

Semiconductor Sensors Innovating Mobile Devices & User Experiences

April 18, 2012

Moderated by:

Tristan Joo (tristanjoo@wca.org)

Board Director & Co-Chair of Mobile SIG

Organized by:

Wireless Communications Alliance
Mobile SIG & Futures SIG

Agenda

6:00 – 6:30P Registration, Food, and Partner Demos

6:30 – 8:20PM Opening and Presentations

• 7:30PM Short Break (Partner Demos)

8:20 – 8:45PM Summary Takeaways and Raffle Giveaways

Microsoft (Win Phone), Samsung (Android), WIMM Labs

8:45 – 9:00PM Partner Demos and Networking









Sensors in Today's Smartphones & Tablets

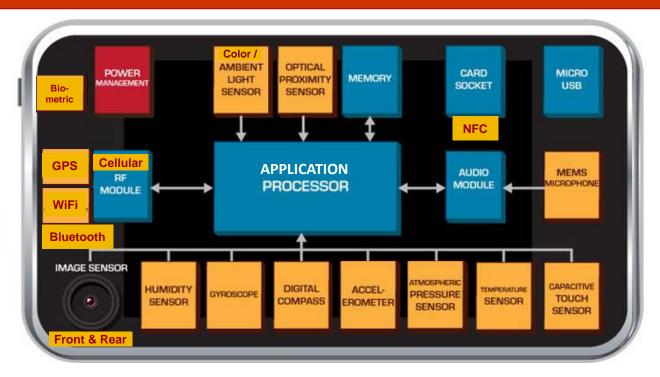


How many Sensor are there?

- -Low-end Smartphones
- -High-end Smartphones



Sensors in Today's Smartphones & Tablets



12 ~ 18 Sensors!

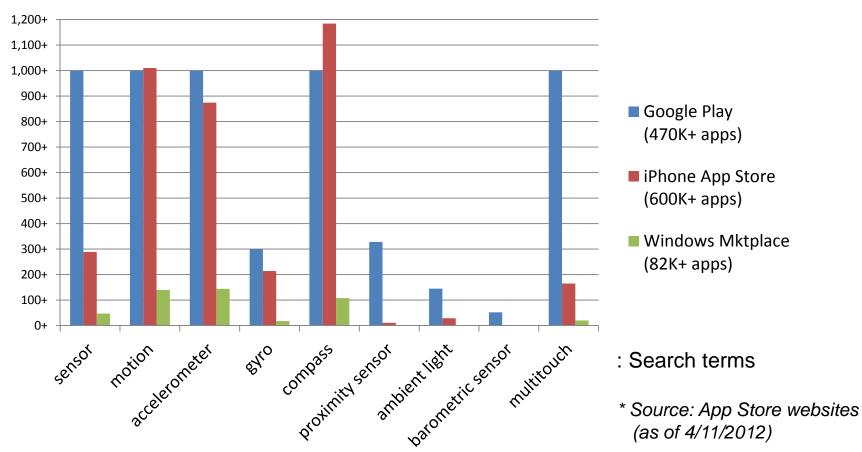
- Motion Sensors: Gyroscope, Accelerometer, e-Compass (Magnetometer)
- Optical Sensors: Proximity, Ambient Light, RGB Color, Image Sensors (Front/Rear)
- Touch Sensors: Multi-Touch, Touchless Hover, Pressure Touch
- Environmental Sensors: Temperature, Humidity, Barometric Pressure, CO Gas*
- Wireless/RF Sensors: GPS, WiFi, Cellular A-GPS, Bluetooth Low Energy, NFC
- Other Sensors: MEMS Microphones, Biometric/Fingerprint* & BioSensors*



Mobile Apps that use Sensors Today

Most popular Sensor Apps still <0.5% Share of Entire App Stores!</p>







Speaker Introductions

Moderator:

Tristan Joo, Board Director & Co-Chair of Mobile SIG, WCA

Presenters:

- Wen Lin, Marketing Manager iNEMO and Sensor Hub solutions, STMicroelectronics
- John Carey, Director of Marketing TrueTouch, Cypress Semiconductor
- Seckin Ozdamar, Business Manager Optical Sensors, Maxim Integrated Products
- Michael Karst, General Manager and CEO, Sensirion, Inc. (Temp/Humidity Sensors)
- Carlos Puig, Principal Engineer Sensor Integration, Qualcomm, Inc. (Event Sponsor)



[BREAK] Partner Sensor Apps Demo's

- Microsoft: Windows Phone Developer Program and Sensors APIs
- Samsung: <u>Samsung Mobile Developers Program</u> and Sensors SDK
- Alohar Mobile: Persistent Sensing Technology (Sensor Fusion)
- SenionLab: Indoor Positioning and Navigation Platform (Sensor Fusion)
- Sensor Platforms Inc.: FreeMotion[™] and Sensor Fusion Software
- WIMM Labs: Custom Android Device and Micro Apps (Motion, Touch)

[Android Devices sponsored by Samsung for Apps Demos below]

- Wikitude Augmented Reality Browser
- UControl Remote Control App
- Sensor Music Player
- SitUp / PushUp / PullUp Apps
- Lux Auto Brightness App
- Motion / Touch Games (ZombieGate, Fruit Ninja, Helidroid 3D, etc.)



Summary Takeaways

Sensor API's & Use Cases



Sensors Comparison across Mobile OS Platforms

• Native OS Sensor API Support

Sensor API	Android 4.0 (Oct. 2011)	Android 2.3 (Dec. 2010)	Android 2.2 (May 2010)	Win Phone 7.5 (Sept. 2011)	iOS 5 (Oct. 2011)	iOS 4 (June 2010)
LINEAR_ACCELERATION	Yes	Yes	No	Yes	Yes	Yes
ORIENTATION	Yes	Yes	Yes	Yes	Yes	Yes
ROTATION VECTOR /QUATERNION	Yes	Yes	No	Yes	Yes	Yes
GRAVITY	Yes	Yes	No	Yes	Yes	Yes
ACCELEROMETER	Yes	Yes	Yes	Yes	Yes	Yes
GYROSCOPE	Yes	Yes	No	Yes	Yes	Yes
COMPASS / MAGN FIELD	Yes / Yes	Yes / Yes	Yes / No	Yes / Yes	Yes / Yes	Yes / No
PROXIMITY	Yes	Yes	Yes	No	Yes	Yes
AMBIENT LIGHT	Yes	Yes	Yes	No	Yes	Yes
PRESSURE	Yes ²	Yes ²	No	No	No	No
AMBIENT TEMPERATURE	Yes ²	No	No	No	No	No
RELATIVE HUMIDITY	Yes	No	No	No	No	No
MULTI-TOUCH	Yes	Yes	Yes	Yes	Yes	Yes
CAMERA (FRONT / REAR)	Yes	Yes	Yes	Yes	Yes	Yes

* Source: OS websites & interviews (Apr. 2012)

: Also available as Software Sensors



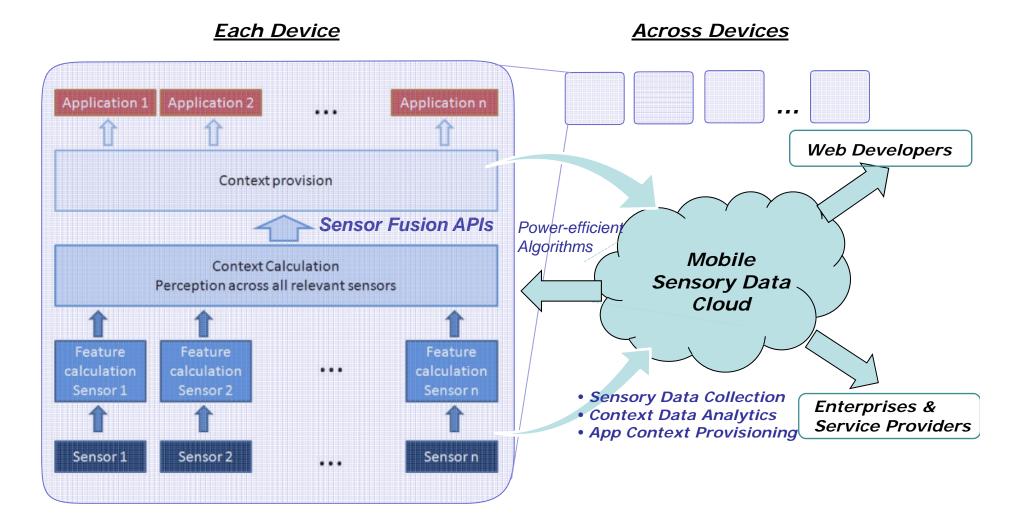
Key Use Cases: Sensor Apps Demo's

- Motion Fusion Teapot, Touchless Hover, Color Sensing, Temp & Humidity Apps
- Indoor Navigation and Positioning Platform SenionLab
- Enhanced Motion Sensor Fusion Games Sensor Platforms Inc.
- Motion & Touch Micro Apps on Wearable Devices (Remote Slideshow) WIMM Labs
- Android Sensor Apps Demos (Devices sponsored by Samsung):
 - Augmented Reality Browser (Orientation, Touch, GPS, Image) -- Wikitude
 - Remote Control App (Motion & Multi-Touch) NeguSoft UControl
 - Sensor Music Player (Optical & Motion Sensor)
 - SitUp / PushUp / PullUp Apps (Proximity & Motion Sensor)
 - Lux Auto Brightness App (Ambient Light Sensor)
 - ZombieGate, Fruit Ninja, Helidroid 3D, etc. (Motion & Touch Games)
- Context-Aware Mobile Services: Address Sense, Smart Assistant, etc.
 - Alohar Mobile Persistent Ambient Sensing Demo

Innovative User Experiences enabled by Multiple Sensors Fusion!



Sensor Fusion: Key to Context-Aware UX Future





Sensor Fusion Demo: Context-Aware Services

Alohar Mobile Persistent Sensing Technology



Why Persistent Sensing Is Changing the Landscape of Mobile Apps

Sam Liang, Ph.D CEO, Co-Founder



More Senses Than Human

- Eyes
- Ears
- Touch
- Talk
- Location, Altitude
- Motion
- Wifi
- Bluetooth
- Proximity
- Temperature
- •













Mobile Apps Should be SMARTER

- It should hear you
- It should feel you
- It should understand you



Persistent Sensing















Feasible With Persistent Sensing

- Persistently sense places
- Automatic Place Detection
 - Detect Semantics beyond just [lat, Ing]
- Activity Recognition:
 - Walking, jogging, driving, stationary
- Understand what the user is doing:
 - Eating at a restaurant
 - Working out at a gym
 - Having fun at a bar
 - Shopping at a grocery store

Build Apps with PersistentAmbient Intelligence













Mobile Location Behavior Platform

Demo

- Auto place detection, place diary app:
 Placeme
- Automobile Crash Detection
- Alzheimer patient assistant



Mobile Location Behavior Platform

Raffle Giveaway #1: Microsoft

Windows Phone Developer Program & Sensor API's





Windows Phone Sensor Apps

Kevin Ashley, Architect Evangelist, Microsoft

http://kevinashley.com @kashleytwit



Windows Phone Put people first.









Sensor APIs in Windows Phone 7

Accelerometer

Compass

Gyroscope

Combined Motion

Camera

Location

Touch panel



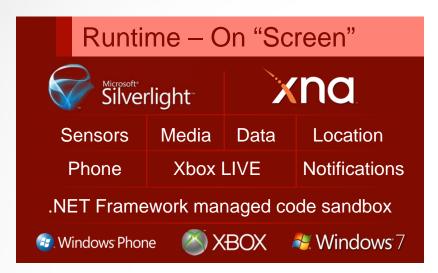
Combined Motion

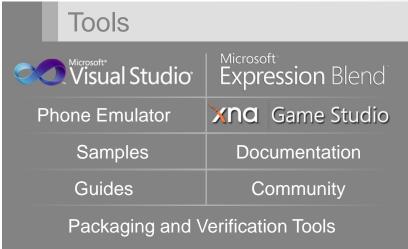
The combined motion API, accessed using the Motion class, uses multiple device sensors to separate the gravity vector from the device acceleration and allows you to easily determine the current attitude (yaw, pitch, and roll) of the device.



Developer Program

http://create.msdn.com





Cloud Services					
Notifications	App Deployment				
Location	Identity	Feeds			
XBOXLIVE	Social	Maps			
Windows Azure					

Portal Services				
Registration	Marketplace			
Validation	MO and CC Billing			
Certification	Business Intelligence			
Publishing	Update Management			



Q&A

Windows Phone

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Raffle Giveaway #2: Samsung

Samsung Developer Program & Sensor SDK



Samsung Developers Program

- Showcase and highlight the opportunities with mobile application development and deployment
- Co-marketing of partners at Samsung events
- Promote Samsung tools and developer program benefits

Education

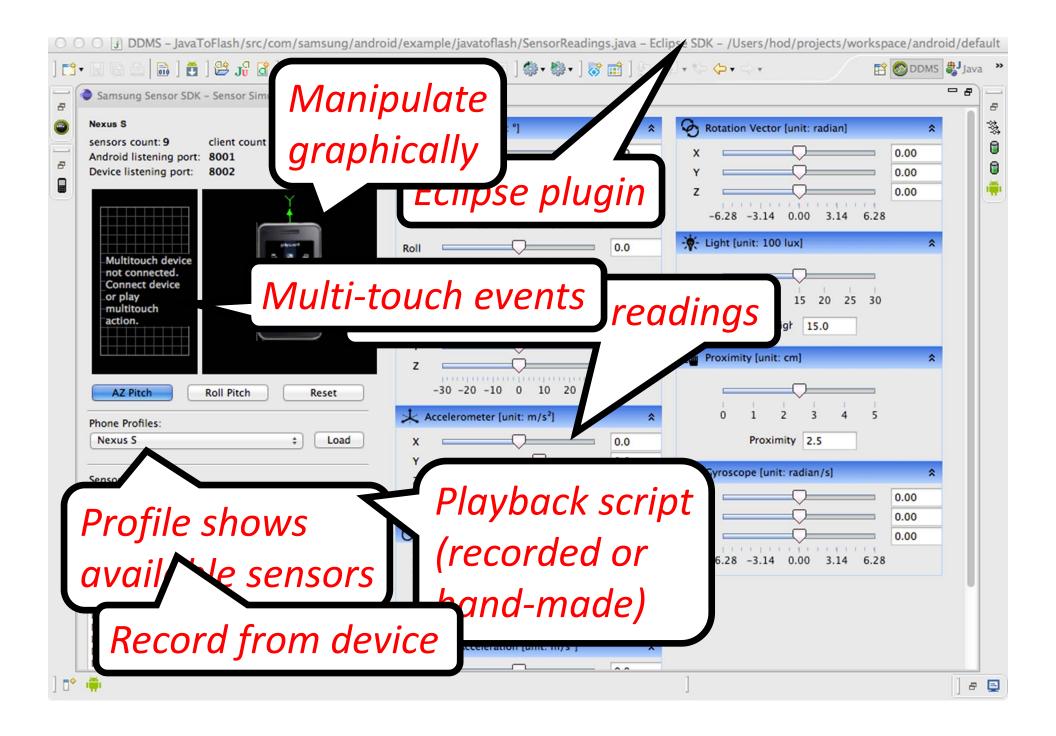
- Talks, hands-on labs, conferences, and more
- How-to information online spanning all skill levels from beginner to expert
- Knowledge base (coming soon)

- Hands-on Technical and business development support
- Online forum and peer support channels
- Access to real people at Samsung, not just an anonymous web form

Awareness

Support





North America Technology Evangelism

Based in San Jose, CA (drop by!) Covering the Americas

Get in touch...

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- twitter @samsung_dev
- facebook Samsung Developers

developer.samsung.com



Raffle Giveaway #3: WIMM Labs

WIMM Device & Micro Apps



THE WIMM WEARABLE PLATFORM Micro Apps. Macro possibilities.



Wrap-Up

- Big Thank You to our Speakers, Demo Partners, and Volunteers!
- Upcoming WCA Event: Smart Grid Standards Soup
 - An Update on the State of Smart Grid Standards Evolution, 5/23(Wed)
 2:30 4:30PM, Santa Clara Convention Center @ Connectivity Week
- Announcing WCA's very own 1st Mobile App for Android!



- Search for <u>"WCA" on Google Play</u>
- Twitter Stream, Facebook page, Current Events,
 Photo Gallery, Contact Us, etc.
- Follow us on WCA's SNS Channels
 - Facebook Page: <u>www.facebook.com/wcaorg</u>
 - Twitter Handles: @wcaorg and @mobilesig
 - LinkedIn: http://www.linkedin.com/groups?gid=2272
- Seeking Volunteers for WCA Mobile & Futures SIG's





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