RUTGERS

MINING SMARTPHONE AND MOBILITY DATA

Introduction

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RUTGERS Rutgers Quantified self App usage / recommendation Example applications · Smartphone activity is much more than a geolocation trace! · What apps you use and when · What actions you take within those apps Recommendations · Much richer data to leverage for better recommendations, e.g., Withings devices M. 0 · Other things to do on or with your smartphone · ..and beyond · Measure "self", visualize, and correlate Idea dates back to 70s; term coined ~2007 by Kevin Kelly · Both peripheral sensors as well as just apps; e.g. · Heart rate, Sleep quality · Weight, Activity • ... http://quantifiedself.com





Mobile mining

- The mobile "revolution" (like the "PC revolution") brings together many disciplines and touches many areas
- So, we had to draw some (occasionally arbitrary) divisions, and leave several things out

This tutorial focuses on:

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- · Work with a substantial analytics component
- Data collected via smartphones (although we'll touch upon others sensors, we won't go into sensing or ubiquitous computing territories—much)

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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
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- So, what's beyond (just) the mobile (smart)phone?





GERS Mining Smartphone and Mobility Dat

Cheap... and ubiquitous

It's easier than you think!

- Proliferation of open-source, open-hardware tools:
 Arduino ecosystem (AVR and ARM), mbed, BeagleBone, RasPi, ...
 - ESP8266, NodeMCU, ...
 - Sensors in forms for easy prototyping (breakout boards, etc)
 Wireless modules (BLE, Xbee, ...)
- · Very active hacker (maker) communities
- Cloud platforms (e.g., Imp, Xively, IFTT, Spark Core, ...)
- · Some mainstream interest (e.g., Android Accesory APIs)
- Co-design of sensing and analytics
 Already a trend in mHealth

Mining Standphone and Mobility Data 24 Larger picture: venues In addition to data mining / web + social media venues: • Medical health informatics • Many... • Good collection: http://mhealth.jmir.org/collection/view/51 • Ubiquitous computing • Mobile sensing workshop • Urban computing conferences • Networking • PhoneSense • MobiCASE • More: please check tutorial website! • Many of these areas are starting "analytics" workshops







