Summer Workshop 2013
Emerging Technologies in HCI

ANDROID SENSORS

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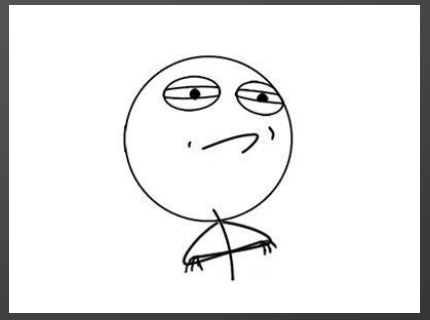
After this presentation you will…

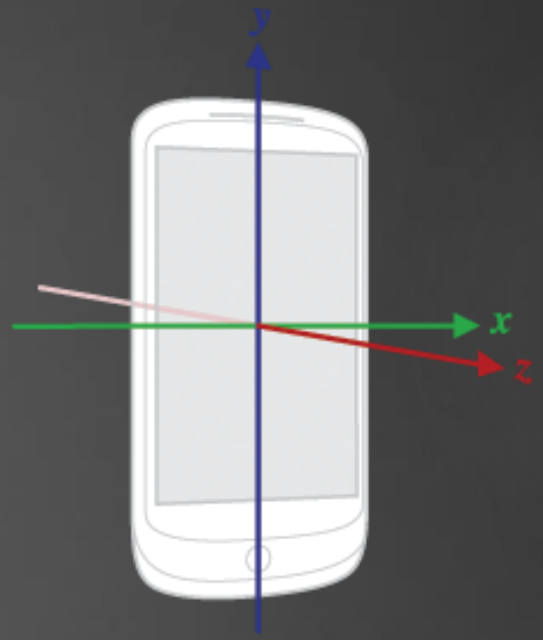
- First Part
  - Theory about sensors
  - Know about sensors what they do and how to use them
- Second part
  - Hands-on session - “mãos á obra”
  - Be prepared to develop apps using sensors
- Third part
  - Do stuff
  - Challenge accepted ?



Tools needed

Sensors Overview

- Motion Sensors
- Position Sensors
- Environmental Sensors
- Other Sensors



Motion Sensors

- Accelerometer
  - Measures the acceleration force in m/s^2 that is applied to a device on all three physical axes (x, y, and z), including the force of gravity.
  - Motion detection (shake, tilt, etc.).
- Gravity
  - Measures the force of gravity in m/s^2 that is applied to a device on all three physical axes (x, y, z).
  - Motion detection (shake, tilt, etc.).
- Others like: Giroscope, Linear Accelaration

Position Sensors

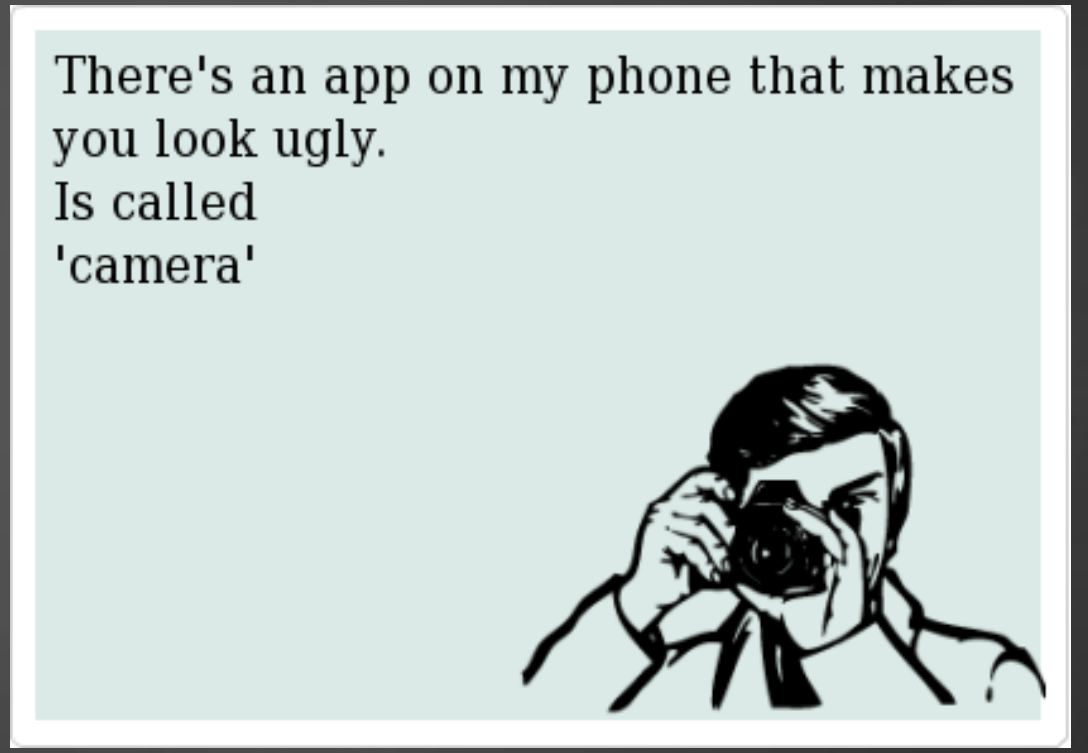
- Orientation
  - Measures degrees of rotation that a device makes around all three physical axes (x, y, z).
  - Determining device position.
- Proximity
  - Measures the proximity of an object in cm relative to the screen of a device.
  - Phone position during a call.
- Magnetic Field
  - Measures the ambient geomagnetic field for all three physical axes (x, y, z) in μT.
  - Creating a compass.

Environment Sensors

- Light
  - Measures the ambient light level (illumination) in lx.
  - Controlling screen brightness.
- Others like: air pressure, temperature, humidity

Other Sensors

- GPS
- Camera
- Audio Sensors



Sensor framework

- SensorManager
  - Create an instance of the sensor service and provides methods for accessing and listing sensors, registering and unregistering sensors, and acquiring orientation information
- Sensor
  - Create an instance of a specific sensor and methods to determine sensor's capabilities.
- SensorEvent
  - Provides information about the raw sensor data, the type of sensor that generated the event, the accuracy of the data, etc.
- SensorEventListener
  - Interface to create receive notifications from sensor changes

Best practices for accessing and using sensors

- Don't test your code on the emulator
- Unregister sensor listeners
- Don't block the onSensorChanged() method
- Verify sensors before you use them
- Avoid using deprecated methods or sensor types

Hands-on Lab

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http://tinyurl.com/guideandroid

http://tinyurl.com/classandroid

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http://tinyurl.com/challengeandroid

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