Mobile Sensing and Geo-Social Data Analysis for Social Science

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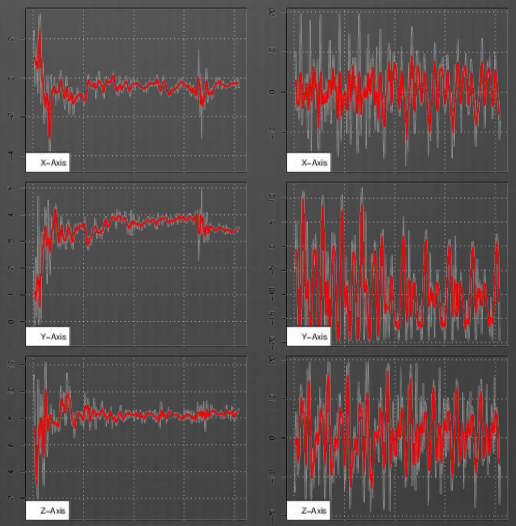
Sensors on a Phone

Accelerometer
GPS / Wi-Fi
Gyroscope
Bluetooth
Microphone
Humidity
Temperature
Phone / Text Logs
Device Logs
Social Media APIs
App Usage
..and user input

Monitoring **Human** Behaviour



What does this enable?

- Performing studies out of a laboratory
- Temporally extensive studies

- Uncontrolled vs Controlled

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App taps phone and personal clues to your happiness

Researchers at Cambridge University have developed an app that tries to track happiness by combining smartphone data with users' perception of mood.

EmotionSense collects information about where users are, how noisy the environment is and whom they are communicating with.

It then combines this data with the user's own report about mood.

The app is part of a project to see how mobile phones can be used to improve health and wellbeing.

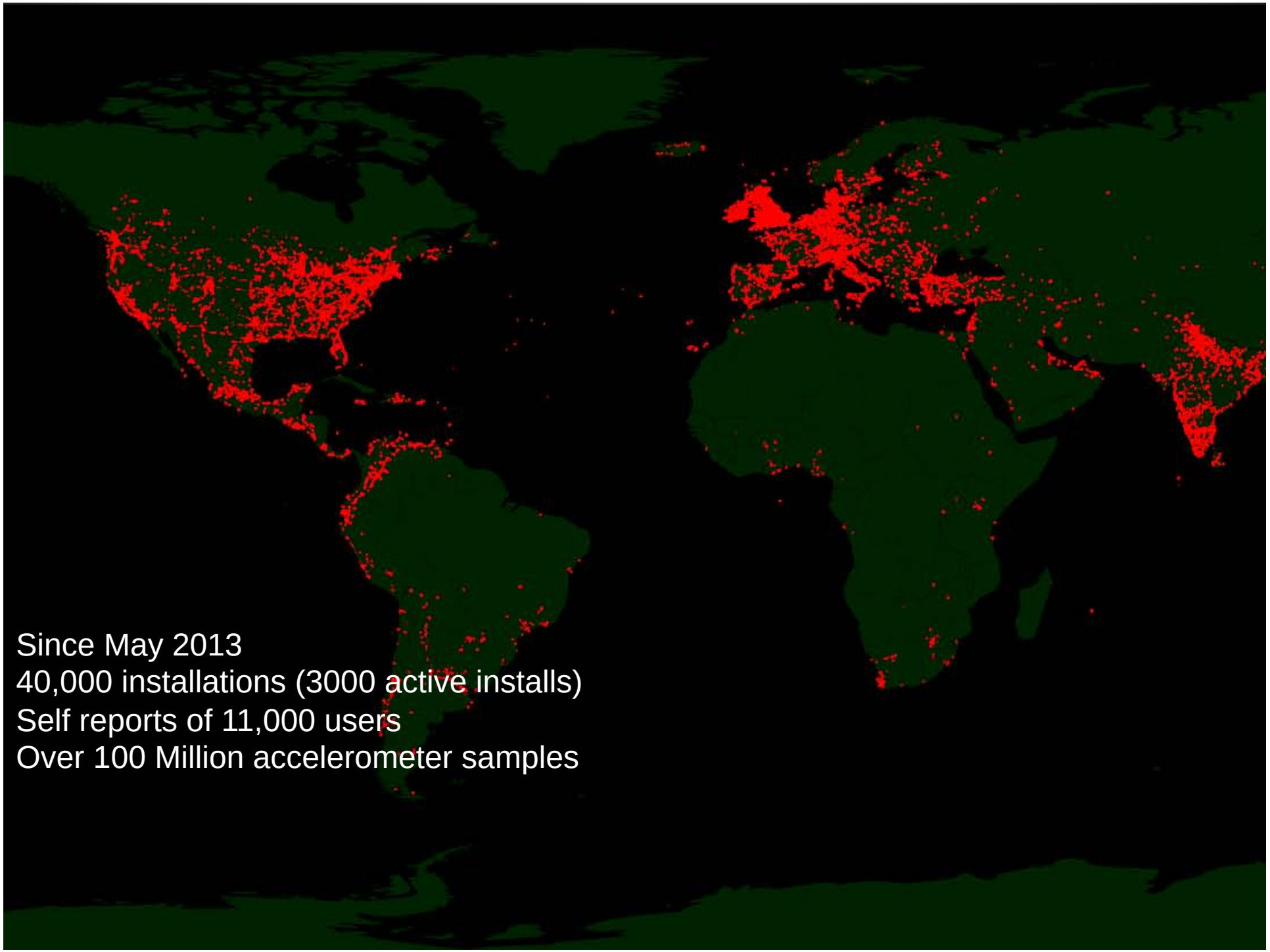
The app aims to combine phone data with perceived emotions

Emotional state

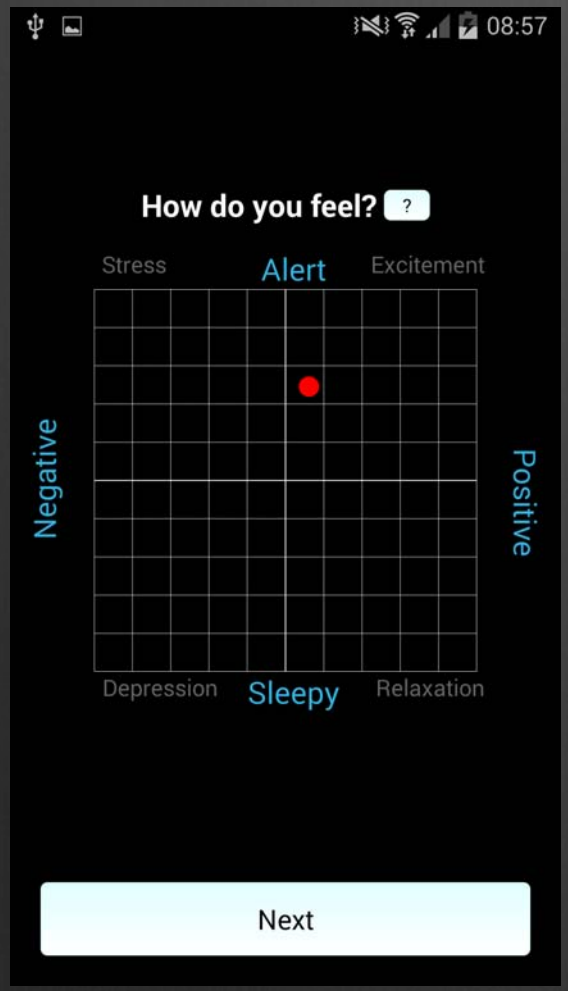
Mood-tracking apps already exist but the team from the Cambridge Computer Laboratory think this is the first time that user-input data and phone information sources have been combined.

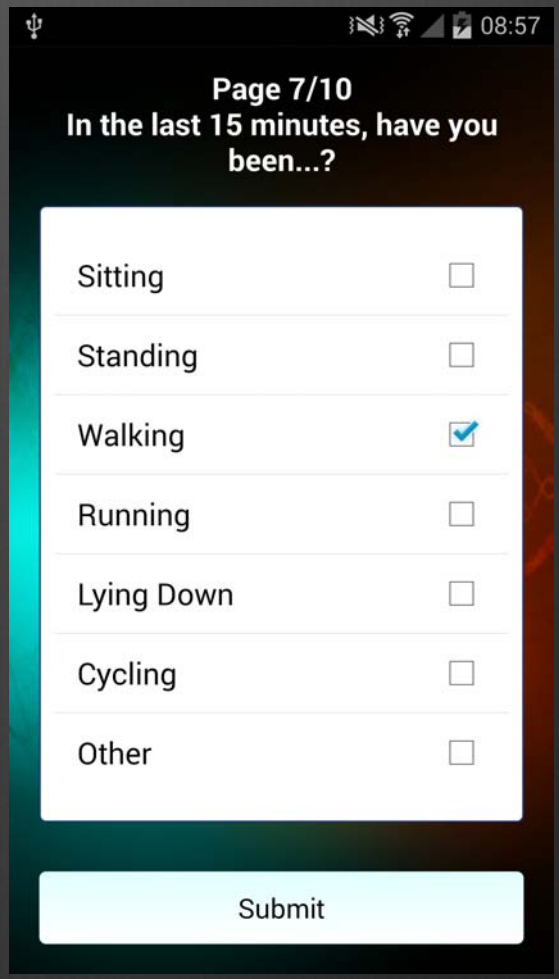
"Most other attempts at software like this are coarse-grained in terms of

Related Stories

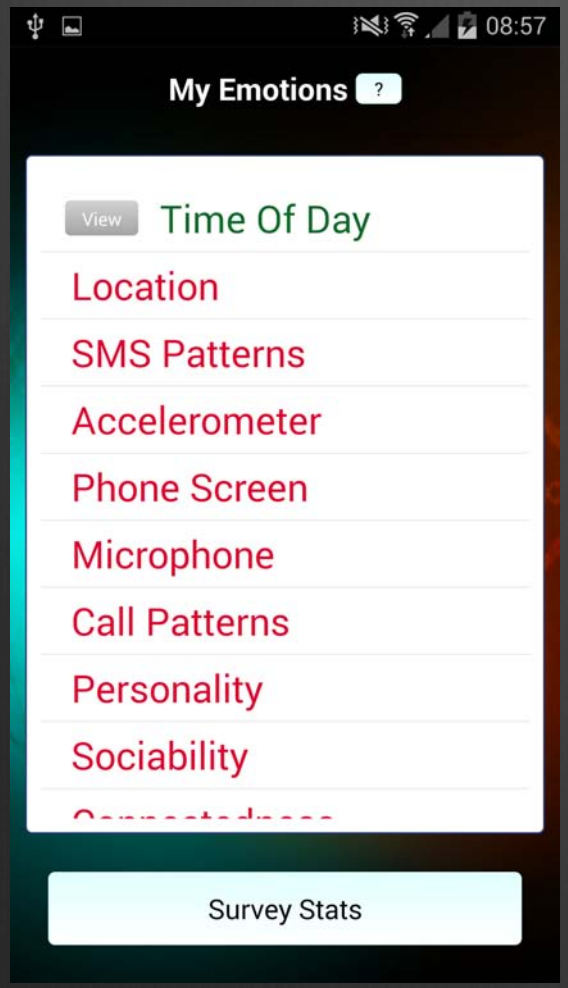

Since May 2013
40,000 installations (3000 active installs)
Self reports of 11,000 users
Over 100 Million accelerometer samples

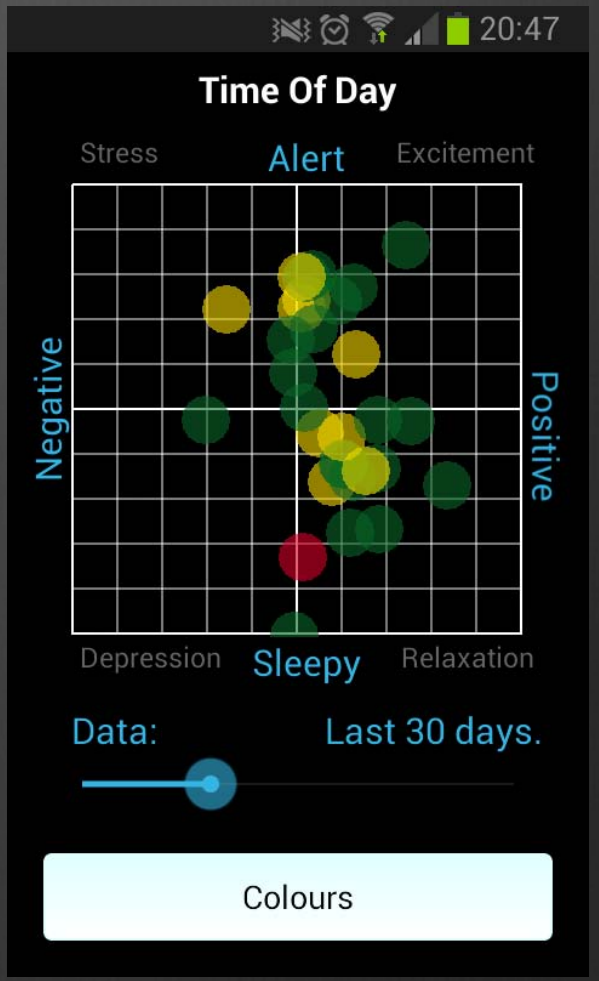
Sampling Mood and Activity



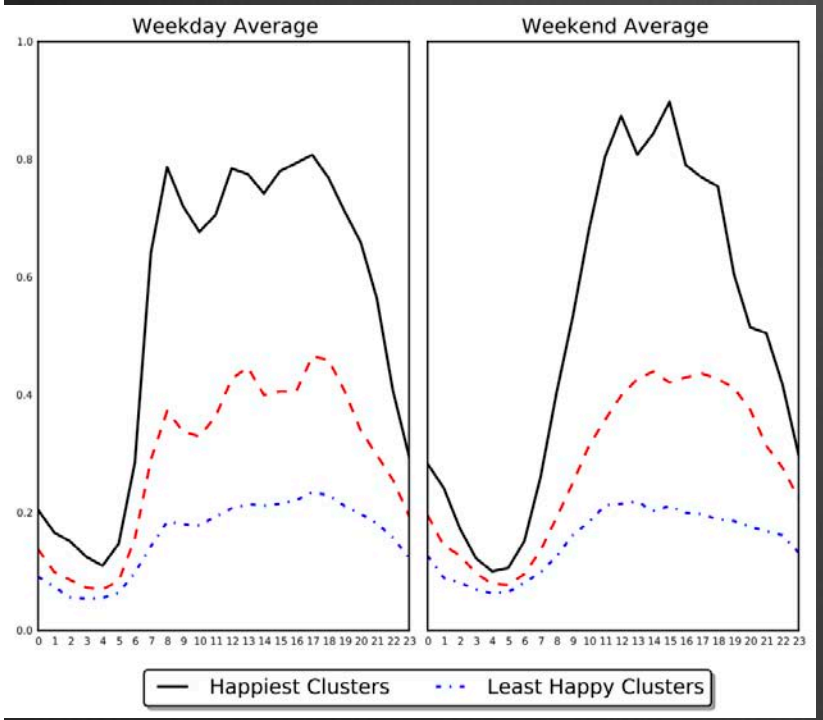


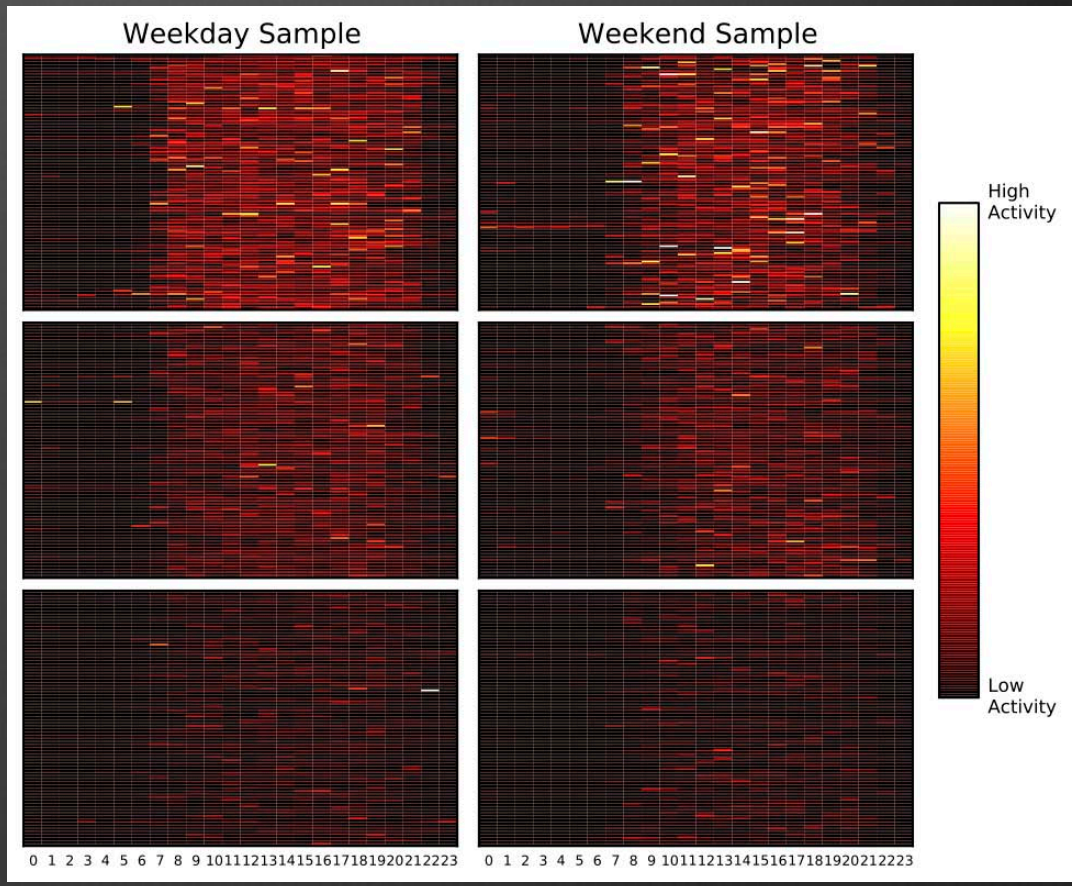
Sensor Sampling and Correlating





The First Findings





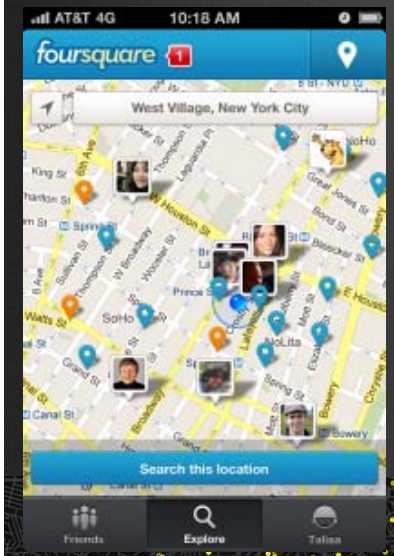
The potential

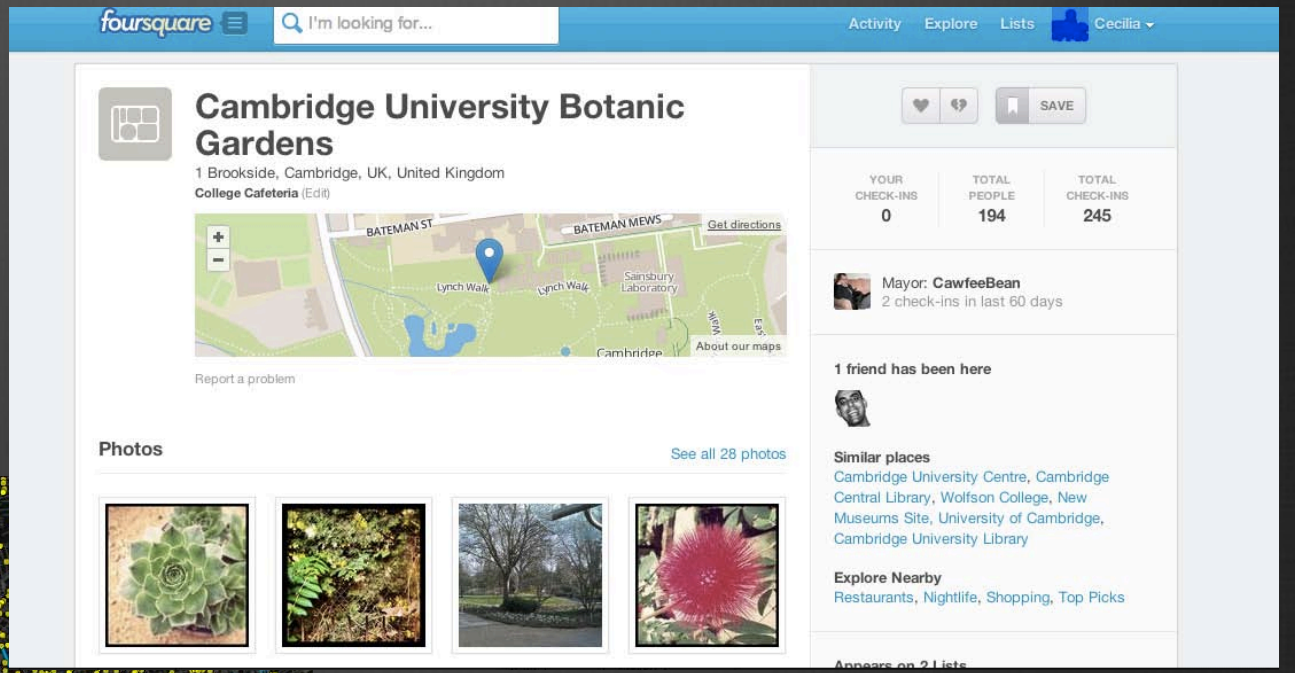
- Build apps which help gathering data needed
- Distribute them in a controlled or uncontrolled fashion
- Longitudinal studies can happen more easily
- Data will likely be less artificial (but also less predictable and more noisy)

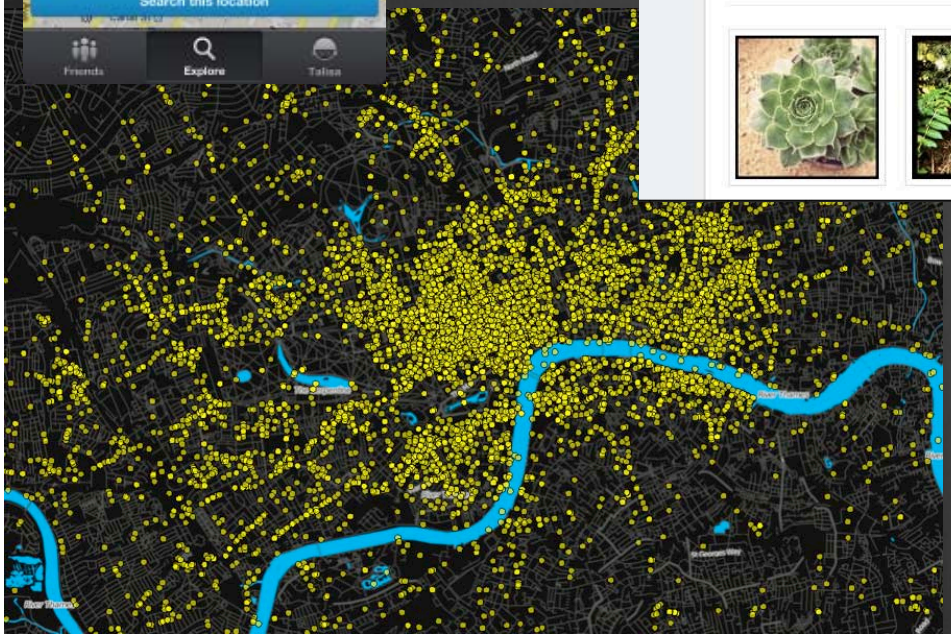
Data from existing services…

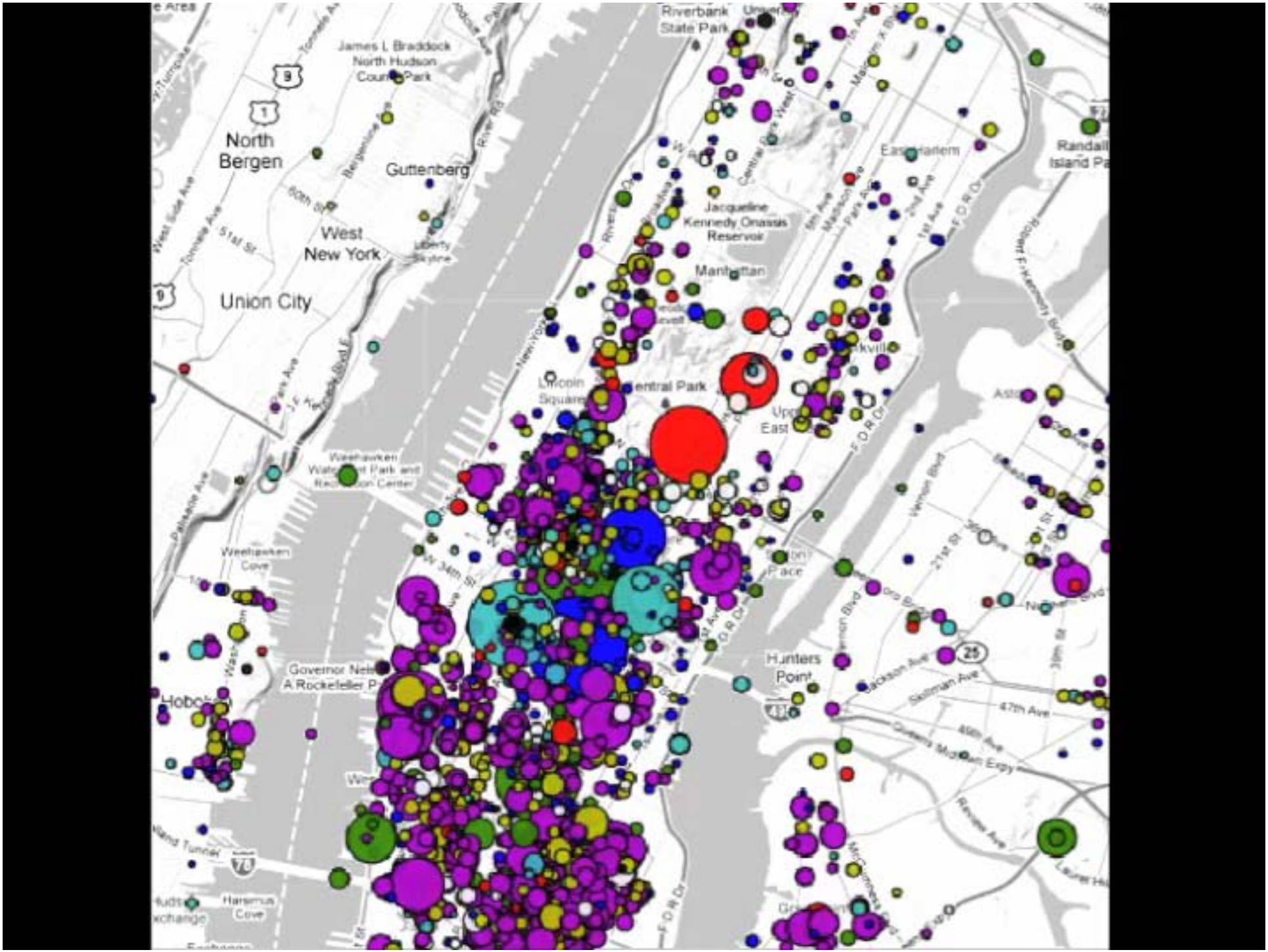
- Spatial and Temporally **very fine grained** data is available through people using certain mobile services
- These data can be correlated with other datasets (census, phone call data from mobile providers, Index of Multiple Deprivation Score,…)
- In general it can say a lot about the use of a city or the use of a city compared to other cities

Location-based social networks offer unprecedented data








James L Braddock
North Hudson
County Park
North
Bergen
Guttenberg
West
New York
Union City
Riverbank
State Park
Jacqueline
Kennedy Onassis
Reservoir
Manhattan
Central Park
Lincoln
Square
East
Weehawken
Weehawken
Cove
Hoboken
Hunters
Point
Harsimus
Cove
F.D.R.Dr
Randall
Island

What can we study with this type of data?

- Relationship of friendship and distance
- Relationship of interaction and distance
- Human mobility
- Models for geo-social network evolution
- Communities in space and evolution
- Place networks
- Role of places
- Participation to events and gathering
- What is discussed where

Study of Community Mobility

- Do people behave similarly when they are with friends?
- How does the group size impact this mobility?

Acks

- Chloe Brown
- Neal Lathia
- Anastasios Noulas
- Kiran Rachuri
- Jason Rentfrow
- Gillian Sandstrom

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