

What's New in Accessibility

Developing for everyone

Session 202

Conor Hughes Accessibility Engineer

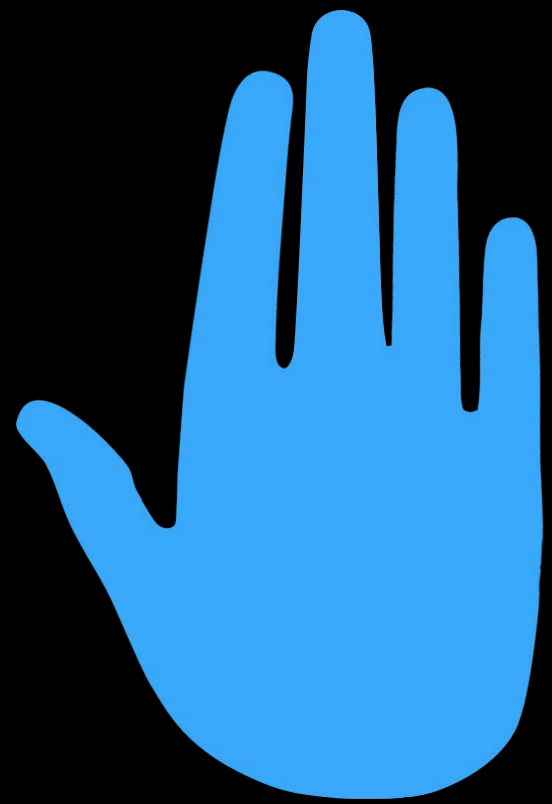
Accessibility

Accessibility

Making a system usable for everyone, regardless of their needs

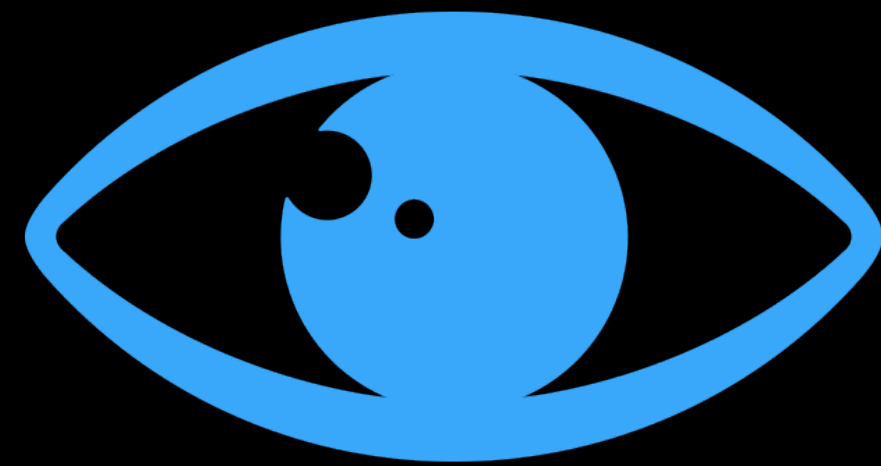
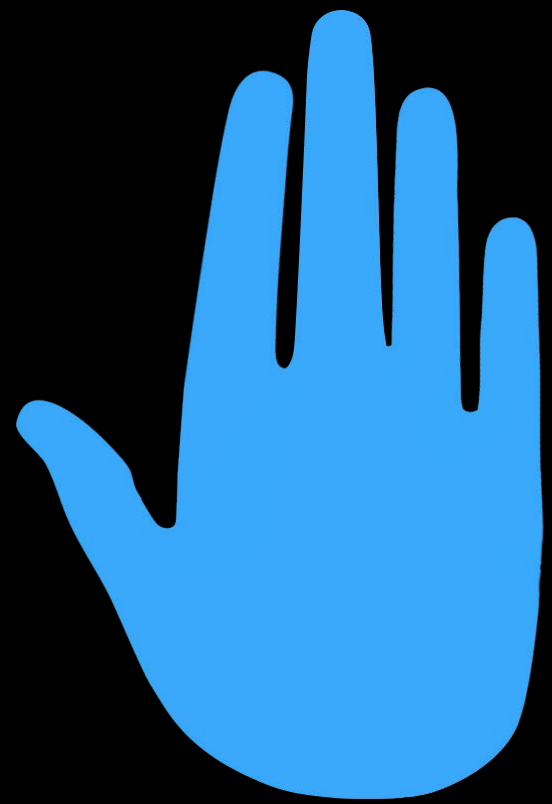
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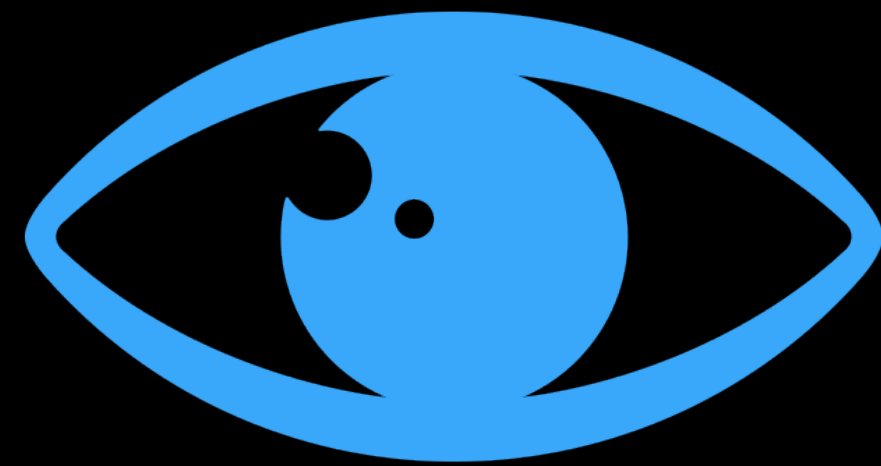
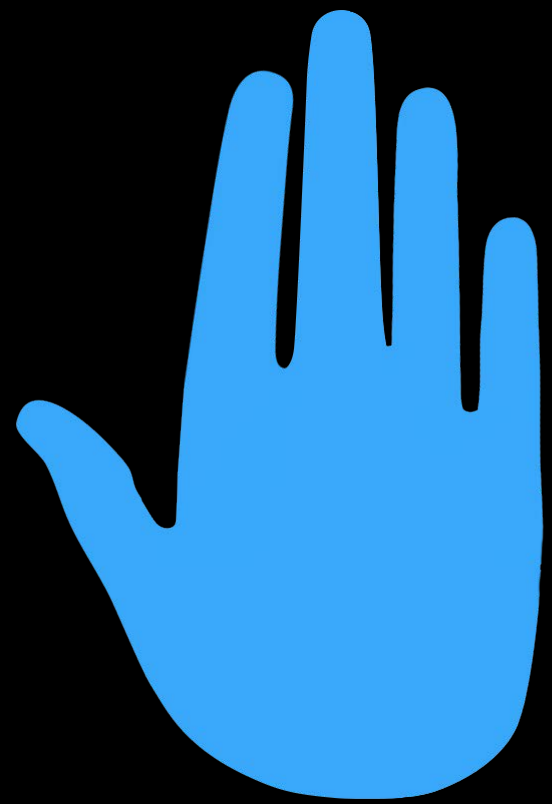
Accessibility

Making a system usable for everyone, regardless of their needs



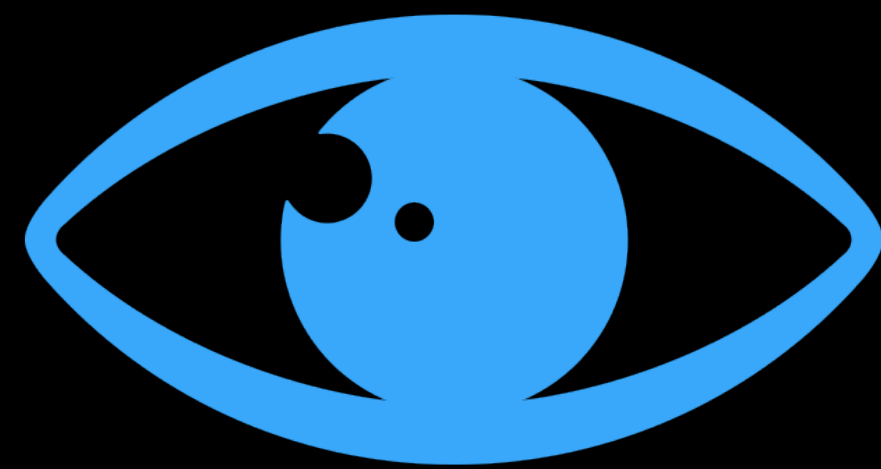
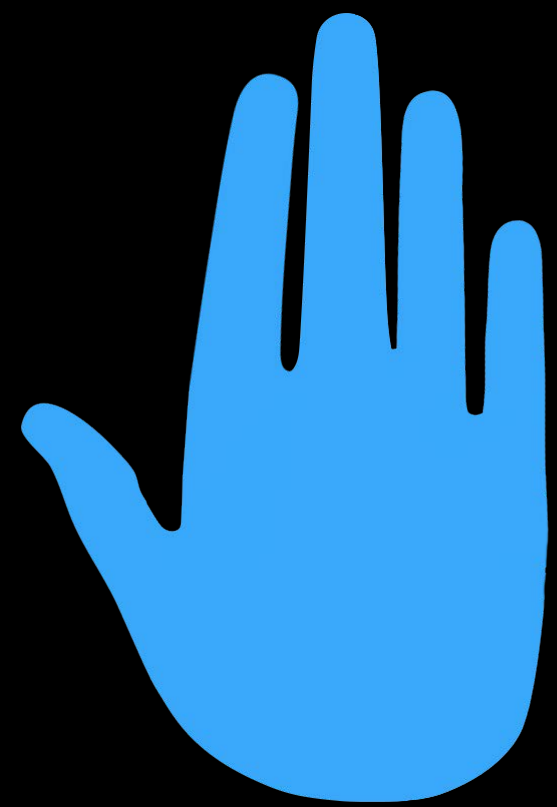
Accessibility

Making a system usable for everyone, regardless of their needs



Accessibility

Making a system usable for everyone, regardless of their needs



Aa

Agenda

Agenda

New assistive features

Agenda

New assistive features

Accessibility audit

Agenda

New assistive features

Accessibility audit

App accessibility API

Agenda

New assistive features

Accessibility audit

App accessibility API

Fixing app accessibility issues

New Assistive Features

Motor

Motor

Switch Control



Motor

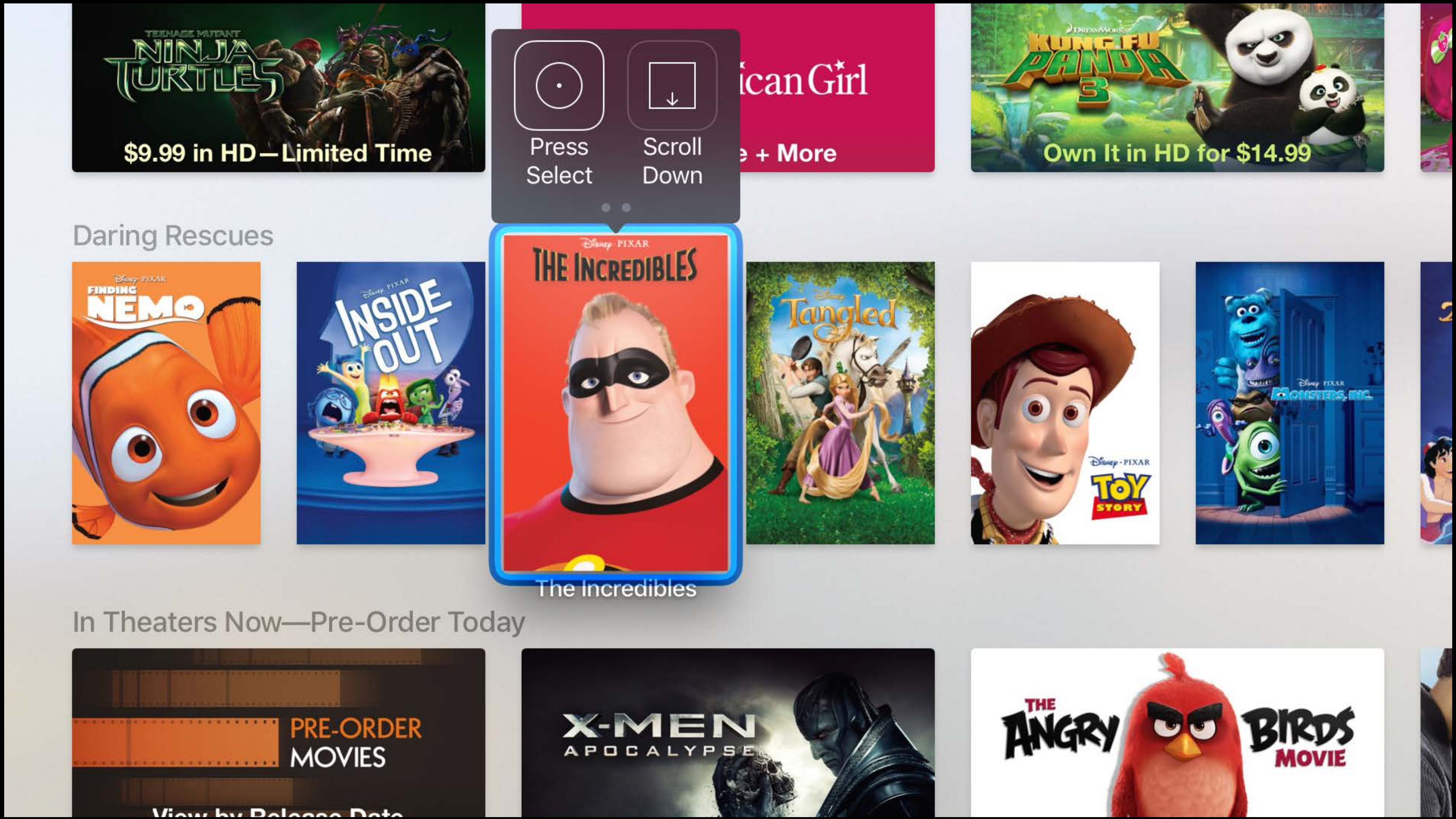
Switch Control



Motor

Switch Control on tvOS

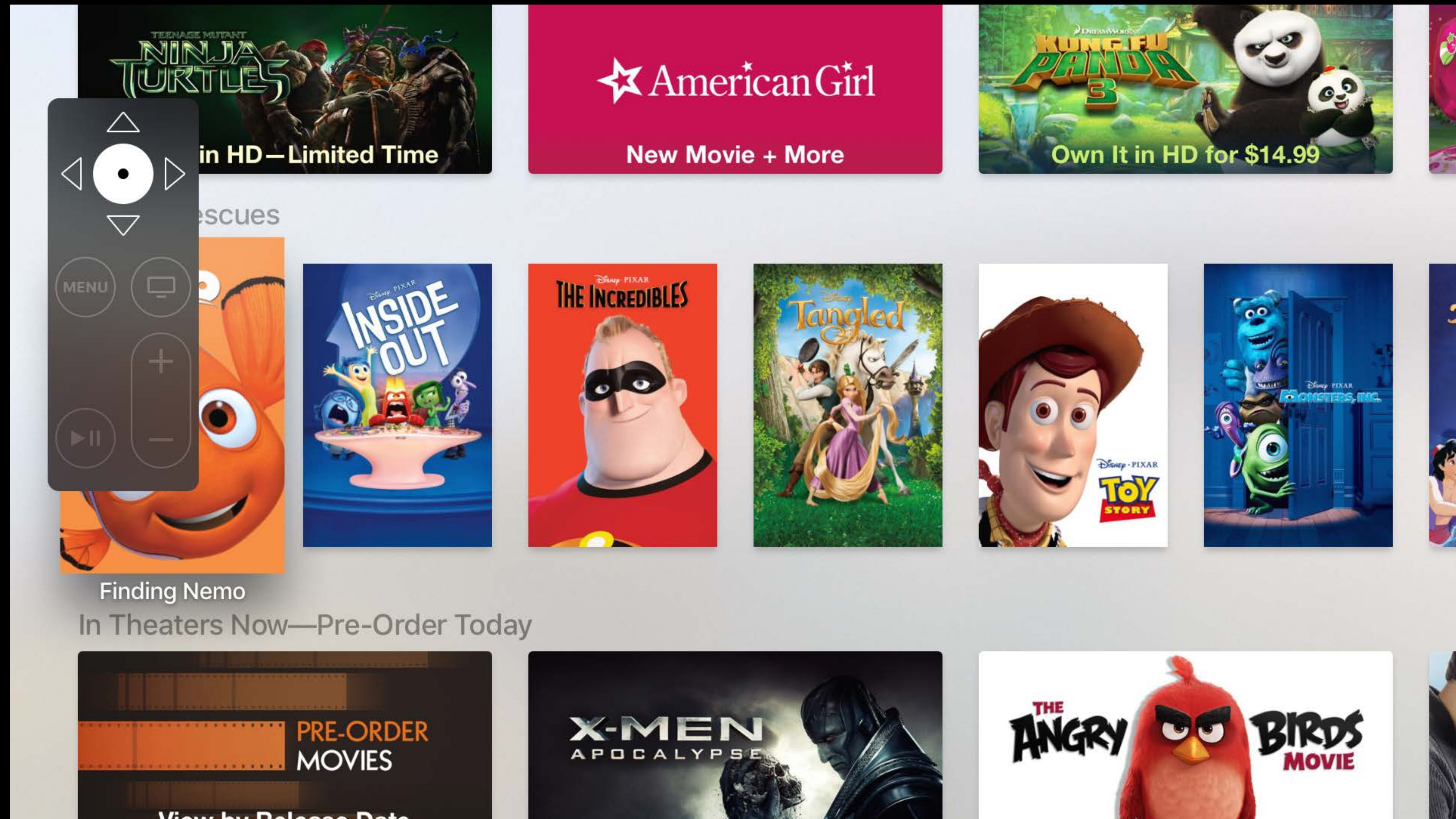
NEW



Motor

Switch Control on tvOS

NEW



Motor Dwell Control

NEW

The screenshot displays a software interface with a control panel and a calendar. The control panel, titled "Home - Dwell", includes icons for "Left click", "Double click", "Right click", "Toggle drag", "Scroll menu", "Keyboard", "System", and "Custom". The calendar shows the date "Saturday, June 18, 2016" and a time slot from "all-day" to "9 PM". The calendar grid shows the current date "18" selected. The text "No Event Selected" is visible in the calendar area.

| S | M | T | W | T | F | S |
|----|----|----|----|----|----|----|
| 29 | 30 | 31 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Motor Dwell Control

NEW

The screenshot displays a software interface with a control panel on the left and a calendar on the right. The control panel, titled "Home - Dwell", contains several icons and labels: "Left click", "Double click", "Right click", "Toggle drag", "Scroll menu", "Keyboard", "System", and "Custom". The calendar shows the date "Saturday, June 18, 2016" and a time slot from "10 AM" to "9 PM". The text "No Event Selected" is visible in the calendar area.

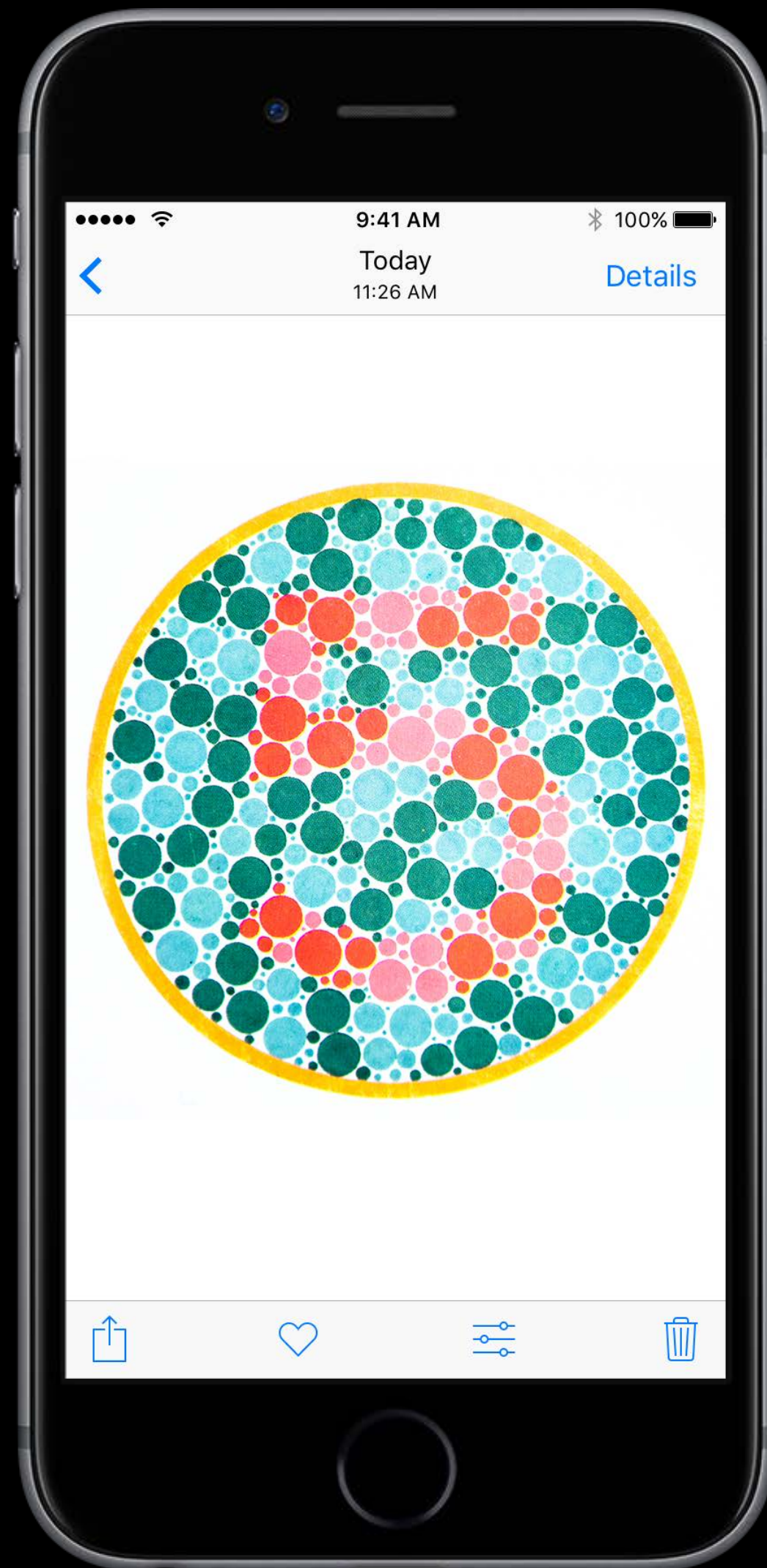
| S | M | T | W | T | F | S |
|----|----|----|----|----|----|----|
| 29 | 30 | 31 | 1 | 2 | 3 | 4 |
| 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 | 25 |
| 26 | 27 | 28 | 29 | 30 | 1 | 2 |
| 3 | 4 | 5 | 6 | 7 | 8 | 9 |

Vision

Vision

Display Adjustments

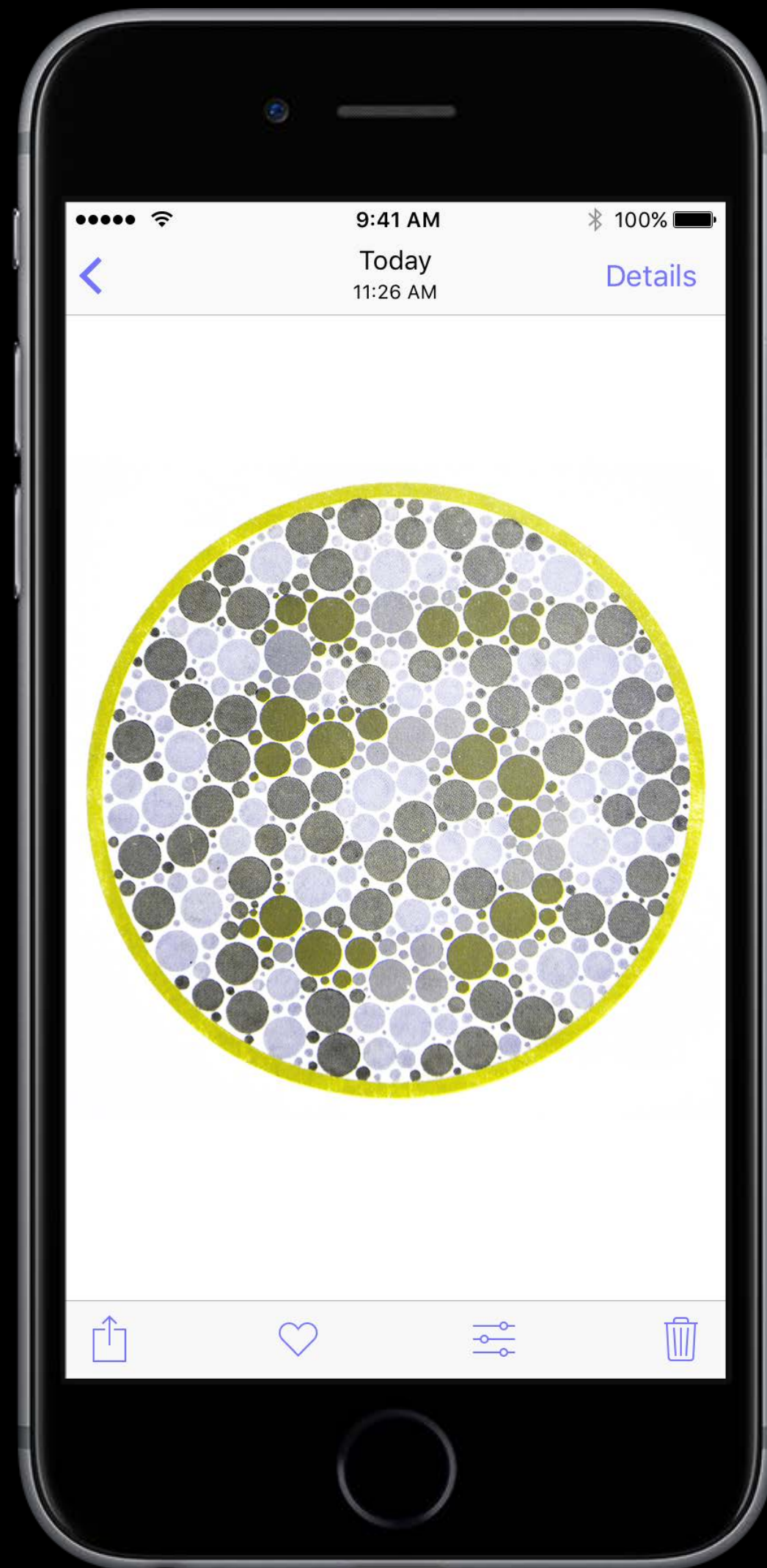
NEW



Vision

Display Adjustments

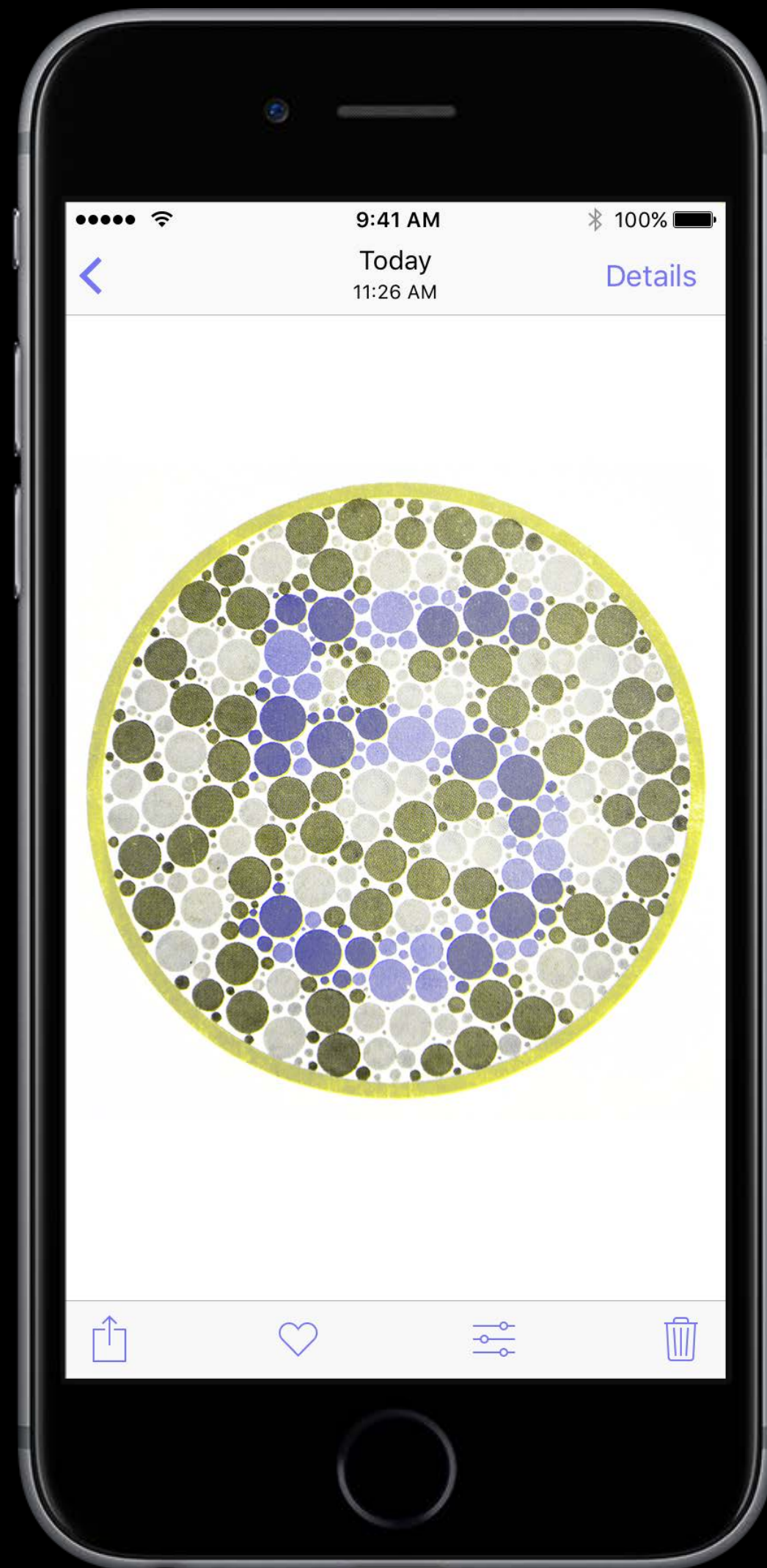
NEW



Vision

Display Adjustments

NEW



Vision

Taptic Time

NEW



Vision

Taptic Time

NEW



Vision Magnifier

NEW



Demo

Magnifier

Hearing

Hearing

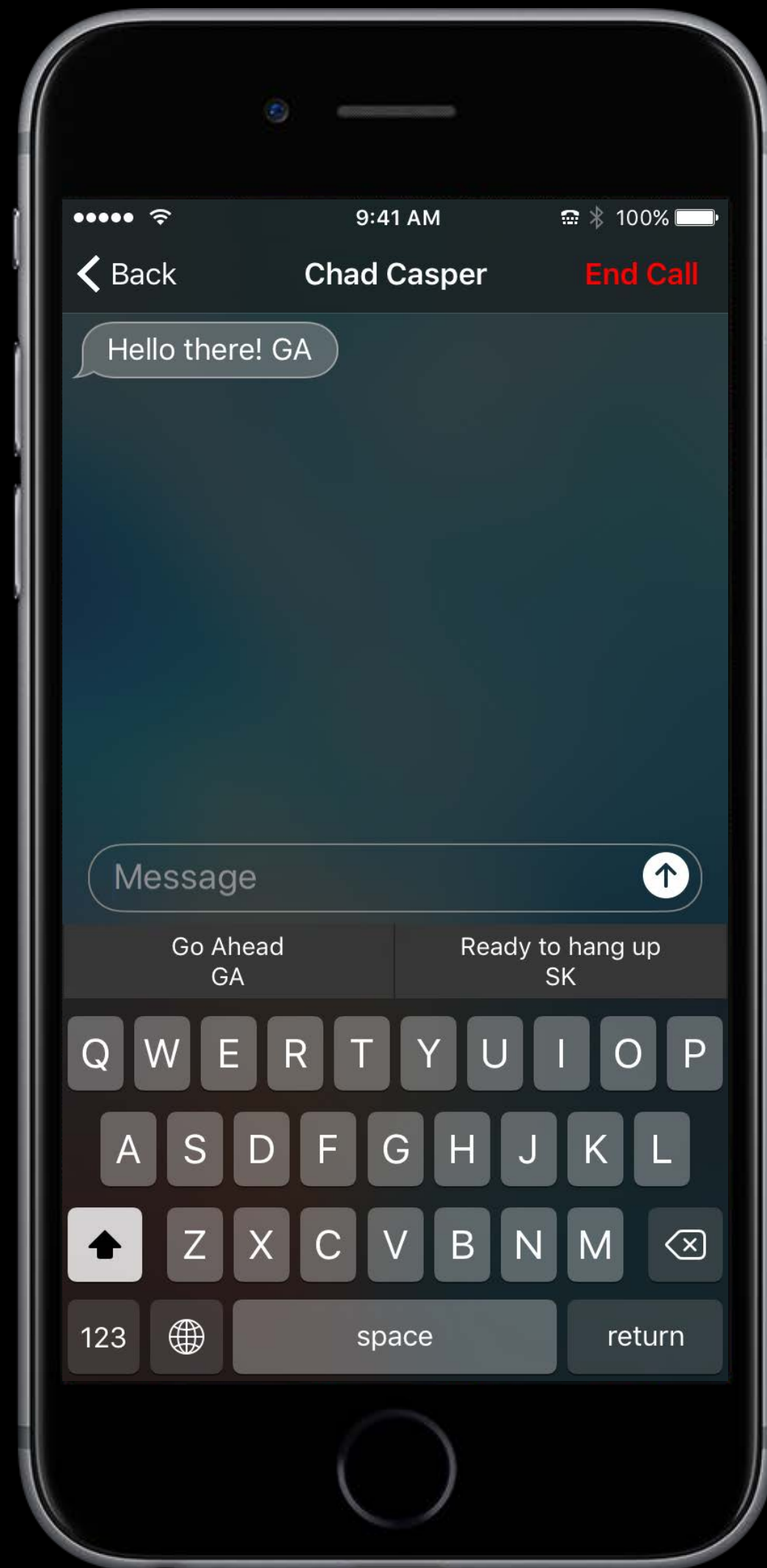
TTY



Hearing

Software TTY

NEW

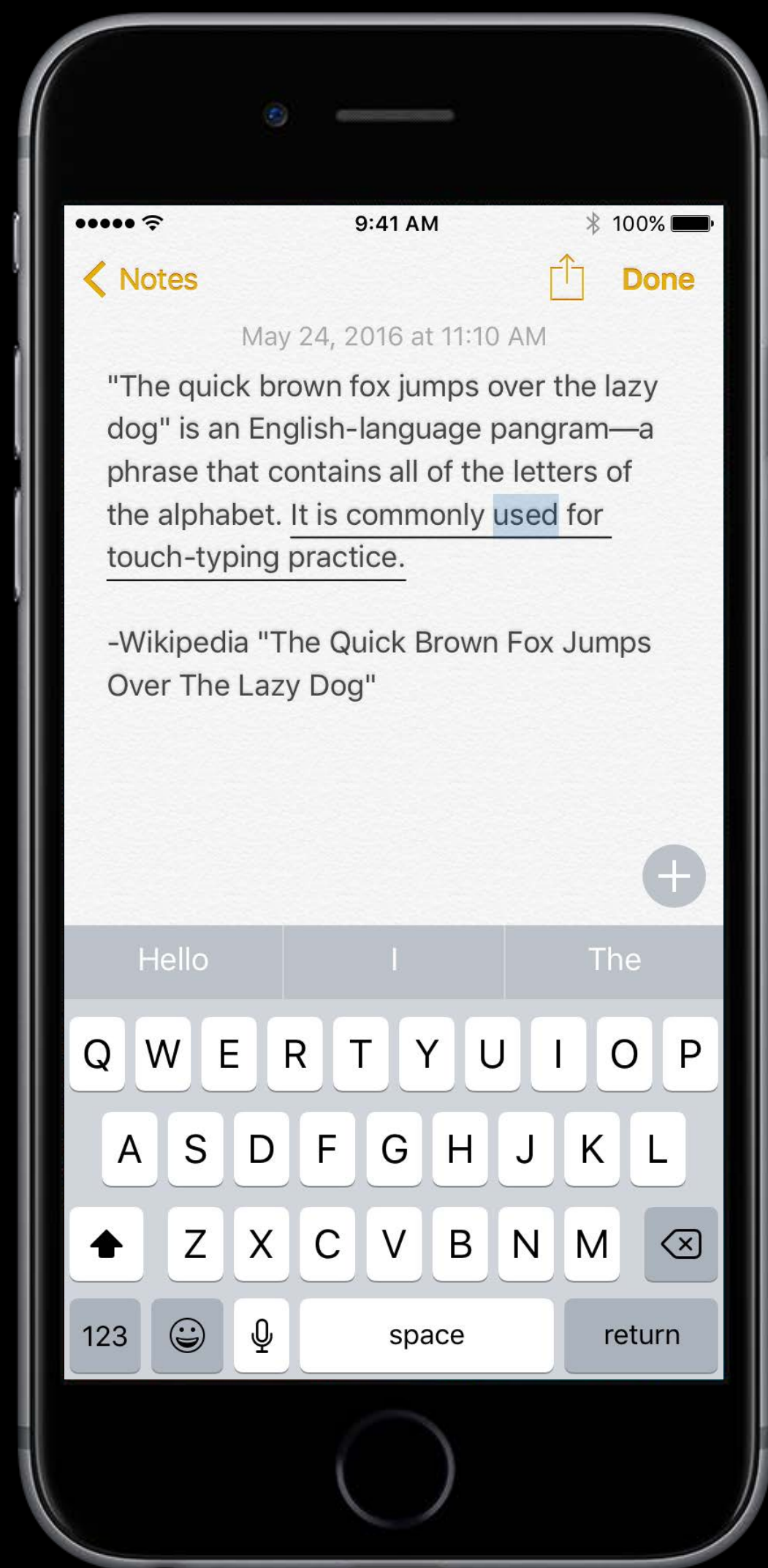


Learning

Learning

Enhanced typing feedback

NEW



Demo

Typing feedback enhancements

Accessibility API

Auditing Your App's Accessibility

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

- All items exposed

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

- All items exposed
- All exposed items labeled

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

- All items exposed
- All exposed items labeled
- All interactions supported

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

- All items exposed
- All exposed items labeled
- All interactions supported
- Good interface flow

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

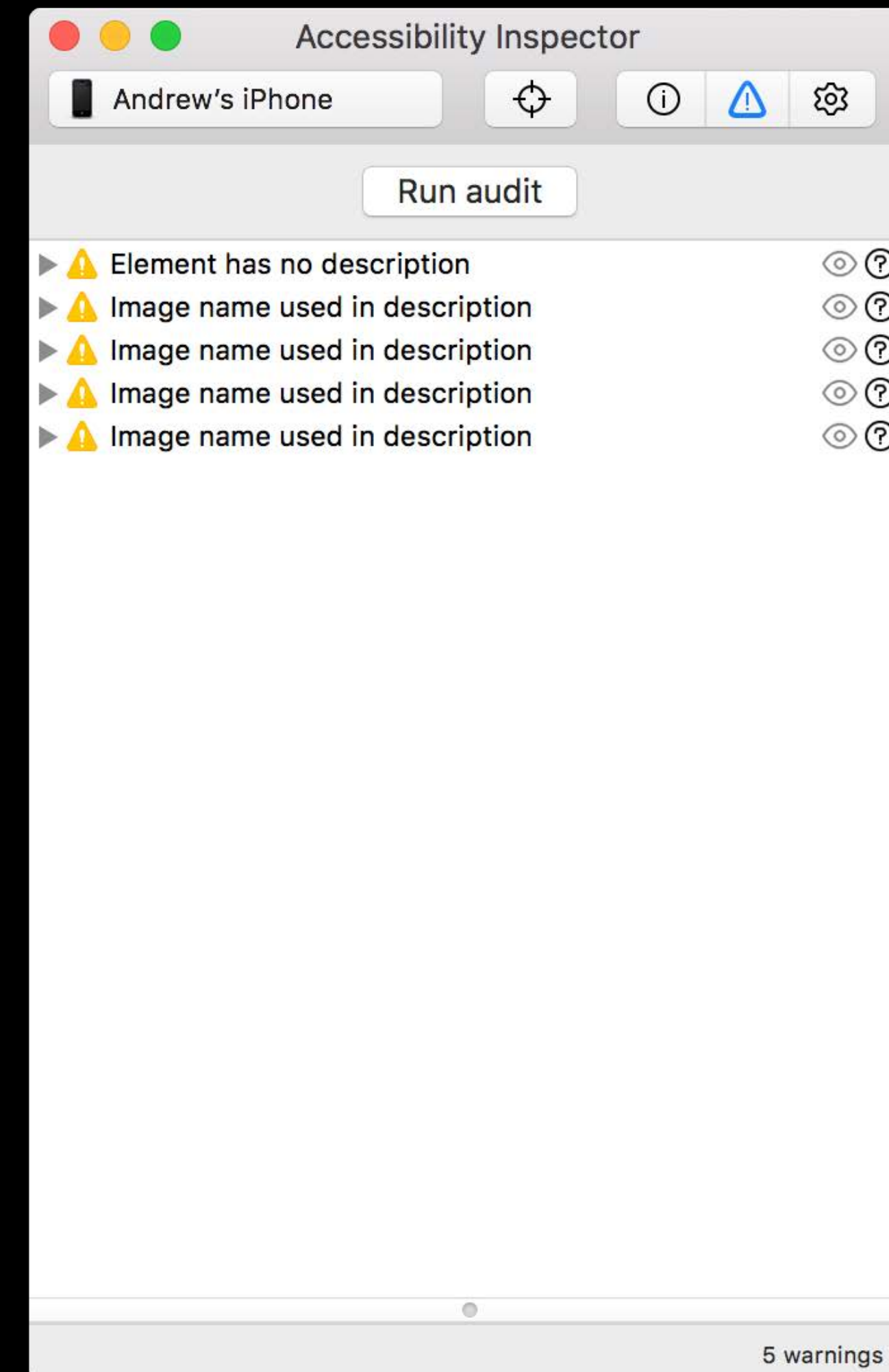
- All items exposed
- All exposed items labeled
- All interactions supported
- Good interface flow

Auditing Your App's Accessibility

Turn on VoiceOver or Switch Control

- All items exposed
- All exposed items labeled
- All interactions supported
- Good interface flow

Accessibility Inspector



Demo

Accessibility audit

Accessibility Audit Results

Accessibility Audit Results

Route list cells

Avenue Loop



0.8 miles

Accessibility Audit Results

Route list cells

- Favorite button has bad label

Avenue Loop



0.8 miles

Accessibility Audit Results

Route list cells

- Favorite button has bad label
- Isn't clear that table cell can be activated

Avenue Loop



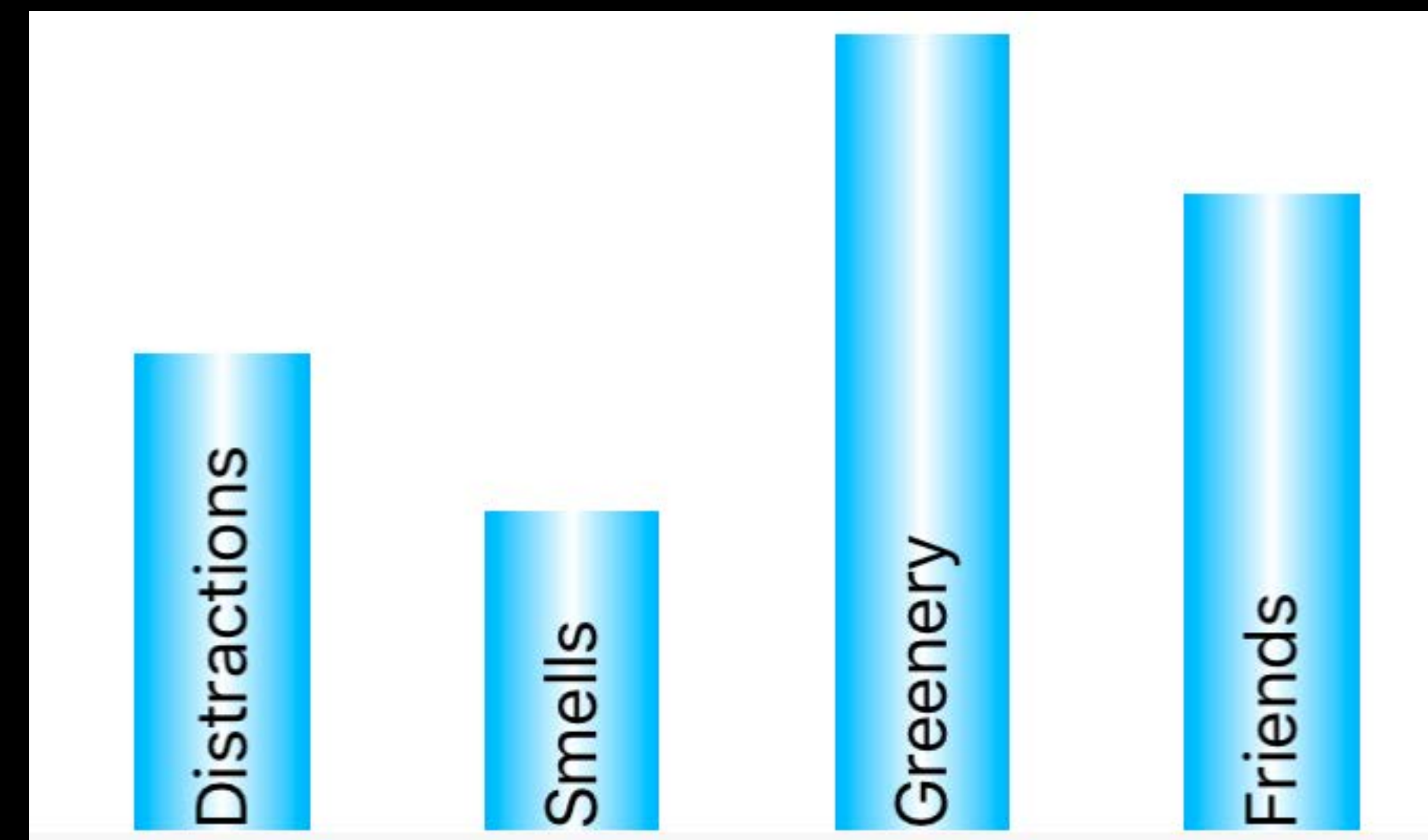
0.8 miles

Accessibility Audit Results

Route list cells

- Favorite button has bad label
- Isn't clear that table cell can be activated

Ratings graph



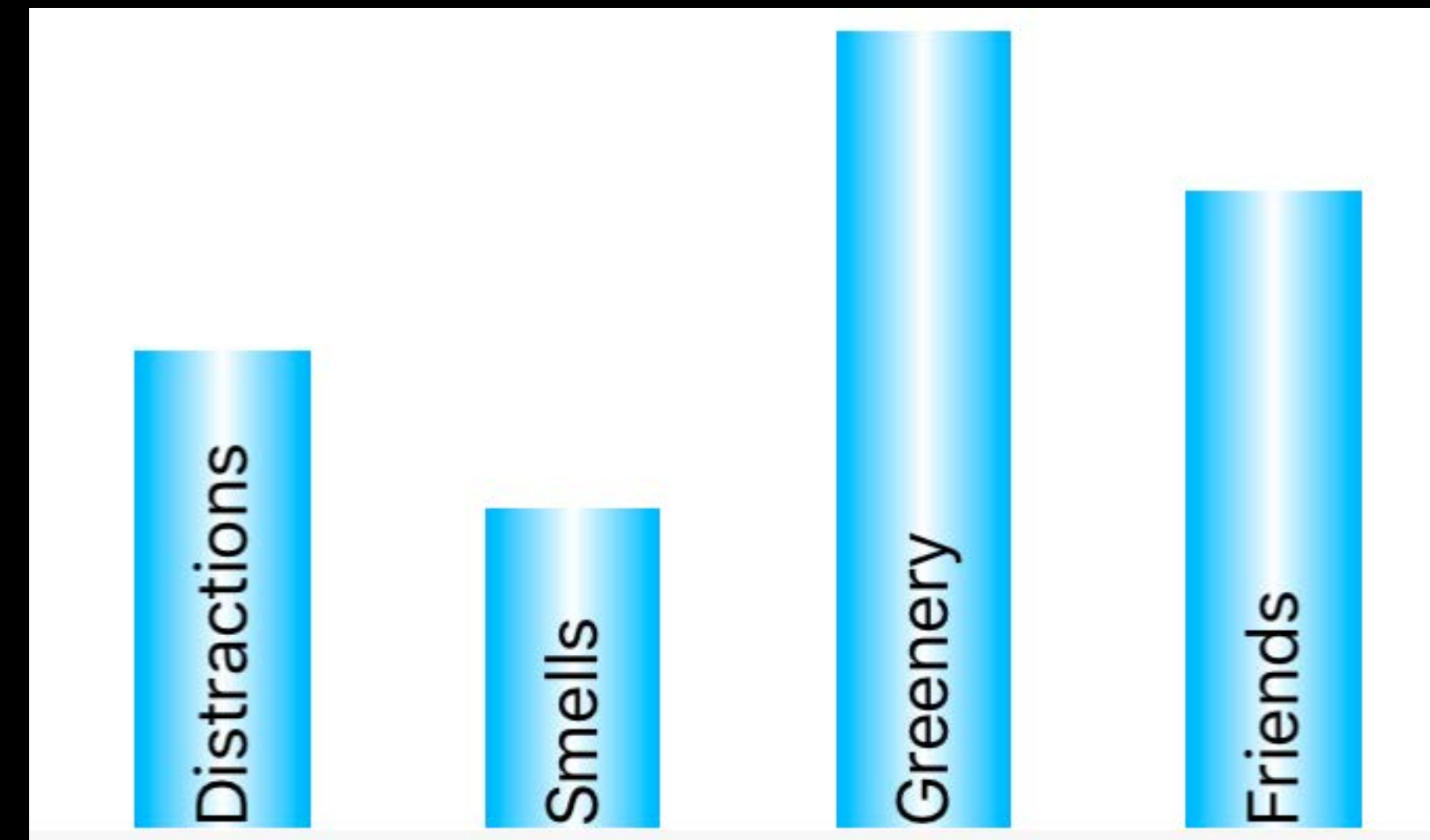
Accessibility Audit Results

Route list cells

- Favorite button has bad label
- Isn't clear that table cell can be activated

Ratings graph

- Graph values inaccessible



Accessibility Audit Results

Route list cells

- Favorite button has bad label
- Isn't clear that table cell can be activated

Ratings graph

- Graph values inaccessible

Route step list

Boys' Choir on Ridgeway

Boys' choir between Gilbert and Montgomery on Ridgeway. Continue along Ridgeway.



Careful of cars and children.

Accessibility Audit Results

Route list cells


- Favorite button has bad label
- Isn't clear that table cell can be activated

Ratings graph

- Graph values inaccessible

Route step list

- Hazard steps not differentiated

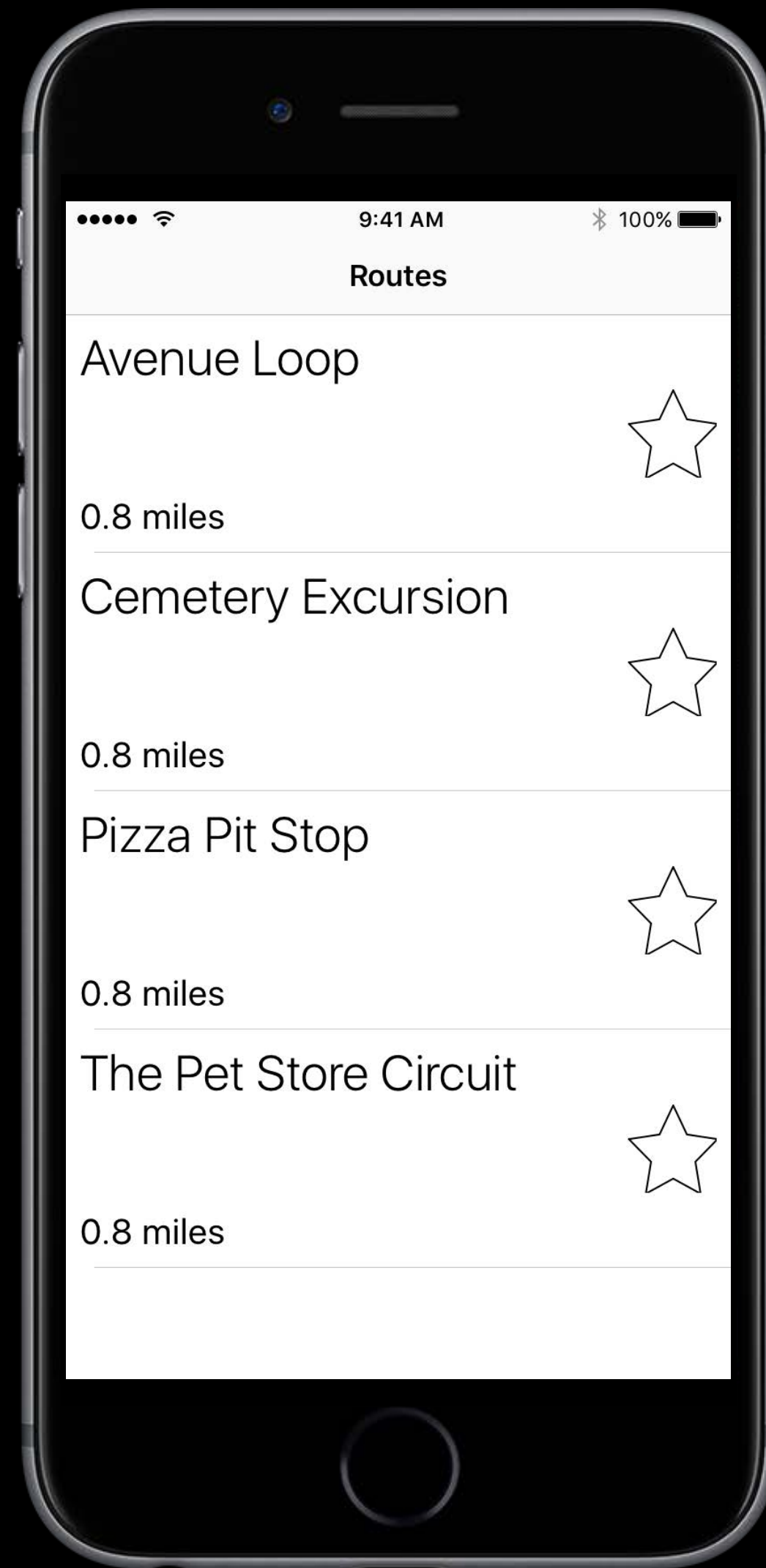
Boys' Choir on Ridgeway 

Boys' choir between Gilbert and Montgomery on Ridgeway. Continue along Ridgeway.

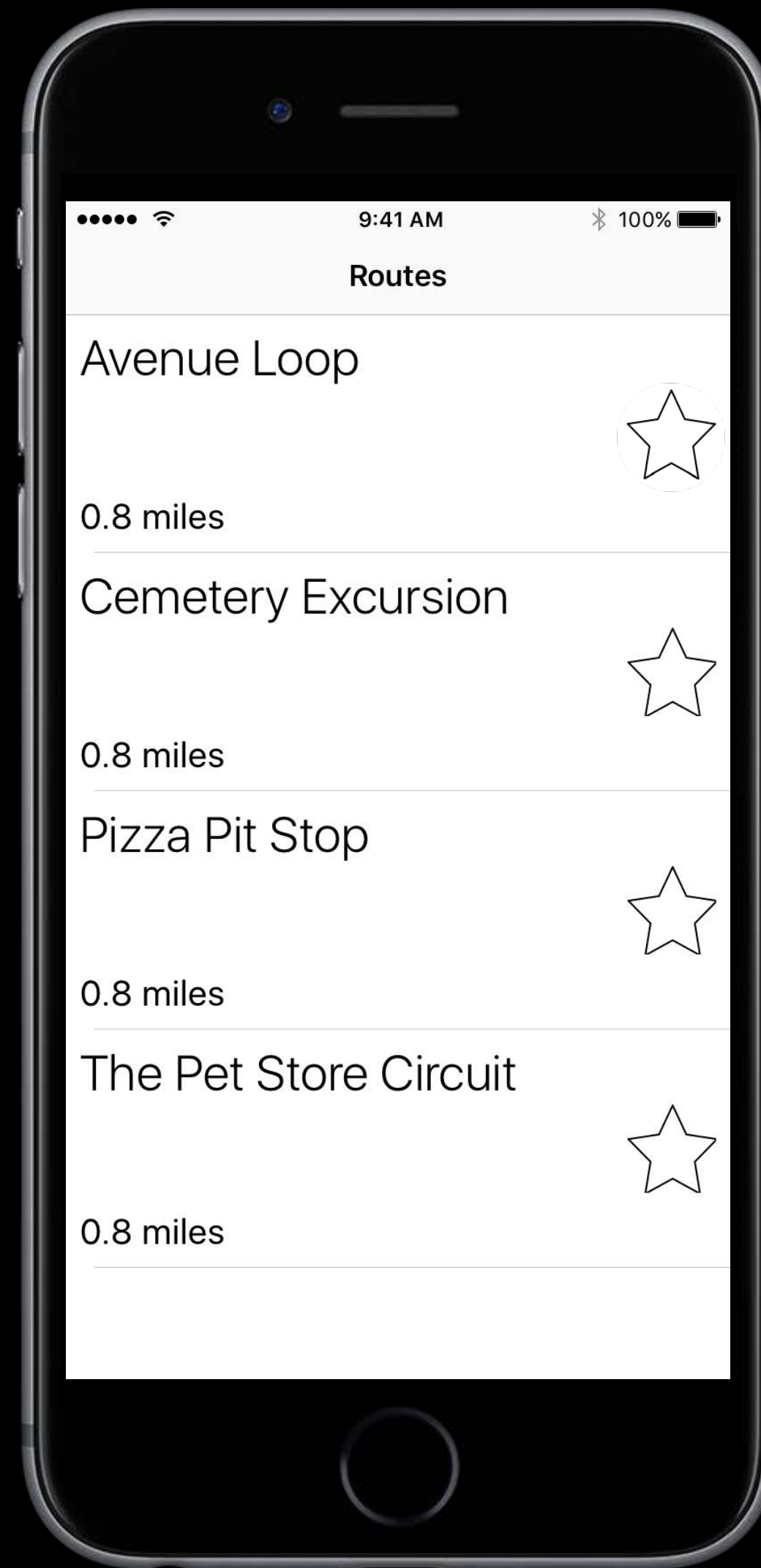
Careful of cars and children.

UIAccessibility

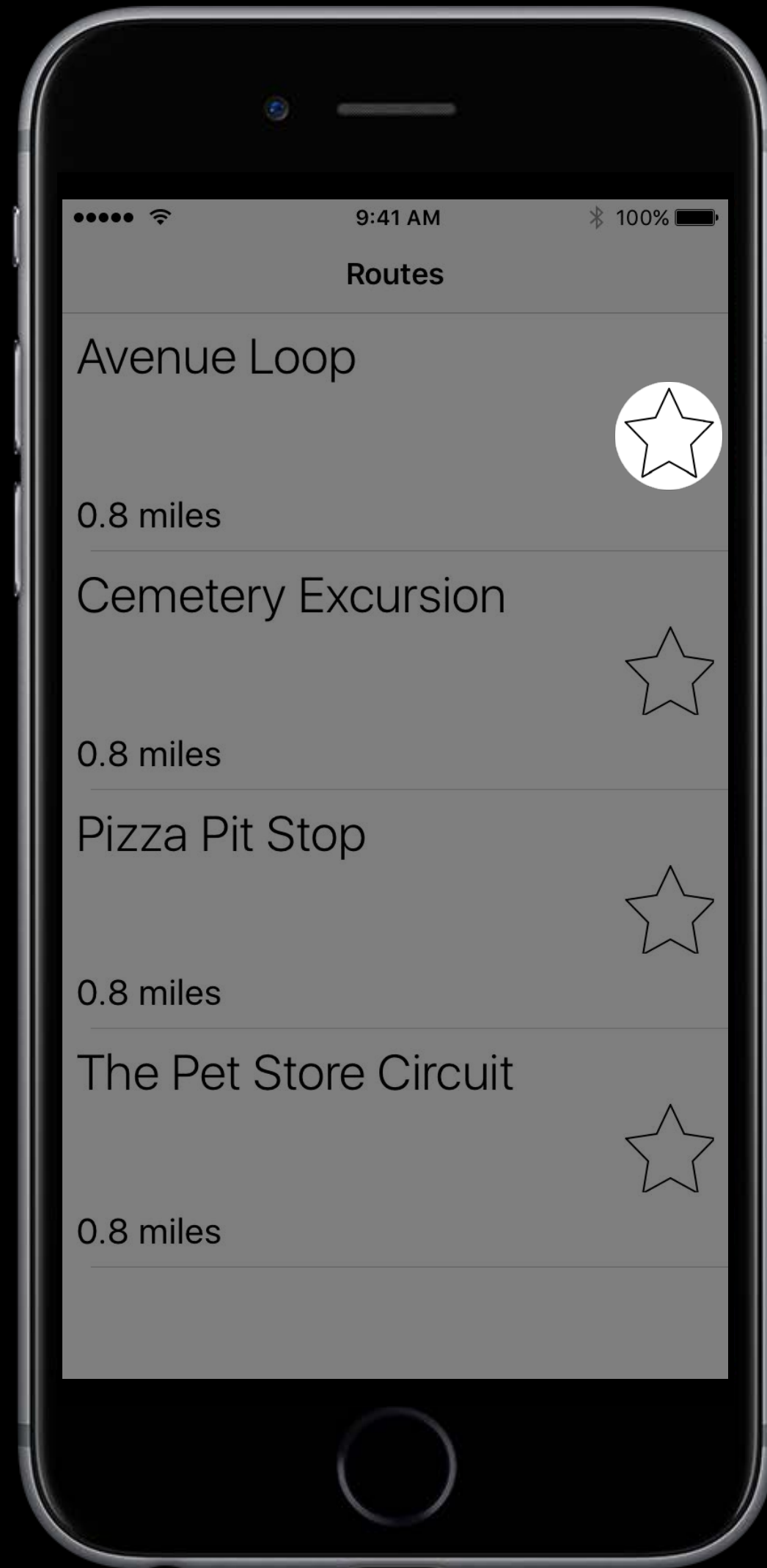
UIAccessibility



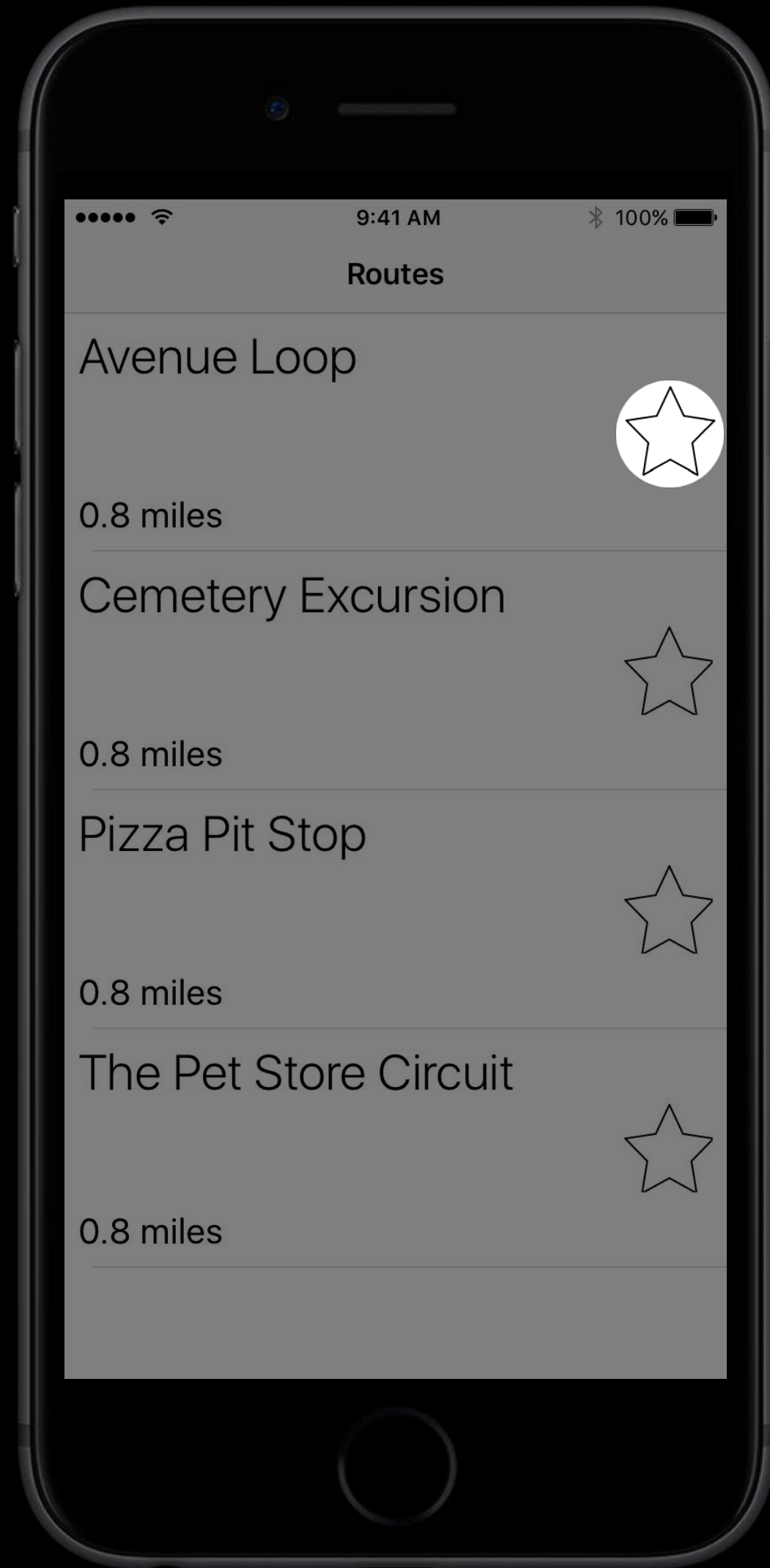
UIAccessibility



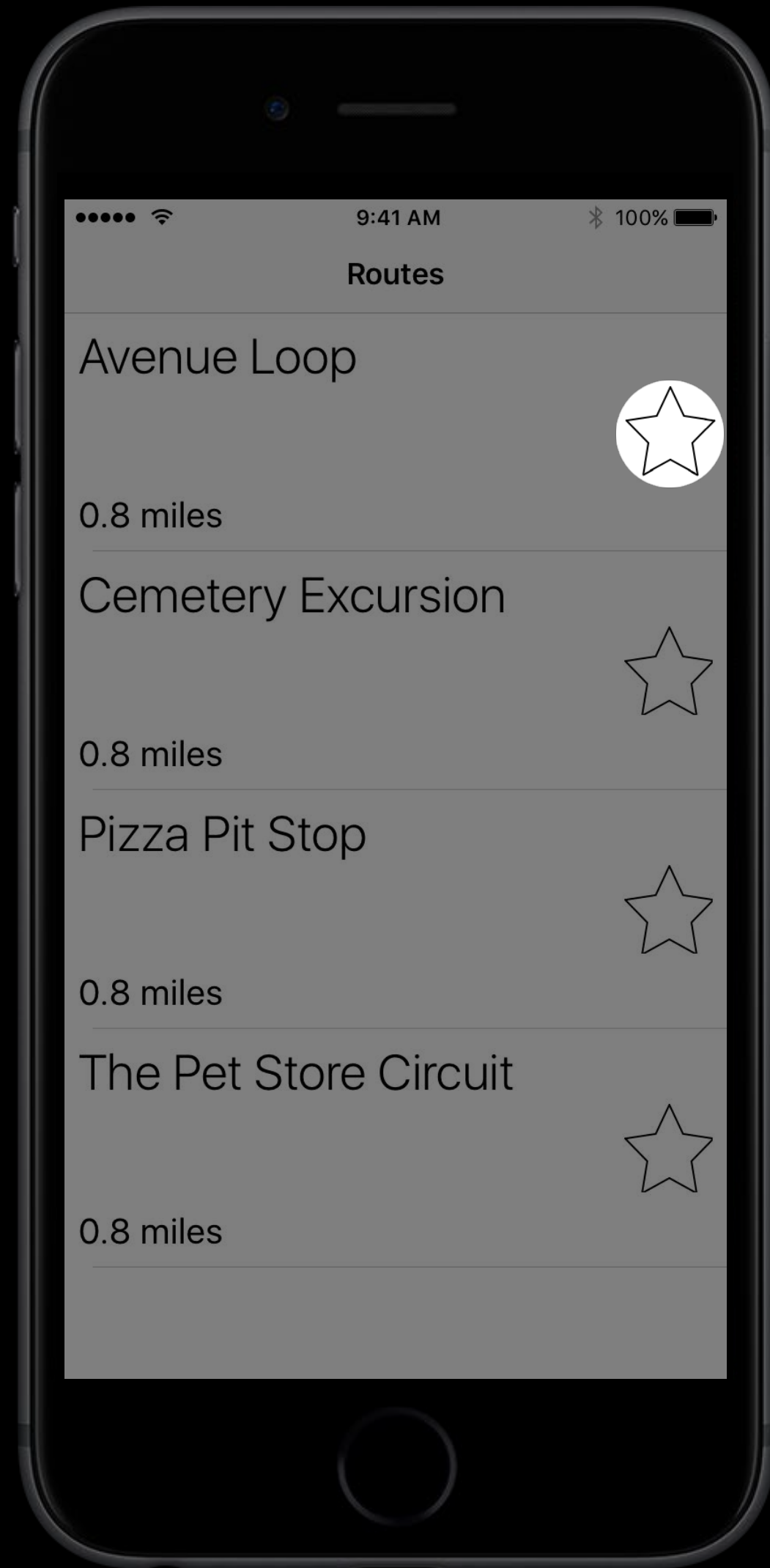
UIAccessibility



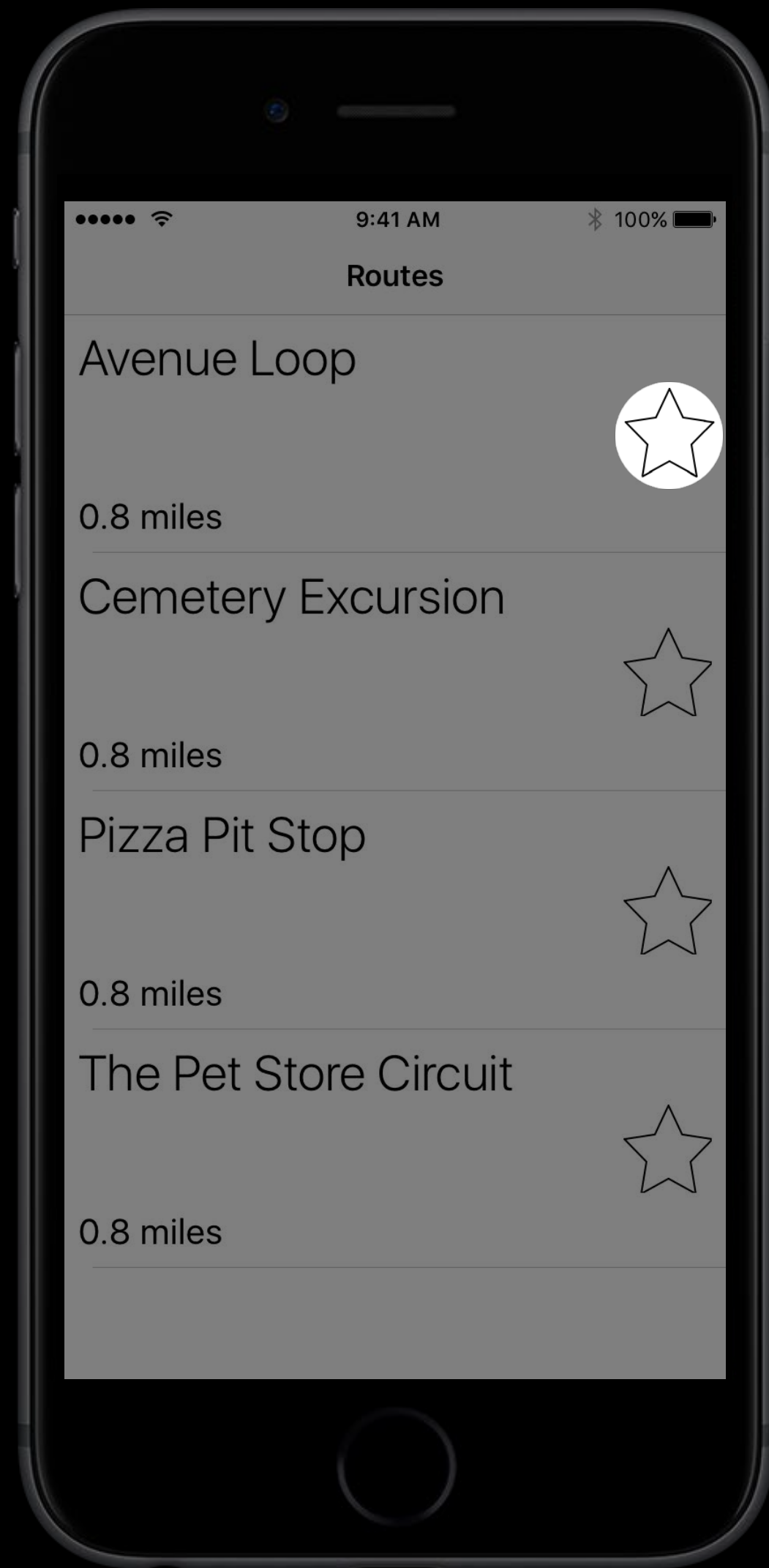
UIAccessibility



UIAccessibility



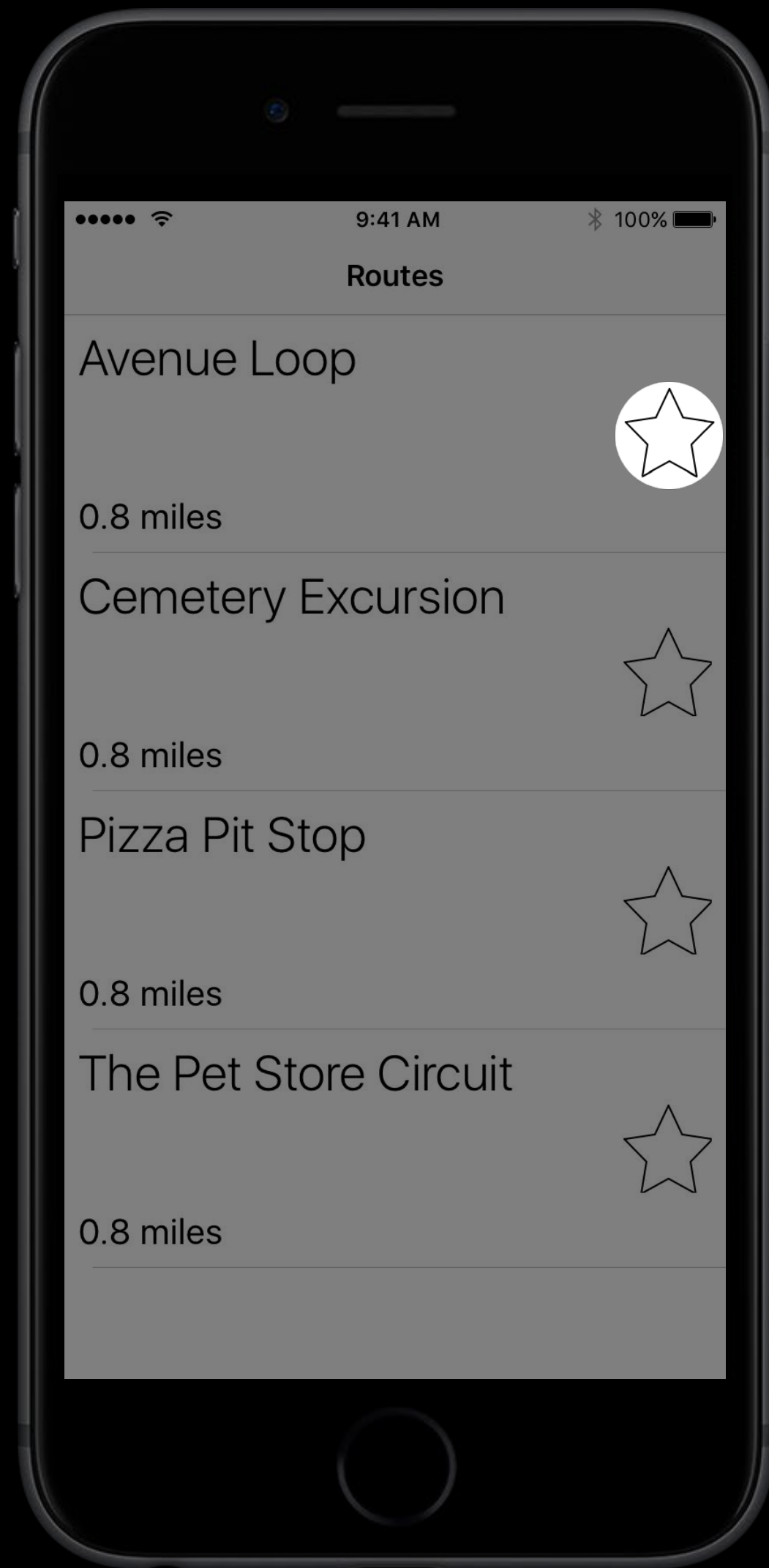
UIAccessibility



What are you?



UIAccessibility

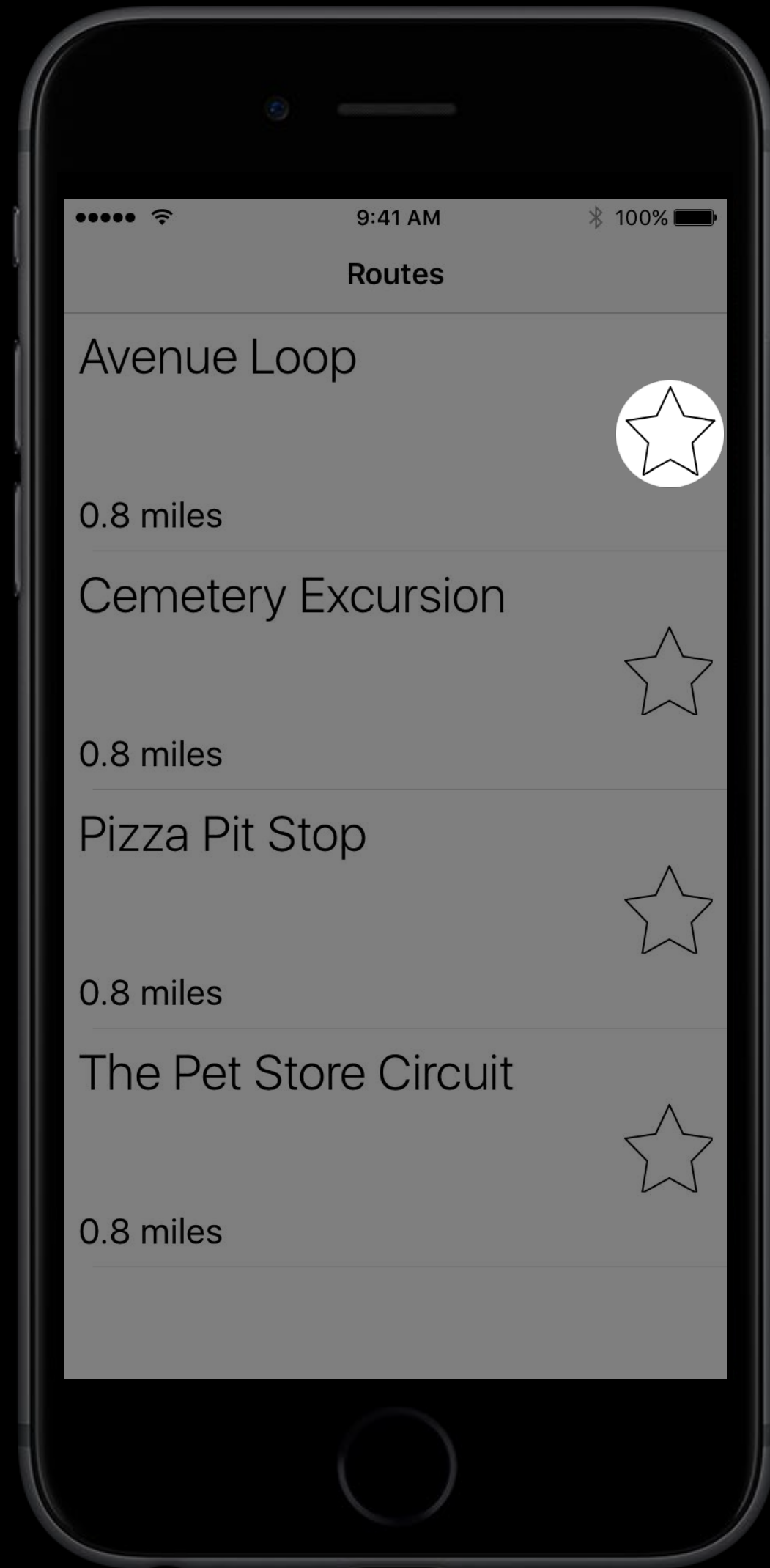


What are you?

Button



UIAccessibility



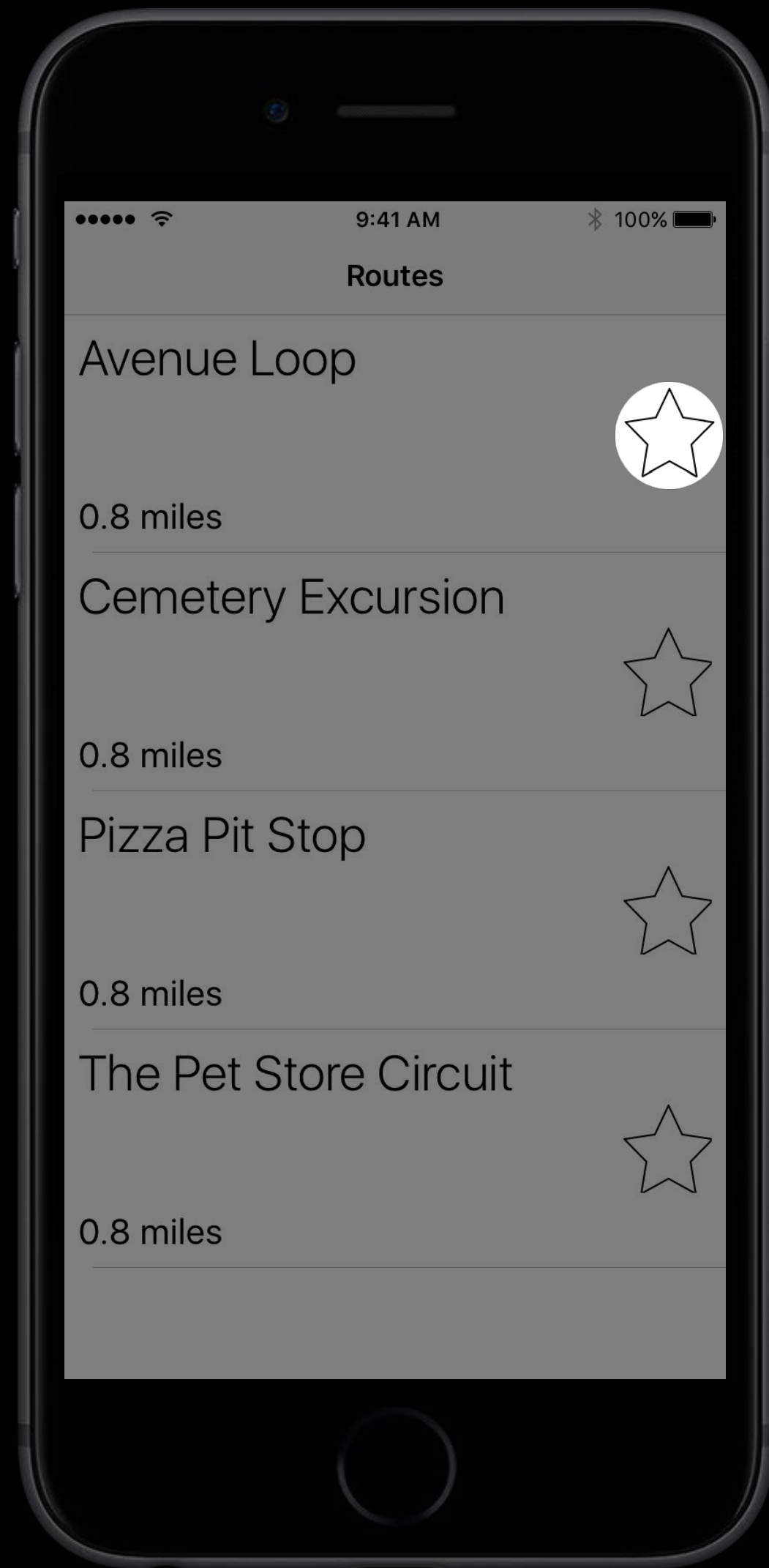
What are you?

Button

Who are you?



UIAccessibility



What are you?

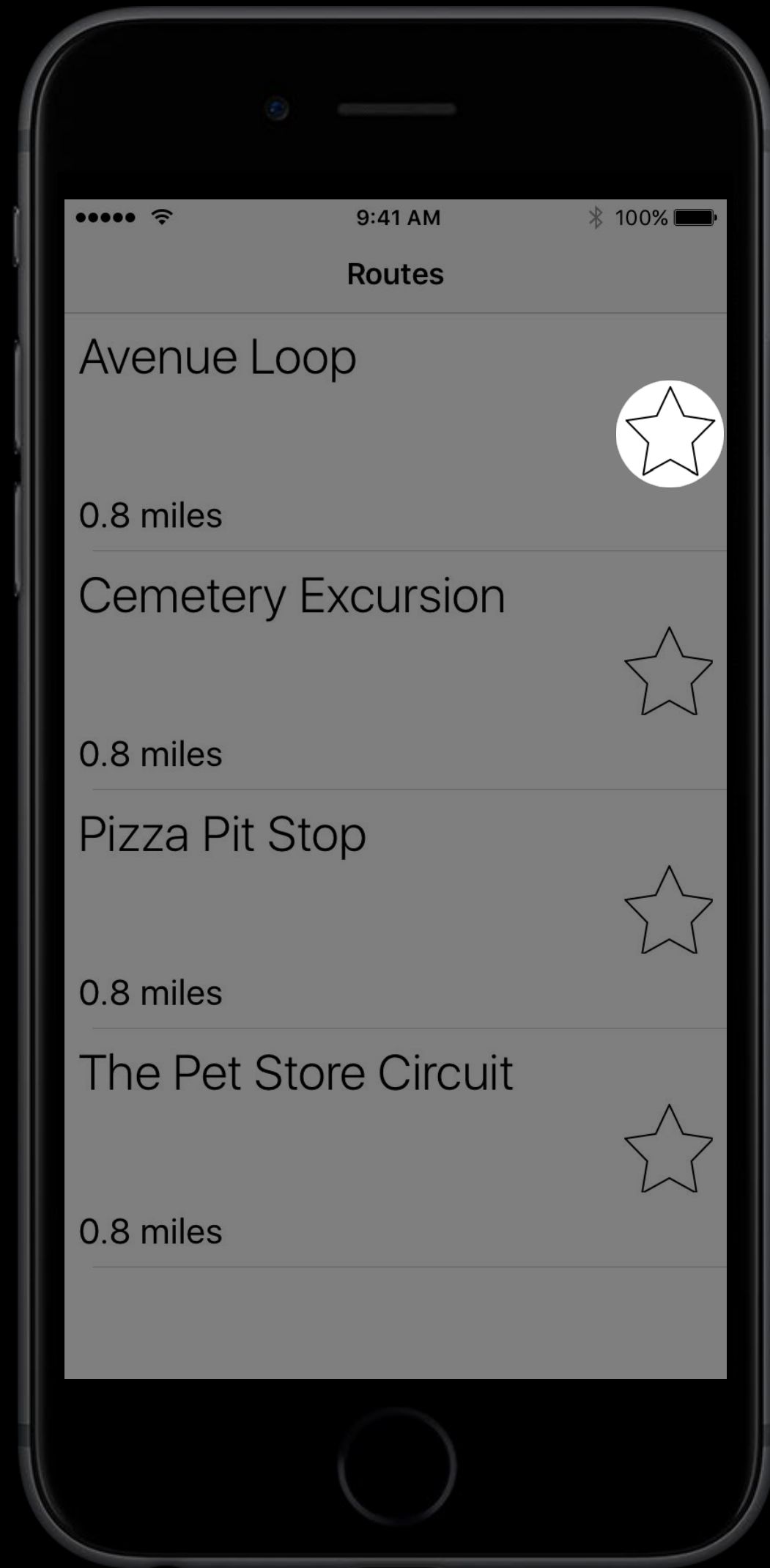
Button

Who are you?

Favorite



UIAccessibility



What are you?

Button

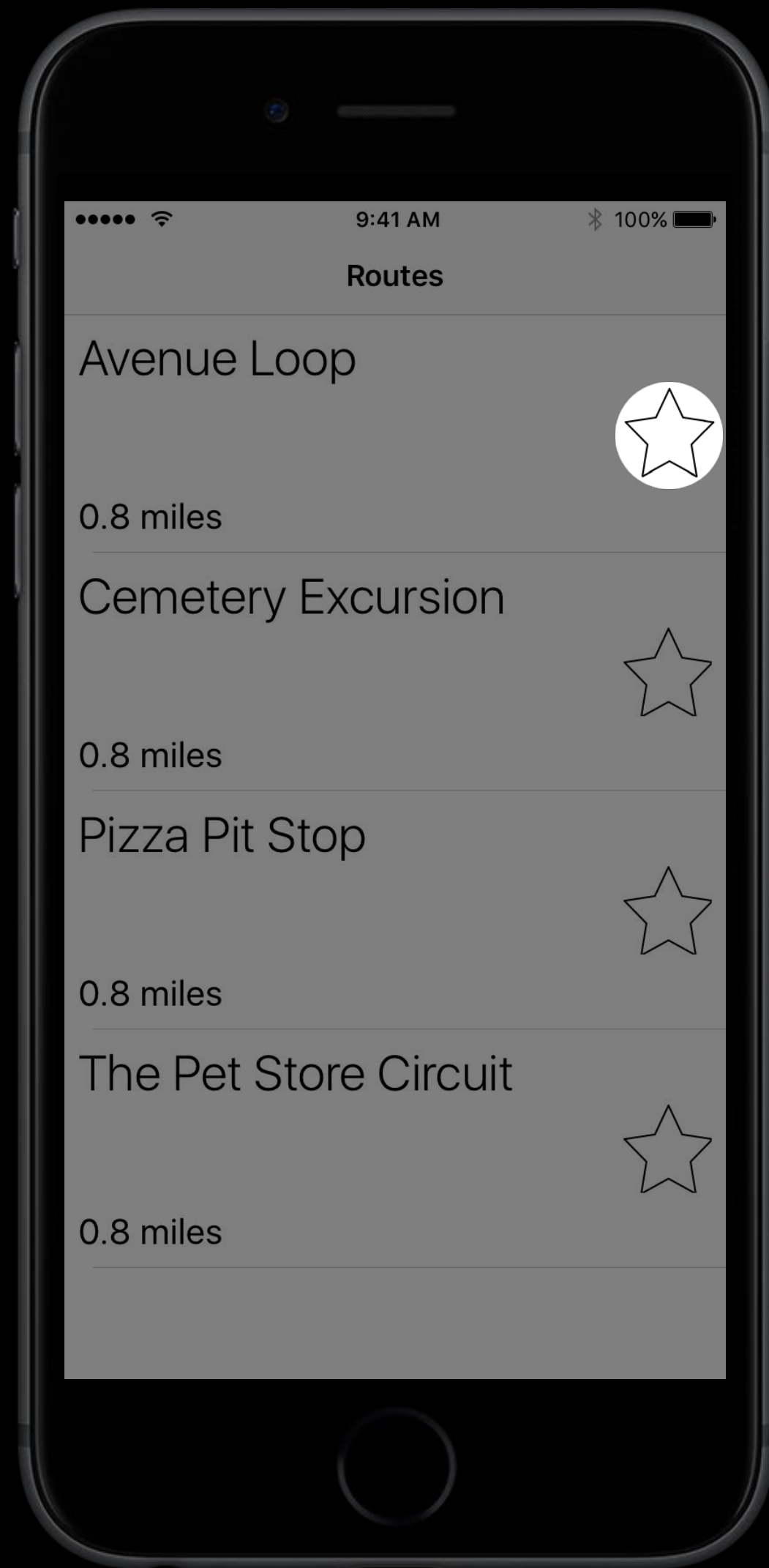
Who are you?

Favorite

Where are you?



UIAccessibility



What are you?

Button

Who are you?

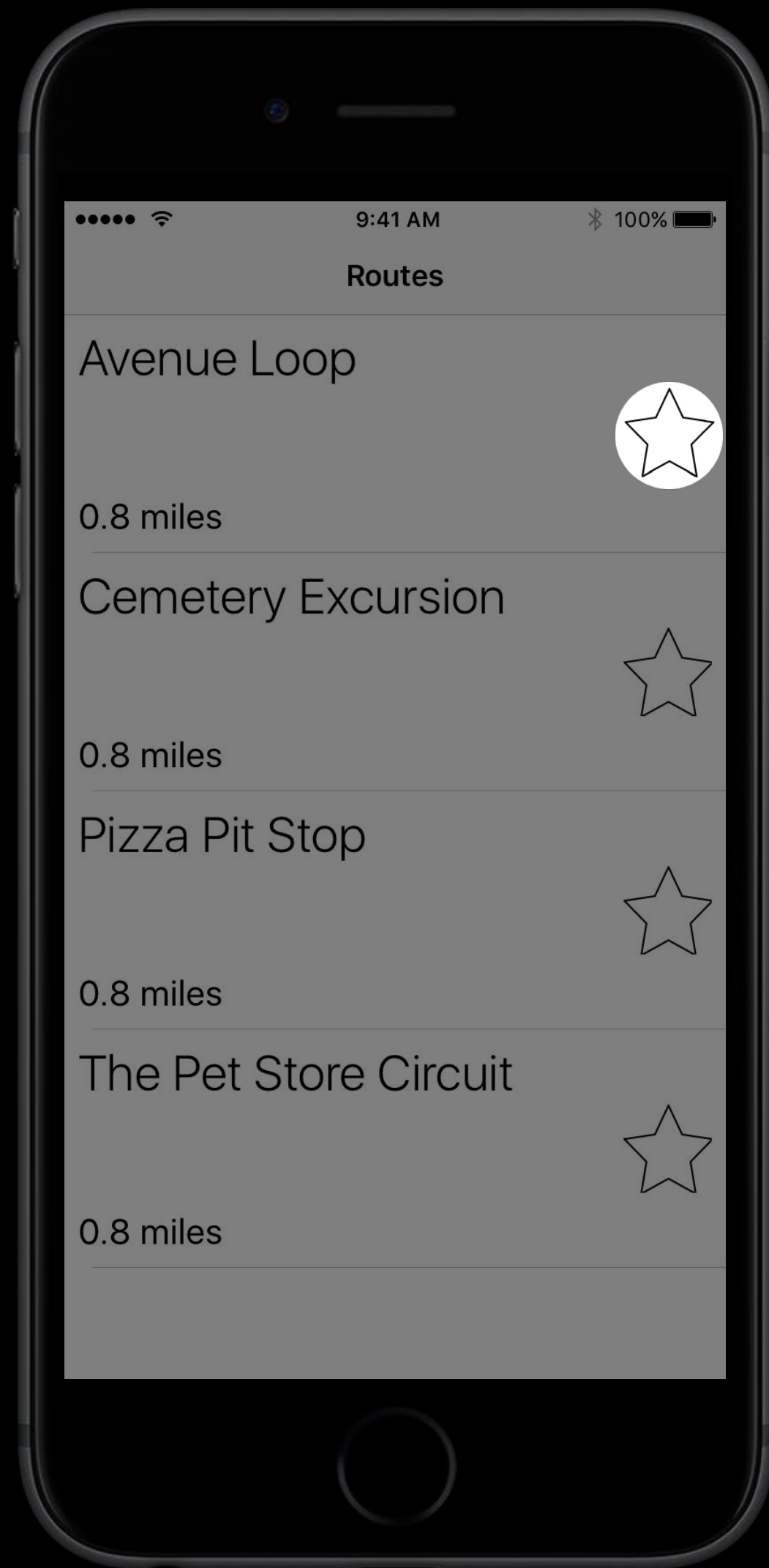
Favorite

Where are you?

$((317, 106), (50, 50))$



UIAccessibility



button.accessibilityTraits

UIAccessibilityTraitButton

button.accessibilityLabel

"Favorite"

button.accessibilityFrame

CGRect(x: 317, y: 106, width: 50, height: 50)



UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
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UIAccessibility

The basics

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    public var isAccessibilityElement: Bool  
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    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

```
imageView.isAccessibilityElement = true
```

UIAccessibility

The basics

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extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
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UIAccessibility

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extension NSObject {  
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UIAccessibility

The basics

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extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

```
myButton.accessibilityLabel = "New Alarm"
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```


UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

```
myButton.accessibilityTraits |= UIAccessibilityTraitButton
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
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UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

UIAccessibility

The basics

```
extension NSObject {  
    public var isAccessibilityElement: Bool  
    public var accessibilityLabel: String?  
    public var accessibilityTraits: UIAccessibilityTraits  
    public var accessibilityFrame: CGRect  
  
    public var accessibilityValue: String?  
}
```

```
magControl.accessibilityValue = "\\(level) times magnification"
```

```
extension NSObject {  
    public var accessibilityElements: [AnyObject]?  
}  
  
public class UIAccessibilityElement : NSObject {  
    public init(accessibilityContainer container: AnyObject)  
  
}
```



```
extension NSObject {
```

```
    public var accessibilityElements: [AnyObject]?
```

```
}
```

```
public class UIAccessibilityElement : NSObject {
```

```
    public init(accessibilityContainer container: AnyObject)
```

```
}
```

```
extension NSObject {
    public var accessibilityElements: [AnyObject]?
}

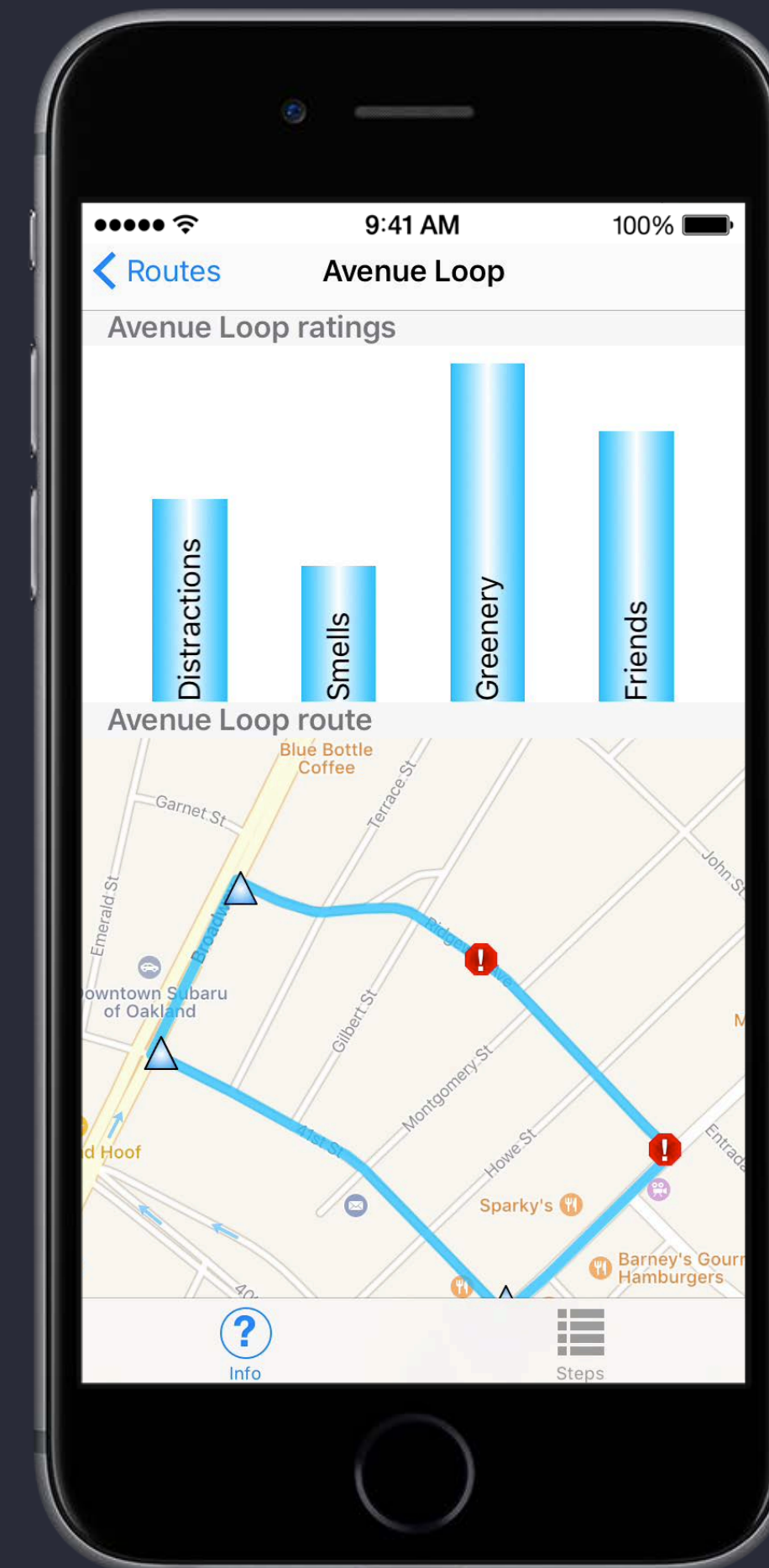
public class UIAccessibilityElement : NSObject {
    public init(accessibilityContainer container: AnyObject)

}
}
```

```
extension NSObject {  
    public var accessibilityElements: [AnyObject]?  
}
```

```
public class UIAccessibilityElement : NSObject {  
    public init(accessibilityContainer container: AnyObject)
```

```
}
```



NEW

```
extension NSObject {
    public var accessibilityElements: [AnyObject]?
}

public class UIAccessibilityElement : NSObject {
    public init(accessibilityContainer container: AnyObject)

    @available(iOS 10.0, *)
    public var accessibilityFrameInContainerSpace: CGRect
}
```

UIAccessibility

Takeaways

UIAccessibility

Takeaways

- The UIAccessibility protocol makes interface items accessible

UIAccessibility

Takeaways

- The UIAccessibility protocol makes interface items accessible
- UIKit controls have support baked-in

UIAccessibility

Takeaways

- The UIAccessibility protocol makes interface items accessible
- UIKit controls have support baked-in
- Set properties to customize behavior

UIAccessibility

Takeaways

- The UIAccessibility protocol makes interface items accessible
- UIKit controls have support baked-in
- Set properties to customize behavior
- Use UIAccessibilityElement for non-view elements

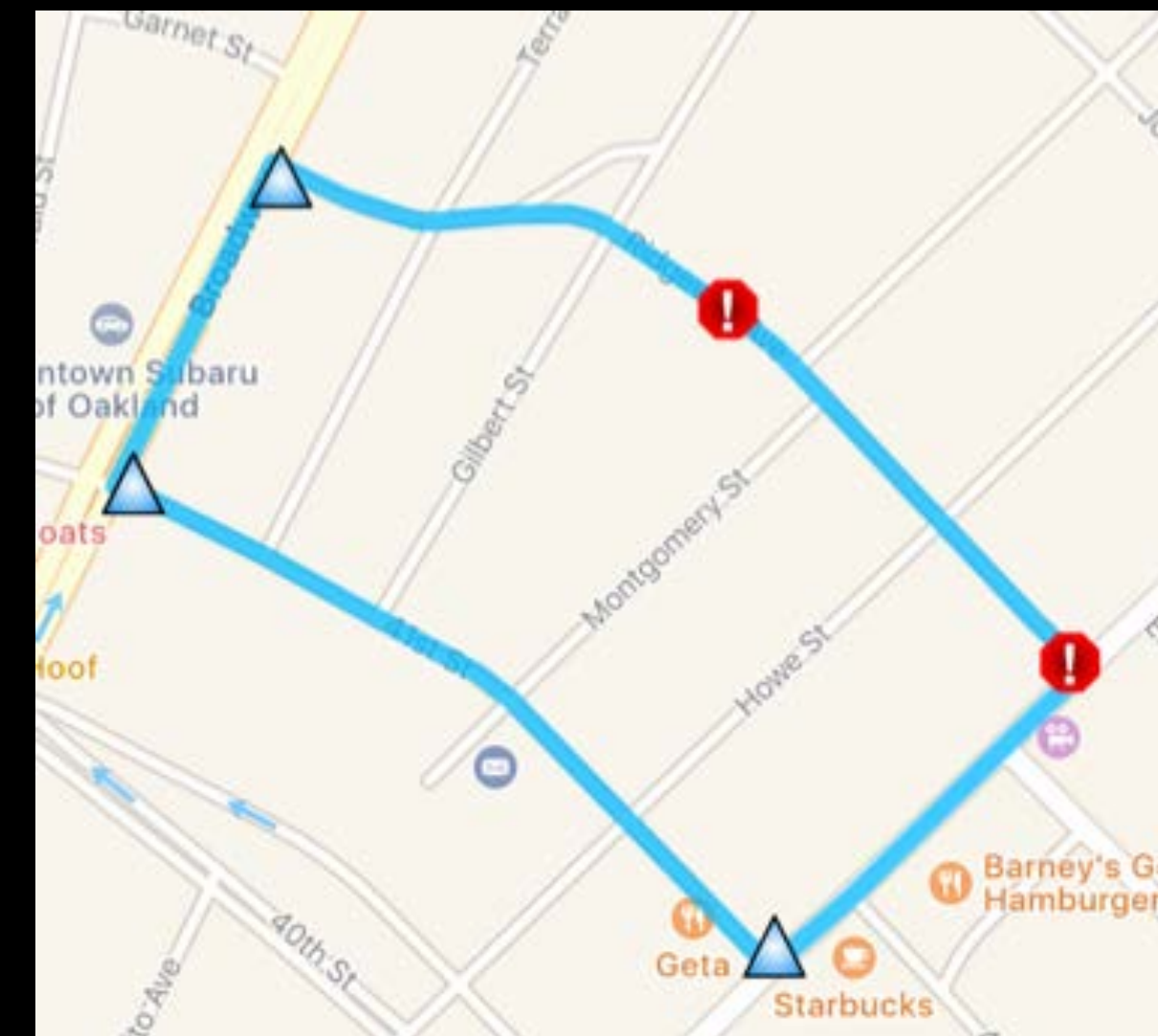
Demo

UIAccessibility API

Accessibility Audit Results

Accessibility Audit Results

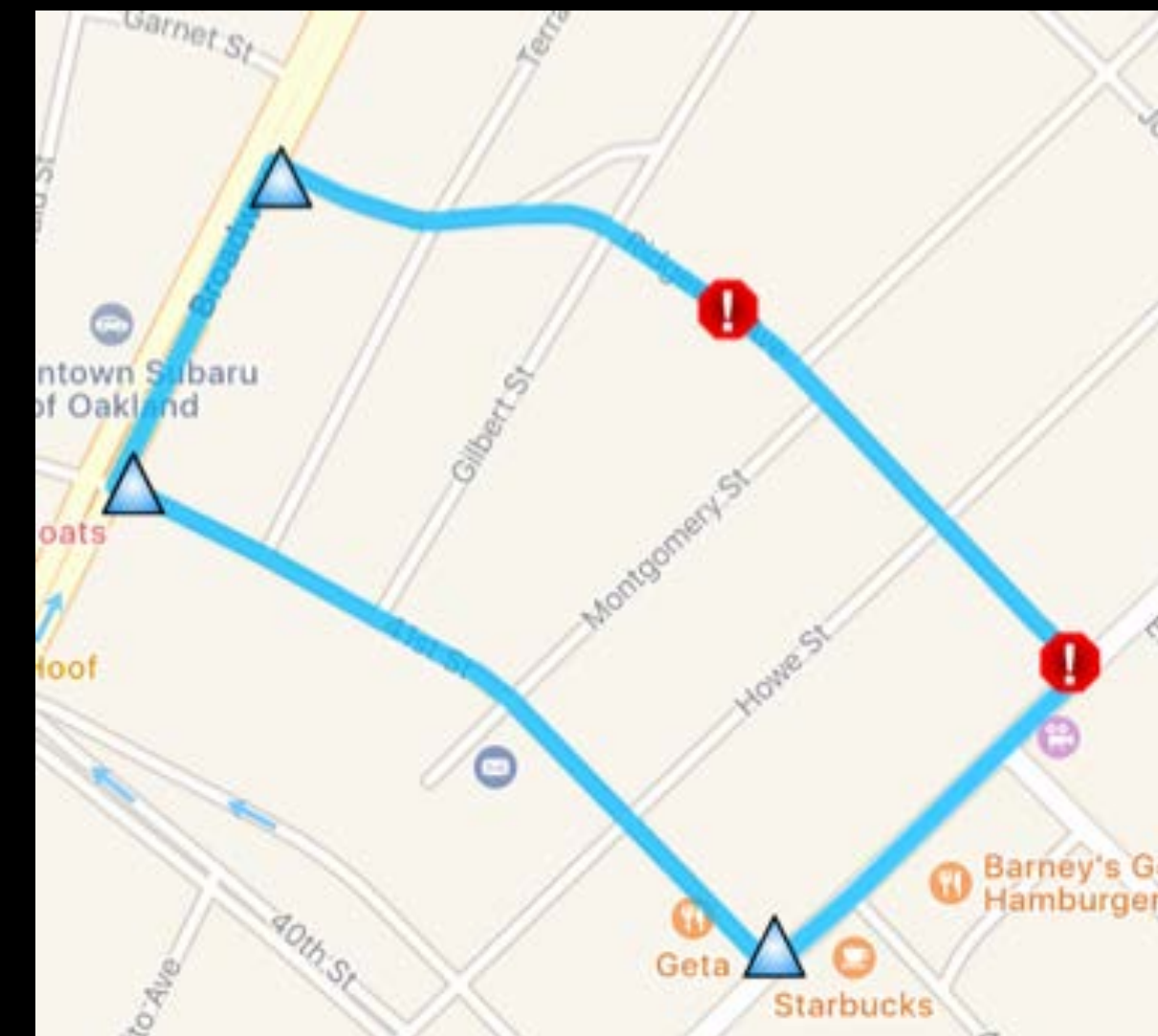
Route map



Accessibility Audit Results

Route map

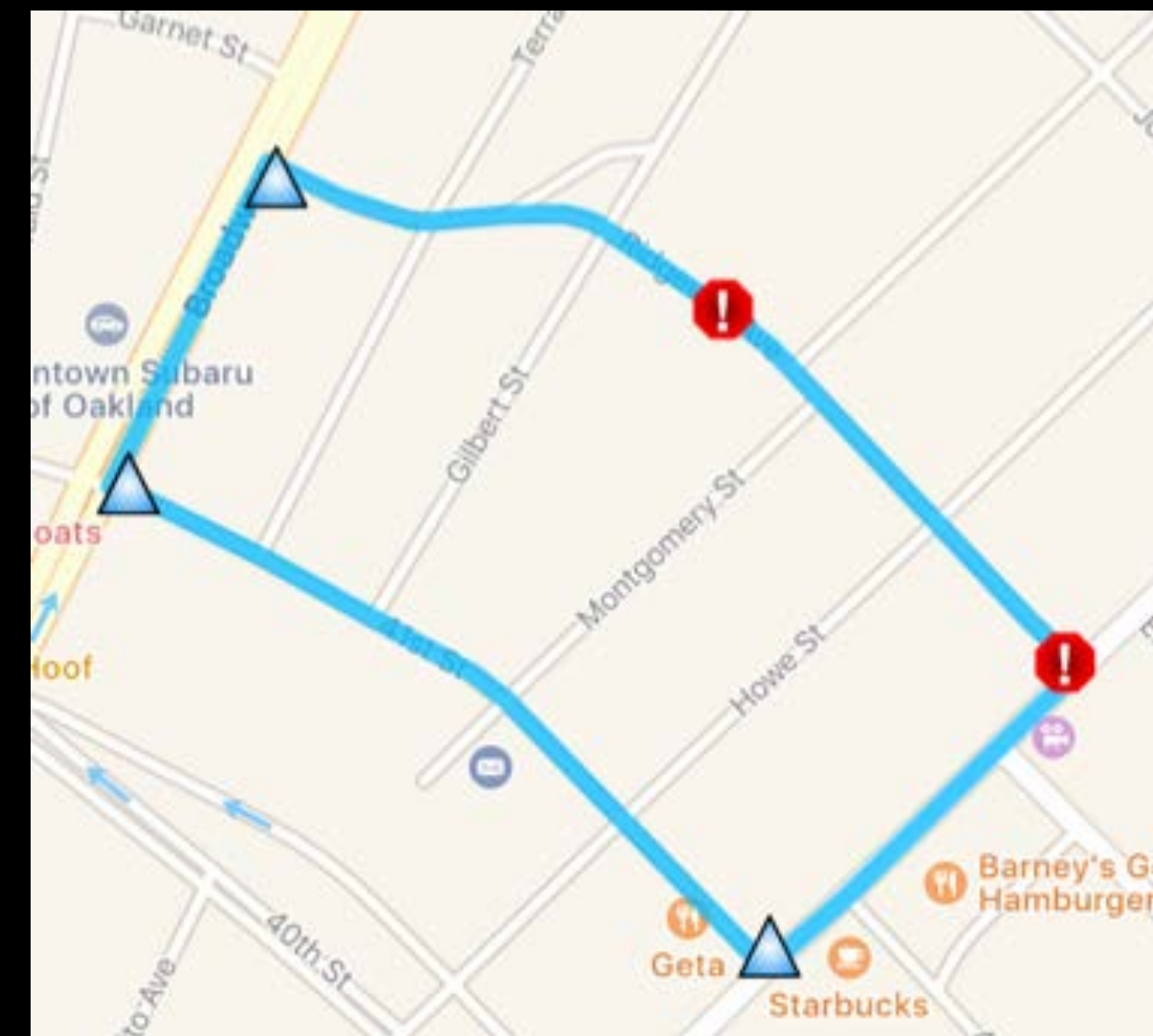
- VoiceOver users miss route order



Accessibility Audit Results

Route map

- VoiceOver users miss route order
- VoiceOver users can't easily discover hazards

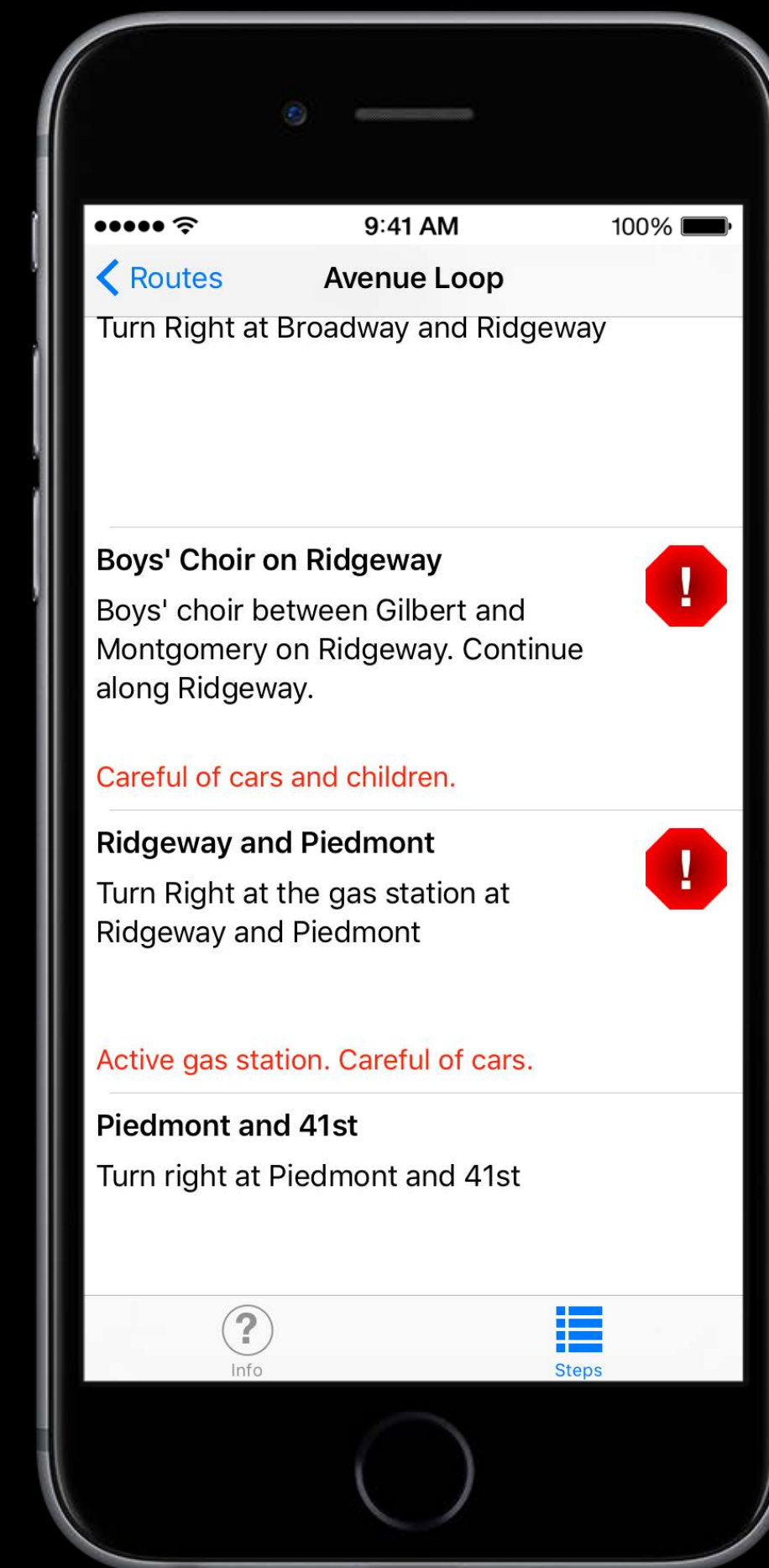


Accessibility Audit Results

Route map

- VoiceOver users miss route order
- VoiceOver users can't easily discover hazards

Route step list



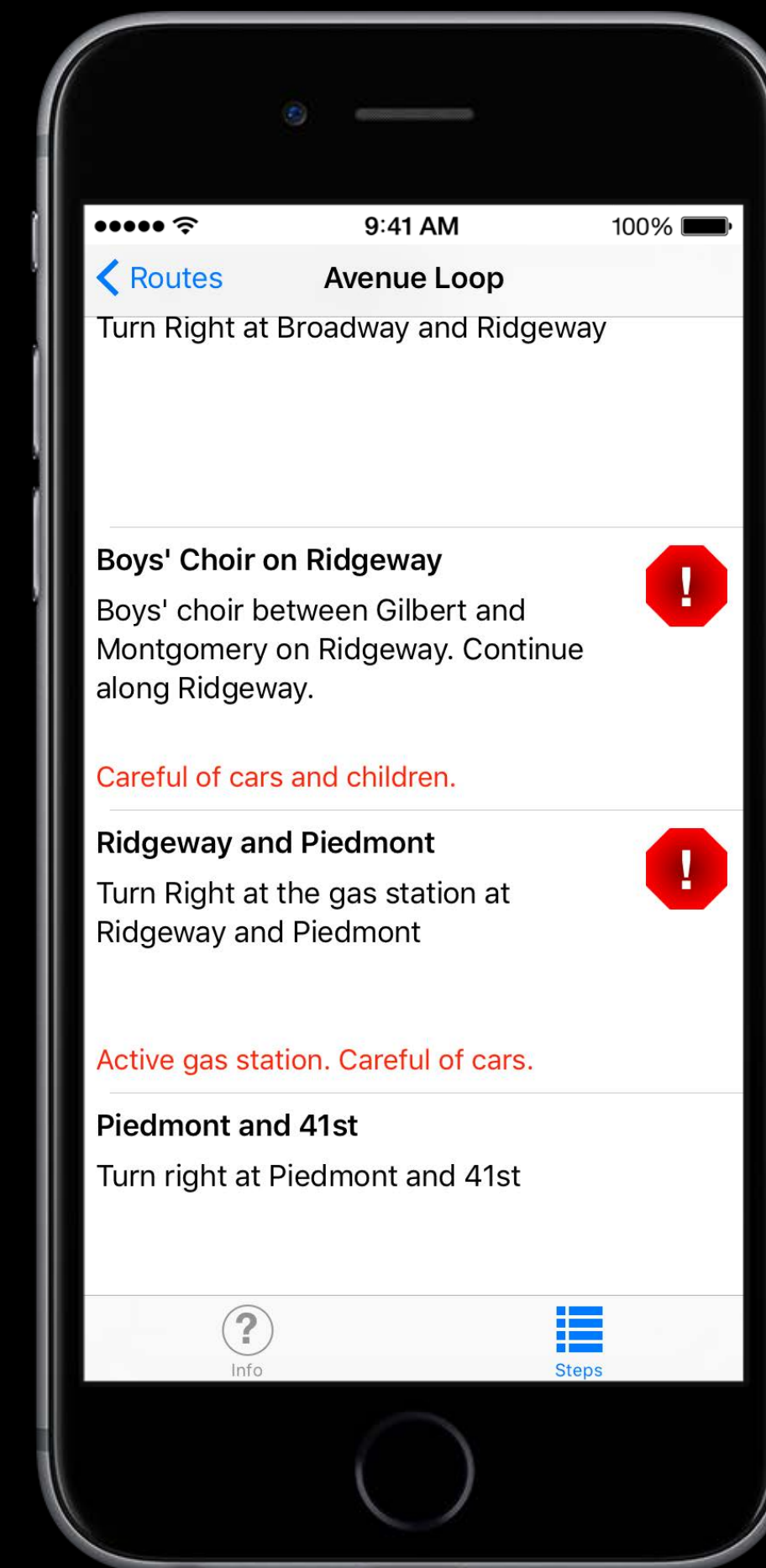
Accessibility Audit Results

Route map

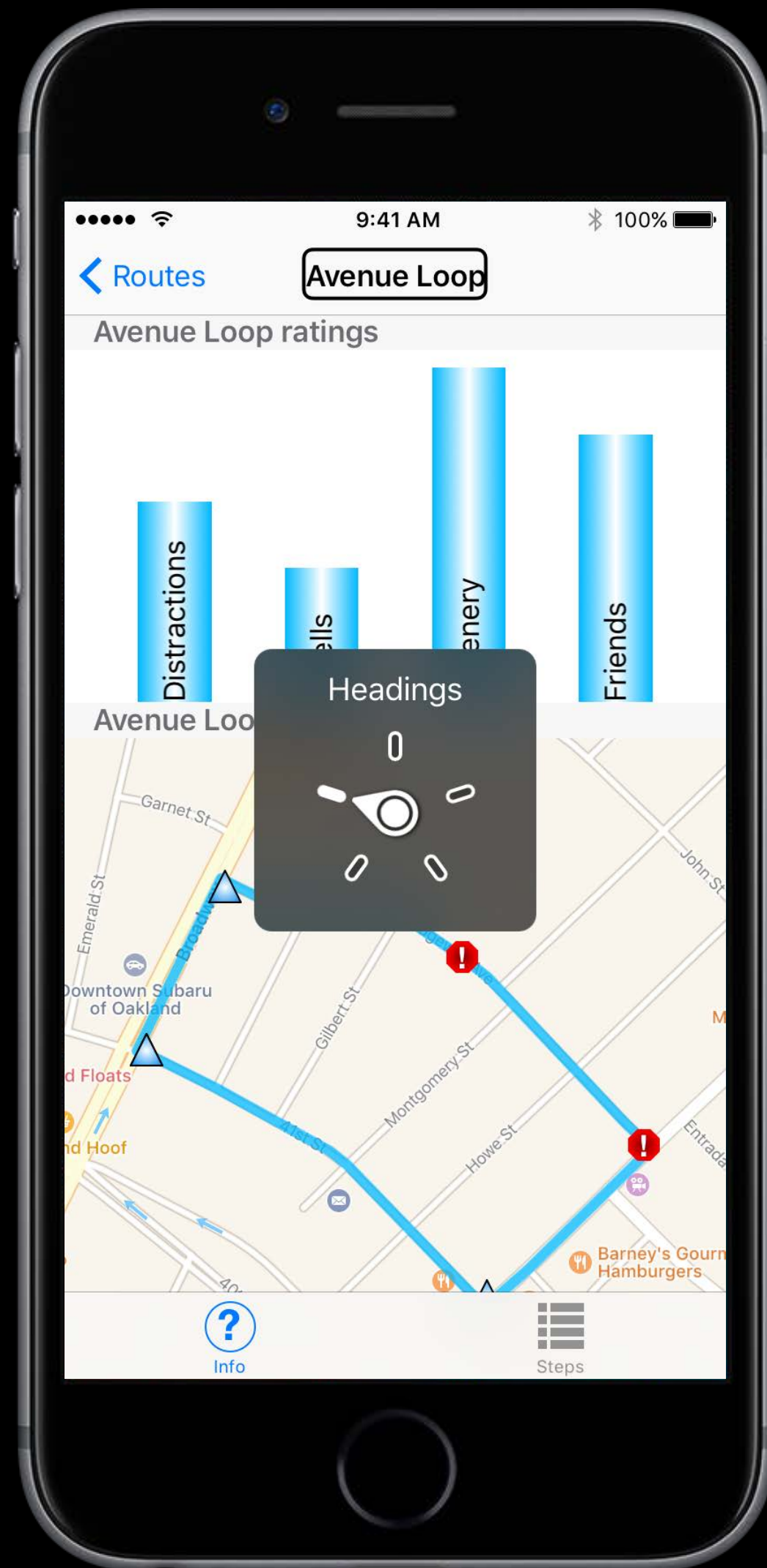
- VoiceOver users miss route order
- VoiceOver users can't easily discover hazards

Route step list

- not "skimmable" for VO users



The Rotor



NEW

```
extension NSObject {
    @available(iOS 10.0, *)
    public var accessibilityCustomRotors: [UIAccessibilityCustomRotor]?
}

public class UIAccessibilityCustomRotor : NSObject {
    public init(name: String,
                itemSearch itemSearchBlock: UIKit.UIAccessibilityCustomRotorSearch)
}
}
```

NEW

```
extension NSObject {  
    @available(iOS 10.0, *)  
    public var accessibilityCustomRotors: [UIAccessibilityCustomRotor]?  
}  
  
public class UIAccessibilityCustomRotor : NSObject {  
    public init(name: String,  
               itemSearch itemSearchBlock: UIKit.UIAccessibilityCustomRotorSearch)  
}
```

NEW

```
extension NSObject {  
    @available(iOS 10.0, *)  
    public var accessibilityCustomRotors: [UIAccessibilityCustomRotor]?  
}
```

```
public class UIAccessibilityCustomRotor : NSObject {  
    public init(name: String,  
                itemSearch itemSearchBlock: UIKit.UIAccessibilityCustomRotorSearch)  
}
```

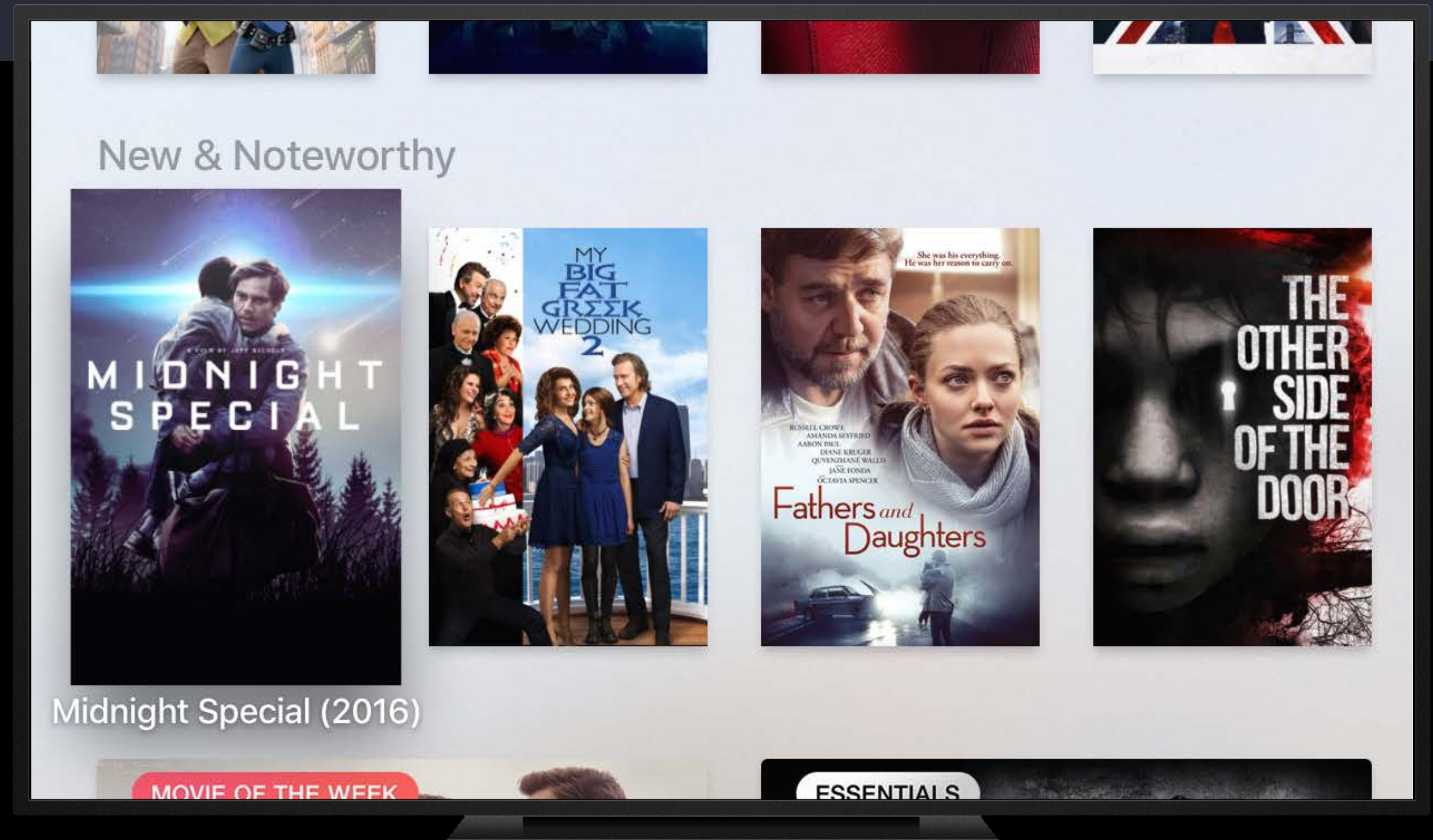
Demo

UIAccessibilityCustomRotor API

A Word on tvOS

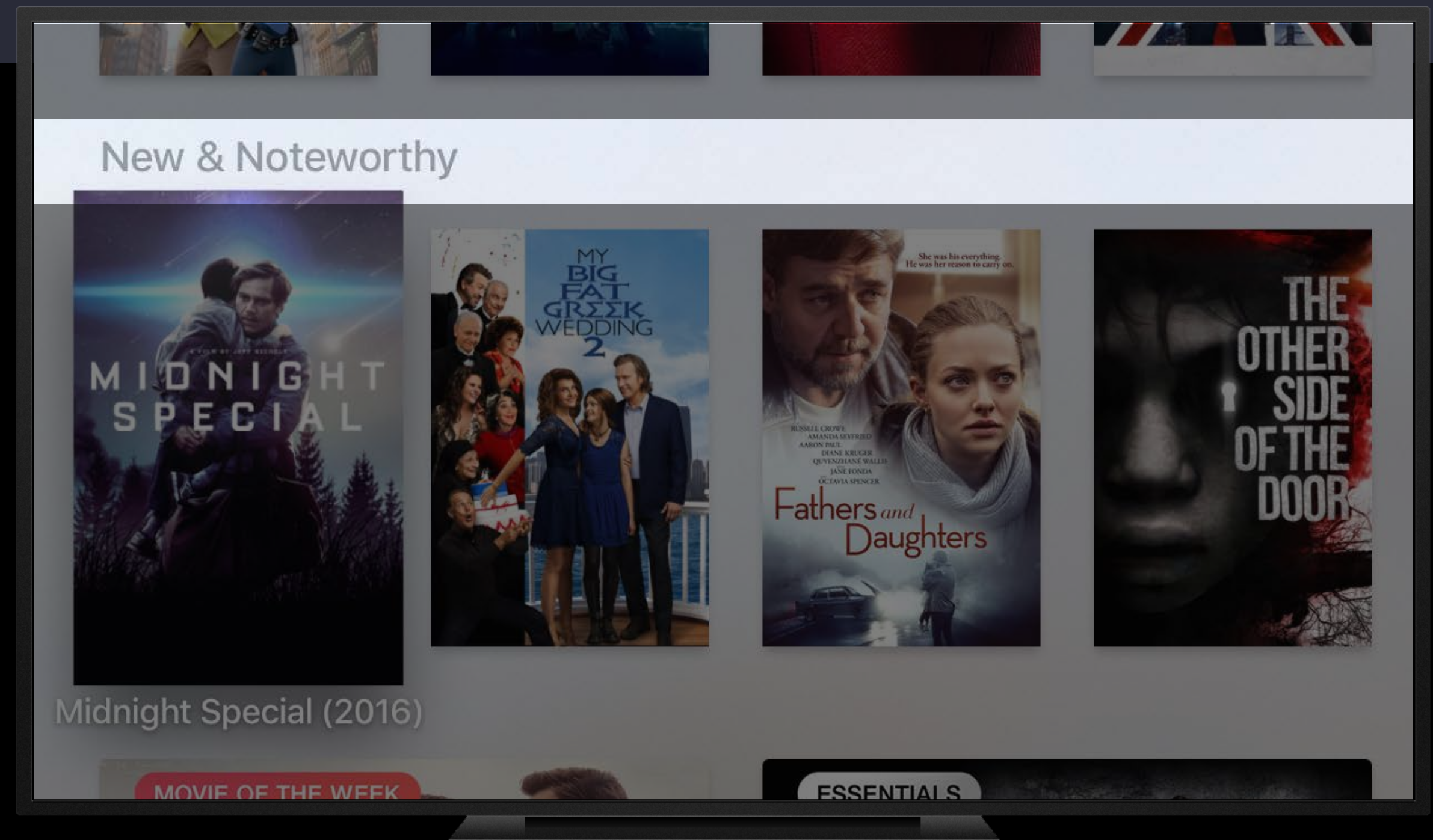
tvOS Header Elements

```
extension NSObject {  
    @available(tvOS 9.0, *)  
    public var accessibilityHeaderElements: [AnyObject]?  
}
```

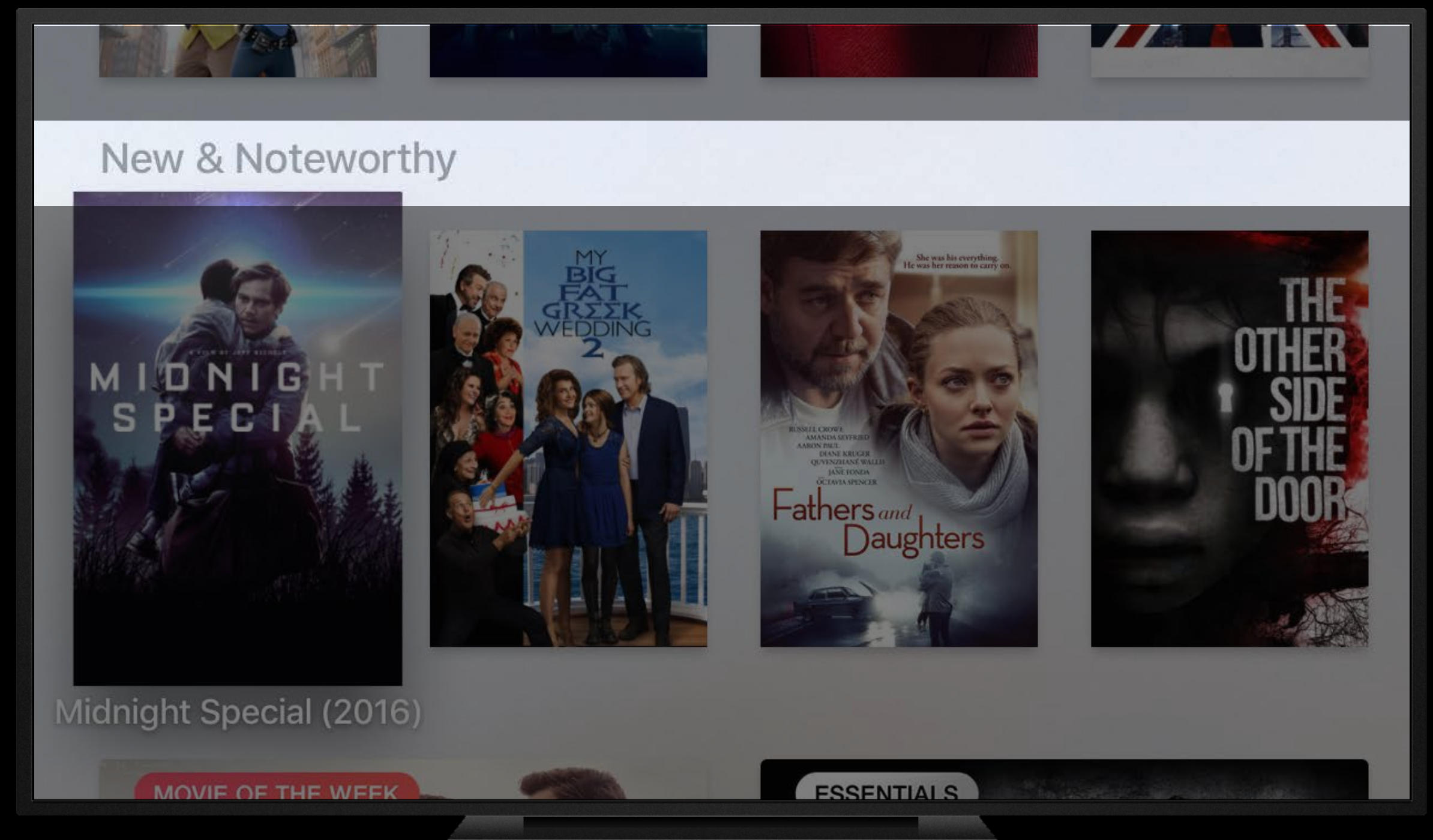


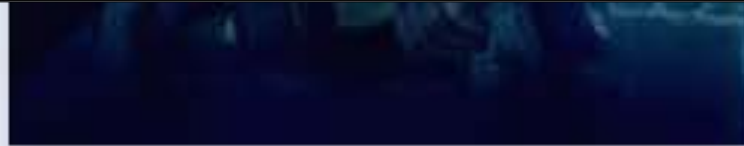
tvOS Header Elements

```
extension NSObject {  
    @available(tvOS 9.0, *)  
    public var accessibilityHeaderElements: [AnyObject]?  
}
```



tvOS Header Elements





New & Noteworthy



Midnight Special (2016)



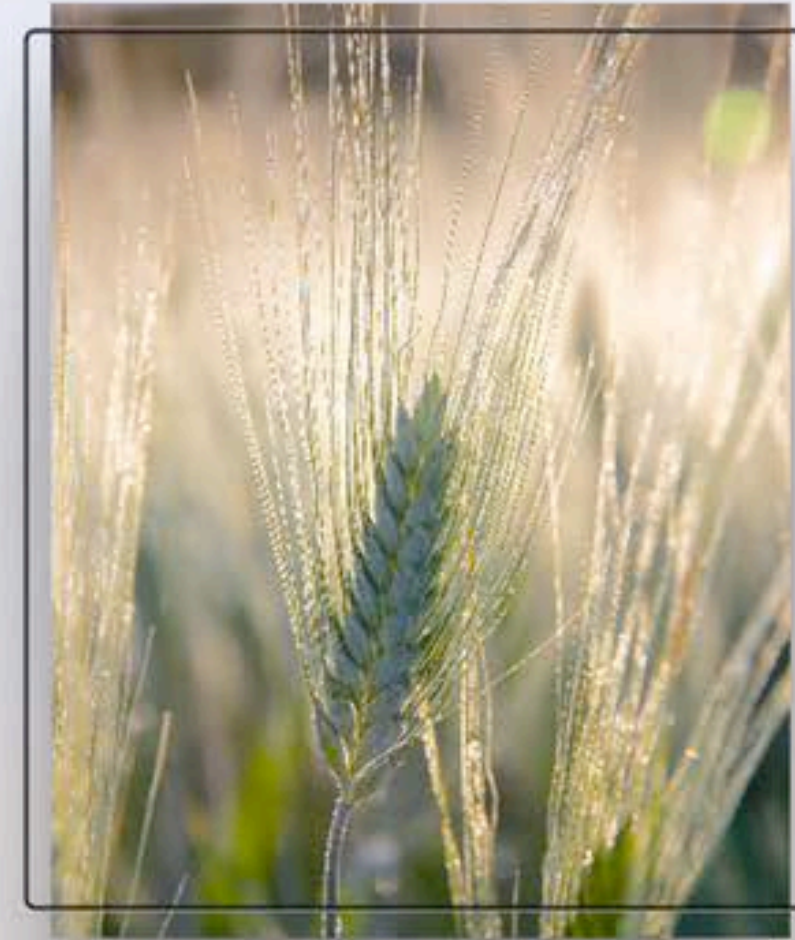
MOVIE OF THE WEEK

ESSENTIALS

Title Grain

Author Vivian Li

Description Close up of a strand of grain.
It glistens with morning dew.



Available Works



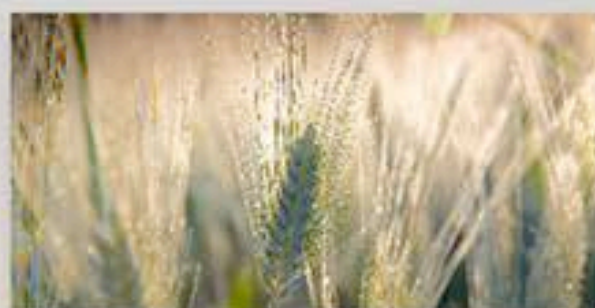
Title Grain

Author Vivian Li

Description Close up of a strand of grain.
It glistens with morning dew.



Available Works



Summary

Summary

Accessibility is about everyone

Summary

Accessibility is about everyone

Design with accessibility in mind

Summary

Accessibility is about everyone

Design with accessibility in mind

UIKit helps your apps become accessible

Summary

Accessibility is about everyone

Design with accessibility in mind

UIKit helps your apps become accessible

Accessible apps make our platforms great!

More Information

<https://developer.apple.com/wwdc16/202>

Related Sessions

Inclusive App Design

Pacific Heights

Tuesday 10:00 AM

Auditing Your Apps For Accessibility

Nob Hill

Wednesday 10:00 AM

Labs

| | | |
|---|------------------------------|-------------------|
| Accessibility and Speech Lab | Frameworks Lab C | Wednesday 2:30 PM |
| Accessibility User Interface by Appointment Lab | User Interface Design Lab | Tuesday 9:00 AM |
| Accessibility User Interface by Appointment Lab | User Interface Design Lab | Wednesday 9:00 AM |

Other Events

Haben Girma: Disability and Innovation:
The Universal Benefits of Accessible Design

Lunch Guest
Speaker
(Haben Girma)

Tuesday 12:20 PM

Accessibility and Inclusive Design Get-Together

Buena Vista Park

Wednesday 6:15 PM

WWDC 16 