

CS65/165 Smartphone Programming



Born on 23rd September 2008

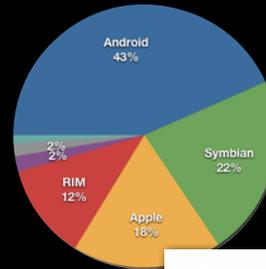


what beauty

Born on 9 January 2007



my first love



The App Store is about to hit 10 billion downloads.

9952049154

some factoids

What's in a smartphone - the hardware inside?

And, why is it such a revolutionary device?

What software runs on phones?

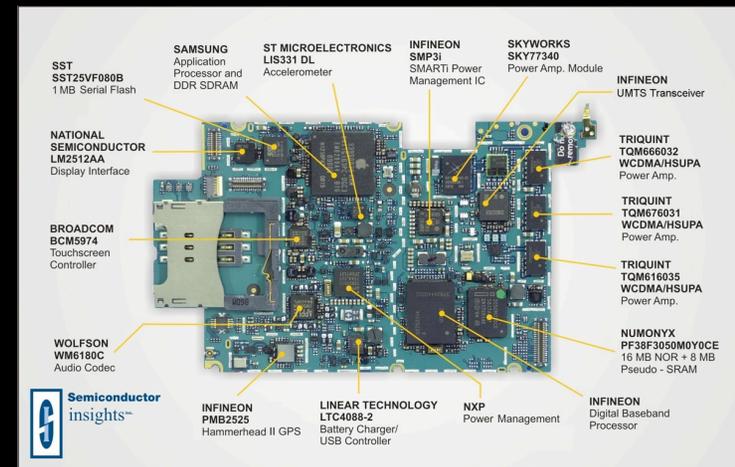
How to I code apps and distribute them to the masses?

Oh, and I do I get rich... quickly.

Where is does the vision lead? End of smartphone era!!



what's under the hood?



The naked iPhone 3GS

Samsung Galaxy Nexus

Also known as Samsung Google Galaxy Nexus I9250, Samsung Google Nexus 3

GENERAL

- 2G Network: GSM 850 / 900 / 1800 / 1900
- 3G Network: HSDPA 850 / 900 / 1700 / 1900 / 2100
- Announced: 2011, October
- Status: Available. Released 2011, November

BODY

- Dimensions: 135.5 x 67.9 x 8.9 mm
- Weight: 135 g

DISPLAY

- Type: Super AMOLED capacitive touchscreen, 16M colors
- Size: 720 x 1280 pixels, 4.65 inches (~316 ppi pixel density)
- Multitouch: Yes
- Protection: Oleophobic coating

SOUND

- Alert types: Vibration; MP3, WAV ringtones
- Loudspeaker: Yes
- 3.5mm Jack: Yes

MEMORY

- Card slot: No
- Internal: 16/32GB storage, 1 GB RAM

DATA

- GPRS: Yes
- EDGE: Yes
- Speed: HSDPA, 21 Mbps; HSUPA, 5.76 Mbps
- WLAN: Wi-Fi 802.11 a/b/g/n, dual-band, DLNA, Wi-Fi hotspot
- Bluetooth: Yes, v3.0 with A2DP
- NFC: Yes
- USB: Yes, v2.0 microUSB (MHL)

CAMERA

- Primary: 5 MP, 2592x1936 pixels, autofocus, LED flash, [check quality](#)
- Features: Touch focus, geo-tagging, face detection
- Video: Yes, 1080p@30fps, [check quality](#)
- Secondary: Yes, 1.3 MP, 720p@30fps video

FEATURES

- OS: Android OS, v4.0 (Ice Cream Sandwich)
- Chipset: TI OMAP 4460
- CPU: Dual-core 1.2 GHz Cortex-A9
- GPU: PowerVR SGX540
- Sensors: Accelerometer, gyro, proximity, compass, barometer
- Messaging: SMS(threaded view), MMS, Email, Push Mail, IM, RSS
- Browser: HTML, Adobe Flash
- Radio: No
- GPS: Yes, with A-GPS support
- Java: Yes, via Java MIDP emulator
- Colors: Black

CHECK PRICE

- WElectronics
- Popular Electronics
- Piemix
- Addicted to Phones
- Nagri Electronics
- uSwitch (UK)
- SGBest (Singapore)

POPULARITY

Daily interest: 35%

Total hits: 1895697

VOTING RESULTS

Design:



Things you can do

what's your favorite app?



Learning to program phones
Six thematic labs (MyRuns)
Group continuous Sensing app

MyRuns app

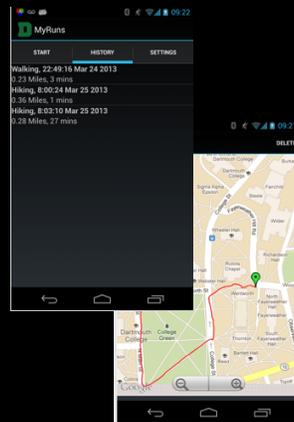
Built the UI

Database (SQLite) and adapters

Maps, location (GPS) and services

Motion sensors and exercising stats

Cloud side using AppEngine



accelerometer

emotion

gyroscope

air quality

compass

near-field

barometer

proximity

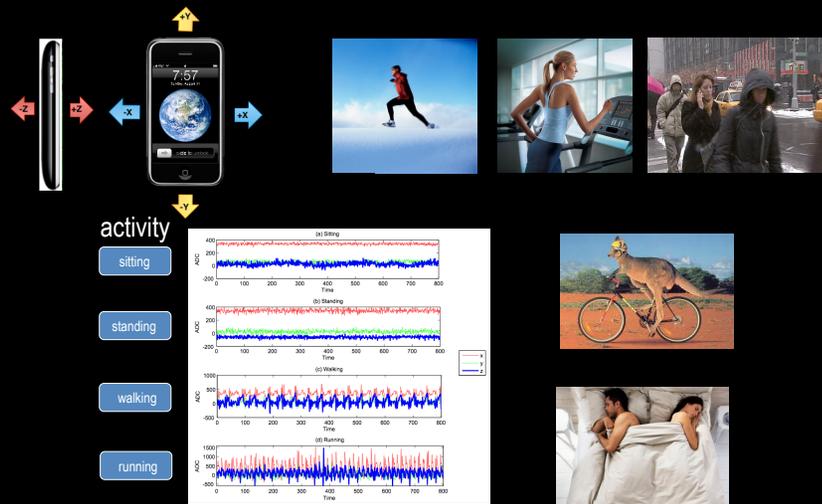
radios

light

location

microphone

front/back cameras



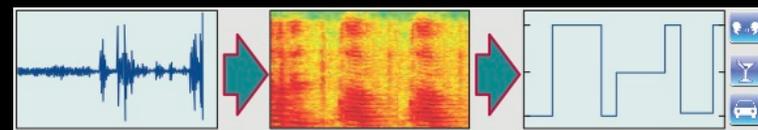
accelerometer



gyroscope, barometer, compass



collocation nets (BlueTooth)



raw sensor
data

extracted
features

classification
inference

making sense of data

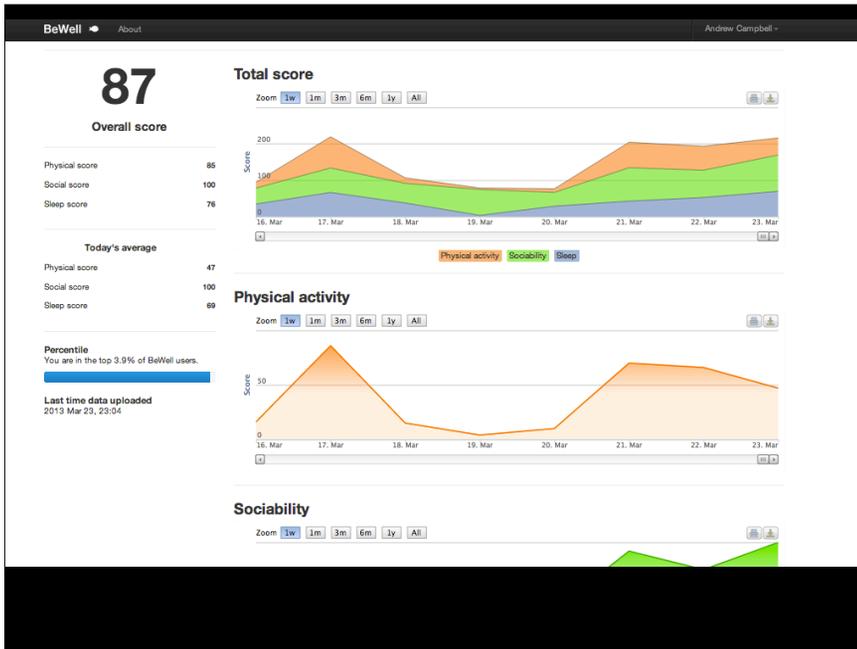
Group Project

Groups of 5 students -- last 2 weeks of class hopefully

Common thematic project: develop a continuous sensing application using activity, sleep, sociability, others -- e.g., collocation, places visited, application usage.

Come up with the concept -- has to use sensor streams -- develop the app, and demo it.





Dartmouth Biorhythms Project

The sprint and the marathon (a view from two Ivyies)

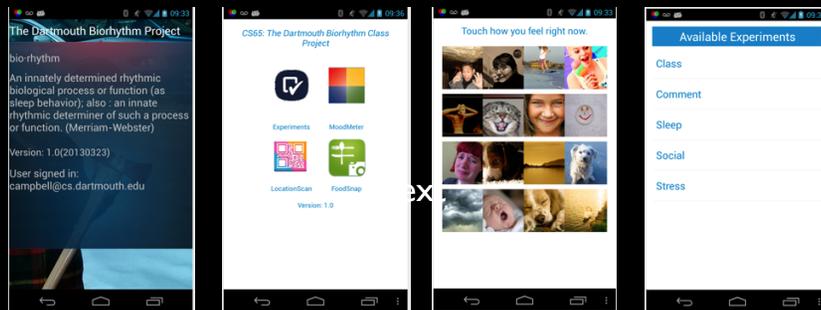
Goal: to study one dartmouth class across one term -- first time this has been done - anywhere.

Question: understanding the lives of the typical dartmouth undergraduate student; issues such as workload, stress, sleep, activity, health, social support, burnout across one term

Surveys, sensor streams and self-report -- you have to carry you Nexus-4 with you answer some questions.

Sensing is automatic and unobtrusive.

Bio + Paco



Reasons to opt in

Be part of an exciting project, make history at Dartmouth, in this class.

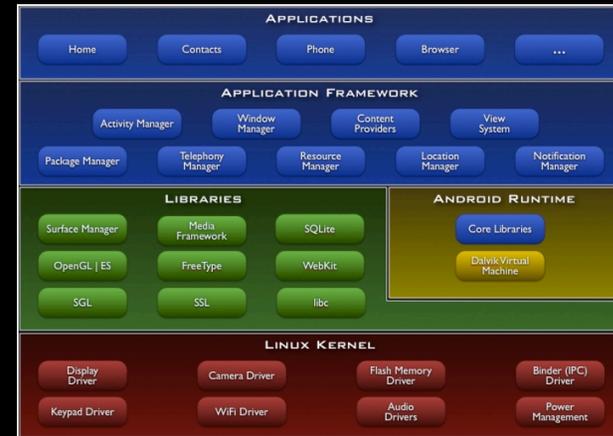
Giving 10 Nexus-4 phones and Jawbones (for top users) away and Dartmouth Biorhythm T-Shirts to all people that complete.

Use your own live streams in the group projects.

Dartmouth Biorhythm study is approved by Dartmouth Committee Protection of Human Subjects and all data is stored securely, protects privacy



Let's take a look at our little green friend's software



android architecture