# Automated UI tests for Mobile Apps

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# What I'll be covering

- Basics
  - What are UI tests?
  - The notion of Emulator and Simulator
- What are our challenges?
- Platform specific UI testing frameworks
  - For Native Apps
  - For Mobile Web Apps
- Generic frameworks

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# What are UI tests?

Performing actions on a user interface (UI)

UI tests are done at a higher level than unit tests

Also known as Functional or Acceptance  tests

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# The notion of Emulator vs. Simulator

- Emulator 


- Simulator 


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# What are our challenges?

- Fragmentation. Multiple OS versions and devices.
- Test on a huge array of devices with different sizes and screen resolutions.
- Rendering of images and positioning of elements on a screen is unsuitable in some devices.
- Due to a large number of devices available in the market, it is not feasible to buy a new device every time.
- Emulators and Simulators are not reliable.
- Time to Market.

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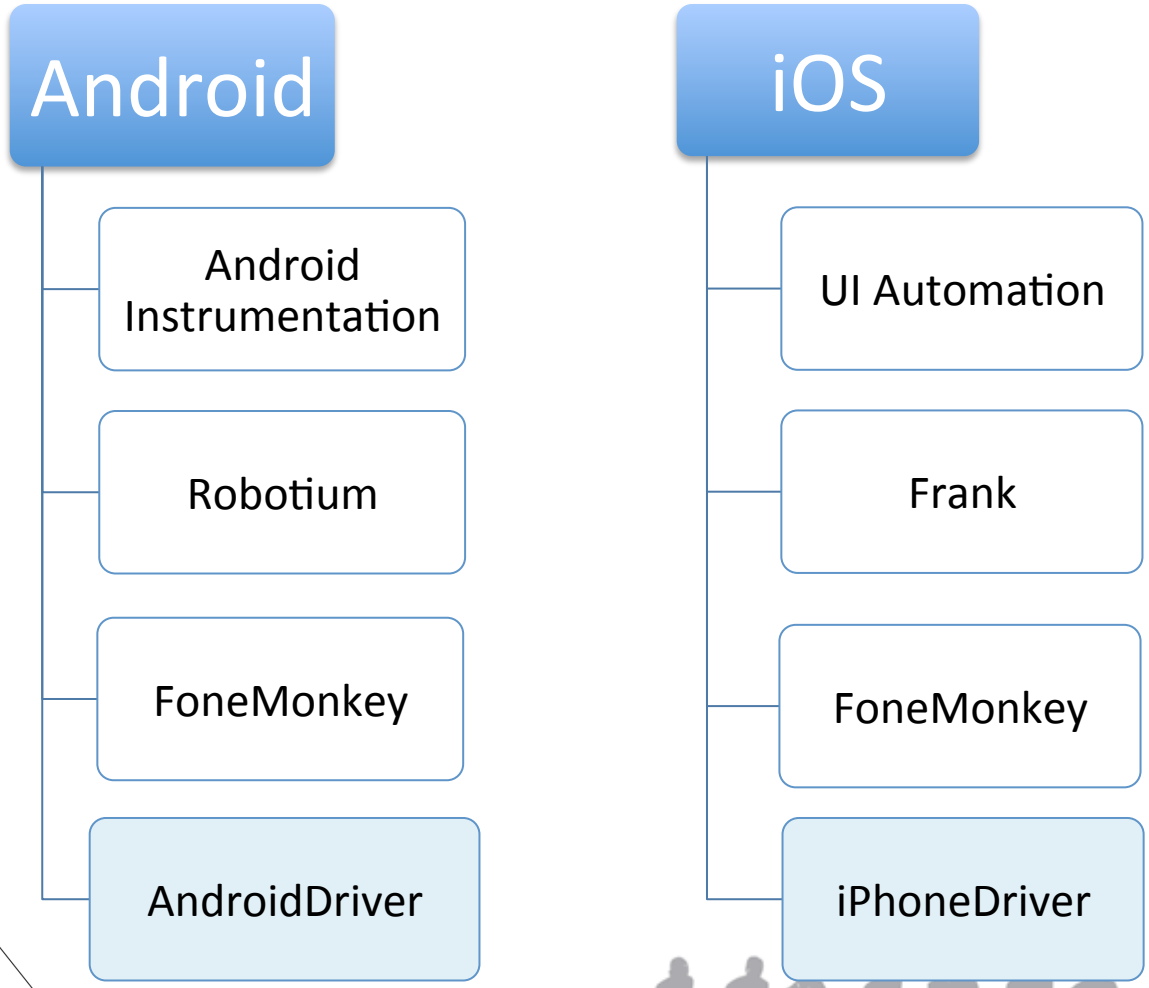
# Platform Specific UI Testing Automation Tools

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# Android test framework

**Android Instrumentation**

test framework that already comes with the Android SDK

**But we are not going to use it,**

**not directly anyway …**

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# Robotium is better way to test Android Native Apps

**Robotium**
**http://code.google.com/p/robotium**

**Built on Android test framework and solves a very important issue …**

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# Can deal with tests running faster than UI threads

- Your UI test can perform actions faster than you can
- That means it will expect something to happen faster than the UI finishes its task
- Robotium is smart enough to wait for things to happen – no sleeps required!

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# Why use Robotium instead of standard SDK?

- Robotium  uses Solo, which allows to simulate gestures
- Active community to help if you get stuck
- Gets updated more often than Android SDK

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# We will be automating UI tests for a Calculator

**Scenario: Can add two numbers together**

*Given* the user enters 1 and 2

*When* the user touches calculate

*Then* the total should be 3

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# DEMO

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# Frank for iOS native apps

- A bridge between Cucumber and UISpec
- A “Frank Driver” that sends HTTP requests from Cucumber to a “Frank Server” that is installed in the Application
- The “Frank Server” executes UISpec queries against the application, returns the results

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# UISpec

http://code.google.com/p/uispec/

- UISpec is a BDD framework for the iPhone that provides a full automated testing solution that drives the actual iPhone UI.
- It is modelled after the very popular Rspec for Ruby.
- Written in Objective C.

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# Cucumber

http://cukes.info/

- Tool that executes plain-text functional descriptions as automated tests.
- Written in Ruby.
- Created originally for use with *Ruby on Rails*

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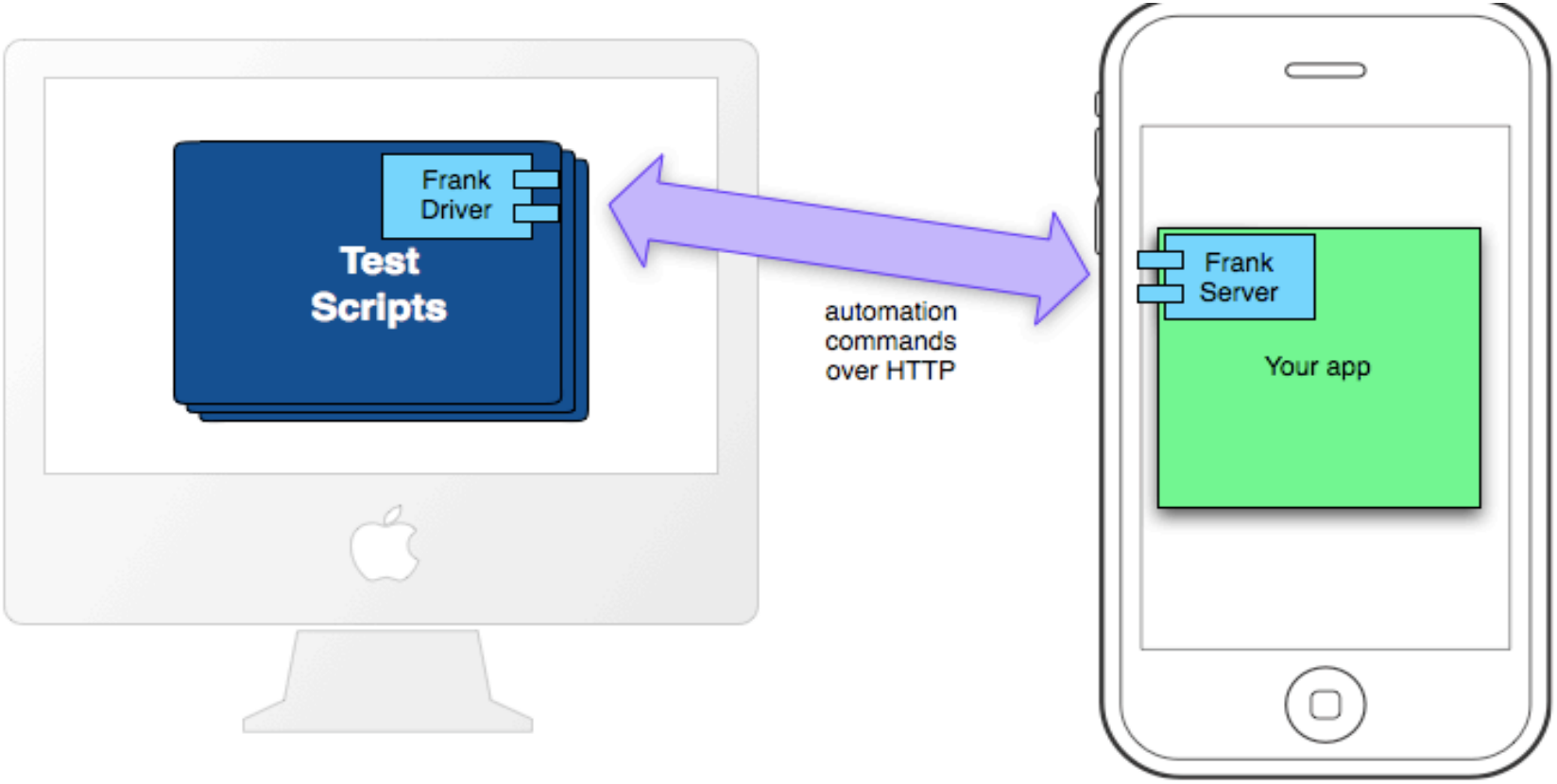
# Frankified app

http://www.testingwithfrank.com/

http://softnoise.wordpress.com/2010/11/14/ios-running-cucumberfrank-with-code-coverage-in-hudson/

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# DEMO

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# FoneMonkey for iOS

http://www.gorillalogic.com/fonemonkey

Record/Playback functional testing tool

- Records high-level user action
- Integrates with OCUnit
- Generation of OCUnt test scripts
- Validation commands

# DEMO

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# Automating UI tests for Mobile Web Apps

Selenium - http://seleniumhq.org/

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# How Selenium works

iOS http://code.google.com/p/wiki/iPhoneDriver

Android http://code.google.com/p/wiki/AndroidDriver

Install the driver application onto the device.

This runs a webserver which listens for commands …

which you send from your computer.

Similar to remote control.

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# Generic Testing Approach

- Image based test automation
- Automate user operations like Click, type, drag-drop, mouse actions etc.
- Visual verification of the expected output
- Not dependent on platform underneath
- Can be used to automate emulator/ simulator as well as device

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# Sikuli

## http://sikuli.org

- Visual technology to automate GUI using images.
- MIT research project. Open Source license.
- Sikuli IDE
- Sikuli Script API
- Automates anything on screen without internal API's support
- Works on Windows, Mac, Linux.

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# Who is using Sikuli?

Google

VSee

Digital Arc Systems

Spotify

intel

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# DEMO

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# SeeTest

http://www.experitest.com

- Same technology as Sikuli
- Record and Playback
- Paid product
- Plugs into Java, C#, QTP, TestComplete, Perl and Python
- Works on Windows and Linux
- Runs only on devices

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# Who is using SeeTest?






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# Advantages of the Generic Approach

- Can accurately test GUI and rendering of applications.
- Write test outside the device
- Can be used to automate multiple devices without getting into details of each platform technology
- Easier to start with.

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# Limitations of the Generic Approach

- Highly depends on the Resolution.
- Can not run in background.

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# Some Testing Strategies and Recommendations

| Type of testing | Testing on Simulator/Emulator | Testing on Device |
|---|---|---|
| Unit Testing | Yes | |
| Integration Testing | Yes | |
| Regression Testing | Yes | Yes |
| Compatibility Testing | | Yes |
| Performance Testing | | Yes |
| Security Testing | | Yes |

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