Accessibility on iOS
Developing for everyone

Session 210
Clare Kasemset
iOS Accessibility
What You Will Learn
What You Will Learn

Introduction to accessibility
What You Will Learn

Introduction to accessibility
• Accessibility features on iOS
What You Will Learn

Introduction to accessibility
• Accessibility features on iOS
• What’s new
What You Will Learn

Introduction to accessibility
• Accessibility features on iOS
• What’s new

Accessibility tutorial
What You Will Learn

Introduction to accessibility
  • Accessibility features on iOS
  • What’s new

Accessibility tutorial
  • Visual accommodations
What You Will Learn

Introduction to accessibility
• Accessibility features on iOS
• What’s new

Accessibility tutorial
• Visual accommodations
• Semantic accessibility
Introduction to Accessibility
What Is Accessibility?
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What Is Accessibility?
Physical and Motor Switch Control

Switch Control allows you to use your iPhone by sequentially highlighting items on the screen that can be activated through an adaptive accessory.

- **Switches**: 1
- **Auto Scanning**: On
- **Auto Scanning Time**: 0.4 Seconds
- **Pause on First Item**: Off
- **Loops**: 4
Physical and Motor Switch Control

Switch Control

Switch Control allows you to use your iPhone by sequentially highlighting items on the screen that can be activated through an adaptive accessory.

- Switches: 1
- Auto Scanning: On
- Timing:
  - Auto Scanning Time: 0.4 Seconds
- Pause on First Item: Off
- Loops: 4
Physical and Motor
Switch Control

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Physical and Motor
Switch Control

Switch Control
Switch Control allows you to use your iPhone by sequentially highlighting items on the screen that can be activated through an adaptive accessory.

Switches 1

Auto Scanning

TIMING
Auto Scanning Time 0.4 Seconds
Pause on First Item Off
Loops 4
Physical and Motor
Switch Control

Switch Control allows you to use your iPhone by sequentially highlighting items on the screen that can be activated through an adaptive accessory.

Switches: 1

Auto Scanning Time: 0.4 Seconds
Pause on First Item: Off
Loops: 4
Learning
Guided Access
Learning
Guided Access
Hearing
Made for iPhone Hearing Aids
Hearing
Made for iPhone Hearing Aids
Vision

VoiceOver

- VoiceOver speaks items on the screen:
  - Tap once to select an item
  - Double-Tap to activate the selected item
  - Swipe three fingers to scroll

- **Speak Hints**
  - On

- **Use Pitch Change**
  - On

- **Use Sound Effects**
  - On
Vision
VoiceOver

Accessibility VoiceOver

VoiceOver

VoiceOver speaks items on the screen:
• Tap once to select an item
• Double-Tap to activate the selected item
• Swipe three fingers to scroll

VoiceOver Practice

SPEAKING RATE

Speak Hints

Use Pitch Change
Vision

Low vision accommodations
Vision
Reduce Motion
Vision
Reduce Motion
New Accessibility Features in iOS 8
Guided Access Time Limits
Alex
Anne of Green Gables

by Lucy Maud Montgomery
Speak Screen

Anne of Green Gables

by Lucy Maud Montgomery
Zoom

Zoom magnifies the entire screen:
- Double-tap three fingers to zoom
- Drag three fingers to move around the screen
- Double-tap three fingers and drag to change zoom

Follow Focus
Detach Zoom Controls
Leave Keyboard Unzoomed
Lens Mode
Lens Effects
Zoom

went to the

Today, I went to the

June 3, 2014, 9:41 AM
Demo

Zoom
Accessibility Tutorial
Accessibility Tutorial

Visual accommodations
Semantic accessibility
Visual Accommodations API

BOOL UIAccessibilityIsBoldTextEnabled();

BOOL UIAccessibilityIsReduceTransparencyEnabled();

BOOL UIAccessibilityDarkerSystemColorsEnabled();

BOOL UIAccessibilityIsReduceMotionEnabled();
Demo
Visual accommodations
Semantic Accessibility
Semantic Accessibility
Semantic Accessibility
Semantic Accessibility
Semantic Accessibility
Semantic Accessibility
Semantic Accessibility
Example: VoiceOver
Semantic Accessibility

Example: VoiceOver
Semantic Accessibility

Example: VoiceOver
Semantic Accessibility
Example: VoiceOver
Semantic Accessibility

Example: VoiceOver
Semantic Accessibility

Example: VoiceOver
Semantic Accessibility

Example: VoiceOver

- x,y
- element
- activate

"5"
Semantic Accessibility Audit
Semantic Accessibility Audit

Most is built into iOS
Semantic Accessibility Audit

Most is built into iOS
Audit with VoiceOver
Semantic Accessibility Audit

Most is built into iOS
Audit with VoiceOver
• Can VoiceOver speak everything?
Semantic Accessibility Audit

Most is built into iOS
Audit with VoiceOver
• Can VoiceOver speak everything?
• Can VoiceOver do everything?
Semantic Accessibility Audit

Setup

TRIPLE-CLICK THE HOME BUTTON FOR:

- VoiceOver
- Invert Colors
- Grayscale
- Zoom
- Switch Control
- AssistiveTouch
Semantic Accessibility Audit

VoiceOver cheat sheet
Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak
Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak
Semantic Accessibility Audit
VoiceOver cheat sheet

Tap: select and speak
Double tap: activate
Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak
Double tap: activate
Semantic Accessibility Audit
VoiceOver cheat sheet

Tap: select and speak
Double tap: activate
Semantic Accessibility Audit

VoiceOver cheat sheet

- Tap: select and speak
- Double tap: activate
- Swipe right: select and speak the next element
Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak
Double tap: activate
Swipe right: select and speak the next element
Semantic Accessibility Audit
VoiceOver cheat sheet

Tap: select and speak
Double tap: activate
Swipe right: select and speak the next element
Three finger swipe: scroll
Semantic Accessibility Audit

VoiceOver cheat sheet

Tap: select and speak
Double tap: activate
Swipe right: select and speak the next element
Three finger swipe: scroll
Demo
Semantic accessibility audit
Basic Accessibility API
Basic Accessibility API

@property(nonatomic) BOOL isAccessibilityElement;
Return YES to make a view visible to an assistive technology
Default is YES for controls and labels
Basic Accessibility API

@property(nonatomic, copy) NSString *accessibilityLabel;
Return a description of the view
Spoken by VoiceOver
Basic Accessibility API

Interface Builder
Basic Accessibility API

Interface Builder

isAccessibilityElement

Accessibility

Accessibility: Enabled

Label: Hello goodbye, meet your match
Basic Accessibility API

Interface Builder

- `isAccessibilityElement`
- `accessibilityLabel`

Accessibility settings:

- **Accessibility**: Enabled
- **Label**: Hello goodbye, meet your match
Basic Accessibility API

Code

```swift
view.isAccessibilityElement = YES;
view.accessibilityLabel = @"Profile photo";
```
Demo
Basic accessibility API
Accessibility API for Custom UI
Accessibility Traits

@property(nonatomic) UIAccessibilityTraits accessibilityTraits;

Describe the function of a view
Accessibility Traits
Accessibility Traits
Accessibility Traits

UIAccessibilityTraitAdjustable
Accessibility Traits

UIAccessibilityTraitAdjustable
Accessibility Traits

UIAccessibilityTraitAdjustable

UIAccessibilityTraitButton
Accessibility Traits

Interface Builder

Traits

- Button
- Static Text
- User Interaction Enabled
Accessibility Traits

Code

```javascript
view.accessibilityTraits = (view.accessibilityTraits | UIAccessibilityAccessibilityTraitButton);
```
Accessibility Value
Accessibility Value

@property(nonatomic, copy) NSString *accessibilityValue;
Accessibility Value

@property(nonatomic, copy) NSString *accessibilityValue;
Use with UIAccessibilityTraitAdjustable
@property(nonatomic, copy) NSString *accessibilityValue;
Use with UIAccessibilityTraitAdjustable
Accessibility Value

@property (nonatomic, copy) NSString *accessibilityValue;
Use with UIAccessibilityTraitAdjustable
Accessibility Actions
Accessibility Actions

- (void)accessibilityIncrement;
Accessibility Actions

- (void)accessibilityIncrement;
- (void)accessibilityDecrement;
Accessibility Actions

- (void)accessibilityIncrement;
- (void)accessibilityDecrement;

Use with UIAccessibilityTraitAdjustable
Accessibility Actions

- (void)accessibilityIncrement;
- (void)accessibilityDecrement;

Use with UIAccessibilityTraitAdjustable

Increase or decrease an element’s value
Accessibility Actions

- (void)accessibilityIncrement;
- (void)accessibilityDecrement;

Use with UIAccessibilityTraitAdjustable

Increase or decrease an element’s value
Accessibility Actions

- (void)accessibilityIncrement;
- (void)accessibilityDecrement;

Use with UIAccessibilityTraitAdjustable

Increase or decrease an element’s value
Accessibility Actions

- (BOOL)accessibilityActivate;
Provide a default action for views requiring a specific gesture
Accessibility Notifications
Accessibility Notifications

Notify assistive technology of a change
Accessibility Notifications

Notify assistive technology of a change

UIAccessibilityLayoutChangedNotification
Accessibility Notifications

Notify assistive technology of a change
UIAccessibilityLayoutChangedNotification
Notify assistive technology of a change

UIAccessibilityLayoutChangedNotification
Notify assistive technology of a change

UIAccessibilityLayoutChangedNotification

UIAccessibilityPostNotification(UIAccessibilityLayoutChangedNotification, nil);
Notify assistive technology of a change

UIAccessibilityLayoutChangedNotification

UIAccessibilityPostNotification(UIAccessibilityLayoutChangedNotification, nil);
Demo
Accessibility API for custom UI
New Accessibility API
UIAccessibilityContainer
UIAccessibilityContainer

Return a list of accessibility elements from a view
UIAccessibilityContainer

Return a list of accessibility elements from a view
Necessary for elements that don’t correspond to views
UIAccessibilityContainer

Return a list of accessibility elements from a view
Necessary for elements that don’t correspond to views
UIAccessibilityContainer

Return a list of accessibility elements from a view
Necessary for elements that don’t correspond to views

See last year’s talk for example
UIAccessibilityContainer

Can be used to sort existing elements
UIAccessibilityContainer

Can be used to sort existing elements

Age: 32
Hobbies: Cooking, bubble tea with friends, travel

Elevator Pitch
I will cook you a gourmet dinner in a log cabin I built you with my own hands.
UIAccessibilityContainer

Can be used to sort existing elements

Elevator Pitch
I will cook you a gourmet dinner in a log cabin I built you with my own hands.
UIAccessibilityContainer

@interface NSObject (UIAccessibilityContainer)

-(NSInteger)accessibilityElementCount;
-(id)accessibilityElementAtIndex:(NSInteger)index;
-(NSInteger)indexOfAccessibilityElement:(id)element;

@end
@interface NSObject (UIAccessibilityContainer)

- (NSInteger)accessibilityElementCount;
- (id)accessibilityElementAtIndex:(NSInteger)index;
- (NSInteger)indexOfAccessibilityElement:(id)element;

@property (nonatomic, strong) NSArray *accessibilityElements;

@end
UIAccessibilityCustomAction
UIAccessibilityCustomAction

More than one action for an element
UIAccessibilityCustomAction

More than one action for an element
App switcher: launch or close app
UIAccessibilityCustomAction

More than one action for an element
App switcher: launch or close app
Say hello or goodbye to a match
@interface UIAccessibilityCustomAction : NSObject

- (instancetype)initWithName:(NSString *)name target:(id)target selector:(SEL)selector;

@property (nonatomic, copy) NSString *name;
@property (nonatomic, weak) id target;
@property (nonatomic, assign) SEL selector;

@end
UIAccessibilityCustomAction

@property (nonatomic, retain) NSArray *accessibilityCustomActions;
Demo
New accessibility API
Summary
iOS users are diverse
Summary

iOS users are diverse
Widen your user base
Summary

iOS users are diverse
Widen your user base
Low effort, high reward
More Information

Jake Behrens
App Frameworks Evangelist
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Documentation
Accessibility Programming Guide for iOS

Apple Developer Forums
http://devforums.apple.com
## Related Sessions

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Labs

- Accessibility and Speech Lab
 Frameworks Lab B  Wednesday 10:15AM