Creative Apps (DG241)

Lecture 3: Building apps with HTML5

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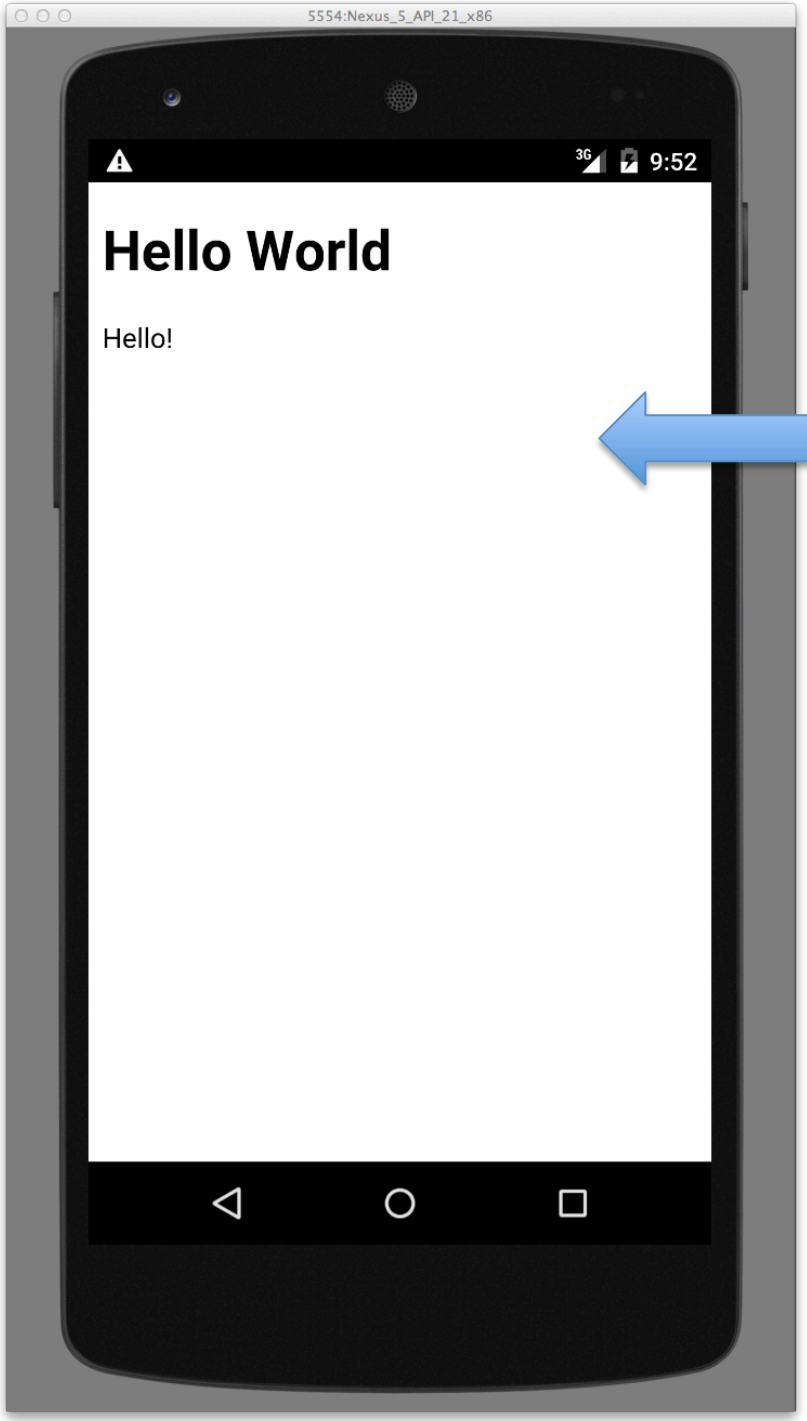
Overview

- Bootstrapping: first HTML5 app on Android
  - Webview container
  - Android project structure for HTML apps
- Accessing sensors from HTML / JavaScript
  - HTML / JavaScript event intro
  - JS event handling
  - Example: Acceleration sensor with UI update
- Processing in HTML on Android
  - Linking the P5.js library
  - Drawing on the HTML page like a canvas
  - Connecting sensor data to P5.js



HTML file

App container with a "WebView" that shows the HTML contents

HTML file

mypage.html – [app] – My Application – [~/Documents/AndroidStudioProjects/HTML5Bootstrap]

HTML5Bootstrap › app › src › main › assets › www › mypage.html

Gradle project sync failed. Basic functionality (e.g. editing, debugging) will not work properly. Try Again Open 'Messages' View Show Log in Finder

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="UTF-8">
    <meta name="viewport" content="width=device-width; user-scalable=0;" />
    <title>My HTML</title>
</head>
<body>
    <h1>Hello World</h1>
    <p id="mytext">Hello!</p>

</body>
</html>
```

App layout

main.xml – [app] – My Application – [~/Documents/AndroidStudioProjects/HTML5Bootstrap]

HTML5Bootstrap > app > src > main > res > layout > main.xml

Android

- app
  - manifests
    - AndroidManifest.xml
  - java
    - iddi.creativeapps.html5.start
      - AndroidHTMLActivity
  - res
    - drawable
    - layout
      - main.xml
    - values
      - strings.xml
      - styles.xml
  - assets
    - www
      - mypage.html
- Gradle Scripts

mypage.html | AndroidHTMLActivity.java | main.xml | AndroidManifest.xml

Gradle project sync failed. Ba... Try Again Open 'Messages' View Show Log in Finder

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    >
    <WebView
        android:id="@+id/mybrowser"
        android:layout_width="fill_parent"
        android:layout_height="fill_parent"
        />
</LinearLayout>
```

Design | Text

Preview: Nexus 4 | AppTheme | 21

4: Run | TODO | Terminal | 0: Messages | 6: Android | 15 Event Log | Gradle Console | Memory Monitor

Session 'app': running (23 minutes ago) 7:1 LF UTF-8

The layout has only one component: a “WebView” that shows the HTML content.

WebView Activity

AndroidHTMLActivity.java – [app] – My Application – [~/Documents/AndroidStudioProjects/HTML5Bootstrap]

HTML5Bootstrap > app > src > main > java > iddi > creativeapps > html5 > start > AndroidHTMLActivity

mypage.html | AndroidHTMLActivity.java | main.xml | AndroidManifest.xml

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      - styles.xml
  - assets
    - www
      - mypage.html
- Gradle Scripts

```java
package iddi.creativeapps.html5.start;

import ...

/**
 * main activity, will create a wrapper for HTML files
 */
public class AndroidHTMLActivity extends Activity {

    WebView myBrowser;
    EditText Msg;
    Button btnSendMsg;

    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);
        myBrowser = (WebView)findViewById(R.id.mybrowser);
        myBrowser.getSettings().setJavaScriptEnabled(true);
        myBrowser.loadUrl("file:///android_asset/www/mypage.html");
    }
}
```

4: Run | TODO | Terminal | 0: Messages | 6: Android | 15 Event Log | Gradle Console | Memory Monitor

Session 'app': running (23 minutes ago) 18:14 LF UTF-8

The “WebView” is started in the main Activity, and pointed to the HTML file in the *assets* directory.

HTML5_0

DEMO

App configuration file

main/AndroidManifest.xml – [app] – My Application – [~/Documents/AndroidStudioProjects/HTML5Bootstrap]

HTML5Bootstrap > app > src > main > AndroidManifest.xml

mypage.html | AndroidHTMLActivity.java | main.xml | AndroidManifest.xml

Gradle project sync failed. Basic functionality (e.g. editing, debugging) will not work properly. Try Again Open 'Messages' View Show Log in Finder

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="html5.example.com.start">

    <application android:allowBackup="true" android:label="My Application"
        android:icon="@drawable/ic_launcher" android:theme="@style/AppTheme">
        <activity
        android:name="iddi.creativeapps.html5.start.AndroidHTMLActivity"
        android:label="My Application"
        android:finishOnTaskLaunch="true"
        android:configChanges="orientation|keyboardHidden|screenSize"
        >
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />

            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>

        </activity>
    </application>

</manifest>
```

The Activity “AndroidHTMLActivity” is referenced in the main configuration file as the starting point of the app.

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HTML / JavaScript

- HTML – the structure
  - http://www.codecademy.com/en/tracks/web

- JavaScript – the behavior / interaction
  - http://www.codecademy.com/en/tracks/javascript
  - http://p5js.org/get-started/

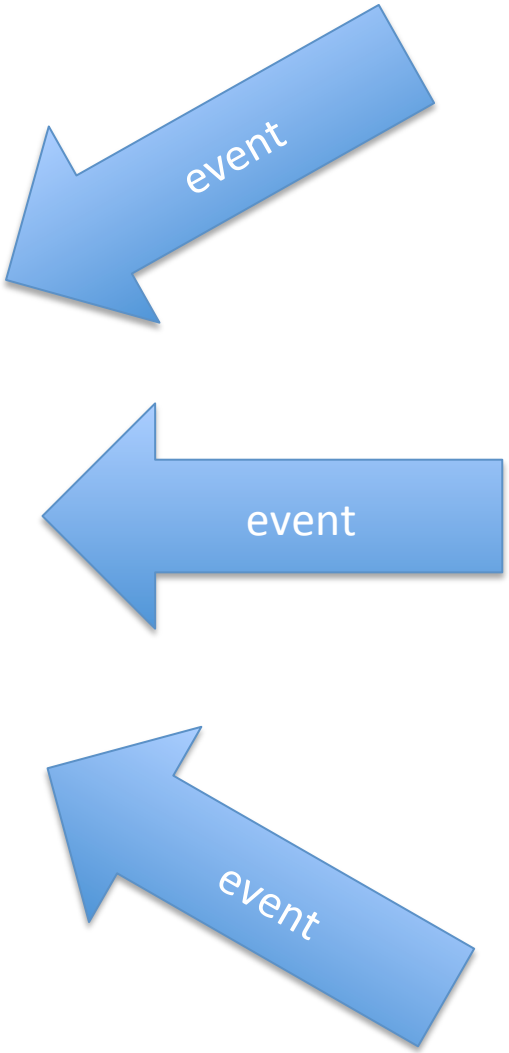
```
<html>
        <head>
                <title>My Page</title>
        </head>
        <body>
                <p> hello world!</p>
        </body>

        <script type="text/javascript" >

                alert('hello back!');

        </script>
</html>
```

HTML page

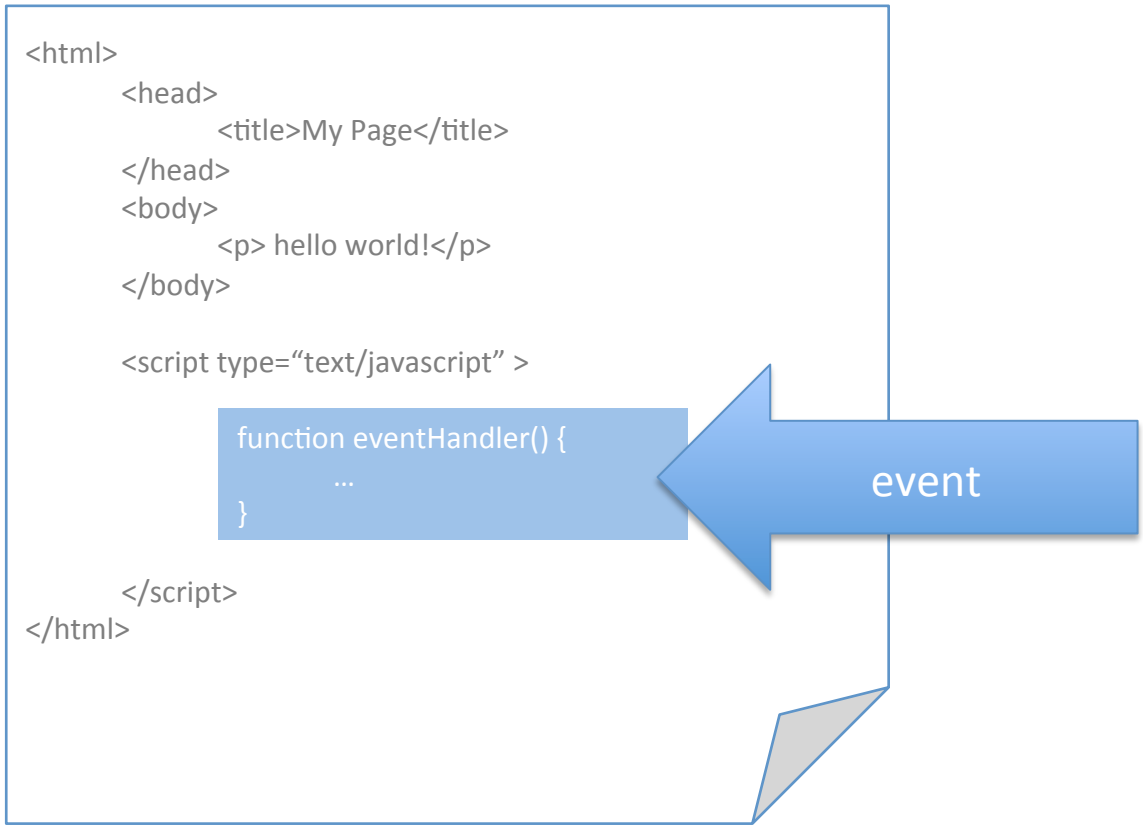
Android webview

```
<html>
        <head>
                <title>My Page</title>
        </head>
        <body>
                <p> hello world!</p>
        </body>

        <script type="text/javascript" >

                alert('hello back!');

        </script>
</html>
```

HTML page



Android webview



Android webview

Simulating acceleration

mfunk — telnet — 80×28

```
dyn-174087:~ mfunk$ telnet localhost 5554
Trying ::1...
telnet: connect to address ::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
Escape character is '^]'.
Android Console: type 'help' for a list of commands
OK
sensor
allows you to request the emulator sensors

available sub-commands:
    status          list all sensors and their status.
    get             get sensor values
    set             set sensor values

KO: missing sub-command
sensor status
acceleration: enabled.
magnetic-field: enabled.
orientation: enabled.
temperature: enabled.
proximity: enabled.
OK
```

Windows: Use PuTTY
http://www.chiark.greenend.org.uk/~sgtatham/putty/

Mac: Use Terminal (built-in)

Simulating acceleration

mfunk — telnet — 80×28

```
telnet: connect to address ::1: Connection refused
Trying 127.0.0.1...
Connected to localhost.
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available sub-commands:
    status          list all sensors and their status.
    get             get sensor values
    set             set sensor values

KO: missing sub-command
sensor status
acceleration: enabled.
magnetic-field: enabled.
orientation: enabled.
temperature: enabled.
proximity: enabled.
OK
sensor get acceleration
acceleration = 0:9.77622:0.813417
OK
sensor set acceleration 1:0.5:0
OK
```

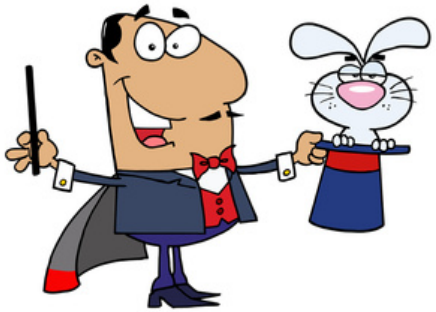

HTML5_1

DEMO

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```
<html>
        <head>
                <title>My Page</title>
        <script type="text/javascript" src="scriptfile.js"></script>
        </head>
        <body>
                <p> hello world </p>
        </body>

        <script type="text/javascript" >

                alert('hello back!');

        </script>
</html>
```

HTML page

```
alert('hello script!');
```

JavaScript file

Android webview

Linking the P5 library JavaScript file

```
<html>
        <head>
                <title>My Page</title>
        <script type="text/javascript" src="P5.min..js"></script>
        </head>
        <body>
                <p> hello world </p>
        </body>

        <script type="text/javascript" >

                alert('hello back!');

        </script>
</html>
```

HTML page

JavaScript file

Android webview

HTML5_2

DEMO

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Homework

- Create an interactive app using one or more sensors
  - Implement it in HTML5/JavaScript
  - Phone or Emulator is both OK

- Deliver code and video link as a single ZIP file to creativeapps.submission@gmail.com

References

Android WebView

https://developer.chrome.com/multidevice/webview/overview

https://developer.chrome.com/multidevice/webview/gettingstarted

P5.js

https://p5js.org/

GitHub repository

https://github.com/iddi/creativeapps