Focus Interaction on tvOS

Session 215

Matthew Ricketson UIKit Frameworks Engineer
Siri Remote
Siri Remote
Game controllers
Bluetooth keyboards
Remote app
Universal remotes
Apple Remote
Agenda
Agenda

What’s new in tvOS 10
Agenda

What’s new in tvOS 10
Case study: Building a custom control
What’s New in tvOS 10
Preferred Focus Enhancements
Preferred Focus

Review

Diagram:
- Window
  - Root View Controller
    - Root View
      - Container
      - Subview
      - Subview
        - Subview
Preferred Focus

Review

- Window
  - Root View Controller
    - Root View
      - Container
      - Subview
      - Subview

`prefers`
Preferred Focus

Review

Diagram:
- Window
  - Root View Controller
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Preferred Focus

Review

- Window
  - Root View Controller
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      - Subview
- Subview
  - Subview
Preferred Focus Environments
New API
Preferred Focus Environments

New API

```swift
public protocol UIFocusEnvironment: NSObjectProtocol {
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }
}
```
Preferred Focus Environments
New API

Benefits:

```swift
public protocol UIFocusEnvironment : NSObjectProtocol {

    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }

}
```
Preferred Focus Environments

New API

Benefits:

• Prefer non-item focus environments

```swift
public protocol UIFocusEnvironment : NSObjectProtocol {
    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }
}
```
Preferred Focus Environments
New API

Benefits:

- Prefer non-item focus environments
- Prefer multiple ordered focus environments

```swift
public protocol UIFocusEnvironment: NSObjectProtocol {

    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }
}
```
Preferred Focus Environments

- Container View Controller
  - Child VC #1
    - Subview
  - Child VC #2
    - Subview
class ContainerViewController: UIViewController {

    override var preferredFocusEnvironments: [UIFocusEnvironment] {
        return [childVC1, childVC2]
    }
}
class ContainerViewController: UIViewController {

override var preferredFocusEnvironments: [UIFocusEnvironment] {
    return [childVC1, childVC2]
}
}
class ContainerViewController: UIViewController {

    override var preferredFocusEnvironments: [UIFocusEnvironment] {
        return [childVC1, childVC2]
    }
}
Preferred Focus Enhancements

Restoring focus after transitions
Restoring Focus

Root View Controller

Default Button

Button

Button
Restoring Focus

Root View Controller

Default Button

Button

Button
Restoring Focus

Root View Controller

- Default Button
- Button
- Button

Detail View Controller

- Cell
- Cell
- Cell
- Cell

Presented
Restoring Focus

Root View Controller

Default Button

Button

Button
Restoring Focus

Root View Controller

- Default Button
- Button
- Button
Restoring Focus
New API
Restoring Focus

New API

```swift
public class UIViewController : ... {
    public var restoresFocusAfterTransition: Bool
}
```
Restoring Focus

New API

True by default

```swift
public class UIViewController : … {

    public var restoresFocusAfterTransition: Bool

}
```
Restoring Focus

New API

True by default
Affects presentation, push/pop, and tab bar selection

```swift
public class UIViewController : ... {
  public var restoresFocusAfterTransition: Bool
}
```
Demo
preferredFocusEnvironments and
restoresFocusAfterTransition

Brandon Kieft tvOS Software Engineer
Focus Interaction in SpriteKit
Focus Interaction in SpriteKit

Use cases
Focus Interaction in SpriteKit

Use cases

Game menus
Focus Interaction in SpriteKit

Use cases

Game menus
Board games
Focus Interaction in SpriteKit

Use cases

Game menus
Board games
Any “selection”-based game
Focus Interaction in SpriteKit

Overview
Focus Interaction in SpriteKit

Overview

Shared Focus API across UIKit and SpriteKit
Focus Interaction in SpriteKit

Overview

Shared Focus API across UIKit and SpriteKit
Opt-in for SpriteKit
Focus Interaction in SpriteKit

Overview

Shared Focus API across UIKit and SpriteKit
Opt-in for SpriteKit
Seamless focus movement between views and nodes
Focus Interaction in SpriteKit

UIView
Focus Interaction in SpriteKit
Focus Interaction in SpriteKit

UIView

var canBecomeFocused: Bool
Focus Interaction in SpriteKit

UIView

var canBecomeFocused: Bool
Focus Interaction in SpriteKit

UIFocusEnvironment

UIView

var canBecomeFocused: Bool
Focus Interaction in SpriteKit

- UIView
  - var canBecomeFocused: Bool
- UIFocusEnvironment
Focus Interaction in SpriteKit

UIFocusEnvironment

UIFocusItem

var canBecomeFocused: Bool

UIView

NEW
Focus Interaction in SpriteKit

- **UIView**
- **SKNode**
- **UIFocusEnvironment**
- **UIFocusItem**
  - `var canBecomeFocused: Bool`
public class UIFocusUpdateContext : NSObject {

    weak public var previouslyFocusedItem: UIFocusItem? { get }

    weak public var nextFocusedItem: UIFocusItem? { get }

}
public class UIScreen : NSObject {

    weak public var focusedItem: UIFocusItem? { get }

}
public protocol UIFocusEnvironment : NSObjectProtocol {

}


public protocol UIFocusEnvironment : NSObjectProtocol {

    weak optional public var preferredFocusedView: UIView? { get }

}
public protocol UIFocusEnvironment: NSObjectProtocol {

    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }

    weak optional public var preferredFocusedView: UIView? { get }

}
public protocol UIFocusEnvironment : NSObjectProtocol {

    public var preferredFocusEnvironments: [UIFocusEnvironment] { get }

    @available(tvOS, introduced: 9.0, deprecated: 10.0)
    weak optional public var preferredFocusedView: UIView? { get }

}
Focus Interaction in SpriteKit

Summary
Focus Interaction in SpriteKit

Summary

Focus API supports both UIKit and SpriteKit
Focus Interaction in SpriteKit

Summary

Focus API supports both UIKit and SpriteKit

UIView and SKNode conform to UIFocusItem
Focus Interaction in SpriteKit

Summary

Focus API supports both UIKit and SpriteKit
UIView and SKNode conform to UIFocusItem
Opt-in for SpriteKit
Focus Interaction in SpriteKit

Summary

Focus API supports both UIKit and SpriteKit
UIView and SKNode conform to UIFocusItem
Opt-in for SpriteKit
No changes required for UIKit-only apps
Focus Interaction in SpriteKit

Summary

Focus API supports both UIKit and SpriteKit
UIView and SKNode conform to UIFocusItem
Opt-in for SpriteKit
No changes required for UIKit-only apps
Case Study
Building a custom control
Building a Custom Control

Five star rating control
Building a Custom Control

Five star rating control
Building a Custom Control

Five star rating control

1 Star
Building a Custom Control

Five star rating control

1 Star
Demo

Building a custom control

Brandon Kieft tvOS Software Engineer
Building a Custom Control

Recommendations
Building a Custom Control

Recommendations

Subclass UIControl
Building a Custom Control

Recommendations

Subclass UIControl

Use the focus animation coordinator
Building a Custom Control

Recommendations

Subclass UIControl

Use the focus animation coordinator

Use motion effects
Building a Custom Control

Testing
Building a Custom Control

Testing

Input devices have different capabilities
Building a Custom Control

Testing

Input devices have different capabilities
Test using different input devices
Building a Custom Control

Testing

Input devices have different capabilities
Test using different input devices
Test with accessibility
Summary
Summary

Preferred focus enhancements
Summary

Preferred focus enhancements

Focus interaction support for SpriteKit
Summary

Preferred focus enhancements
Focus interaction support for SpriteKit
Building a custom, focusable control
Focus-Driven Interfaces with UIKit
Apple TV Tech Talks 2016

Covers the basics
In-depth Focus API overview
Best practices
Tools and debugging support
More Information

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