Why am I here?
What’s in it for you?
What’s in it for you?

_ a tour on goodcitylife.org
_ can repeat in your cities (replicable & scalable methodology)
_ unsolved problems/collaborations
Typical slide format

[AAAI ICWSM] Smelly Maps: The Digital Life of Urban Smellscapes

paper title (can be «googled»)
Measuring the intangible

social-dynamics.net
Nokia Bell Labs, Cambridge UK
smart city
Design for urban beauty
Aesthetic Capital: What Makes London Look Beautiful, Quiet, and Happy?

goodcitylife.org/happymaps

UrbanGems: Crowdsourcing Quiet, Beauty and Happiness

Which place do you find more beautiful?
most beautiful

... 

least beautiful
The Shortest Path to Happiness
Chatty maps: constructing sound maps of urban areas from social media data

Luca Maria Aiello¹, Rossano Schifanella², Daniele Quercia³ and Francesco Aletta⁴

¹Yahoo Labs, London, UK
²University of Turin, Turin, Italy
³Bell Labs, Cambridge, UK
⁴University of Sheffield, Sheffield, UK
This violinist literally played with such feeling and beauty that 'grown men' were tearful in the audience.
French Quarter, New Orleans, Louisiana, USA
(Please View Full Screen... )
Sound profile:
75% transport
20% human
5% music
\[
B, |A| = \frac{P(B_i) P(A|B)}{P(A)} \leq \sum_{i=2}^{n} P(E_i),
\]

- Singularity
- G.U.T.
- I.O.E.
- D-D Fusion
p(calm|nature)
#nature pics -> calm
Match collected words to social media

[AAAI ICWSM] Smelly Maps: The Digital Life of Urban Smellscapes
What are you up to today?

How many miles do you want to run?

- 5

What is your preferred experience today?

- mindful
- vibrant

GIVE ME A GOOD ROUTE
Hearts and Politics
Metrics for Tracking Biorhythm Changes during Brexit and Trump
[DH’18] **Hearts and Politics**: Metrics for tracking biorhythm changes during Brexit and Trump

**NOKIA HEALTH**

- 11,600 users in London and San Francisco over 365 days
- ~4M daily datapoints
- Steps, sleep duration, heart rate
Aggregate avg volume of heart rate

[DH’18] **Hearts and Politics:** Metrics for tracking biorhythm changes during Brexit and Trump
3 Metrics

Volume
Rhythms
Synchronicity
[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
[DH’18] **Hearts and Politics**: Metrics for tracking biorhythm changes during Brexit and Trump

Volume: steps
[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump

Volume: avg heart rate
[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump

Volume: avg heart rate
Ruling out confounding factors

New users

 Increased activity

Software update

Temperature

[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
Ruling out confounding factors

Hearts of Americans started beating faster in the days leading to Trump’s election. They took months to go back to normal.
[DH'18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump

Rhythm disruption

![Graph showing rhythm disruption](image)
Rhythm disruption - results
Rhythm disruption - results

[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
In the month following Trump election, the natural cycle of sleep and heart rate were heavily disrupted.

Rhythm disruption - results

[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
Synchronicity

[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
Synchronicity disruption - results

Out-of-synch score ~ 0

Out-of-synch score ~ 1

Time
Synchronicity disruption - results

[DH’18] Hearts and Politics: Metrics for tracking biorhythm changes during Brexit and Trump
In the week following Trump election, the number of people going to bed at very unusual times increased by 30%.
Your life in a grocery bag

Large-scale analysis of food consumption in the city
**Essential part of our life**

- Health
- Habits
- Culture

- Complex domain
- Long-term effects
- Lack of data

[EPJ’19] Large-scale and high-resolution analysis of food purchases and health outcomes
Lifestyle diseases

80% deaths in Western World

300k premature deaths in EU by obesity

€70B spent in EU yearly
[EPJ’19] Large-scale and high-resolution analysis of food purchases and health outcomes

FOOD CONSUMPTION

• 1.6M customer in London over 365 days
• ~1.6B food purchases in 400+ stores
• Products = nutrients
Associations with cancer risk or benefits have been claimed for most food ingredients. Many single studies highlight implausibly large effects, even though evidence is weak.
No large-scale data
Penetration

[EPJ’19] Large-scale and high-resolution analysis of food purchases and health outcomes
The “average” food product

[EPJ’19] Large-scale and high-resolution analysis of food purchases and health outcomes

MSOA
[EPJ'19] Large-scale and high-resolution analysis of food purchases and health outcomes

Dataset coming soon:
“Large-scale and high-resolution analysis of food purchases and health outcomes”
NHS dataset on GP medicine prescriptions
1,174 practices in Greater London
1.1B prescriptions in 2016
[EPJ’19] Large-scale and high-resolution analysis of food purchases and health outcomes

Map of Nutrient Diversity
You can **predict diabetes** from nutrient diversity & calories, for example.
What can we learn from billions of food purchases derived from fidelity cards?

danielequercia
May 16 - 2 min read

By combining 1.6B food item purchases with 1.1B medical prescriptions for the entire city of London for one year, we discovered that, to predict health outcomes, socio-economic conditions matter less than what previous research has shown: despite being of lower-income, certain areas are healthy, and that is because of what their residents eat!
[EPJ’19] Large-scale and high-resolution analysis of food purchases and health outcomes

http://goodcitylife.org/food/
Self-representation

What we eat

vs.

What we share
Food consumption vs. online representation: soup

Tesco

Social media
Food consumption vs. online representation: alcohol

Tesco

Social media
Dear epidemiologists and doctors, we need your help! We have built algorithms that reliably extract symptoms and diseases out of geo-referenced social media posts for the entire world. Do you know anyone interested in collaborating? Cc @soc_dynamics
Satellite Data
I have often dreamed of this moment.
AI for Good