

# Introduction to Computational Social Science

Bamberg Summer Institute in Computational Social  
Science

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*Many thanks to Matthew Salganik for providing material for this lecture*

What is computational social science?

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# What is computational social science?

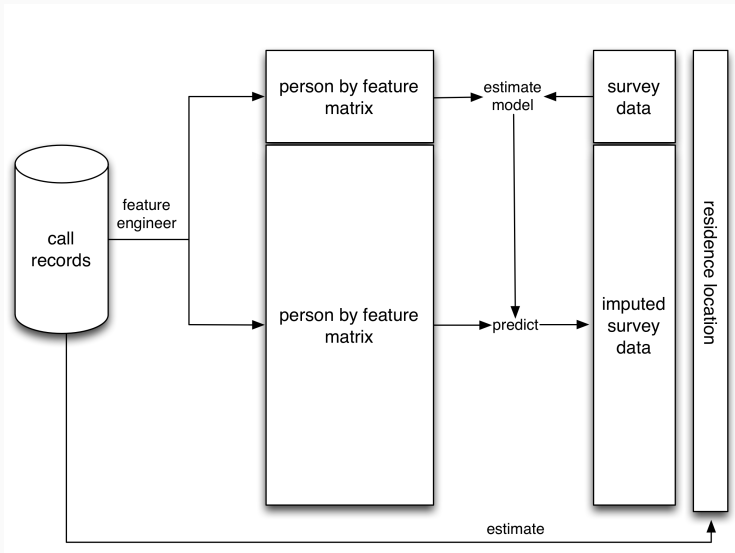
Anything that's cool

## **Predicting poverty and wealth from mobile phone metadata**

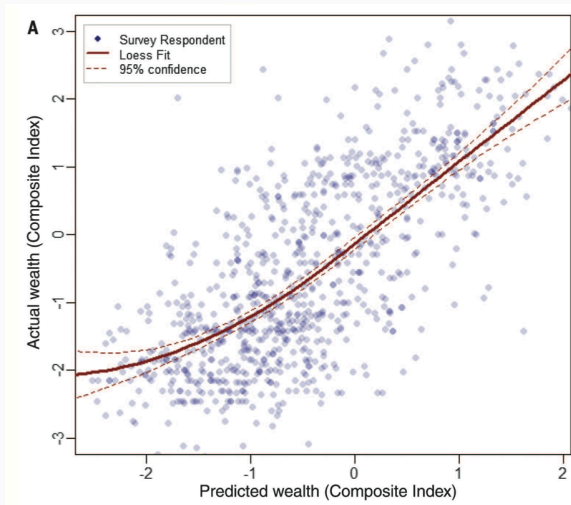
**Joshua Blumenstock,<sup>1\*</sup> Gabriel Cadamuro,<sup>2</sup> Robert On<sup>3</sup>**

<http://dx.doi.org/10.1126/science.aac4420>

# What is computational social science?

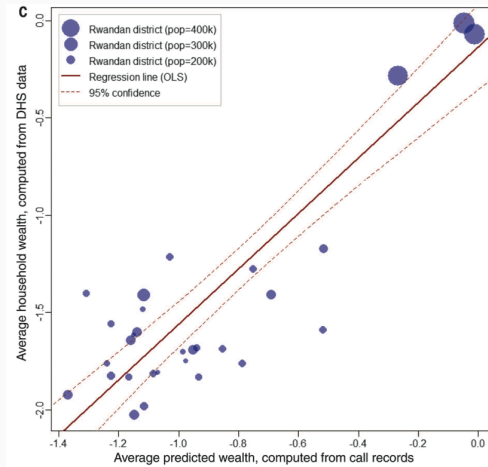


# What is computational social science?



<http://dx.doi.org/10.1126/science.aac4420>

# What is computational social science?



10 times faster, 50 times cheaper

<http://dx.doi.org/10.1126/science.aac4420>

# What is computational social science?

- *computational and social science*
- often involves ethical/privacy questions that are now considered complex
- combines readymades and custommades



# What is computational social science?



readymades



custommades

[https://commons.wikimedia.org/wiki/File:Duchamp\\_Fontaine.jpg](https://commons.wikimedia.org/wiki/File:Duchamp_Fontaine.jpg)

[https://commons.wikimedia.org/wiki/File:%27David%27\\_by\\_Michelangelo\\_JBU0001.JPG](https://commons.wikimedia.org/wiki/File:%27David%27_by_Michelangelo_JBU0001.JPG)

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- combines readymades and custommades
- involves five key communities: social science, data science, business people, privacy advocates, policy makers

# What is computational social science?

Balance between social science, data science, business people, privacy advocates, and policy makers

Healthy Ecosystem vs Horrific Monoculture

# What is computational social science?

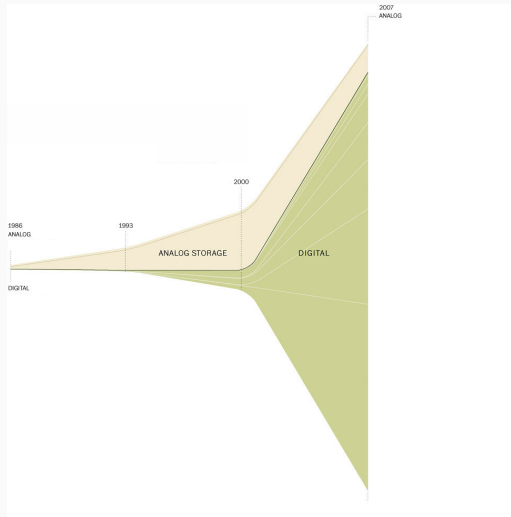
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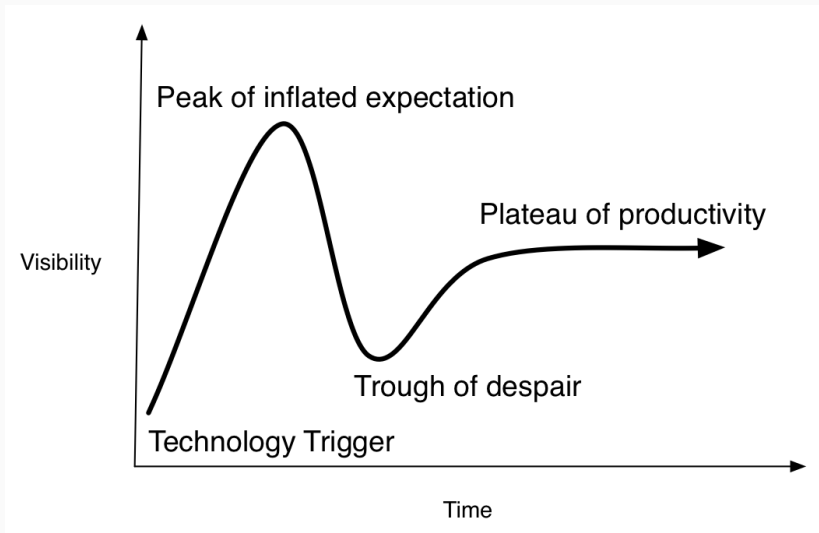
No

# What is computational social science?



<http://www.washingtonpost.com/wp-dyn/content/graphic/2011/02/11/GR2011021100614.html>,  
based on Hilbert and López (2011)

# What is computational social science?





How do we create computational social science, individually and as a community?

Social Scientists  $\longleftrightarrow$  Data Scientists

# What is data science?

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Anything that's cool

## 50 Years of Data Science

David Donoho

Department of Statistics, Stanford University, Stanford, CA

<https://doi.org/10.1080/10618600.2017.1384734>

- goes back to Tukey (1962)
- learning from data
- it includes statistics and much more

# What is data science?

- data science alone is not enough if we want to study social behavior (e.g., Anderson)
- social science alone is not enough if we want to use new data sources

# What is data science?

Hanna Wallach (2015) reports overhearing: “I don’t get it. Why is that research?”

Computer science	Social science
Study anything	Study social things
Methods driven	Question driven
Large found data	Small designed data
Prediction	Explanation

[http://videlectures.net/icml2015-wallach\\_social\\_science/](http://videlectures.net/icml2015-wallach_social_science/)

# What is data science?

Another important difference between social science and data science:





Social Scientists  $\longleftrightarrow$  Data Scientists