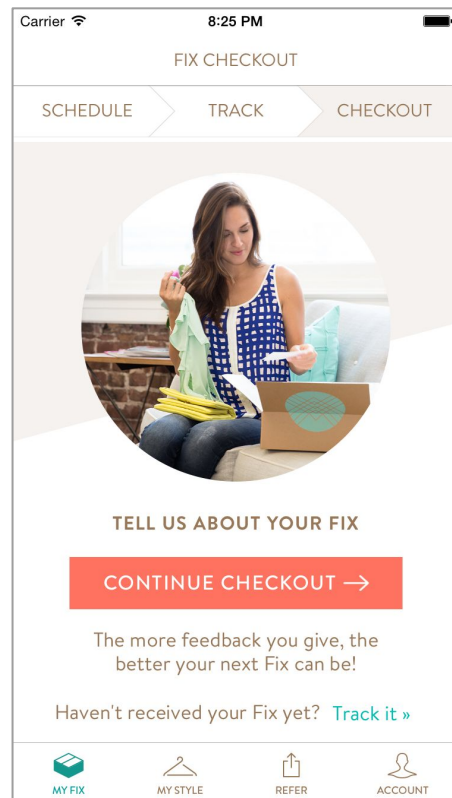
Signifiers

#5

Signifiers

#5

- Public, private, internal
  - Yes, again
- Names
- Comments
- Tests
- Enum/Struct/Class
- Protocols
- Optionals
- let/var
- throws
- guard

Mappings

#6

Mappings

#6

- .xcodeproj organization

Constraints

#7

Constraints

#7

- Swift's type system

Recap

- Book report
- Psychology
- Built a Swift app
- Design theory

A challenge

Thanks!

● ● ●

The Design of Everyday Swift
Rachel Bobbins
@bobbins