appium
MOBILE AUTOMATION
MADE AWESOME

ABOUT THE SPEAKER

Dan Cuellar

@thedancuellar

- Creator of Appium
- Head of Software Testing at FOODit
- Previously at Shazam, Zoosk, and Microsoft
- BS in Computer Science from Carnegie Mellon

AGENDA

- What is Appium?
- What's New in Appium 1.6?
- Automate Desktop Apps with Appium (live demo)
- Mobile App Automation with Appium (sample code)
- Appium Tips & Tricks (sample code)
- Robots!

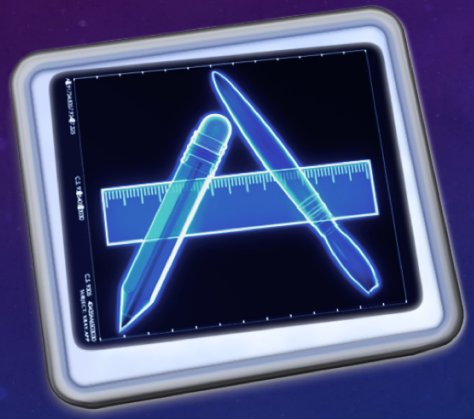
appium

Evolution

THE MOST TERRIFYING 5 WORDS IN TESTING

THIS ALL SOUNDS FAMILIAR

EVERYTHING IS NOT AWESOME

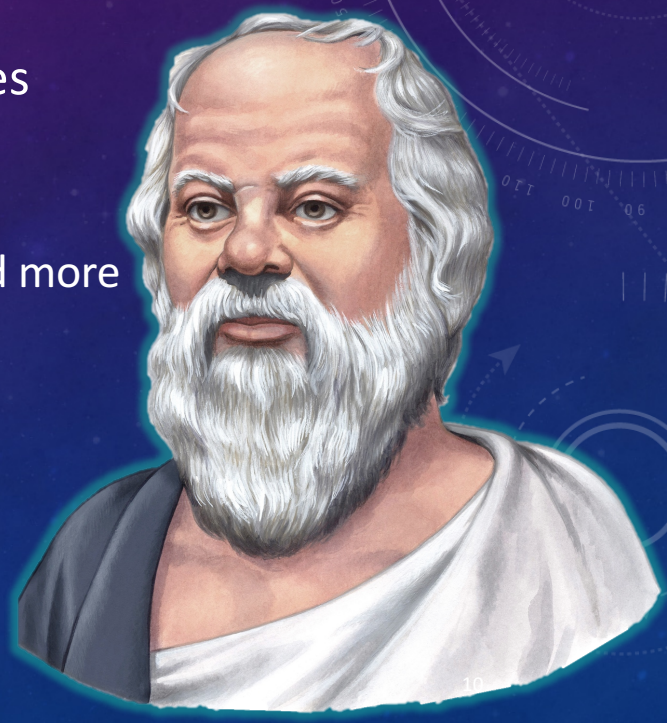


WHAT IS APPIUM

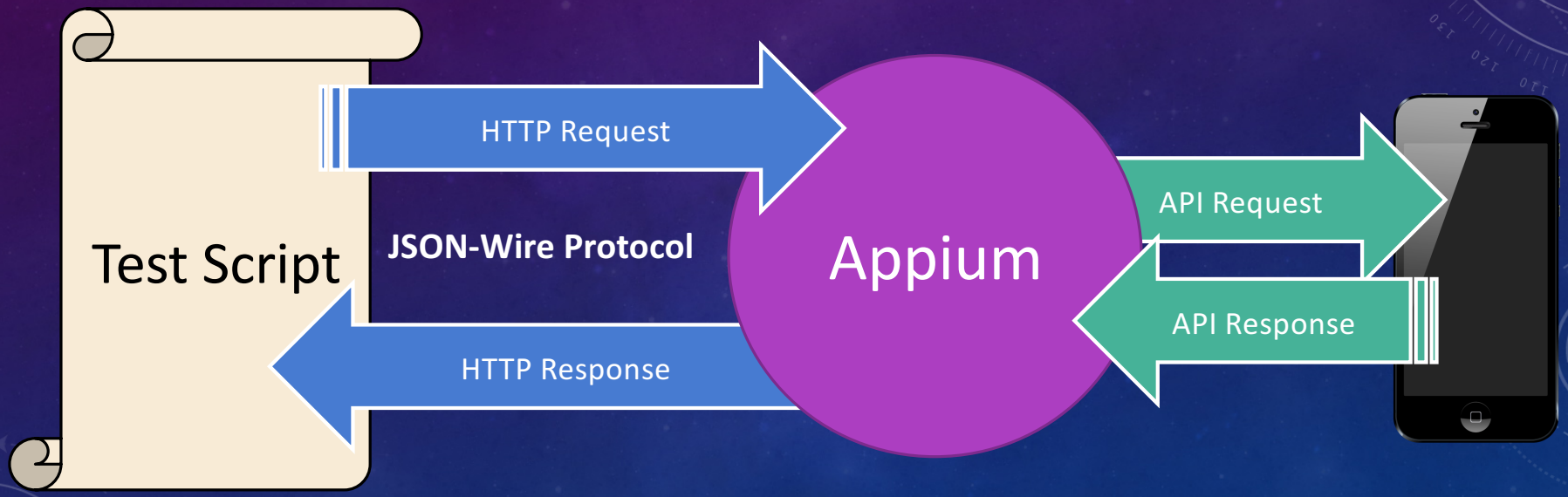
- An implementation of the Selenium JSON-wire protocol that controls native and hybrid iOS and Android application
- The most popular open source mobile functional testing framework

APPIUM PHILOSOPHY

- Use standardized and sanctioned APIs and techniques
- Code in the language of your choice
  - Java, C#, Python, Ruby, Objective-C, JavaScript, PHP, and more
- Do not modify the application under test
- Keep it free and open source



HOW DOES IT WORK?



BY THE NUMBERS

In the last 4 years:

- Over 4,500 Stars, 2,000 Forks on GitHub
- Over 200 Contributors and 5,000 commits
- Over 150,000 downloads of Appium 1.0
- Over 4,000 issues closed

What's New

WHAT'S NEW IN APPIUM 1.6?

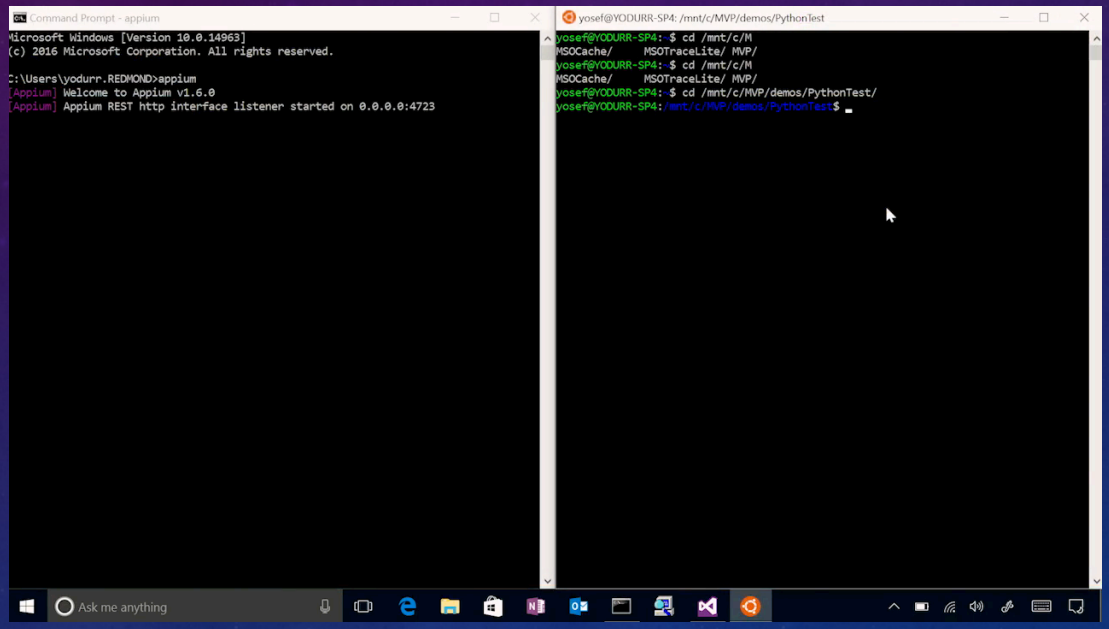
- Windows Universal App Support
- JS.Foundation
- XCUITest iOS Backend for iOS 9.3 and 10+
- You.i.TV platform support
- UIAutomator 2 Support (beta)

WHAT'S COMING NEXT

- Mac application support
- New GUIs
- Better docs and onboarding material

Desktop Apps

HELL HAS FROZEN OVER



Windows Support

Microsoft

https://github.com/Microsoft/WinAppDriver

Mac Apps

https://github.com/appium/appium-for-mac

The Basics

SETUP CAPABILITIES – IOS

```
@Before
  public void setUp() throws Exception {

    // set up appium
    File app = new File("/path/to/your/TestApp.app");
    DesiredCapabilities capabilities = new DesiredCapabilities();
    capabilities.setCapability("platformVersion", ”10.0.1");
    capabilities.setCapability("deviceName", "iPhone 7s");
    capabilities.setCapability("app", app.getAbsolutePath());
    capabilities.setCapability(“automationName”, “xcuitest”);

    driver = new IOSDriver<WebElement>(new URL("http://127.0.0.1:4723/wd/hub"), capabilities);
  }
```

SETUP CAPABILITIES - ANDROID

```
@Before
   public void setUp() throws Exception {

      // set up appium
      File app = new File(”/path/to/my/test-app.apk");
      DesiredCapabilities capabilities = new DesiredCapabilities();
      capabilities.setCapability("deviceName","Android Emulator");
      capabilities.setCapability("automationName",”uiautomator2");
       capabilities.setCapability("platformVersion", ”6.0");
      capabilities.setCapability("app", app.getAbsolutePath());
      capabilities.setCapability("appPackage", ”com.yourcompany.testapp");
      capabilities.setCapability("appActivity", ".HomeScreenActivity");

      driver = new AndroidDriver<WebElement>(new URL("http://127.0.0.1:4723/wd/hub"),
capabilities);
   }
```

THE CODE – FINDING ELEMENTS

```
WebElement el = driver.findElement(By.className("XCUIElementTypeButton"));

WebElement el = driver.findElement(By.xpath("//XCUIElementTypeTextField[1]"));

WebElement el = driver.findElement(MobileBy.AccessibilityId("Done"));
```

THE CODE – ACTIONS

```
el.click();

el.sendKeys("Hello World");

// 2 finger tap
action0 = TouchAction().tap(el)
action1 = TouchAction().tap(el)
MultiAction().add(action0).add(action1).perform()
```

AUTOMATING WEB-VIEWS

Each webview in your app is a context. Change context and automate as you would a webpage using regular selenium syntax.

```
driver.context(contextName);
WebElement el = driver.findElement(By.cssSelector(".awesome"));
el.click();
```

CONTEXTS

Native Context

Web Context

Advanced

SMS as Alert

9:41 AM
100%
Messages
Thursday
23
Calendar
Photos
Clock
App Store
Camera
Settings
The Weather Channel
The Weather
Facebook
Twitter
Tube Map
Google Maps
Authenticator
Amex
Amex UK
HSBC
Skype
WhatsApp
Spotify
Shazam
Phone
Mail
Safari
Music

Slow iOS Simulator

- Xcode 7 and iOS 9 do not support installing the speedup tool automatically that previous versions of Appium used
- No worries, you can install it manually
  - https://github.com/appium/appium/blob/master/docs/en/advanced-concepts/iwd_xcode7.md
- Now your iOS tests will be fast again

Capabilities

- iOS and Android
  - **autoWebView –** start in the webview context (really useful for Cordova apps)
- Android
  - **ignoreUnimportantViews** – can speed up your Android tests
  - **nativeWebScreenshot** – takes the screenshot from UIAutomator instead of chromedriver

Capabilities

- iOS
  - **locationServicesAuthorized –** pre-authorizes location services (prevents an alert)
  - **Auto[Accept|Dismiss]Alerts** – useful to prevent alerts
  - **nativeWebTap** – uses non-javascript taps on web content
  - **safariIgnoreFraudWarning** – allows https without proper certs
  - **interKeyDelay** - time between keystrokes
  - **sendKeyStrategy** – (oneByOne, grouped, or setValue)

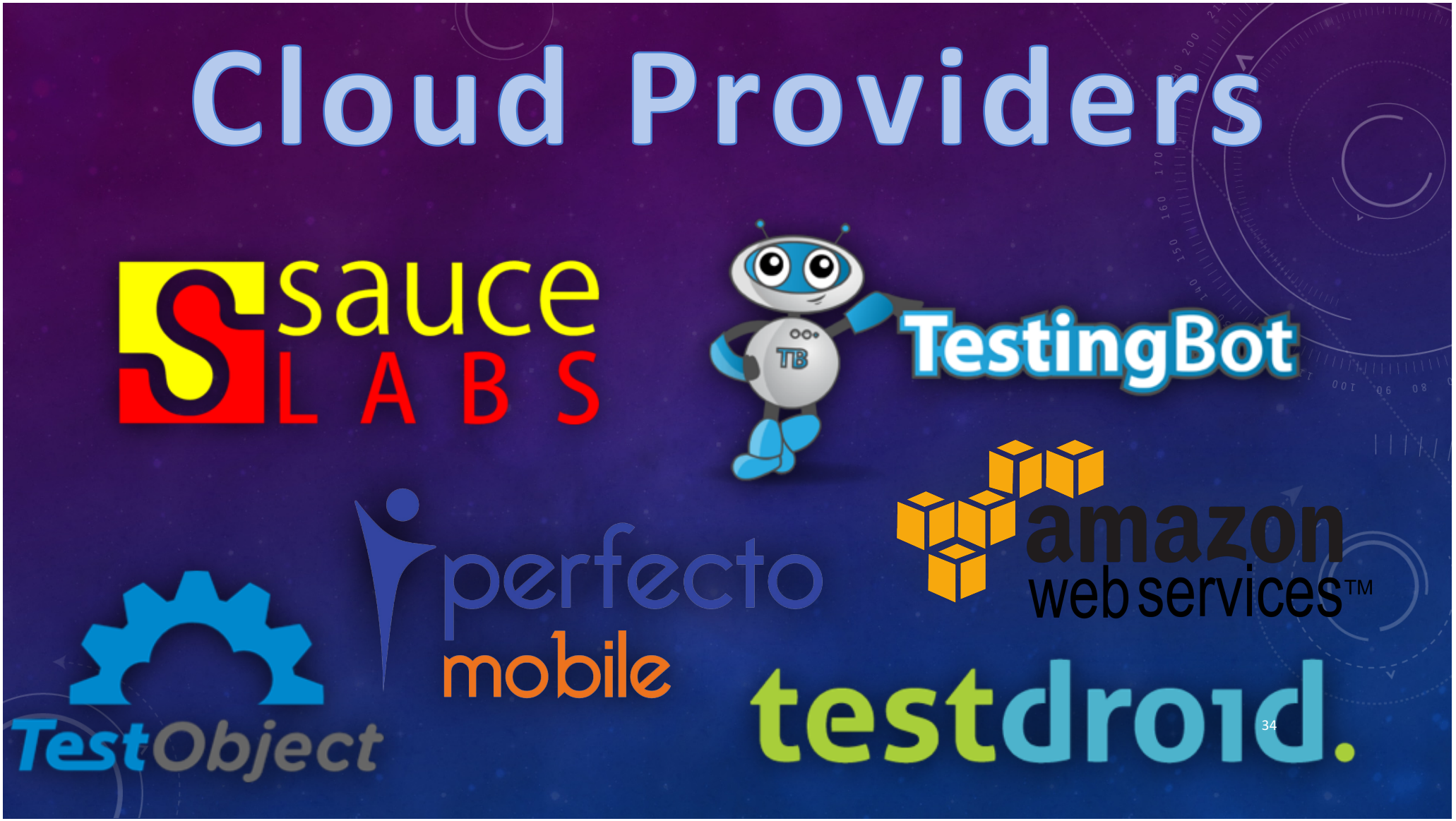
Network Conditioning

driver.setNetworkConnection(value) [Android only]

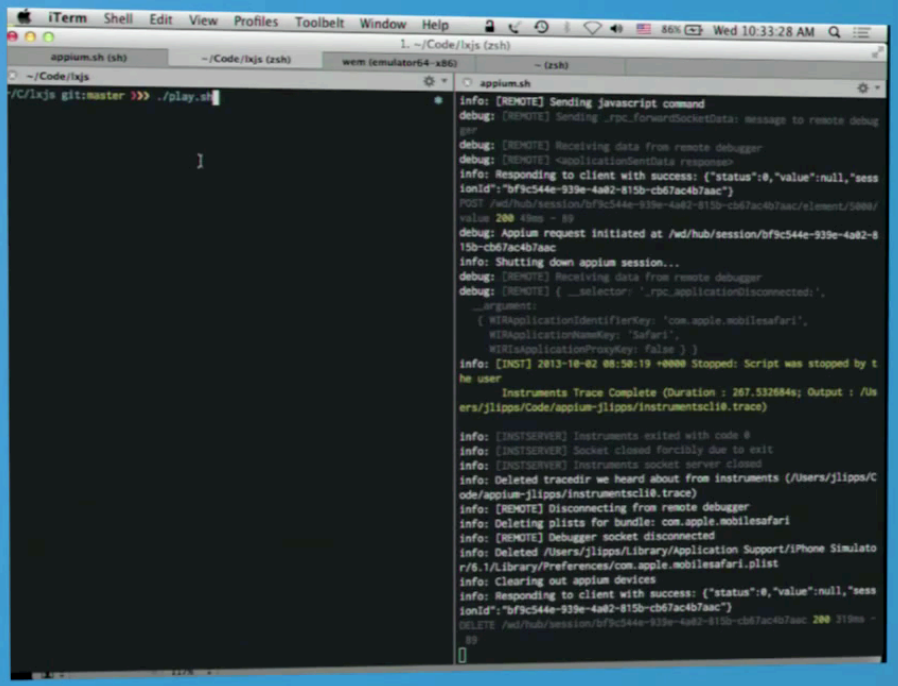
Value (Alias)	Data	Wifi	Airplane Mode
0 (None)	0	0	0
1 (Airplane Mode)	0	0	1
2 (Wifi only)	0	1	0
4 (Data only)	1	0	0
6 (All Network on)	1	1	0

Grab Bag

Cloud Providers

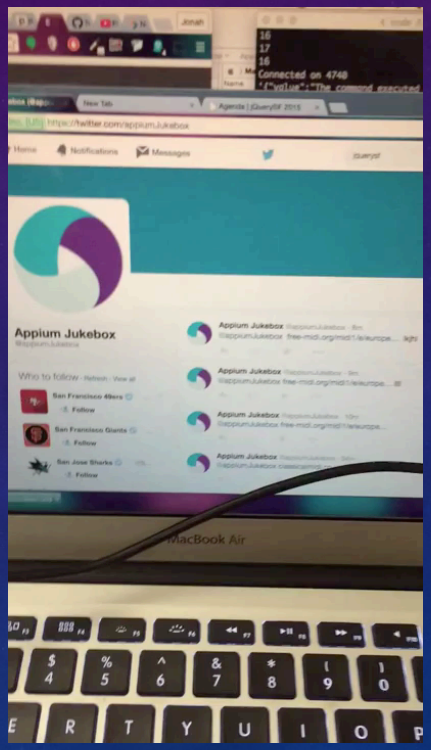


Multiple Servers



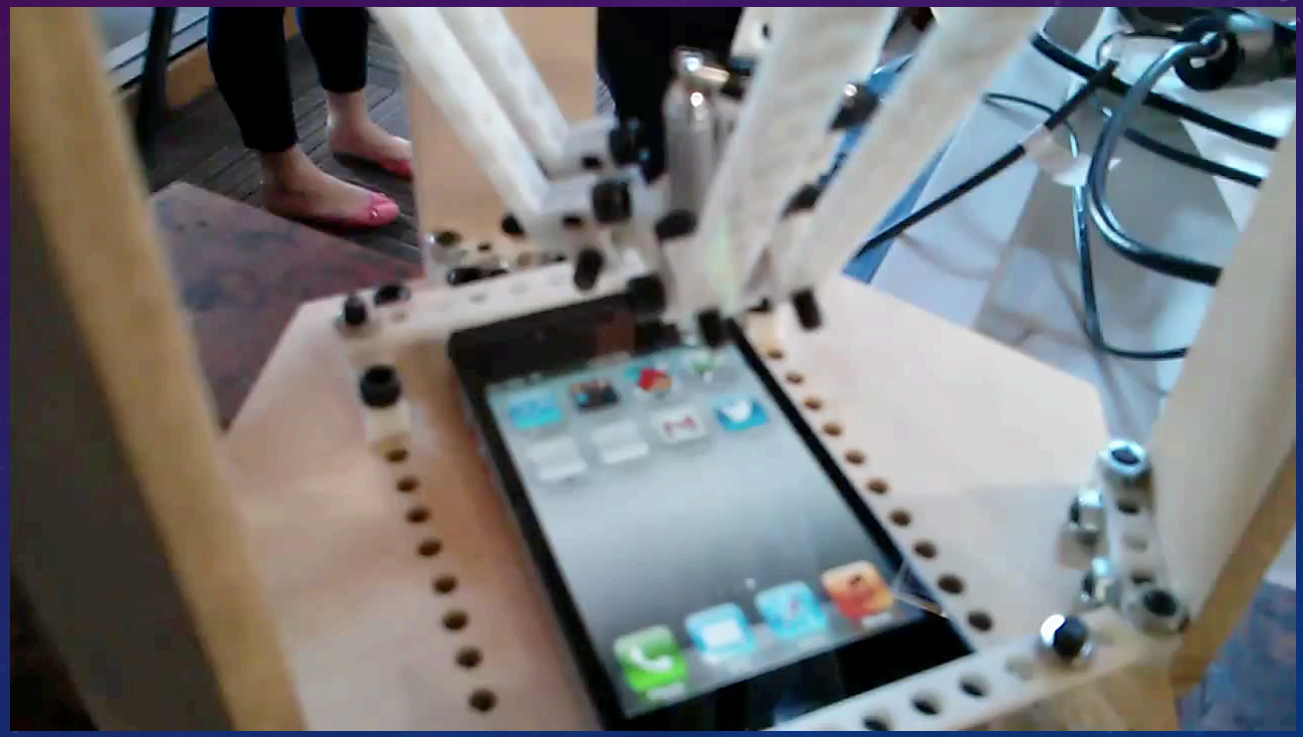
LXJS

Part Deux



Robots

ROBOTS



HOW DOES IT WORK?

- **Calibrate the robot to map points in the physical world to points on a device screen**
  - Run an app on the device with Appium that can tell you what coordinates are being touched
  - Touch three places on the device and record the physical and device-centric coordinates
  - Build a matrix to translate any point between the two systems
- **Intercept touch actions with the Appium Server and send them to the robot**

THE MATH

$$x' = ax + by + c$$
$$y' = bx - ay + d$$

$$\begin{bmatrix} x'_1 \\ y'_1 \\ x'_2 \\ y'_2 \end{bmatrix} = \begin{bmatrix} x_1 & y_1 & 1 & 0 \\ -y_1 & x_1 & 0 & 1 \\ x_2 & y_2 & 1 & 0 \\ -y_2 & x_2 & 0 & 1 \end{bmatrix} \begin{bmatrix} a \\ b \\ c \\ d \end{bmatrix} \Longrightarrow \mathbf{u} = \mathbf{M}\mathbf{v}$$

$$x'_1 = +ax_1 + by_1 + c$$
$$y'_1 = -ay_1 + bx_1 + d$$
$$x'_2 = +ax_2 + by_2 + c$$
$$y'_2 = -ay_2 + bx_2 + d$$

$$\mathbf{u} = \mathbf{M}\mathbf{v} \Longrightarrow \mathbf{v} = \mathbf{M}^{-1}\mathbf{u}$$

Questions?

Takeaway

PERSONAL TAKEAWAY

“Life can be much broader once you discover one simple fact: Everything around you that you call life was made up by people that were no smarter than you and you can change it, you can influence it, you can build your own things that other people can use.

Once you learn that, you'll never be the same again.”

-Steve Jobs

MORE INFO

- Website: http://www.appium.io
- Slack: appium.slack.com
- Forum: discuss.appium.io
- GitHub: http://www.github.com/appium/appium

Test Everything

Thank You