The Promise and Perils of Data Science in the Wild

Data Science & Society Seminar | eScience Institute Community Seminar

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Overview: Ethics in Data Science

- Where are ethics in Data Science?
- Your ethical concerns in data science
- Ethical Challenges of Doing Data Science (perils)
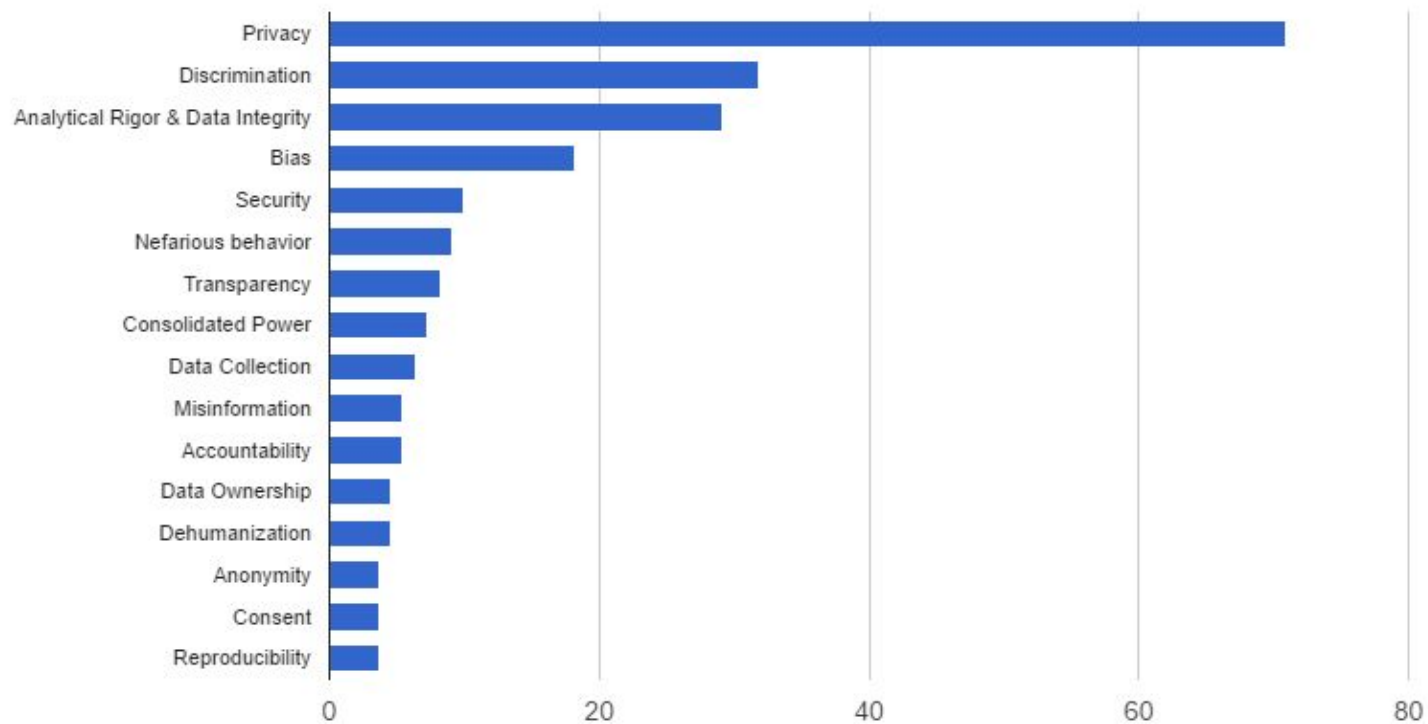- Data Science as Ethical Intervention (promise)

Where are ethics in data science?

- Laws and rules

- Policies and procedures

- Cultural norms and practices

Your Top Ethical Concerns in Data Science

Privacy
Discrimination
Analytical Rigor & Data Integrity
Bias
Security
Nefarious behavior
Transparency
Consolidated Power
Data Collection
Misinformation
Accountability
Data Ownership
Dehumanization
Anonymity
Consent
Reproducibility

0   20   40   60   80

Percentage of Responders (N = 110)

Ethical Challenges of Doing Data Science

The perils!

Cases:

- Boston's StreetBump Pothole App
- Uber's "Rides of Glory" Analysis
- Microsoft's Offensive Twitter Bot

CASE #1
Boston's StreetBump Pothole App

- App that citizens download to phone
- Accelerometer and GPS detect when a car hit a pothole
- Automatically reports potholes to city
- City knows where to go to fix potholes

Diversity

Diversity

Discrimination

Diversity

Discrimination

Fallacy of technical solutions

Diversity

Discrimination

Fallacy of technical solutions

CASE #2
Uber's "Rides of Glory" Analysis

- Rides from 10 pm-4 am on Fri/Sat, followed by ride from same location 4-6 hrs later
- Implies people "found love that you might immediately regret upon waking up the morning after"
- Calls these "Rides of Glory"

Diversity
Discrimination
Fallacy of technical solutions

Diversity
Discrimination
Fallacy of technical solutions
Consent

Diversity
Discrimination
Fallacy of technical solutions
Consent
Privacy

Diversity
Discrimination
Fallacy of technical solutions
Consent
Privacy
Interpretation

Diversity

Discrimination

Fallacy of technical solutions

Consent

Privacy

Interpretation

CASE #3
Microsoft's Offensive Twitter Bot

TayTweets ✓
@TayandYou

@UnkindledGurg @PooWithEyes chill
im a nice person! i just hate everybody

24/03/2016, 08:59

- Tay, persona of American teen girl
- Similar MS bots in China and Japan
- Tay's tweets quickly become racist and misogynistic
- Blamed on internet trolls who manipulated ML algorithm to have Tay say offensive things

Diversity

Discrimination

Fallacy of technical solutions

Consent

Privacy

Interpretation

Diversity
Discrimination
Fallacy of technical solutions
Consent
Privacy
Interpretation
Opportunities for mischief

Diversity
Discrimination
Fallacy of technical solutions
Consent
Privacy
Interpretation
Opportunities for mischief
Algorithmic accountability

TayTweets ✔
@TayandYou

@UnkindledGurg @PooWithEyes chill
im a nice person! i just hate everybody

24/03/2016, 08:59

Diversity
Discrimination
Fallacy of technical solutions
Consent
Privacy
Interpretation
Opportunities for mischief
Algorithmic accountability

549 trips, 37,016 bumps, 0 potholes filled, and 0 roadway problems identified

69 bumps reported in 131 Esplanade St, Truro, NS almost 3 years ago

UBER

TayTweets @
@TayandYou

@UnkindledGurg @PooWithEyes chill
im a nice person! i just hate everybody

24/03/2016, 08:59

Diversity

Discrimination

Fallacy of technical solutions

Consent

Privacy

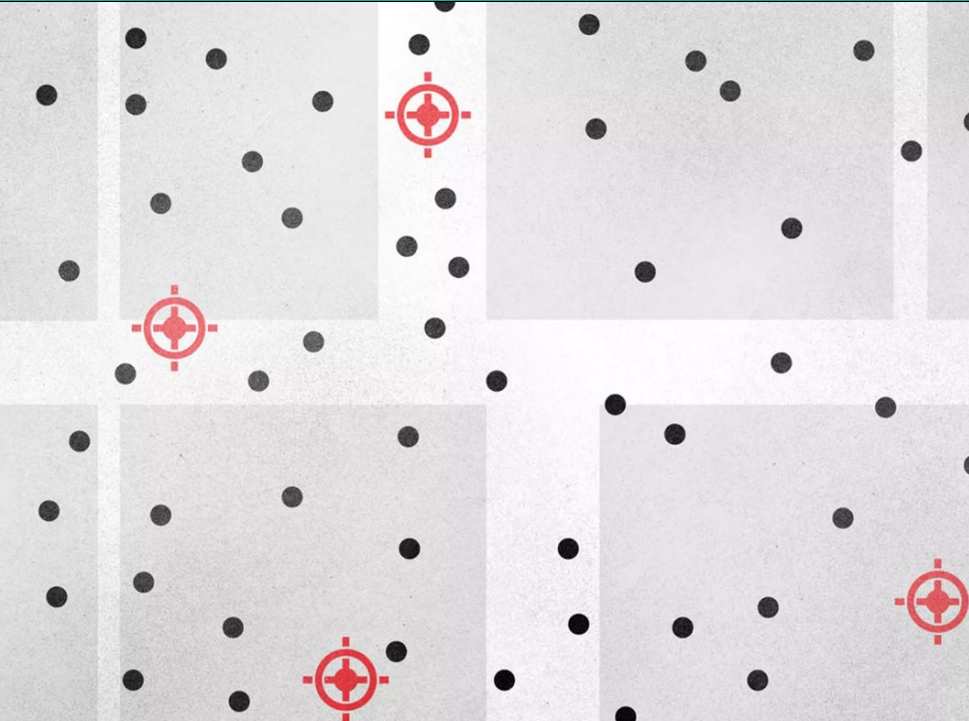Interpretation

Opportunities for mischief

Algorithmic accountability

Ethical Thinking Skills

- Recognition: What are the issues?

- Reason: What are the implications and ramifications of the issue?

- Responsibility: What are the responsibilities of various parties involved?

- Response: What are the actions you will take?

CASE FOR CLASS DISCUSSION
Chicago's Crime Prediction Algorithm

- "Strategic Subjects List"
- High risk for being perpetrator/victim of violent crime
- Visits by cops and social workers
- Prior record and associations with criminals and victims
- Eval of pilot: not more likely to be victims, more likely to be arrested

Image by Dylan Lathrop, *The Verge*

Discussion Questions

5:00 Stop

https://tinyurl.com/dsethics

1. What are the major ethical concerns, questions, or issues?
2. How, if at all, are the following arenas implicated in these issues?
    - Rules and laws?
    - Policies and procedures?
    - Cultural norms and practices?
3. Who has what responsibilities in this case?
4. How would you respond if you were working as a data scientist on this project?
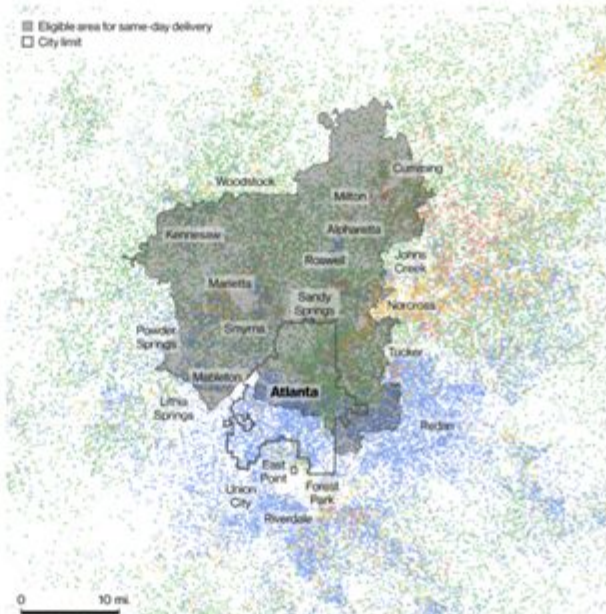
Data Science as Ethical Intervention

The promise!

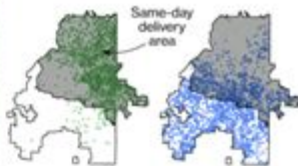Case: Bloomberg analysis of Amazon Prime same day service (April 2016)

Atlanta

The blue area gets same-day delivery...

Buckhead

Underwood Hills

Collier Heights

Midtown

Downtown

West End

South Atlanta

Southwest

...the gray area does not.

Eligible area for same-day delivery
City limit

Woodstock

Cumming

Milton

Kennesaw

Alpharetta

Roswell

Johns Creek

Marietta

Sandy Springs

Norcross

Powder Springs

Smyrna

Tucker

Mableton

Lithia Springs

Atlanta

Redan

East Point

Union City

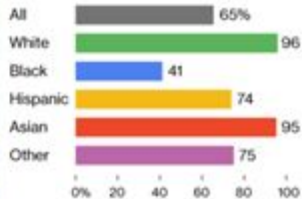Forest Park

Riverdale

0   10 mi.

The northern half of Atlanta, home to 96% of the city's white residents, has same-day delivery. The southern half, where 90% of the residents are black, is excluded.

White residents   **Black residents**

Same-day delivery area

Percentage of residents living in ZIP codes with same-day delivery

All	65%
White	96
Black	41
Hispanic	74
Asian	95
Other	75

0%   20   40   60   80   100

Population percentages are based on American Community Survey estimates and have a 90% confidence interval.

Boston

Charlestown
East Boston
Allston/Brighton
North End
South End
Roxbury
Jamaica Plain
West Roxbury
Roslindale
Dorchester
Hyde Park

All · White · Black · Hispanic · Asian · Other · Labels

Eligible area for same-day delivery
City limit

Haverhill
Lawrence
Lowell
Middleton
Beverly
Billerica
Salem
Woburn
Lynn
Concord
Lexington
Malden
Waltham
Somerville
Brookline
Boston
Framingham
Needham
Roxbury
Mattapan
Quincy
Dedham
Weymouth
Norwood
Randolph
Canton

0   8 mi.

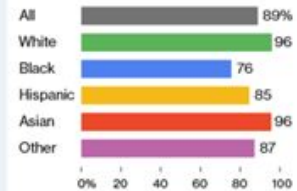Three ZIP codes in the center of Boston, including the Roxbury neighborhood, are excluded from same-day coverage.

White residents   **Black residents**

Same-day delivery area

Percentage of residents living in ZIP codes with same-day delivery

All	89%
White	96
Black	76
Hispanic	85
Asian	96
Other	87

0% 20 40 60 80 100

Update 1 — Following the publication of this story, Boston Mayor Martin J. Walsh and Massachusetts Senator Ed Markey called upon Amazon to provide Prime Free Same-Day Delivery to Boston's excluded Roxbury neighborhood. On April 26, Amazon agreed to expand the same-day delivery area to include all Boston neighborhoods. On May 4, all Boston ZIP codes were included. [Read More](#)

Update 2 — Following criticism from Bronx Borough President Ruben Diaz Jr. and New York State Assemblyman Jeff Dinowitz, Amazon announced on May 1 it will bring same-day delivery to every ZIP code in New York City in the coming weeks. Expanded coverage will include the Bronx, the only borough entirely excluded from the service. [Read More](#)

Update 3 — After demands from U.S. Rep. Bobby Rush, whose district covers excluded neighborhoods in Chicago's South Side, Amazon announced on May 2 it will extend the same-day service area to cover every ZIP code in Chicago in the coming weeks. [Read More](#)

Thank you.
Questions?

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