



Profiling, Micro-targeting and the Right to Reasonable Algorithmic Inferences

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Assistant Professor

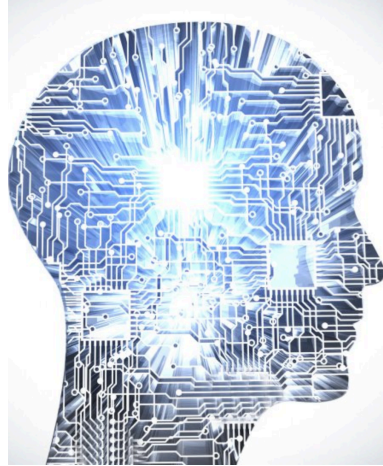
School of Industrial and Systems Engineering,
Georgia Institute of Technology

February 1, 2019

Machine Learning Pipeline



Data



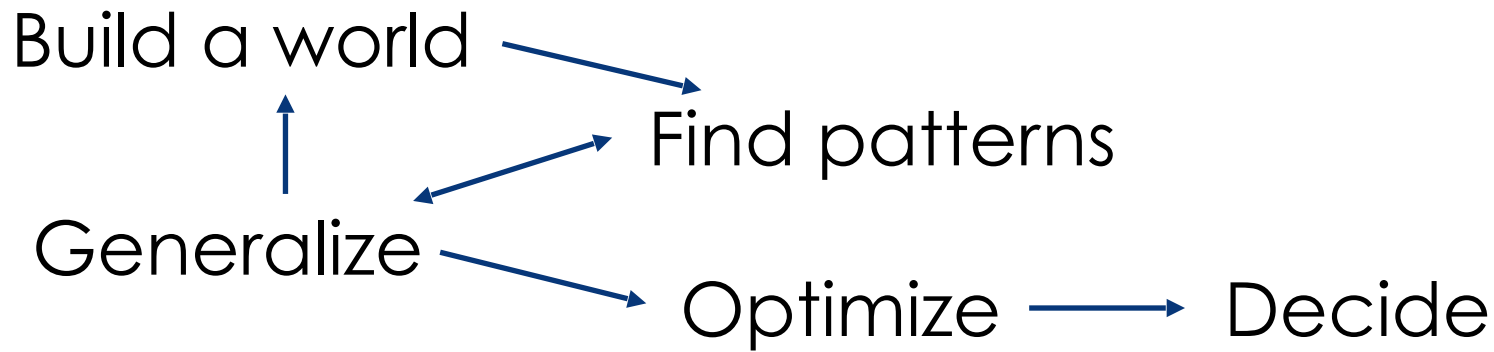
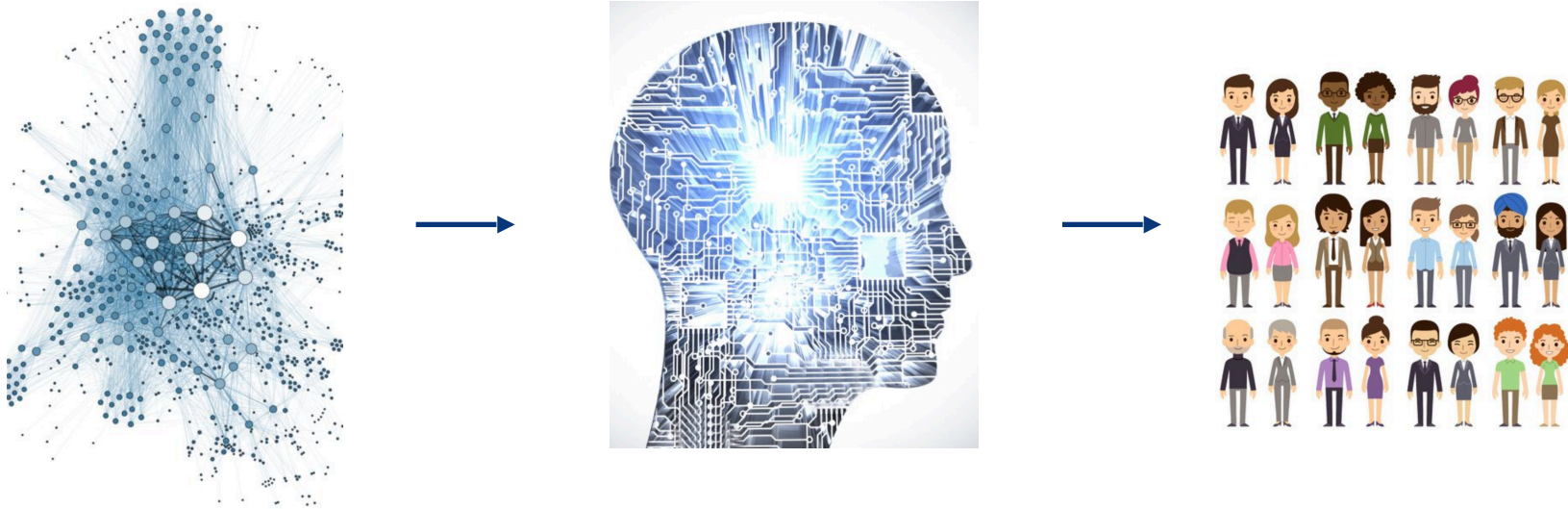
**Machine
Learning/AI**



**Data driven
decisions**

*What is the effect of these decisions on humans in terms of **profiling**, microtargeting, right to reasonable algorithmic inferences?*

ML/AI **automates** human *decision-making*



Search: how to find top 10 items a person likes?



What does a person like?

Content-based,
Collaborative,
Cold Start..

Build a world

Find patterns

Generalize

Optimize

Recommendations

Decide

Search: click through rates, reviews, ratings,..

Advertising: search history, IP address, gender, race, “away-from-home”, social network..

Pricing: historical demand with prices, location, assortment of products, purchasing patterns, ..

Routing: congestion on the roads, usual travel patterns, GPS location, road condition..

Hiring: college, courses, grades, teams, high school, hobbies, gender, zipcode..

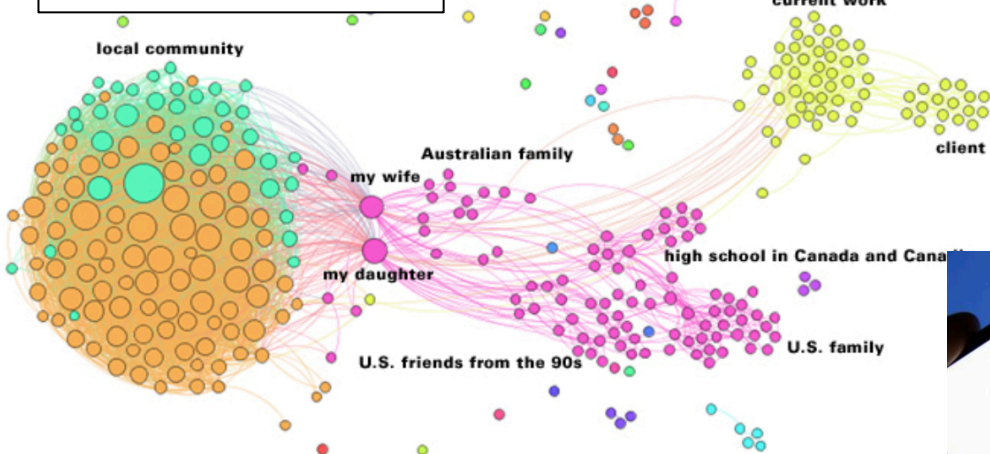
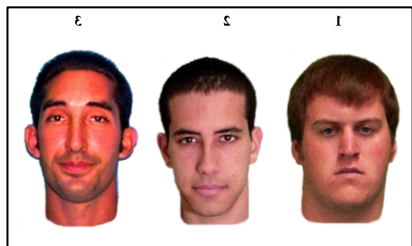
Credit: college, courses, grades, past loans, credit card payments, location, social network..

Data generates (meta)data



Data collection,
Cleaning,
Feature extraction,
Summarization,
Representation,
Proxies,
Neural networks,
A/B testing,
Low rank models,
Website design,
Optimized costs,
Selection of
solutions..

Inference from meta-data



How Target Figured Out A Teen Girl Was Pregnant Before Her Father Did



Kashmir Hill Forbes Staff
Welcome to The Not-So Private Parts where t



BUSINESS / TECH

Detecting suicidal depression: Effort afoot to create smartphone apps that can monitor teen angst

AP

NEW YORK - Rising suicide rates and depression in U.S. teens and young adults have prompted researchers to ask a provocative question: Could the same devices that some people blame for contributing to tech-age angst also be used to detect it?

JAN 4, 2019

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Learning what is “efficient”

DE GRUYTER OPEN

Proceedings on Privacy Enhancing Technologies 2015; 2015 (1):92–112

Amit Datta*, Michael Carl Tschantz, and Anupam Datta

Automated Experiments on Ad Privacy Settings

A Tale of Opacity, Choice, and Discrimination

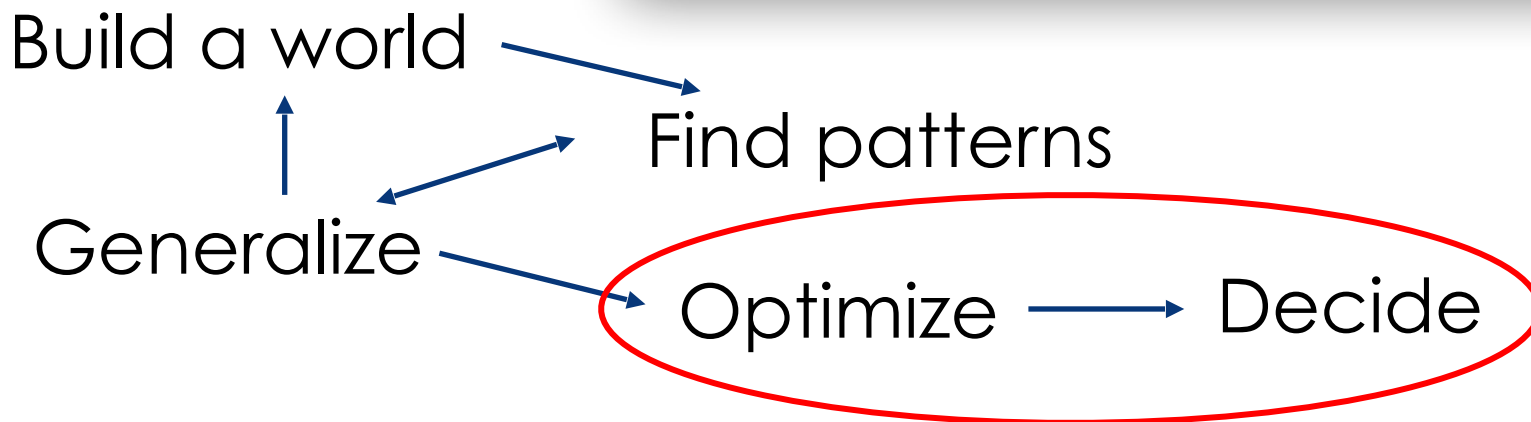
Abstract: To partly address people’s concerns over web tracking, Google has created the Ad Settings webpage to provide information about and some choice over the profiles Google creates on users. We present AdFisher, an automated tool that explores how user behaviors, Google’s ads, and Ad Settings interact. AdFisher can run browser-based experiments and analyze data using machine learning and significance tests. Our tool uses a rigorous experimental design and statistical analysis to

serious privacy data are used content, notab Many websites source their ad ad networks, s works embed t sites providing each user’s bel

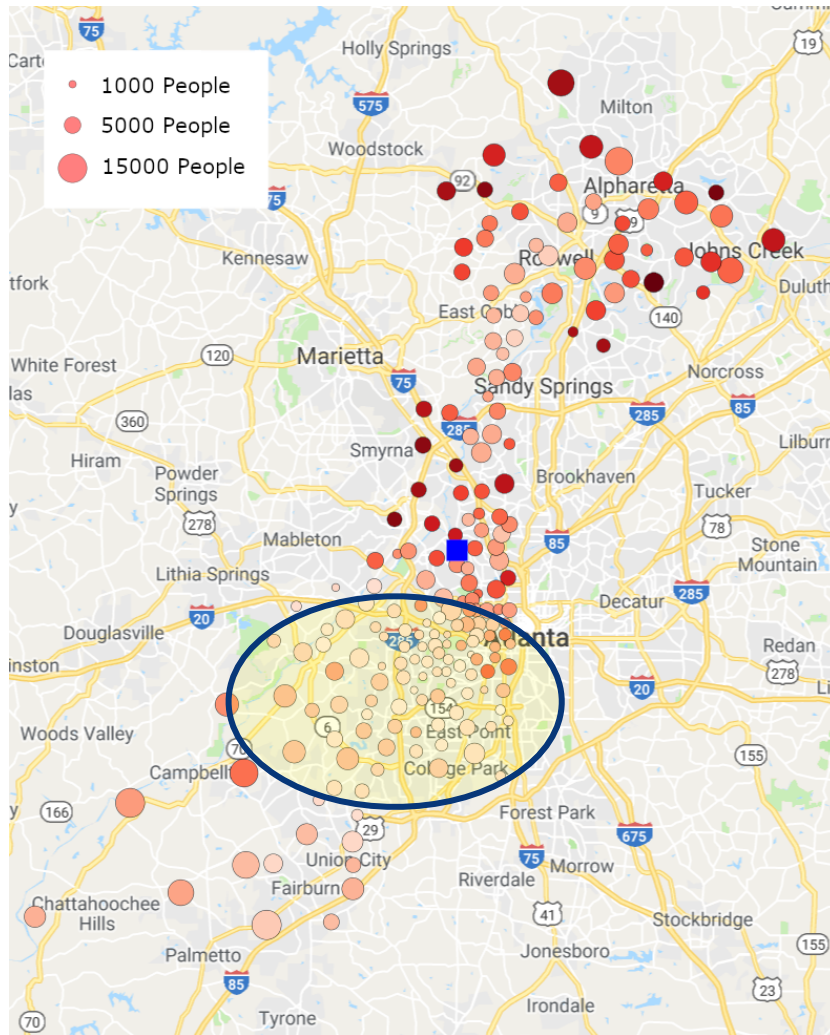
Amazon to Bring Same-Day Delivery to Roxbury After Outcry

by **Spencer Soper**

April 26, 2016, 5:19 PM EDT Updated on April 26, 2016, 8:22 PM EDT



Learning what is “efficient”

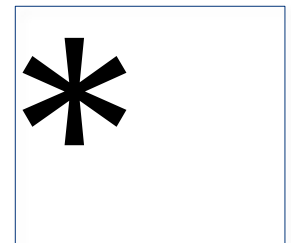
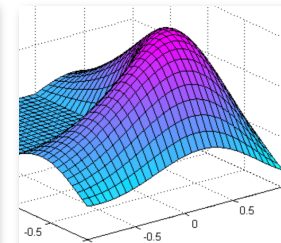


Routing Inventory

Suppose poor customers have a smaller holding capacity than rich customers,

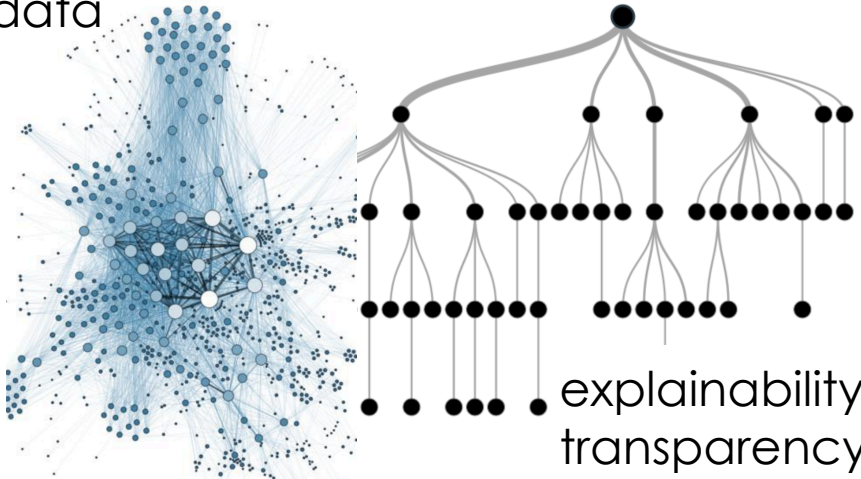
Using minimum cost routes, below poverty line customers stock out **4-5 times more than** above poverty line customers.

Potential Solutions



cross-disciplinary work

data



explainability
transparency



auditing

https://www.amazon.com/gp/help/customer/display.html/ref=pd_ys_help_jyr?ie=UTF8&nodeid=13316081

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Site Features > Your Site Preferences

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You can improve your recommendations by providing feedback on purchased items. You can also stop certain purchases from influencing your recommendations (for example, if you purchased an item as a gift).

To control an item's influence on your recommendations:

- Go to [Improve Your Recommendations](#) or select the **Why recommended?** link below an item on [Your Amazon.com](#).
- You can then rate items to control the item's influence, or exclude items from influencing your Recommendations altogether:
 - To adjust how an item influences your recommendations, choose a rating of 1 to 5 stars, or choose to leave the item unrated. The ratings you submit are private and are never shared with other Amazon.com customers, nor do they affect the average customer review for the item. These ratings are used solely to provide you more accurate recommendations.
 - To exclude certain purchases from being considered in your Recommendations, Select **Don't use for recommendations** next to the purchased item or select **This was a gift**.

4. Choose a rating of 1-5 stars or choose to leave the product unrated

adaptivity

Summary

ML/AI **automates** human *decision-making*

Proxies for Search, Advertising, Hiring, Credit..

Data generates (**meta**)data: features

Inferences from meta-data: relationships

Learning what is “**efficient**”: optimize

Solutions?