

Introduction to computational social science

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Summer Institute in Computational Social Science
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What is computational social science?

Anything that is cool

What is computational social science?

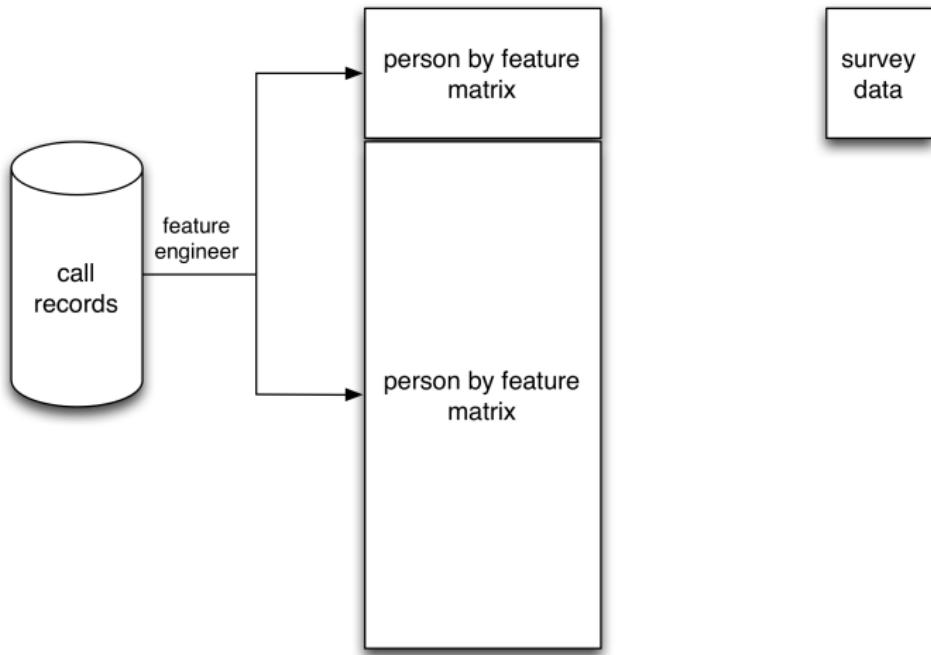
Predicting poverty and wealth from mobile phone metadata

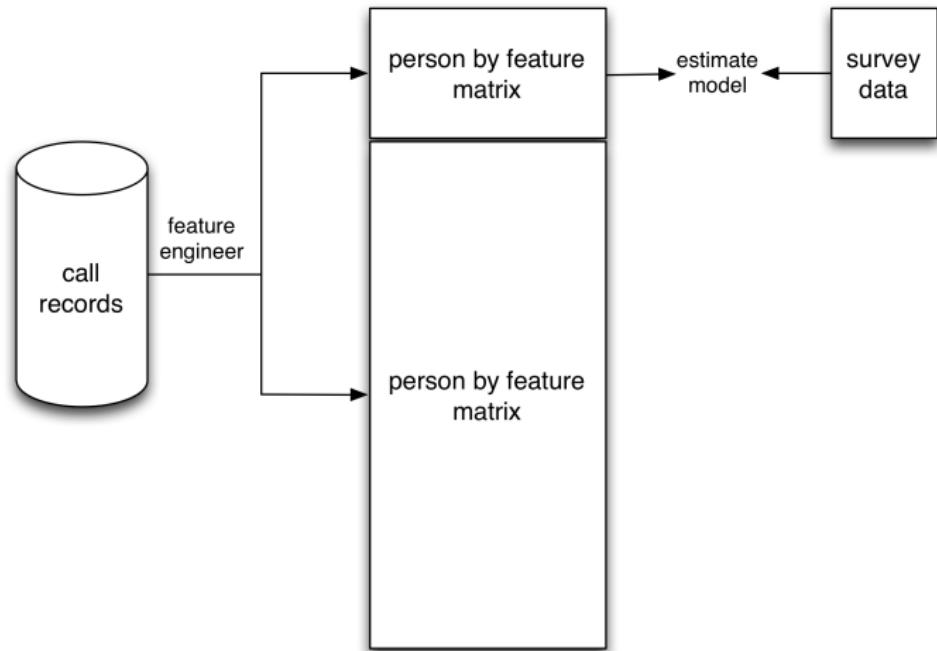
Joshua Blumenstock,^{1*} Gabriel Cadamuro,² Robert On³

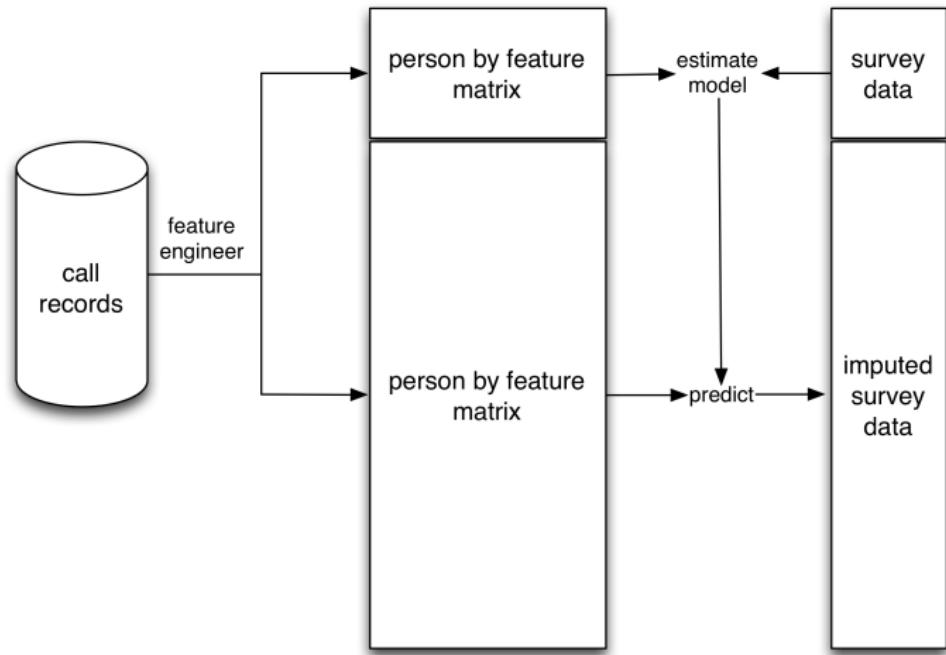
<http://dx.doi.org/10.1126/science.aac4420>

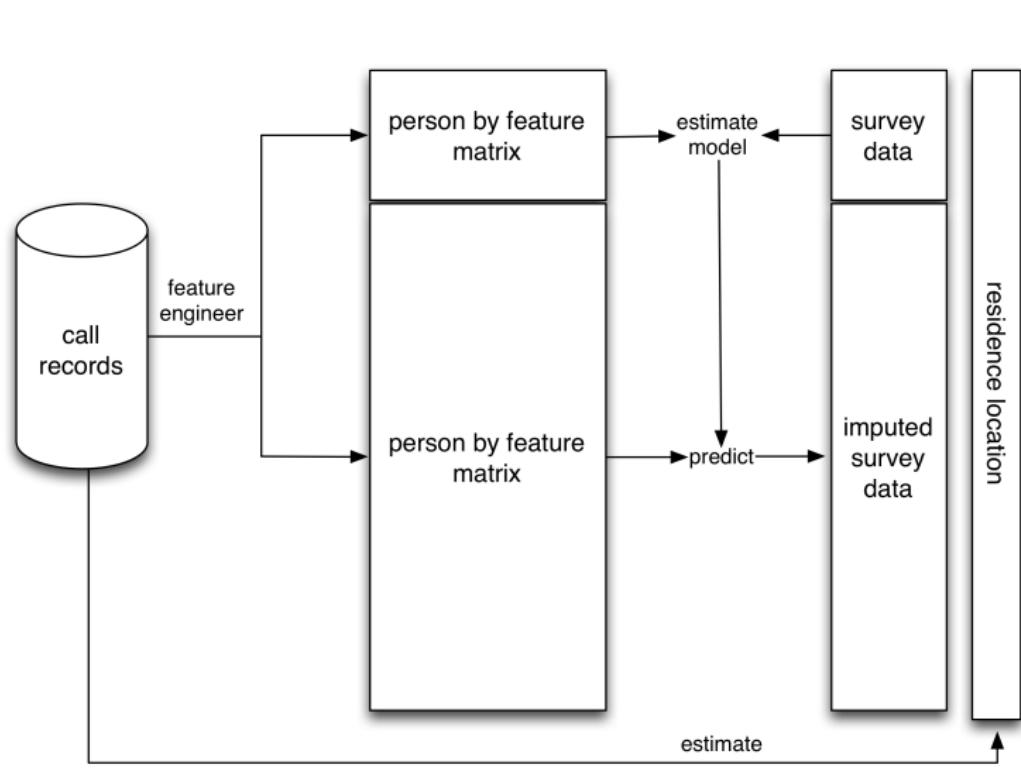


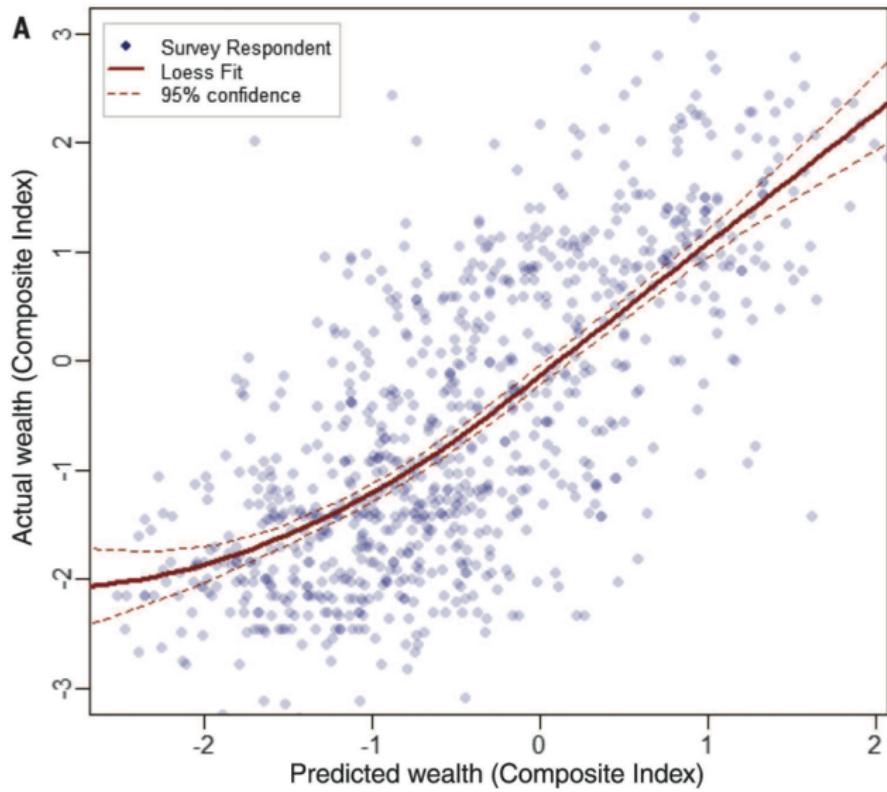


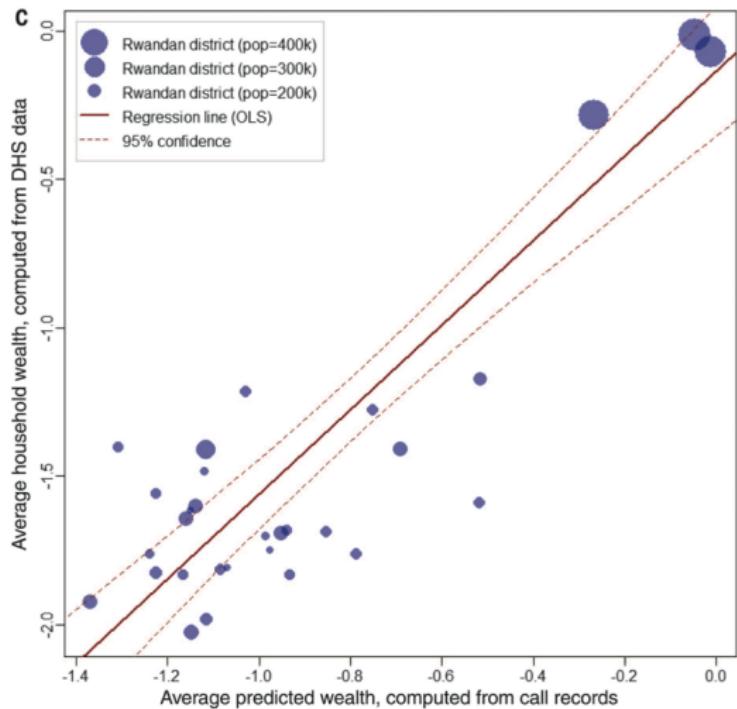


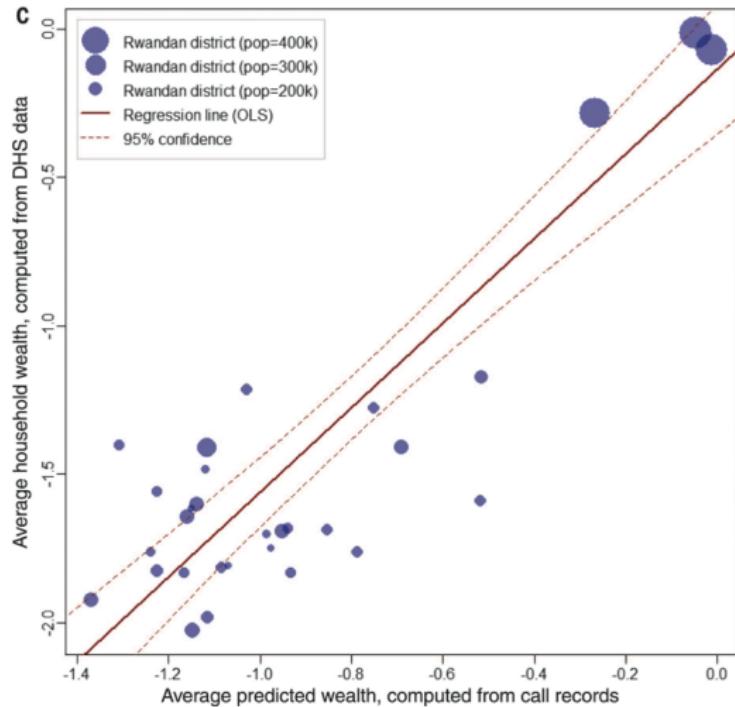












- ▶ 10 times faster
- ▶ 50 times cheaper

- ▶ *computational and social science*

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- ▶ often involves ethical/privacy questions that are now considered complex

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- ▶ combines readymades and custommades







readymades



custommades

https://commons.wikimedia.org/wiki/File:Duchamp_Fountainne.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

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

Health Ecosystem vs Horrific Monoculture

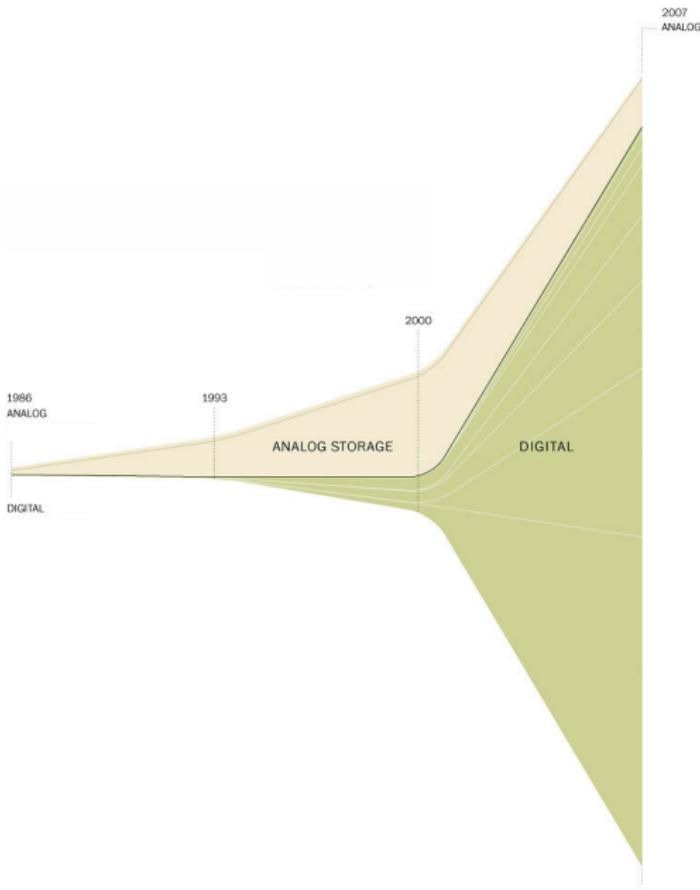
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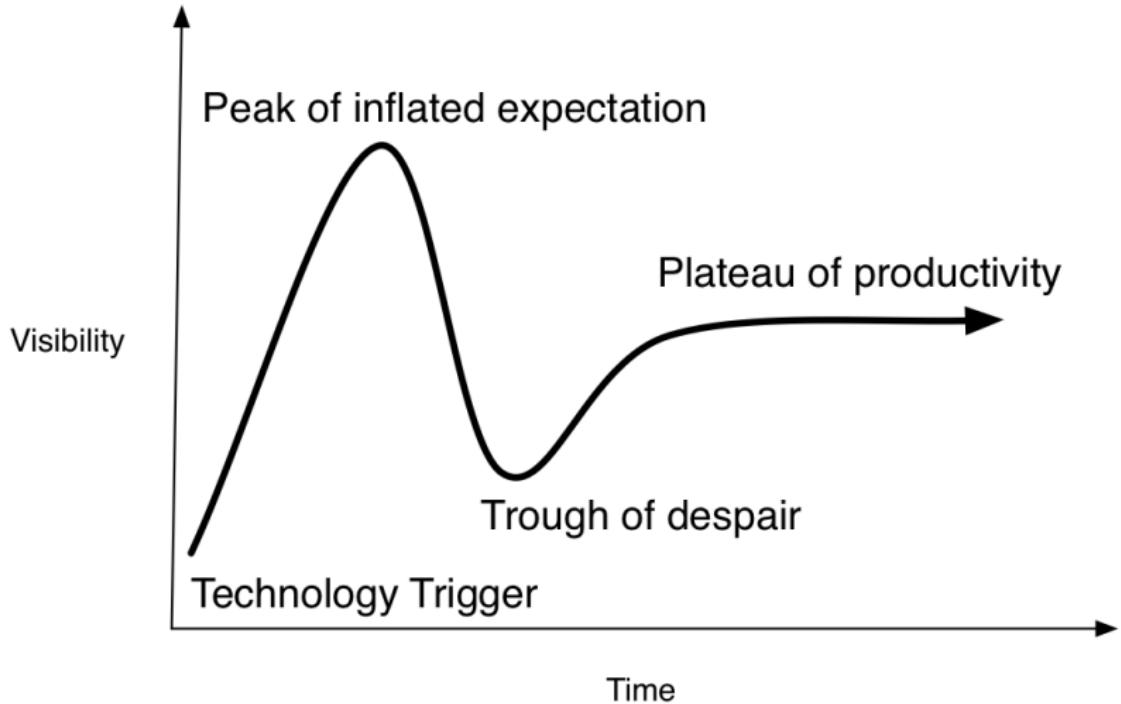
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Isn't computational social science a fad?

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No



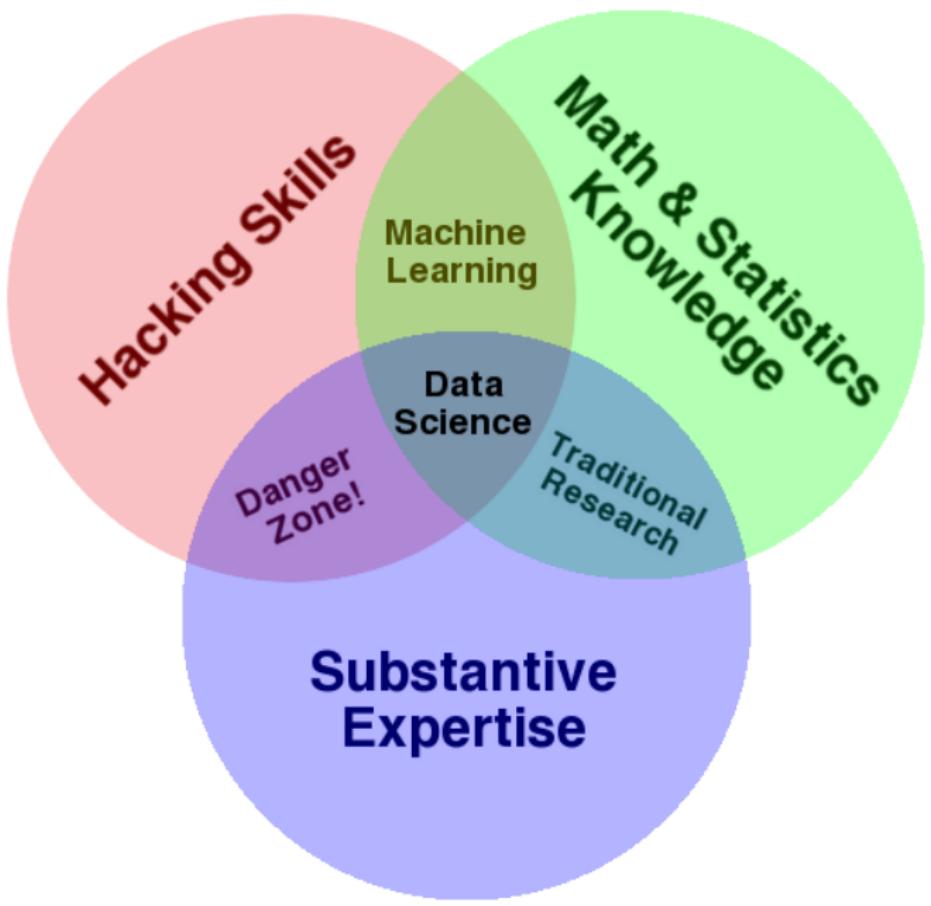


https://commons.wikimedia.org/wiki/File:Gartner_Hype_Cycle.svg

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

Social Scientists ←→ Data Scientists

What is data science?



What is data science?

Academic data science and industrial data science

Academic data science

50 years of Data Science

David Donoho

Sept. 18, 2015

Version 1.00

<http://courses.csail.mit.edu/18.337/2015/docs/50YearsDataScience.pdf>

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- ▶ goes back to Tukey (1962)

Academic data science

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- ▶ goes back to Tukey (1962)
- ▶ learning from data

Academic data science

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

Industrial data science DATA SCIENCE AND ITS RELATIONSHIP TO BIG DATA AND DATA-DRIVEN DECISION MAKING

Foster Provost¹ and Tom Fawcett²

<https://doi.org/10.1089/big.2013.1508>

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- ▶ lots of engineering

Industrial data science

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- ▶ lots of engineering
- ▶ certain kinds of problems (e.g., churn) are not as far from social science as they appear

Data science alone is not enough if we want to study social behavior (e.g., Anderson)

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Social science alone is not enough if we want to use new data sources

Hanna Wallach (2015) reports overhearing: "I don't get it. Why is that research?"

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

http://videolectures.net/icml2015_wallach_social_science/

Another important difference between social science and data science:



Social Scientists ←→ Data Scientists

Let's get started . . .