MINING DATA FROM MOBILE DEVICES

Summary & conclusion

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Recap

• Technology overview

• Algorithms
  - Sensing (localization, activity recognition)
  - Location and context

• Applications
  - Urban
  - Health
  - Social, local
  - Ads
  - Security

• Area is very inter-disciplinary, we had to leave several things out

Looking forward…

• Mobile phone penetration rapidly increasing
  - For many people, a smartphone will be their first computer
• All of these technologies are becoming mainstream
• Sensors are becoming cheaper and easier to hook up

• So, what’s beyond (just) the mobile (smart)phone?

Mobile devices

(Mobile) devices: sensors

(Mobile) devices: medical sensors
(Mobile) devices: “IoT”

Coming everywhere:

E.g., wearable mobile devices

...even in the shower!

Cheap...

Today:
- e.g., RFduino
  - Nordic ARM Cortex-M0 (32bit)
  - Bluetooth 4.0 (BLE)
  - $21

Seven years ago:
Mica Mote (Crossbow)
- Atmel ATmega 103L @16MHz
- 128KB flash / 4KB SRAM
- 916MHz radio transceiver (38.4Kbps)
- ~$300 per mote w/sensors

Cheap... and ubiquitous

- It’s easier than you think!
  - Proliferation of open-source, open-hardware tools:
    - Arduino ecosystem (AVR and ARM), mbed, BeagleBone, RasPi, …
    - Sensors in forms for easy prototyping (breakout boards, etc)
    - Wireless modules (BLE, XBee, …)
  - Very active hacker (maker) communities
  - Cloud platforms (e.g., Imp, Xively, IFTTT, Spark Core, …)
  - Some mainstream interest (e.g., Android Accessories APIs)

- Co-design of sensing and analytics
  - Already a trend in mHealth

Larger picture: venues

In addition to data mining / web venues:
- Medical health informatics
  - Many…
  - Good collection: http://mhealth.jmir.org/collection/view/51
- Ubiquitous computing
- Mobile sensing workshop
- Urban computing workshops
- New urban computing conferences
- Networking
  - PhoneSense
  - MobiCASE
- Many of these areas are starting “analytics” workshops

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