Using iOS Gesture Recognizers

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Overview

- Gesture recognizer basics
- Gesture languages
- Handling gesture conflicts
- Demo

Gesture Recognizers

- Subclass of UIGestureRecognizer
- Self-contained state machine for tracking touches and recognizing gestures
- Each UIView has a list of gesture recognizers
- Add using view.AddGestureRecognizer(gestureRecognizer)

Gesture Recognizers vs. Raw Touch Handling

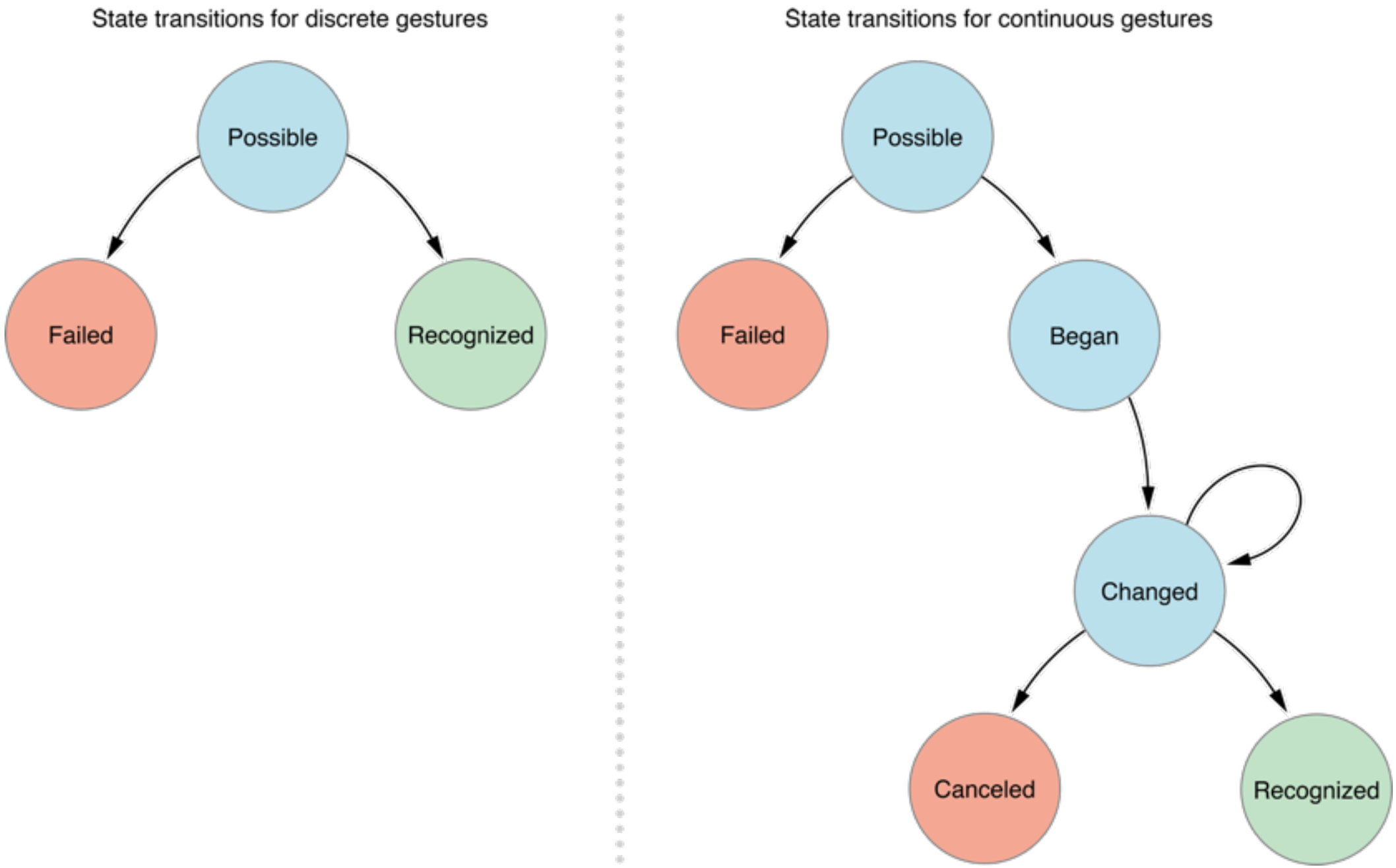
- Gesture recognizers are better for:
  - Conflict resolution
  - Handling touches in different views
  - Reusing touch logic

- **Avoid implementing UIResponder.Touches* methods**

Discrete vs. Continuous Gestures

- Discrete gestures trigger once and then reset
  - ex: tap
- Continuous gestures take place over time
  - ex: pan or pinch

Gesture States



Source: https://developer.apple.com/library/ios/documentation/EventHandling/Conceptual/EventHandlingiPhoneOS/GestureRecognizer_basics/GestureRecognizer_basics.html

Gesture Callbacks

- Called once for discrete gestures
- Called multiple times for continuous gestures:
  - Began (once)
  - Changed (0 or more times)
  - Ended (0 or one time) (== Recognized)
  - Cancelled (0 or one time)

Touch Routing and Priorities

- Touch is delivered to hit test view + “swarm” of recognizers
- Gestures in nested views beat gestures in outer views
- Gestures added earlier beat gestures added later
- First gesture to recognize wins unless others are explicitly allowed to recognize simultaneously

Stock Recognizers

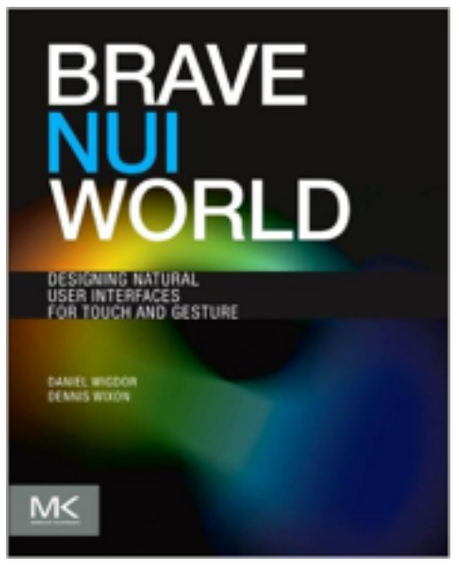
- UITapGestureRecognizer (Discrete)
- UIPanGestureRecognizer (Discrete)
- UISwipeGestureRecognizer (Continuous)
- UIPinchGestureRecognizer (Continuous)
- UIRotationGestureRecognizer (Continuous)
- UILongPressGestureRecognizer (Continuous)

Gesture Languages

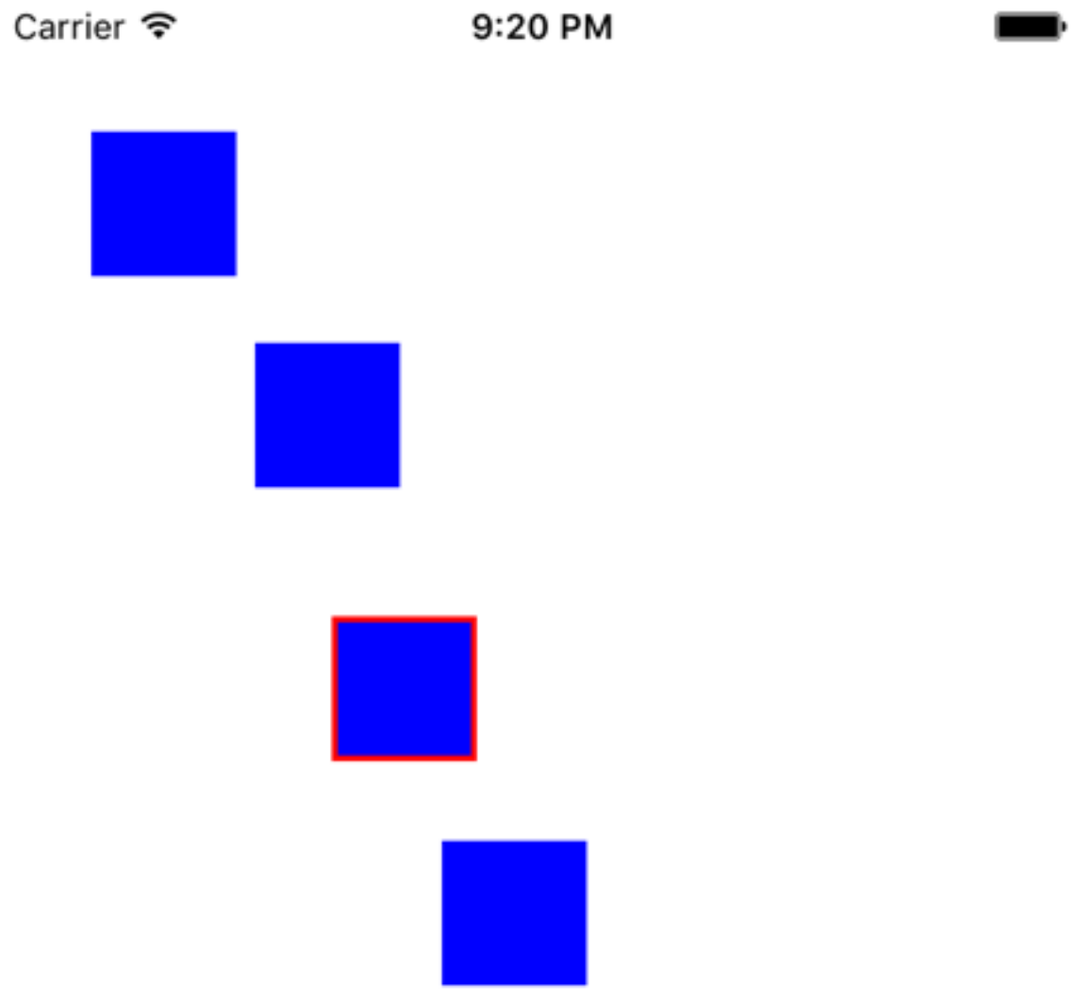
- A set of gestures that work together to allow the user to fulfill tasks

- Must be carefully constructed to avoid conflicts or ambiguities

- Useful reference: Brave NUI World

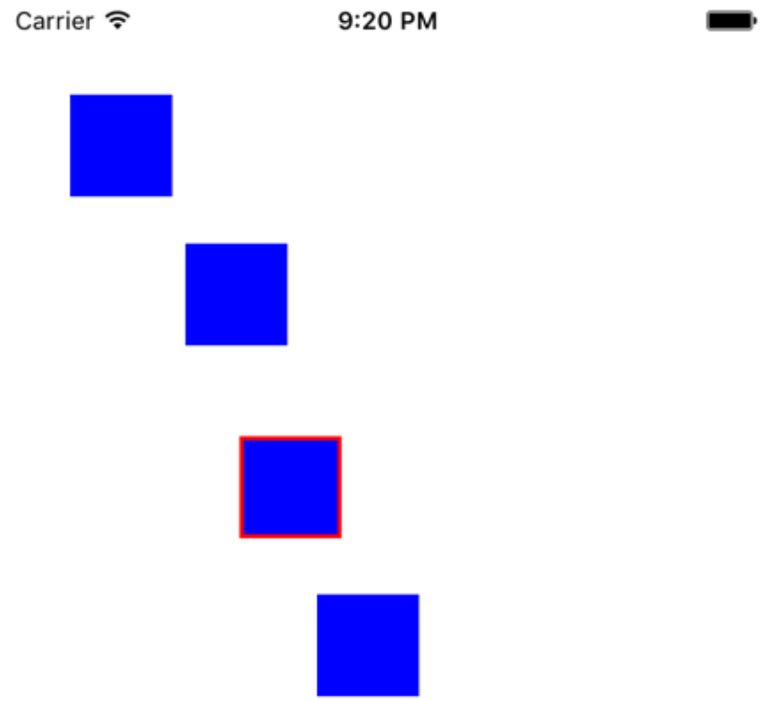


Example Gesture Language



Example Gesture Language

- Tap unselected element to select it (clears existing selection)
- Tap empty canvas to clear selection
- Pan on selected element to move
- Pan anywhere else to scroll



Gesture Conflicts

- Occur when the same gesture input may be interpreted as multiple possible actions
- Gesture languages should be defined to avoid these ambiguities
- In code there are multiple tools to resolve conflicts

Handling Gesture Conflicts in Code

- Add dependencies
    - RequireGestureRecognizerToFail
- Filter touches:
    - ShouldReceiveTouch
- Gate/veto:
    - ShouldBegin (see also: UIView.GestureRecognizerShouldBegin)
- Allow simultaneous recognition:
    - ShouldRecognizeSimultaneously

Demo

Resources

- Gesture Recognizers (iOS Event Handling Guide)
- Brave NUI World (Morgan Kaufmann)
- Programming iOS 8 (O'Reilly)
- WWDC Videos