Sportakus

Fitness App

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Fitness App

iPhone

Fitness App

Apple Watch

Fitness App

Gym strength training

Create training schedules

Add exercises

Choose them on the watch

Watch counts repetitions automatically

WatchKit, HealthKit, Sensors

WatchKit

WatchKit

Framework

watchOS version 3

Smaller UIKit

UIButton vs WKInterfaceButton

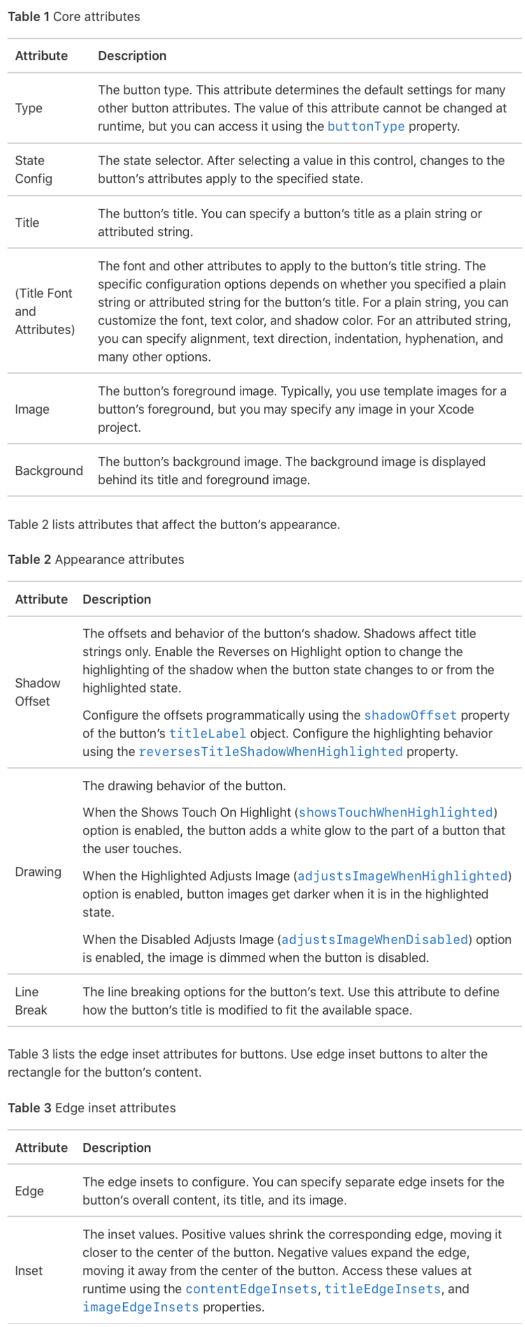


Table 1 Core attributes

Attribute	Description
Type	The button type. This attribute determines the default settings for many other button attributes. The value of this attribute cannot be changed at runtime, but you can access it using the `buttonType` property.
State Config	The state selector. After selecting a value in this control, changes to the button's attributes apply to the specified state.
Title	The button's title. You can specify a button's title as a plain string or attributed string.
(Title Font and Attributes)	The font and other attributes to apply to the button's title string. The specific configuration options depends on whether you specified a plain string or attributed string for the button's title. For a plain string, you can customize the font, text color, and shadow color. For an attributed string, you can specify alignment, text direction, indentation, hyphenation, and many other options.
Image	The button's foreground image. Typically, you use template images for a button's foreground, but you may specify any image in your Xcode project.
Background	The button's background image. The background image is displayed behind its title and foreground image.

Table 2 lists attributes that affect the button's appearance.

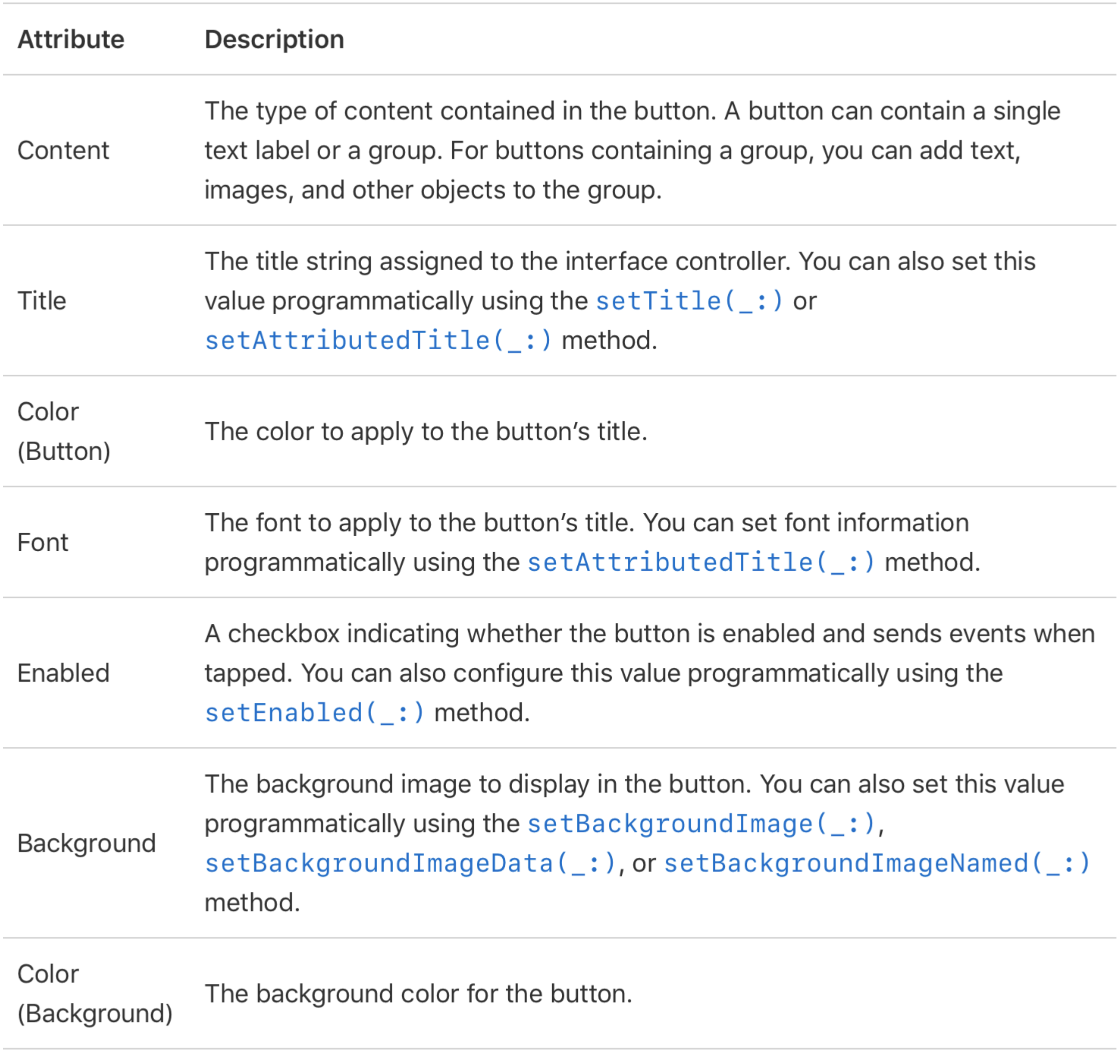
Table 2 Appearance attributes

Attribute	Description
Shadow Offset	The offsets and behavior of the button's shadow. Shadows affect title strings only. Enable the Reverses on Highlight option to change the highlighting of the shadow when the button state changes to or from the highlighted state. Configure the offsets programmatically using the `shadowOffset` property of the button's `titleLabel` object. Configure the highlighting behavior using the `reversesTitleShadowWhenHighlighted` property.
Drawing	The drawing behavior of the button. When the Shows Touch On Highlight (`showsTouchWhenHighlighted`) option is enabled, the button adds a white glow to the part of a button that the user touches. When the Highlighted Adjusts Image (`adjustsImageWhenHighlighted`) option is enabled, button images get darker when it is in the highlighted state. When the Disabled Adjusts Image (`adjustsImageWhenDisabled`) option is enabled, the image is dimmed when the button is disabled.
Line Break	The line breaking options for the button's text. Use this attribute to define how the button's title is modified to fit the available space.

Table 3 lists the edge inset attributes for buttons. Use edge inset buttons to alter the rectangle for the button's content.

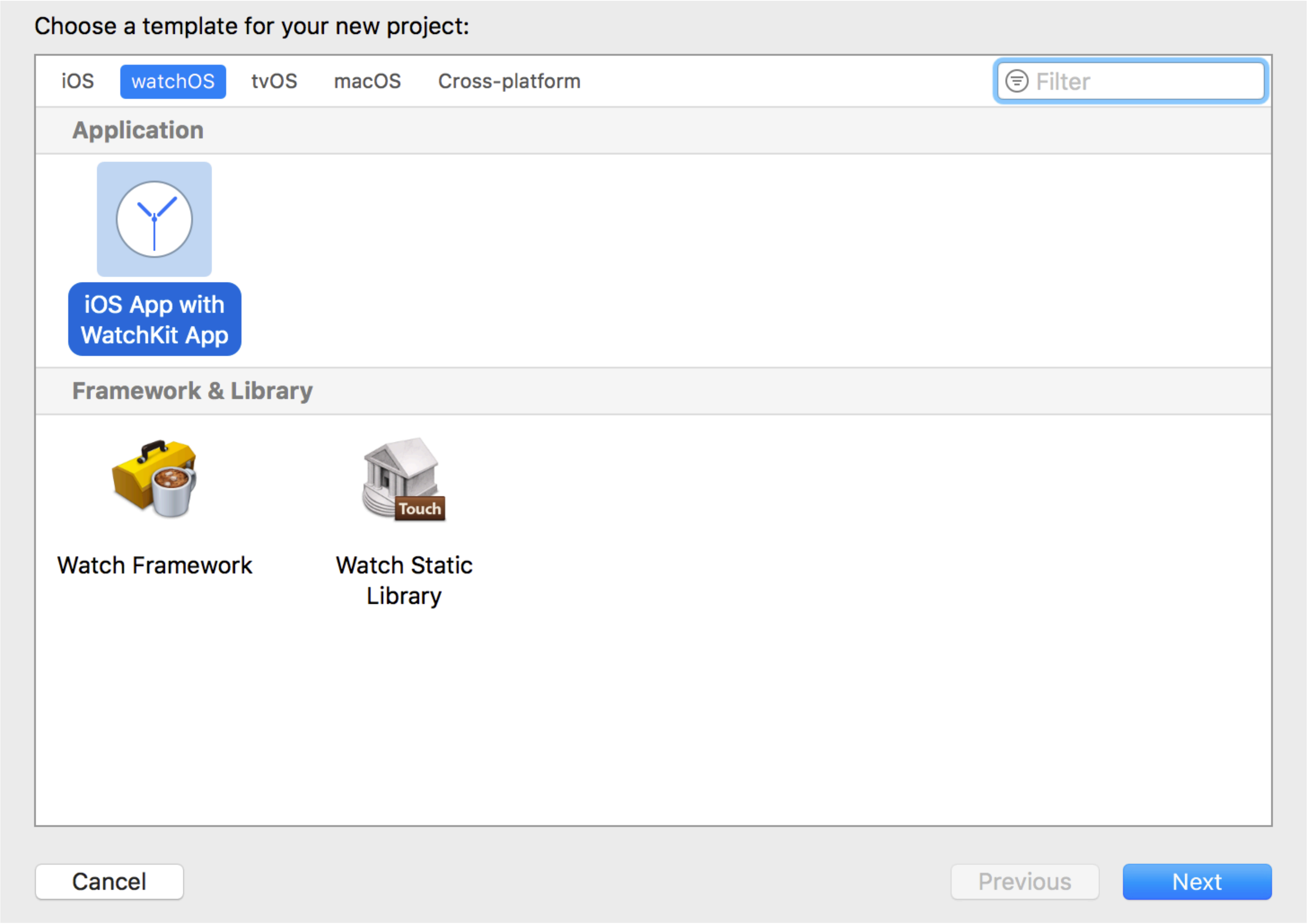
Table 3 Edge inset attributes

Attribute	Description
Edge	The edge insets to configure. You can specify separate edge insets for the button's overall content, its title, and its image.
Inset	The inset values. Positive values shrink the corresponding edge, moving it closer to the center of the button. Negative values expand the edge, moving it away from the center of the button. Access these values at runtime using the `contentEdgeInsets`, `titleEdgeInsets`, and `imageEdgeInsets` properties.



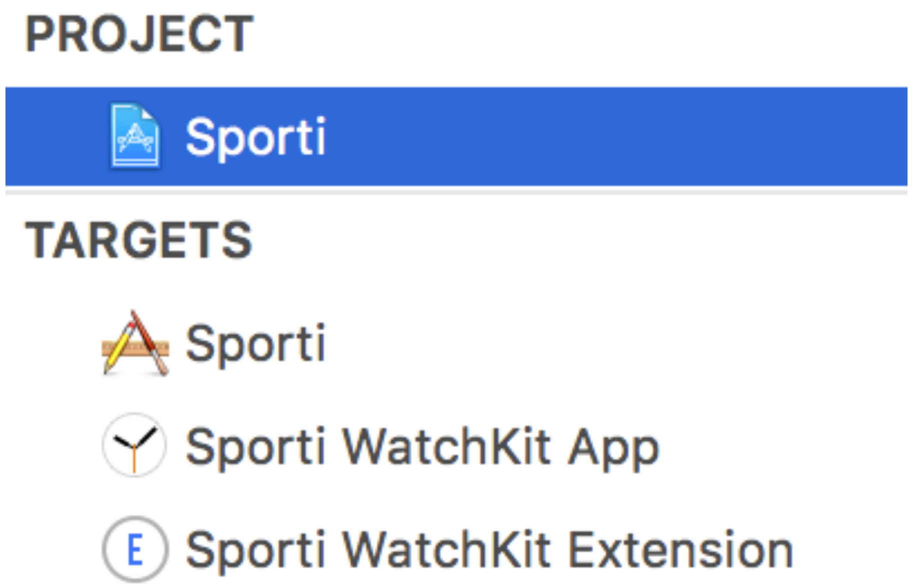
Attribute	Description
Content	The type of content contained in the button. A button can contain a single text label or a group. For buttons containing a group, you can add text, images, and other objects to the group.
Title	The title string assigned to the interface controller. You can also set this value programmatically using the `setTitle(_:)` or `setAttributedTitle(_:)` method.
Color (Button)	The color to apply to the button's title.
Font	The font to apply to the button's title. You can set font information programmatically using the `setAttributedTitle(_:)` method.
Enabled	A checkbox indicating whether the button is enabled and sends events when tapped. You can also configure this value programmatically using the `setEnabled(_:)` method.
Background	The background image to display in the button. You can also set this value programmatically using the `setBackgroundImage(_:)`, `setBackgroundImageData(_:)`, or `setBackgroundImageNamed(_:)` method.
Color (Background)	The background color for the button.

Create project



Choose a template for your new project:

Targets



PROJECT

Sporti

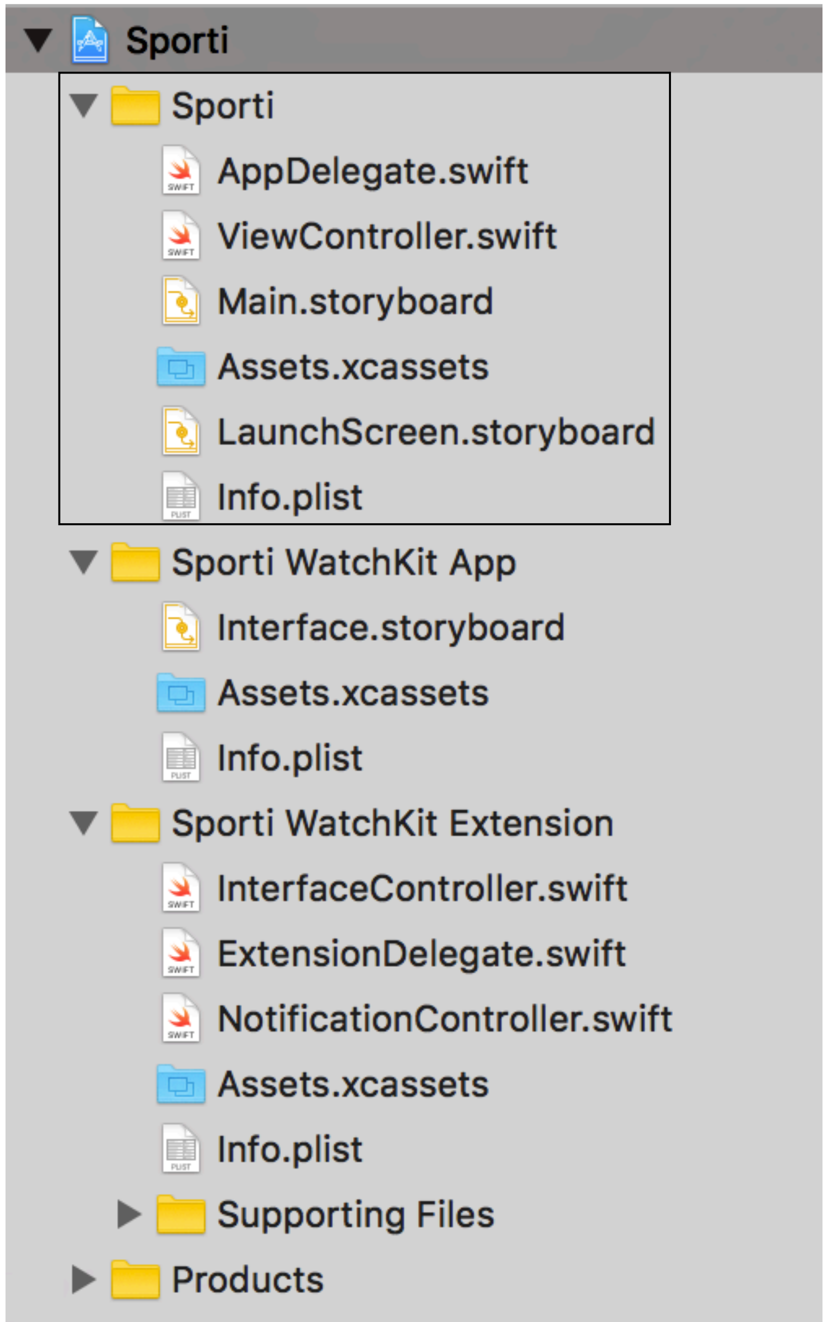
TARGETS

Sporti

Sporti WatchKit App

Sporti WatchKit Extension

Project navigator



```
▼ Sporti
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      AppDelegate.swift
      ViewController.swift
      Main.storyboard
      Assets.xcassets
      LaunchScreen.storyboard
      Info.plist
  ▼ Sporti WatchKit App
      Interface.storyboard
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  ▼ Sporti WatchKit Extension
      InterfaceController.swift
      ExtensionDelegate.swift
      NotificationController.swift
      Assets.xcassets
      Info.plist
    ▶ Supporting Files
  ▶ Products
```
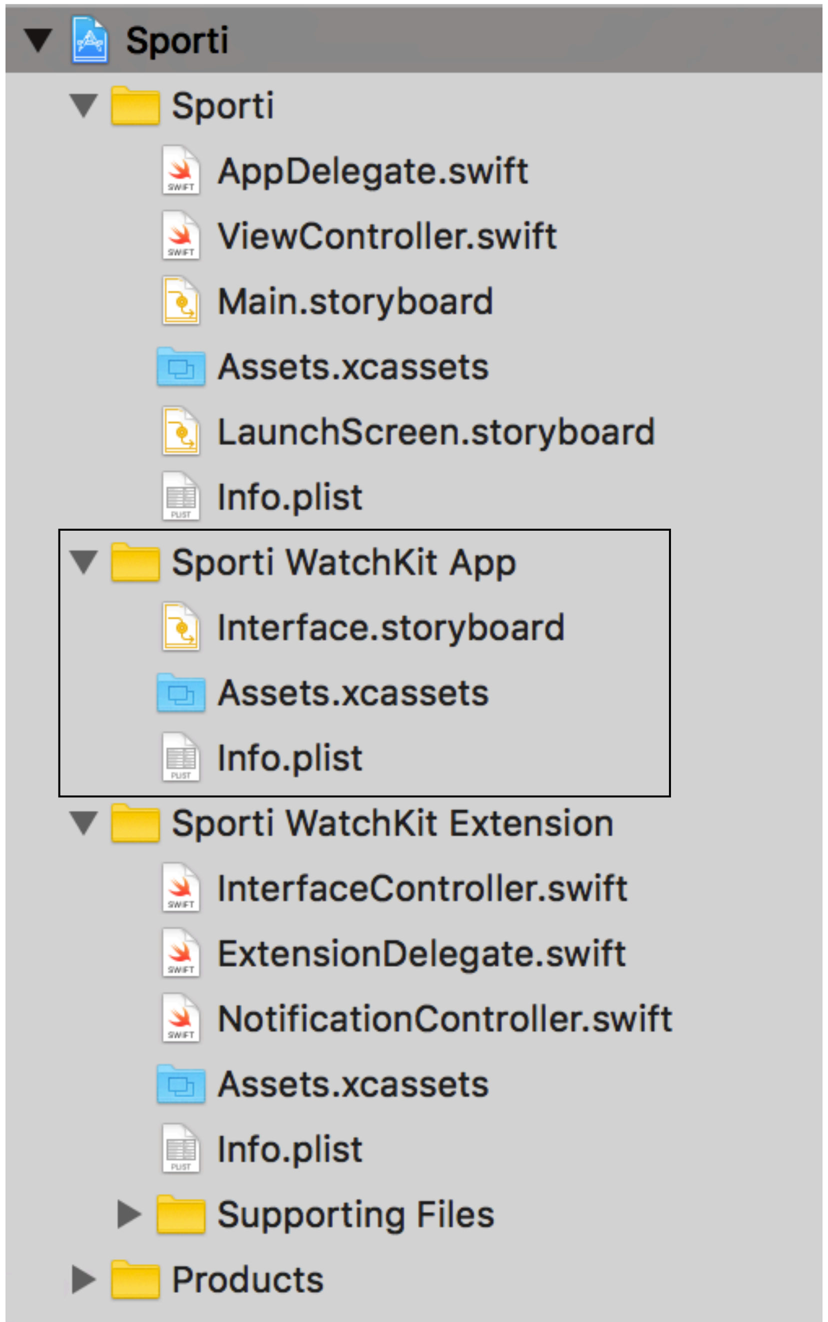

Project navigator



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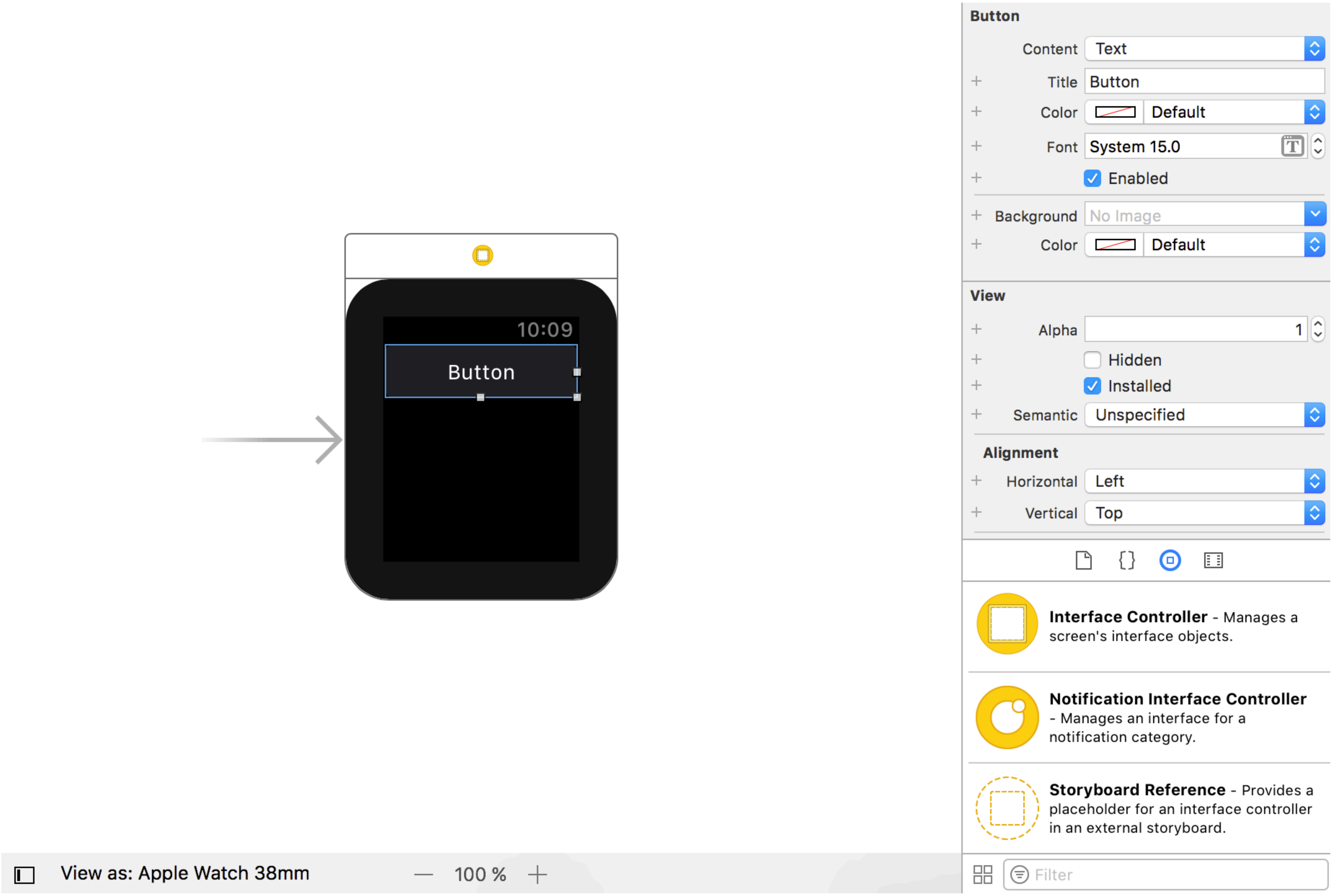
WatchKit storyboard



View as: Apple Watch 38mm — 100 % +

Button

Content: Text
Title: Button
Color: Default
Font: System 15.0
☑ Enabled
Background: No Image
Color: Default

View

Alpha: 1
□ Hidden
☑ Installed
Semantic: Unspecified

Alignment

Horizontal: Left
Vertical: Top

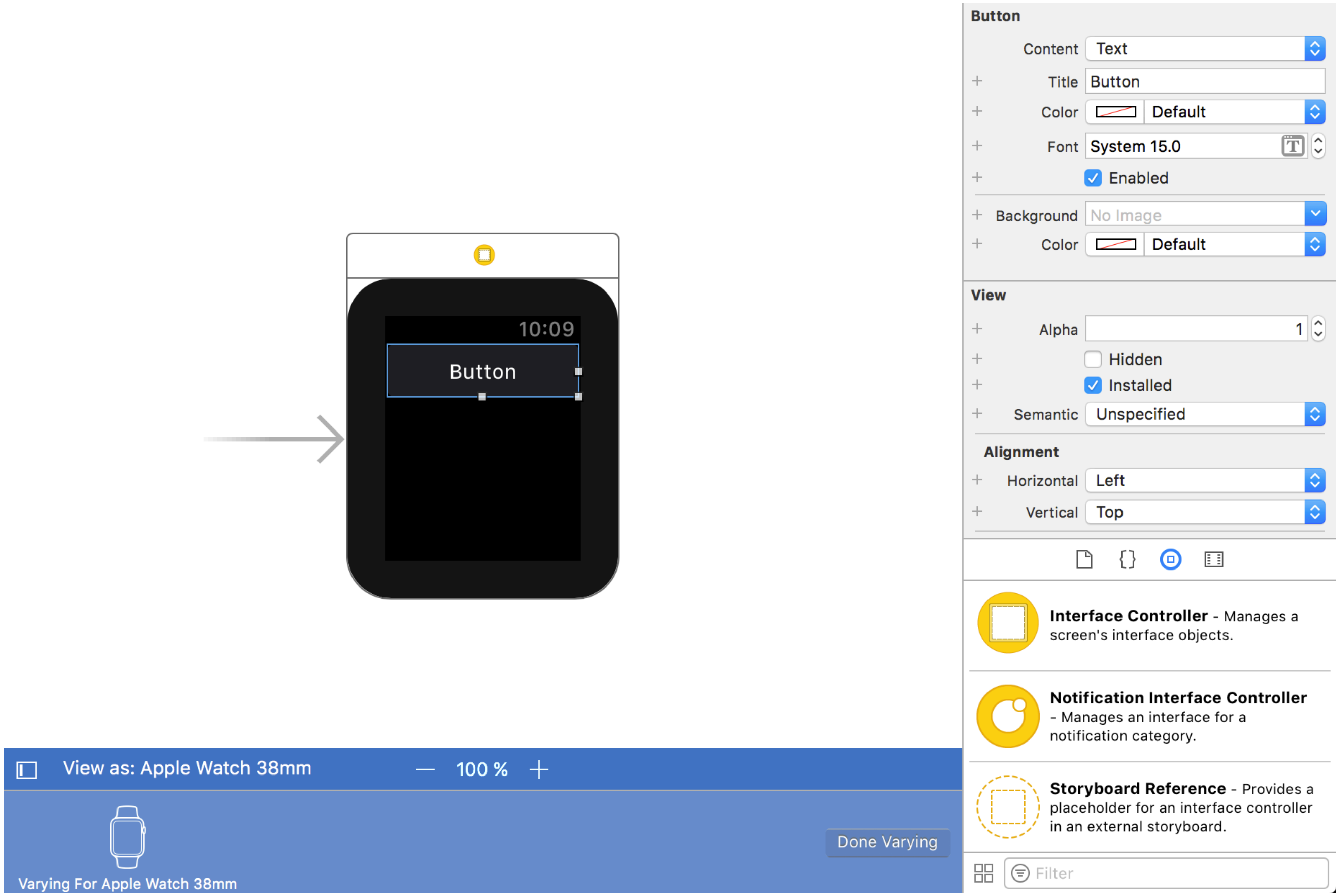
Interface Controller - Manages a screen's interface objects.

Notification Interface Controller - Manages an interface for a notification category.

Storyboard Reference - Provides a placeholder for an interface controller in an external storyboard.

Filter

WatchKit storyboard



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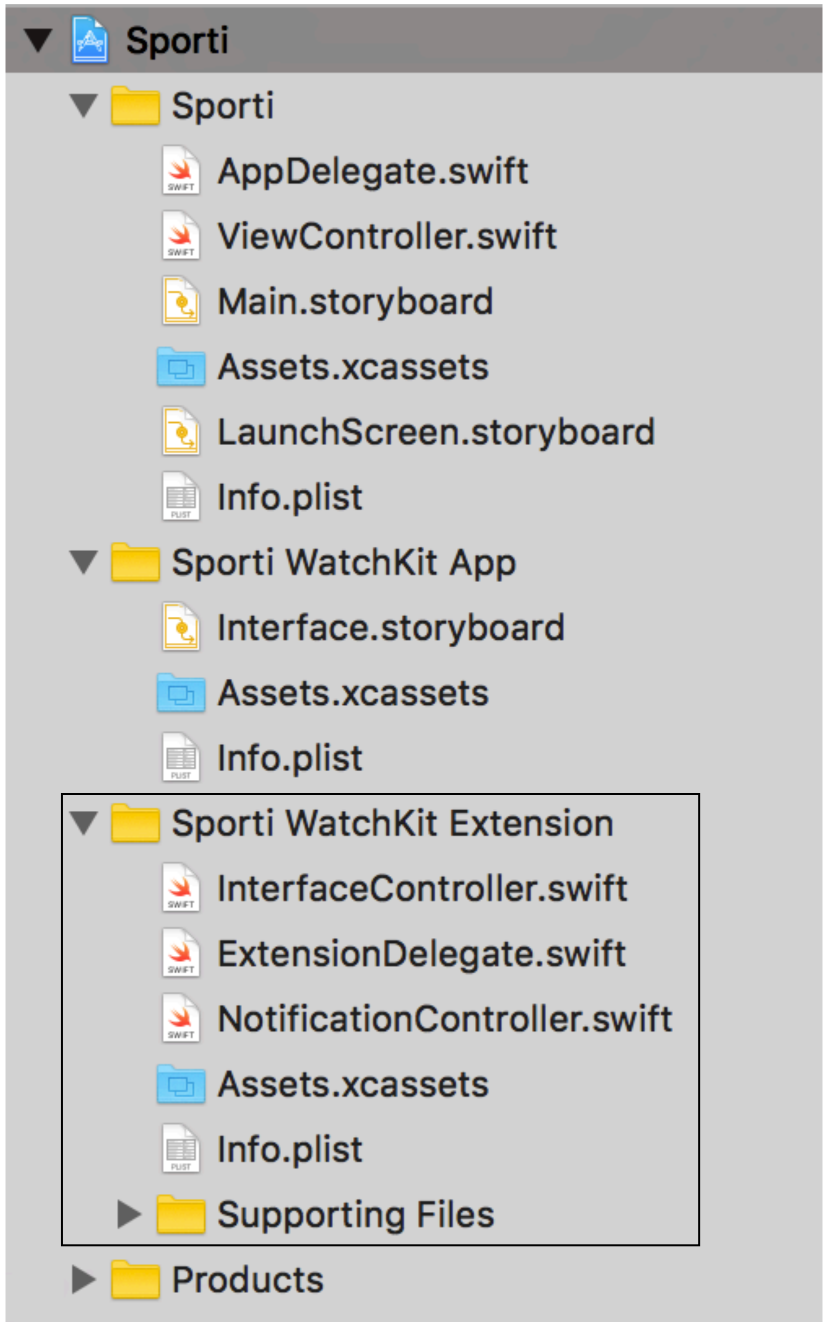

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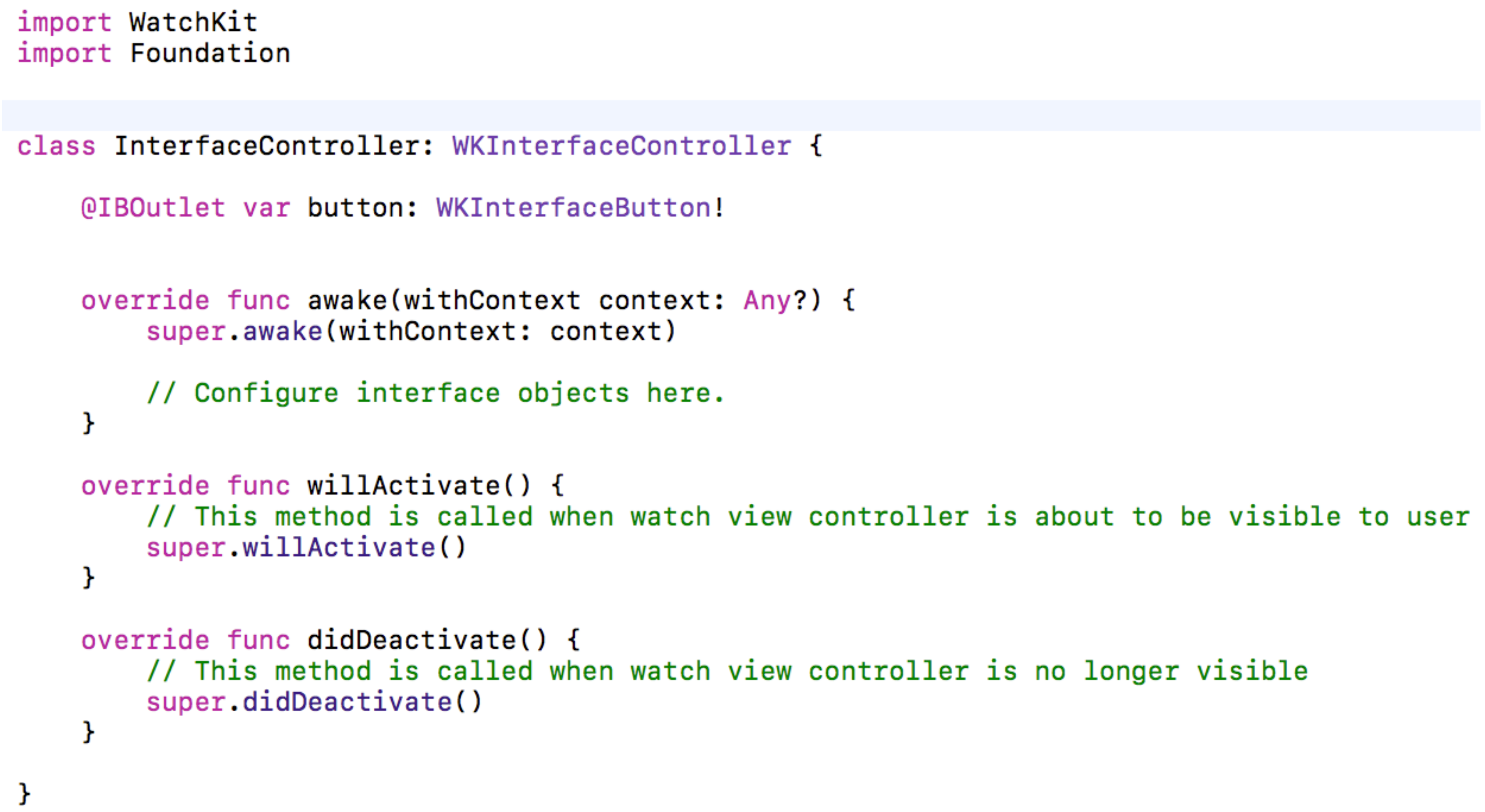
InterfaceController.swift

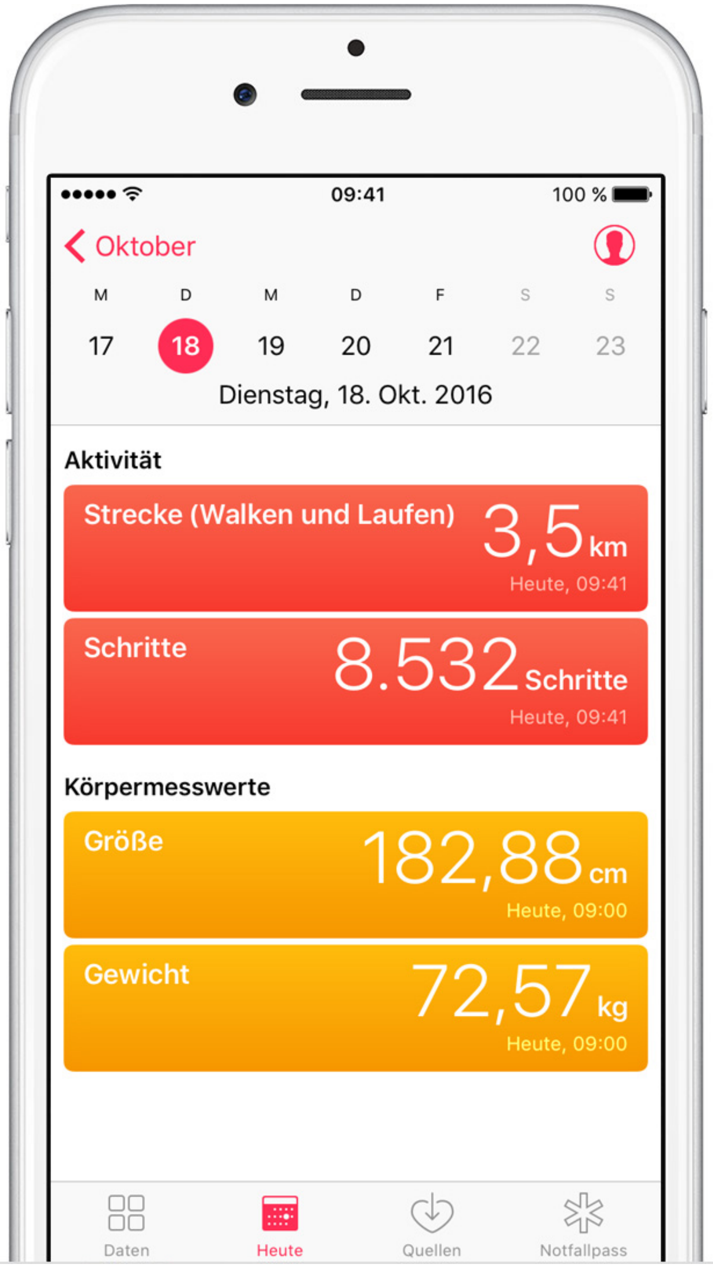


```swift
import WatchKit
import Foundation


class InterfaceController: WKInterfaceController {

    @IBOutlet var button: WKInterfaceButton!


    override func awake(withContext context: Any?) {
        super.awake(withContext: context)

        // Configure interface objects here.
    }

    override func willActivate() {
        // This method is called when watch view controller is about to be visible to user
        super.willActivate()
    }

    override func didDeactivate() {
        // This method is called when watch view controller is no longer visible
        super.didDeactivate()
    }

}
```

WatchKit

HealthKit

Health App



M	D	M	D	F	S	S
17	18	19	20	21	22	23

Dienstag, 18. Okt. 2016

Aktivität

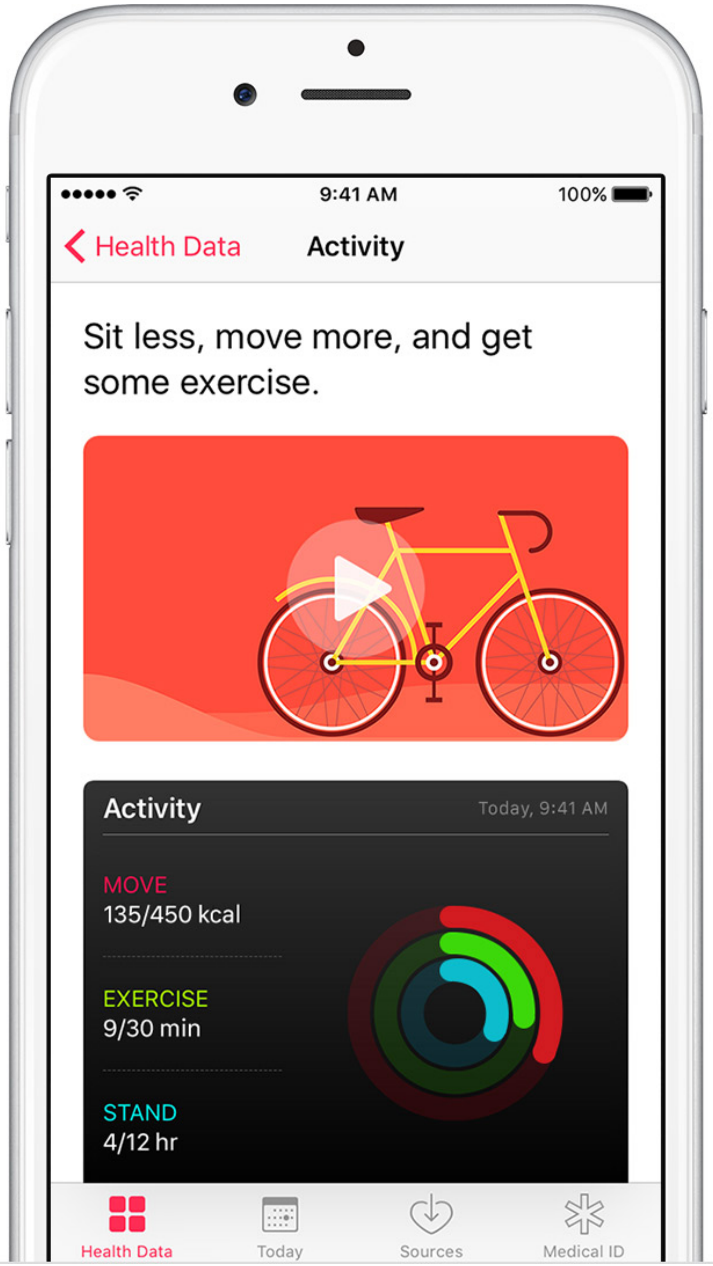
Strecke (Walken und Laufen) 3,5 km
Heute, 09:41

Schritte 8.532 Schritte
Heute, 09:41

Körpermesswerte

Größe 182,88 cm
Heute, 09:00

Gewicht 72,57 kg
Heute, 09:00



Sit less, move more, and get some exercise.

Activity
Today, 9:41 AM

MOVE
135/450 kcal

EXERCISE
9/30 min

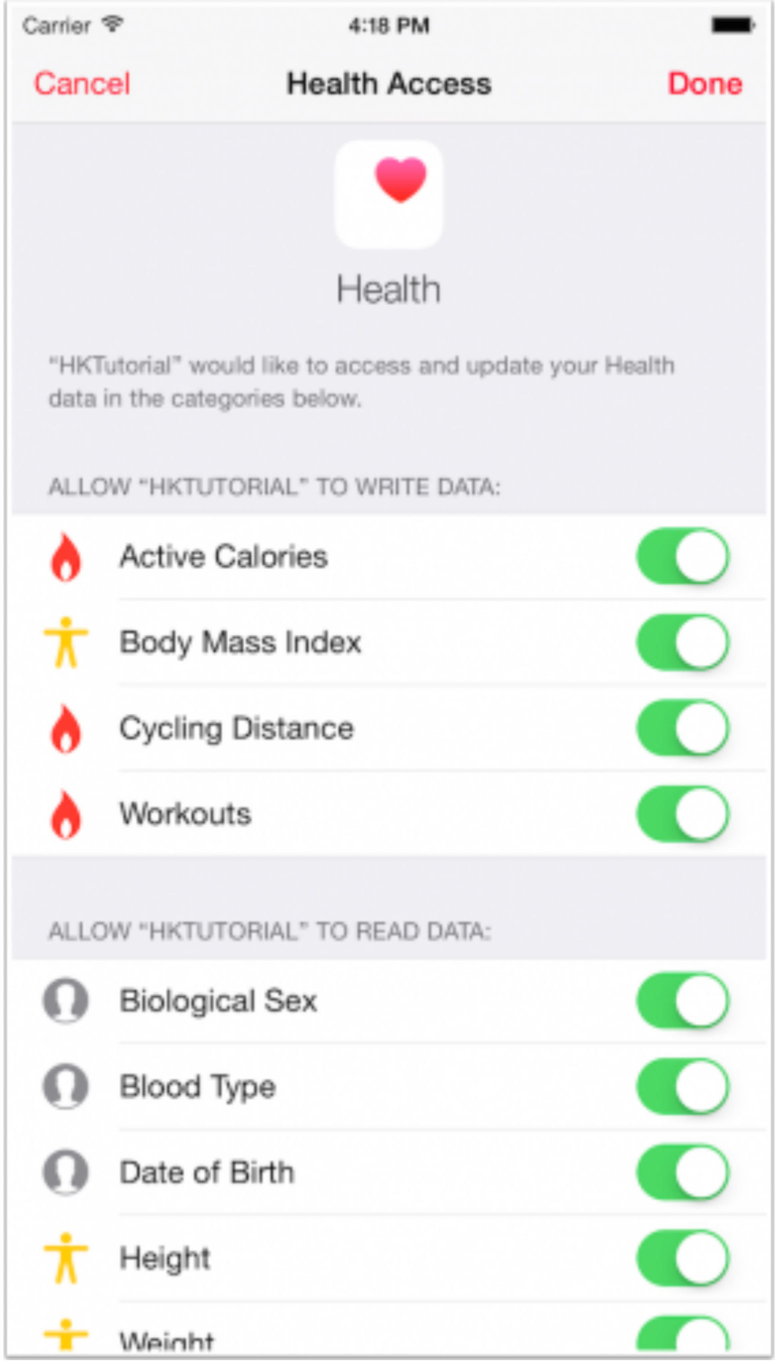
STAND
4/12 hr

HealthKit

permission for your app to read and write health and activity data to their Health app

Start - Stop Session

Receive haptic* while display turned off



Carrier 4:18 PM

"HKTutorial" would like to access and update your Health data in the categories below.

ALLOW "HKTUTORIAL" TO WRITE DATA:

- Active Calories
- Body Mass Index
- Cycling Distance
- Workouts

ALLOW "HKTUTORIAL" TO READ DATA:

- Biological Sex
- Blood Type
- Date of Birth
- Height
- Weight

*haptic: a sound or vibration on the smart watch

Workout Type

```
let configuration = HKWorkoutConfiguration()

configuration.activityType = .traditionalStrengthTraining
configuration.locationType = .indoor
```

Workout Types

American Football
Badminton
Baseball
Bowling
Boxing
Fencing
Fishing
Golf
Gymnastics
Handball
Lacrosse
Martial Arts
Rowing
Rugby
Sailing
Soccer
Swimming
Tennis
Volleyball
Walking
Yoga
WheelChairWalkPace
Other

Sensors

Swift Core Motion

Gyroscope

Pedometer

Magnetometer

Barometer

Accelerometer (User Acceleration & Gravity)

Device Motion

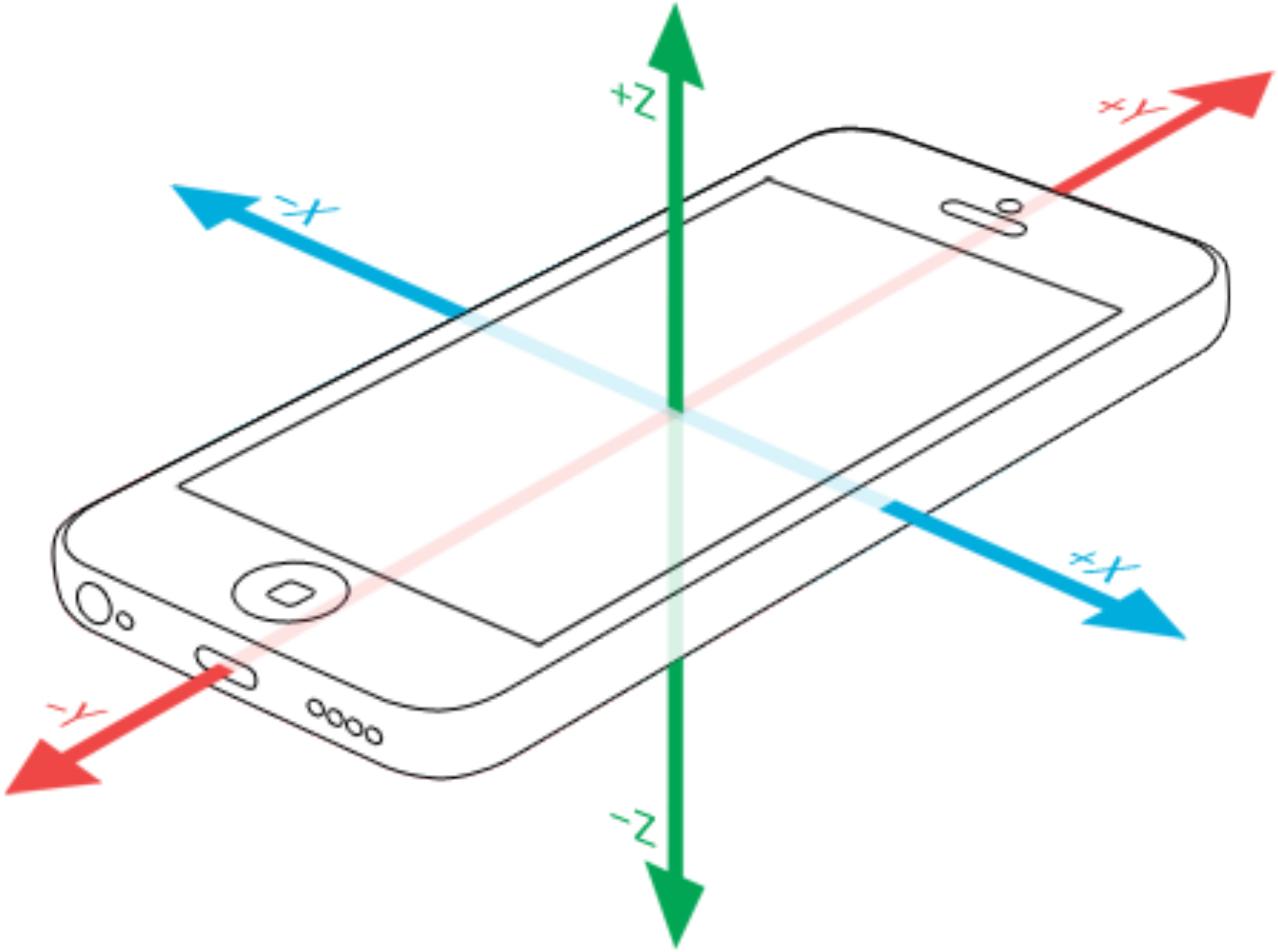
Device Motion

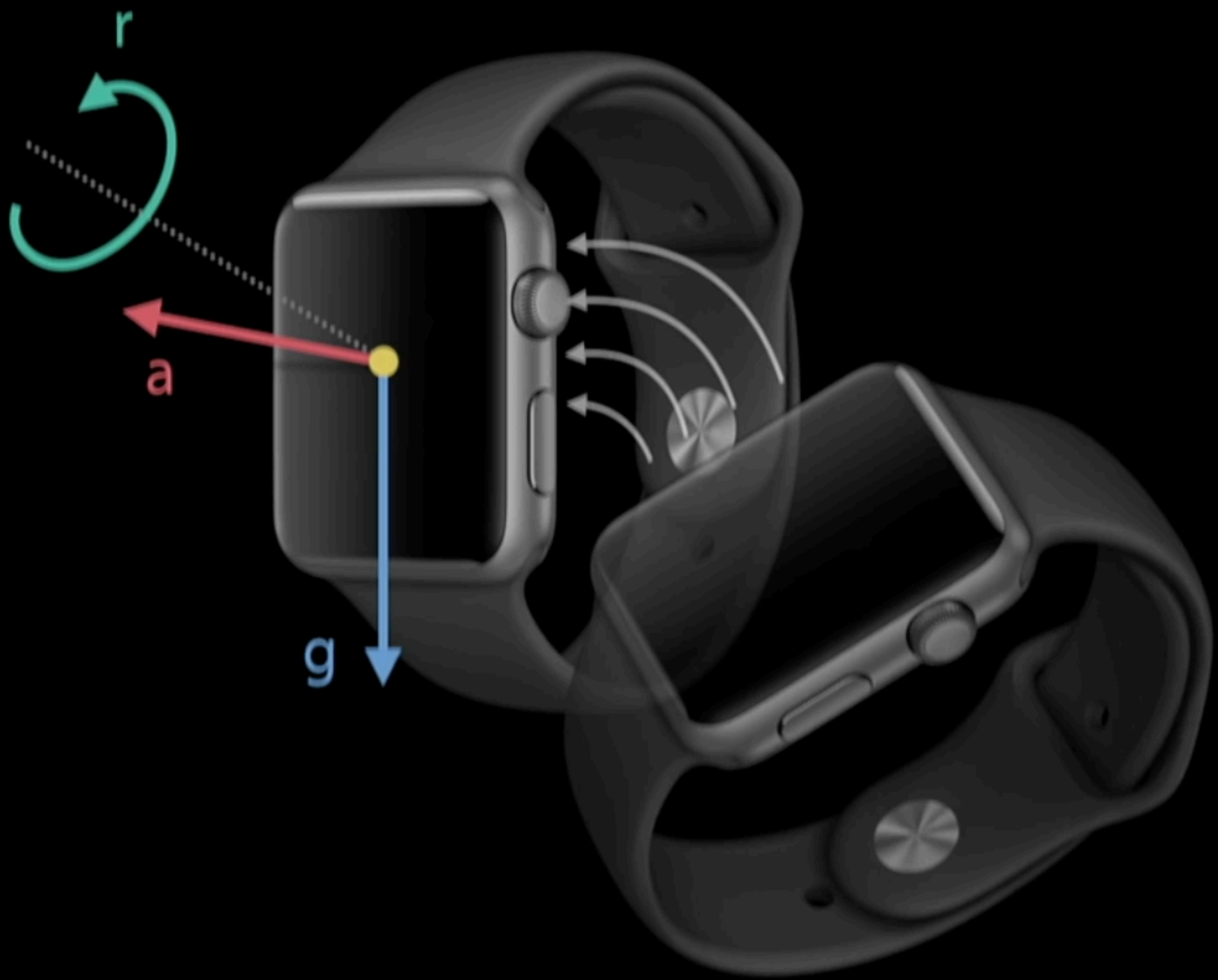
attitude

gravity

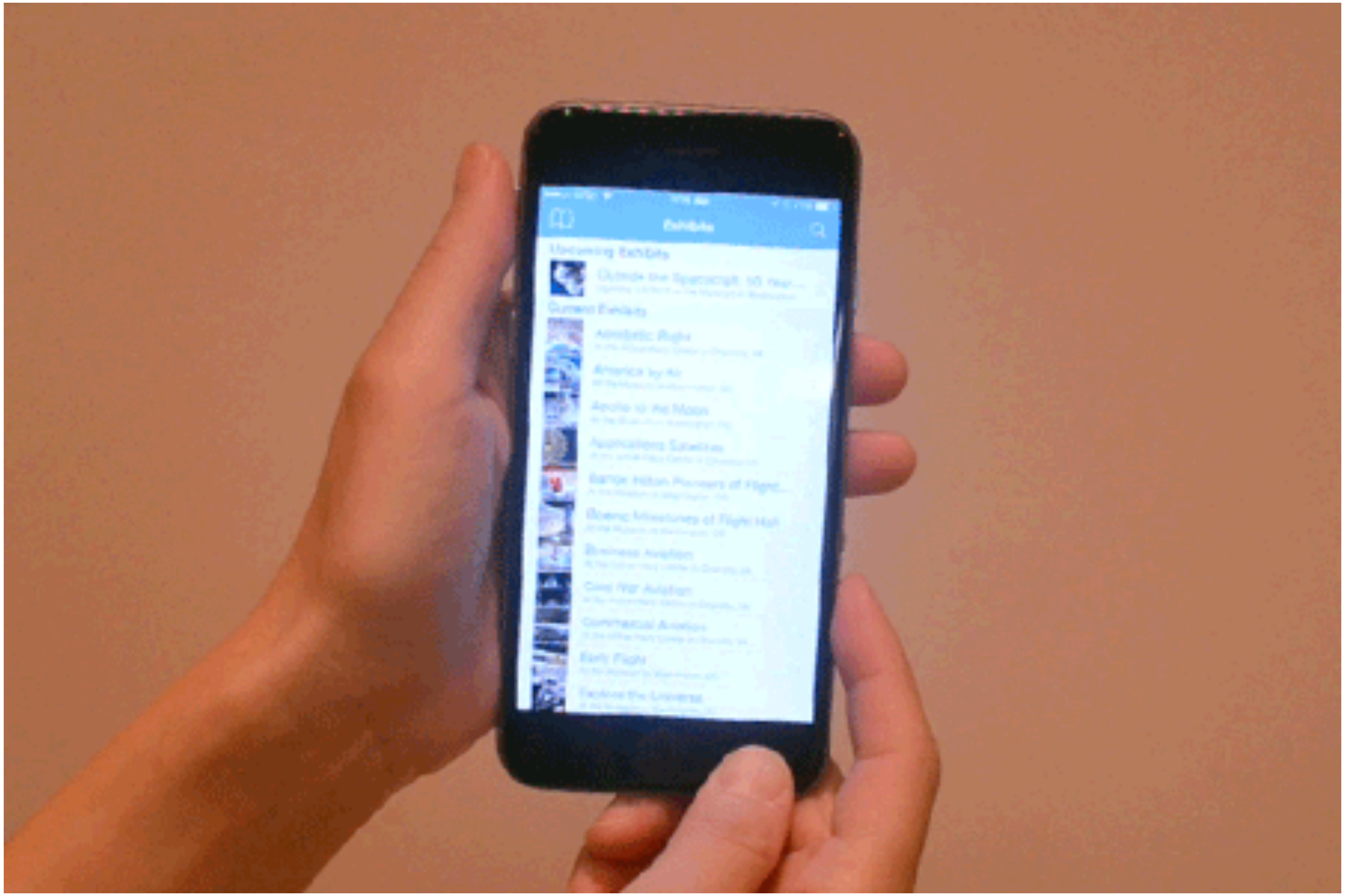
rotationRate

userAcceleration




r
a
g

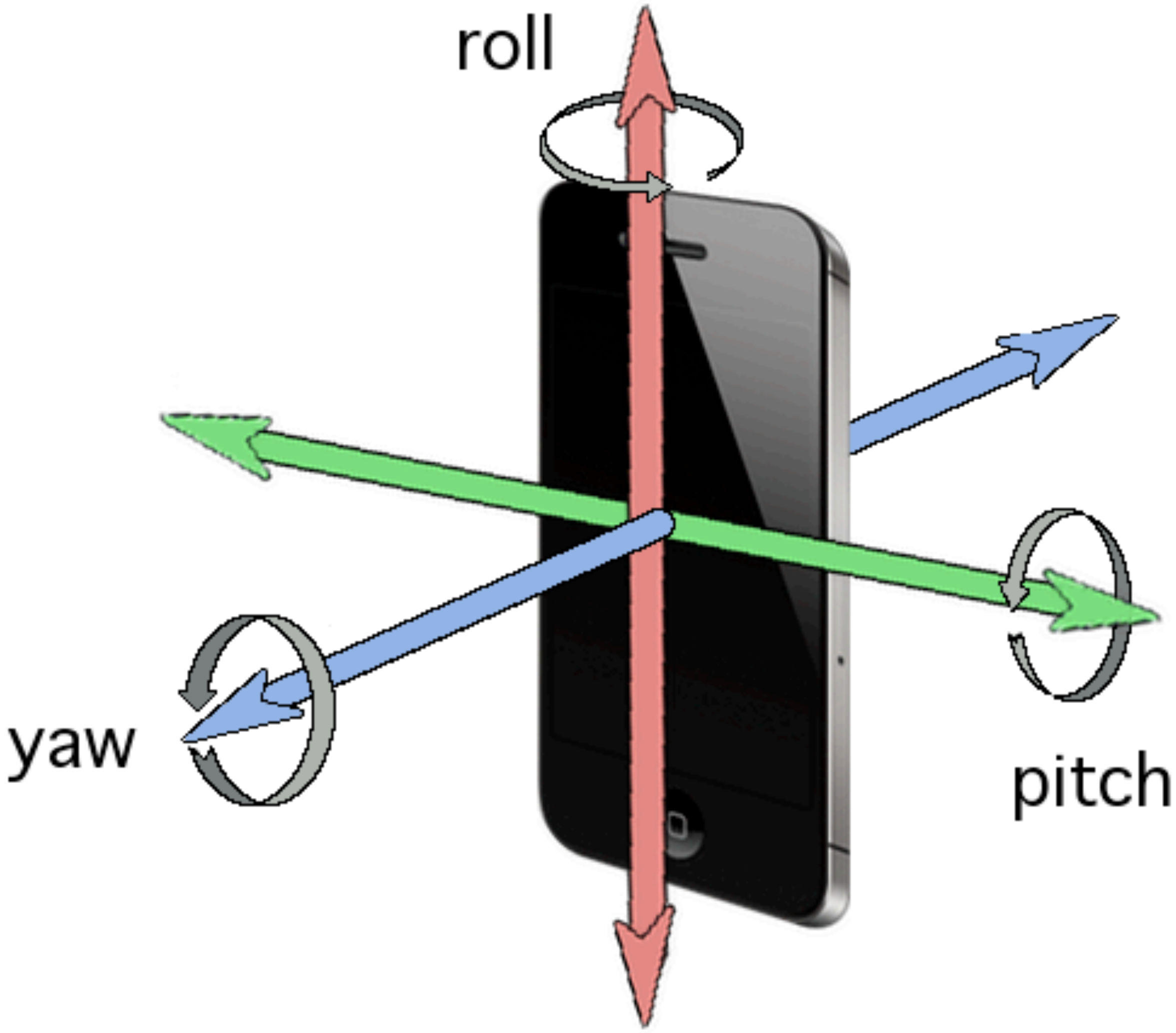
UserAcceleration.X



Attitude.pitch, .roll, .yaw

Attitude

A **CMAttitude** object represents a measurement of attitude—that is, the orientation of a body relative to a given frame of reference.

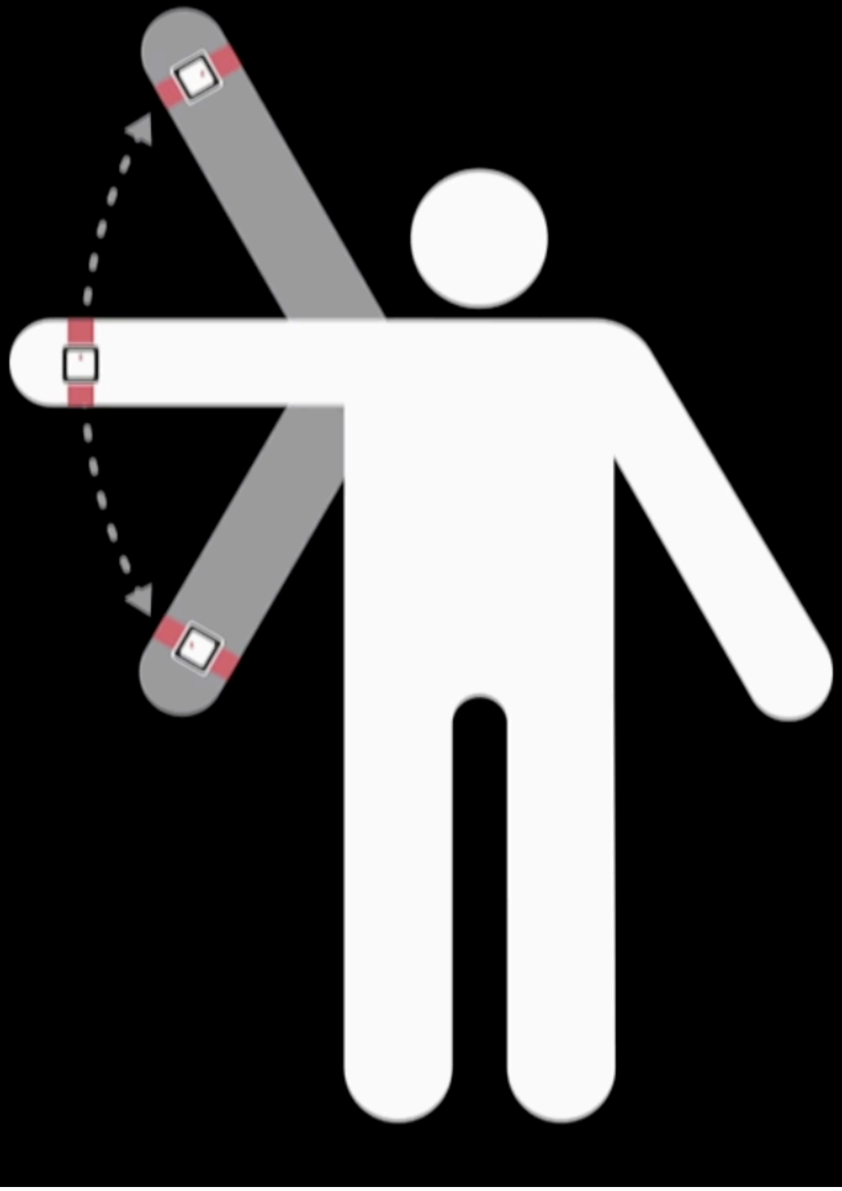


Attitude

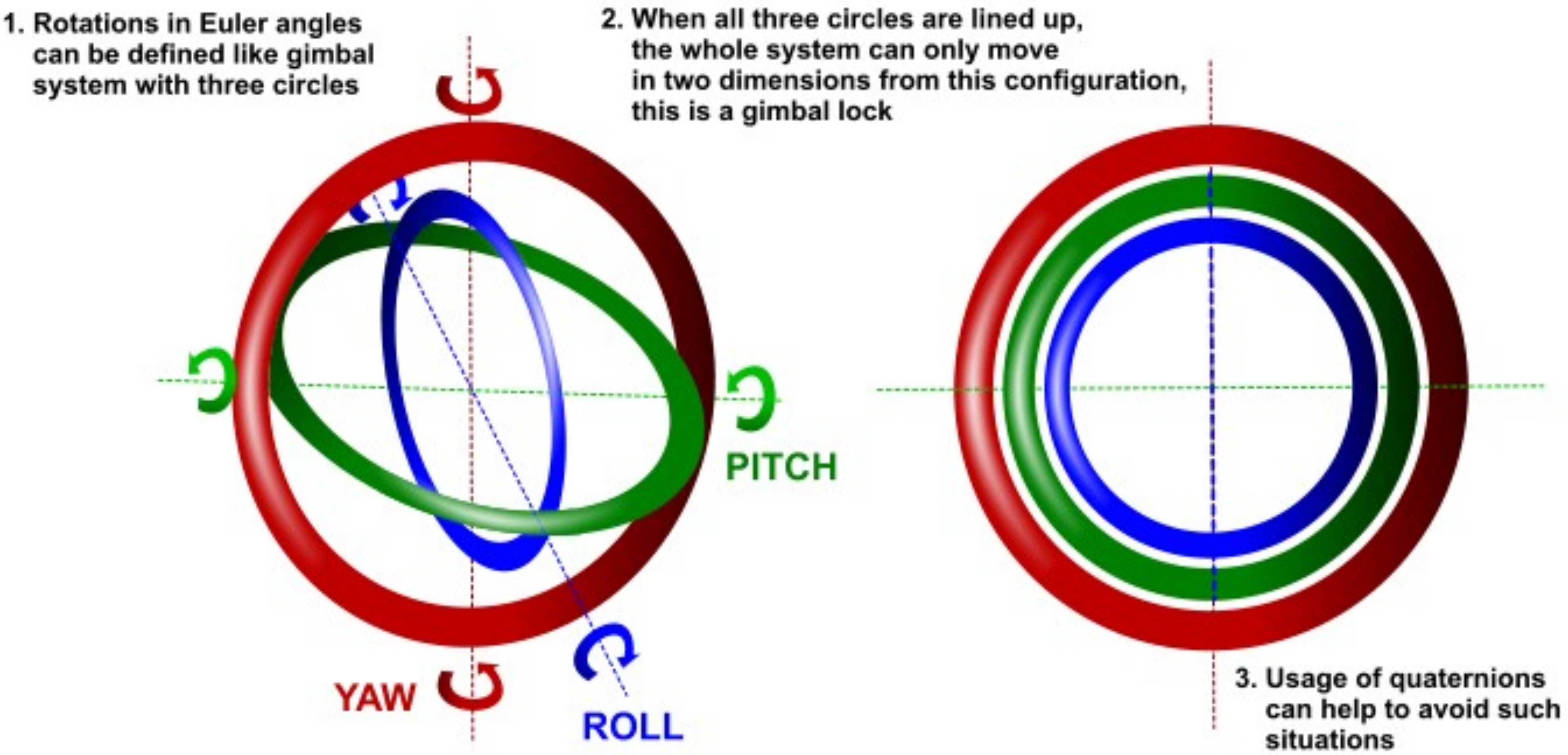
CMDeviceMotion

Device orientation represented as

- Quaternion
- Rotation matrix
- Euler angle (roll, pitch, yaw)



Gimbal lock



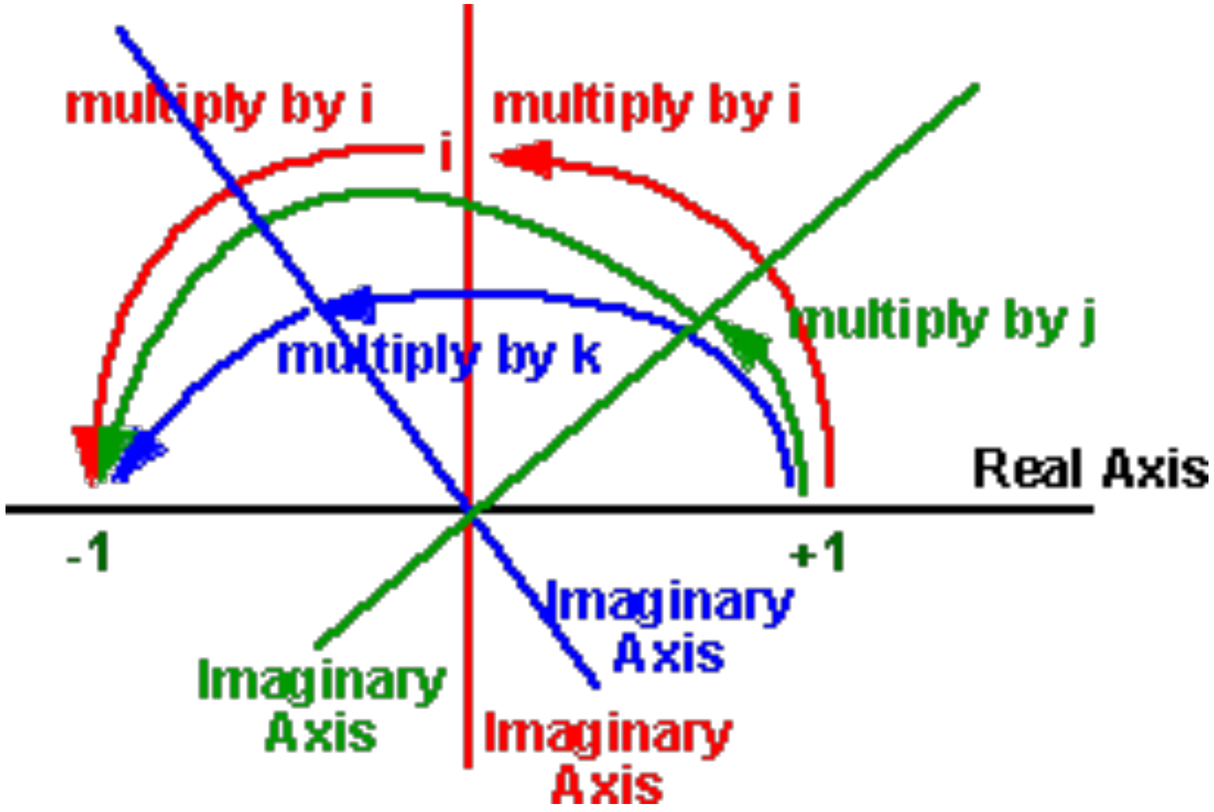
1. Rotations in Euler angles can be defined like gimbal system with three circles

2. When all three circles are lined up, the whole system can only move in two dimensions from this configuration, this is a gimbal lock

3. Usage of quaternions can help to avoid such situations

Quaternion

- Complex number: 2D
    - x + y*i
    - real and imaginary part
- Quaternion number: 3D
    - w + x*i + y*j + z*k



Live demo

Thank you

For your attention

Sources

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