

# React Native 4

## CS571: Building User Interfaces

**Cole Nelson**

# What will we learn today?

- How to pass data using React Navigation?
- How to perform "switch" navigation?
- How to store secrets on mobile devices?
- How to do advanced gestures and animations?
- How to use sensors?
- How to deploy our apps?

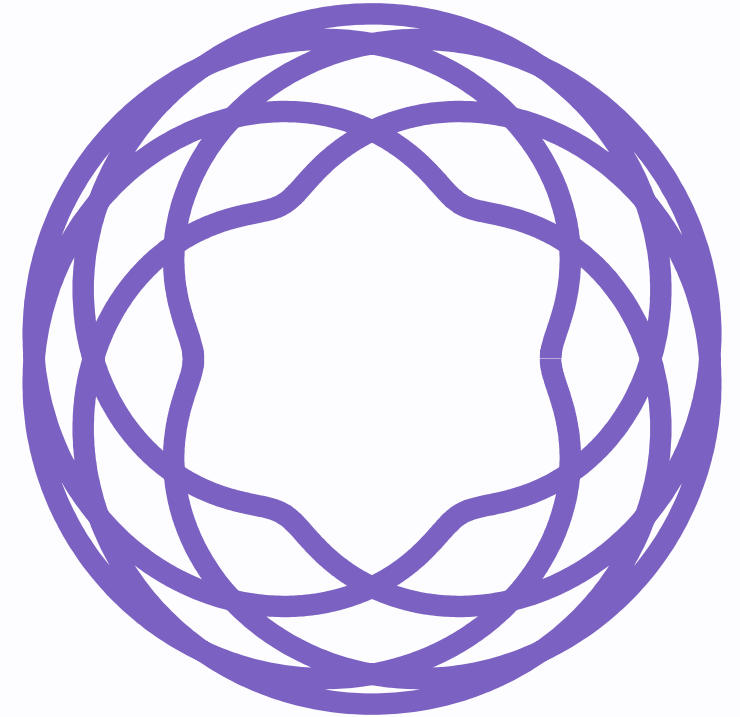
# React Navigation

Last time we covered...

- Stack Navigation
- Tabs Navigation
- Drawer Navigation

How do we pass data down?

- Using context
- Using **render callbacks**



# Passing Data Down

**Problem:** Create a drawer with many tools in it.

```
const [tools, setTools] = useState([
  { name: 'hammer', weight: 2, dangerous: false },
  { name: 'screwdriver', weight: 1, dangerous: false },
  { name: 'sawzall', weight: 6, dangerous: true }
]);
```

Hammer

Screwdriver

Sawzall

# Passing Data Down

Displaying the tool data.

```
export default function ToolScreen(props) {  
  return <View>  
    <Text>I am a {props.name}</Text>  
    <Text>I weigh {props.weight} pounds</Text>  
    {  
      props.dangerous ?  
        <Text>I am dangerous</Text> :  
        <Text>I am not dangerous</Text>  
    }  
  </View>  
}
```



**sawzall**

I am a sawzall

I weigh 6 pounds

I am dangerous

# Creating Navigator

```
<NavigationContainer>  
  <ToolDrawer.Navigator>  
    <ToolDrawer.Screen name="Landing" component={LandingScreen}/>  
    <ToolDrawer.Screen name="Hammer" component={ToolScreen}/>  
    <ToolDrawer.Screen name="Screwdriver" component={ToolScreen}/>  
    <ToolDrawer.Screen name="Sawzall" component={ToolScreen}/>  
  </ToolDrawer.Navigator>  
</NavigationContainer>
```

- ✗ hardcoding tool names
- ✗ not passing tool data

## Snack Example

```
<NavigationContainer>
  <ToolDrawer.Navigator>
    <ToolDrawer.Screen name="Landing" component={LandingScreen}/>
    {
      tools.map(tool => {
        return <ToolDrawer.Screen
          key={tool.name}
          name={tool.name}
          component={ToolScreen}
        />
      })
    }
  </ToolDrawer.Navigator>
</NavigationContainer>
```

Similar Solution: [BadgerChat](#)

✗ not passing tool data

```
<NavigationContainer>
  <ToolDrawer.Navigator>
    <ToolDrawer.Screen name="Landing" component={LandingScreen}/>
    {
      tools.map(tool => {
        return <ToolDrawer.Screen key={tool.name} name={tool.name}>
          {(props) => <ToolScreen {...props} {...tool}/>}
        </ToolDrawer.Screen>
      })
    }
  </ToolDrawer.Navigator>
</NavigationContainer>
```

✓ correct way!

## Snack Example



# Switch Navigation

There is a fourth, "informal" navigation.

⚠ Do not use the one from React Navigation! It is very out-of-date. It existed in React Navigation < 4.x.

# "Switch" Navigation

```
isSignedIn ? (  
  <>  
    <Stack.Screen name="Home" component={HomeScreen} />  
    <Stack.Screen name="Profile" component={ProfileScreen} />  
    <Stack.Screen name="Settings" component={SettingsScreen} />  
  </>  
) : (  
  <>  
    <Stack.Screen name="SignIn" component={SignInScreen} />  
    <Stack.Screen name="SignUp" component={SignUpScreen} />  
  </>  
);
```

## React Navigation AuthFlow

# "Switch Navigation"

**Premise:** perform a conditional render.

**If** the user is signed in, show them their needs feed.

**Else** give the user the option to sign in or sign up.

Snack Solution

# HW10 Demo

Switch navigation and data passing.

# Secure Storage

Storing secrets (asynchronously!)

# Authentication

## Web Development

- Interface with the *user's browser*.
- Prefer HTTP-Only cookies.

## Mobile Development

- Interface with the *user's operating system*.
- Prefer OS-level secure encrypted storage.

# Authentication

**Web:** Specify *option* `include: 'credentials'`

```
fetch("https://example.com/api/submit", {  
  method: "POST",  
  credentials: "include",  
  // ...  
})
```

# Authentication

**Mobile:** Specify...

- *header* Authorization
- *value* Bearer <JWT>

```
fetch("https://example.com/api/submit", {  
  method: "POST",  
  headers: {  
    "Authorization": "Bearer eyJhbGciOiJIUzI1NiIs..."  
  }  
})  
// ...
```

If the request has a body, don't forget **Content-Type** !



# Authentication

[Download HW10 Postman Collection](#)

# Secure Storage

**Uh oh!** We have to store a JWT?

- React has no built-in way to handle credentials! 😬
- [expo-secure-store](#)
  - Only works on Android and iOS -- not web!
- Stores key/value pairs to *persistent* storage.
- Up to 2KB of data per value (small!)
- Cannot store emojis 😞
- Additional options for passcode 🔒 and biometrics 👉

# Secure Storage

Secure storage is asynchronous in nature.

- `getItemAsync(key)`
- `setItemAsync(key, val)`
- `deleteItemAsync(key)`

**Note:** Key refers to a storage key (think HashMap) *not* an encryption key!

# Secure Storage

`expo-secure-store` shows an example of `async` / `await` ... What is this?...

Same thing as `then` and `catch` on a `Promise` (think `fetch`)... just a slightly different syntax!

We'll cover `async` / `await` in DialogFlow!

# Secure Storage

CS571-ifying the expo-secure-store example.

**Use your phone,** not the web!

# Advanced Gestures

Making use of diverse mobile inputs 🙌 🙏 🖐️ 🤲 👍

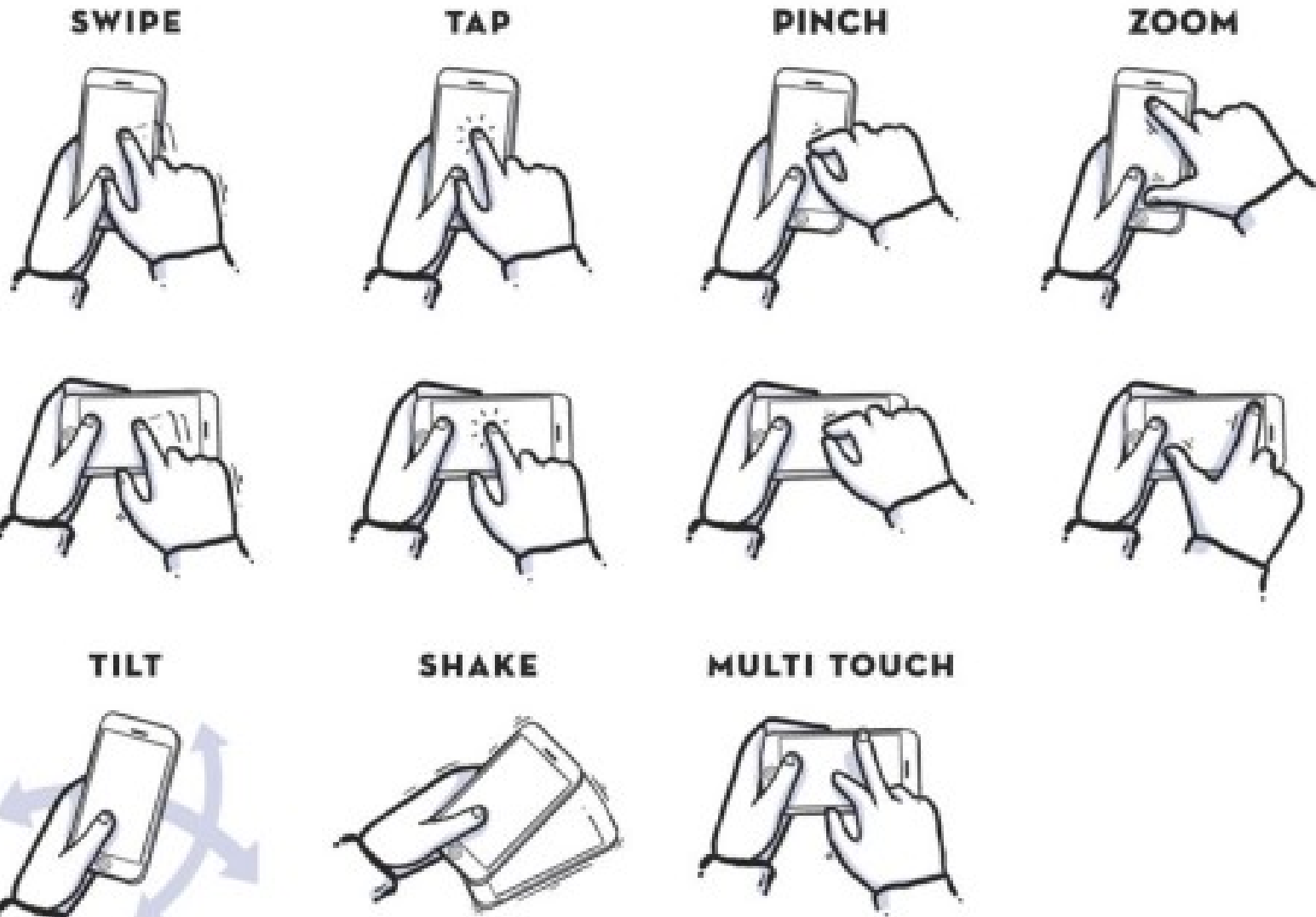


Image Source

# Gestures

React Native **provides methods** to detect when and where the user's fingers move.

Higher-level gesture response libraries...

- react-native's **PanResponder**
- **react-native-gesture-handler**
- component libraries, e.g. **react-native-paper**



# PanResponder & Animated

See S22 Example

# **react-native-gesture-handler & react-native-reanimated**

[See Example](#)

# Component Library Gestures

**react-native's** Button `onPress`

**react-native-paper's** Card `onPress` and `onLongPress`

**react-native-elements'** Slider `onSliding`

**react-native-maps'** Marker `onDrag`

**react-navigation's** Drawer gesture

# Sensors

Use `expo-sensors` instead of `react-native-sensors`

- Accelerometer
- Barometer
- Gyroscope
- LightSensor
- Magnetometer
- Pedometer

Not all devices have all sensors!

# Other Sensors

- expo-camera
- expo-battery
- expo-haptics
- expo-av
- expo-brightness

Beware of **permissions**!

# Deployment

Getting your app to a production environment.

# Deployment

## iOS vs Android Market Share

Region	iOS	Android	Other
USA	54%	45%	1%
North America	52%	47%	1%
Asia	16%	83%	1%
Worldwide	28%	71%	1%

Source: [GlobalStatCounter](#)

# Deployment

Use Expo Application Services (EAS)

```
npm install -g eas-cli
```

```
eas build -p android  
eas build -p ios
```

An `.apk` gets deployed to the Google Play Store

An `.ipa` gets deployed to the iOS App Store



# Deployment

**No web server for deployment!** Hosted on Google Play Store or iOS App Store.

App goes through a review process.

- **Google Play Store:** Hours to Days
- **iOS App Store:** Days to Weeks

# Deployment Considerations

- Reliability
- Performance
- Monitoring
- Business Value of Delivery
- App Store Optimization (ASO)

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# Questions?