Data Ethics: Understanding Big Data, Algorithmic Bias, and Research Ethics

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CRIM 3600 Research Methods
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Northeastern University
NULab for Texts, Maps, and Networks

Feel free to ask questions at any point during the presentation!

Discussion: China's Social Credit System

- What is China's Social Credit system? How does it work?
- In what ways might America have similar or different technological infrastructures?

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Workshop Agenda

- Objectives
- Introduce ‘Big Data’ Concepts
- Discuss data, privacy, and algorithms
- Activity: Adopt or Not?
- Discuss ethical implications of big data and lessons for (digital) research

Slides, handouts, and data available at

http://bit.ly/diti_fall2020-marshall2

Feel free to ask questions at any point during the presentation!

Workshop Goals

- Understand the ways data are being used in society as well as how algorithms impact and shape our daily lives
- Explore the ways in which privacy and security are being reshaped and redefined through the use of big data, algorithms, and policy
- Understand the ways in which technology reflects cultural, social, and political biases.
- Explore the ways in which these questions and methods are influencing how social scientists do research and practice their craft

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What is “Big Data”?

Companies, governments, and other groups collect vast amounts of data (“big data”) from vast amounts of users and analyze these data quickly for particular purposes (advertising, surveillance, search results, etc).

The goal of collecting and processing these data is to predict individual user behavior based on patterns from the user as well as patterns from “similar” users (based on demographic information, behavioral patterns, etc).

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Why should we care?

- Big data is characterized by its **scale**
- Big data **sources** include: digitized records, social media/internet activity, or sensors from the physical environment.
- Big data is often **privately owned**
    - Example: an insurance company purchasing social media activity from Facebook in order to make insurance sales decisions.

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Questions to consider

- How are we being represented online?
- How are our data being used?
- Who is using our data and for what purposes?
- How might our data be used in the future?

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Facebook Preferences

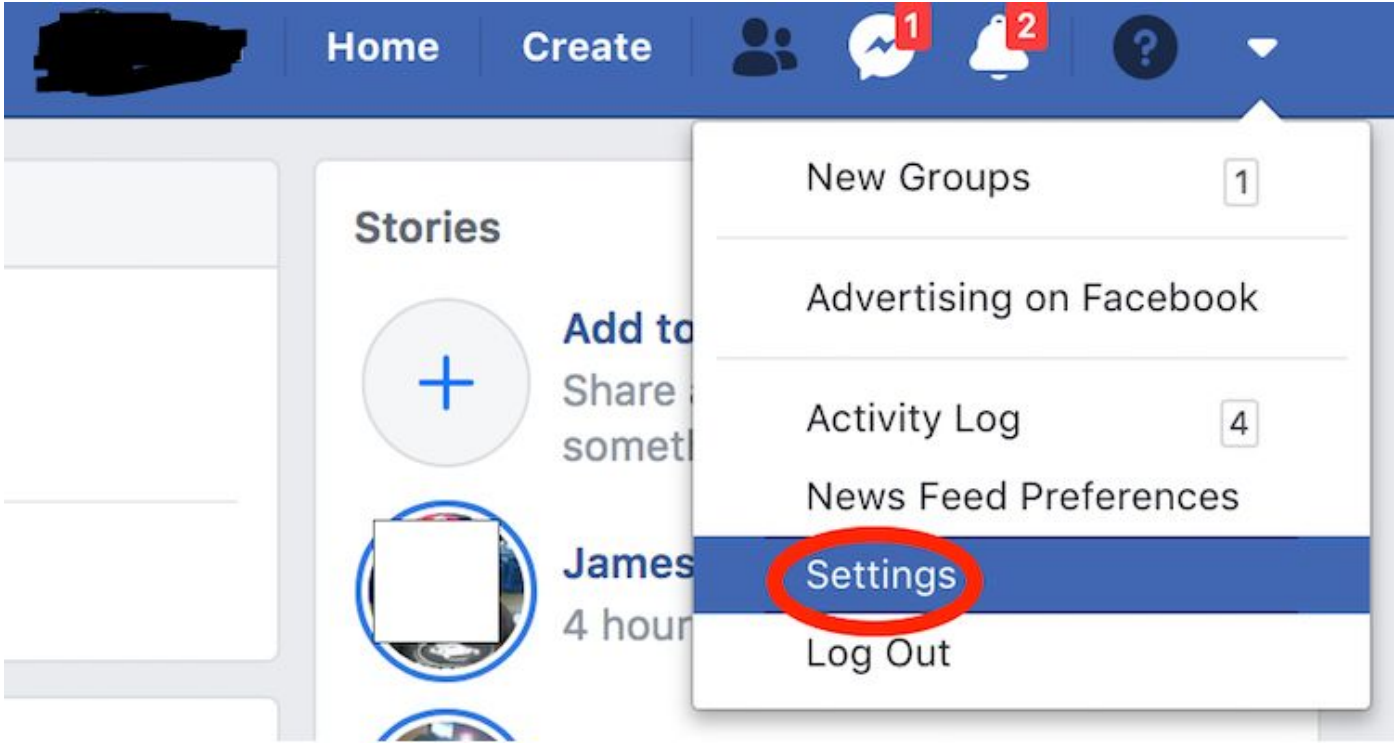
Facebook collects, stores, and sells information about you so you get more targeted ads and your newsfeed is tailored to your categories.

Other social media sites that do this:

- Instagram (owned by Facebook)
- Google
- YouTube (owned by Google)
- Twitter

Feel free to ask questions at any point during the presentation!

Settings > Ads > Your information > Categories



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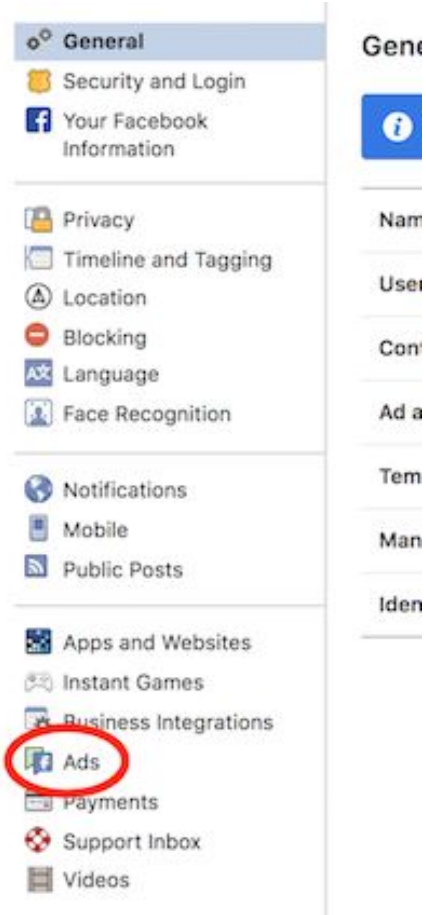

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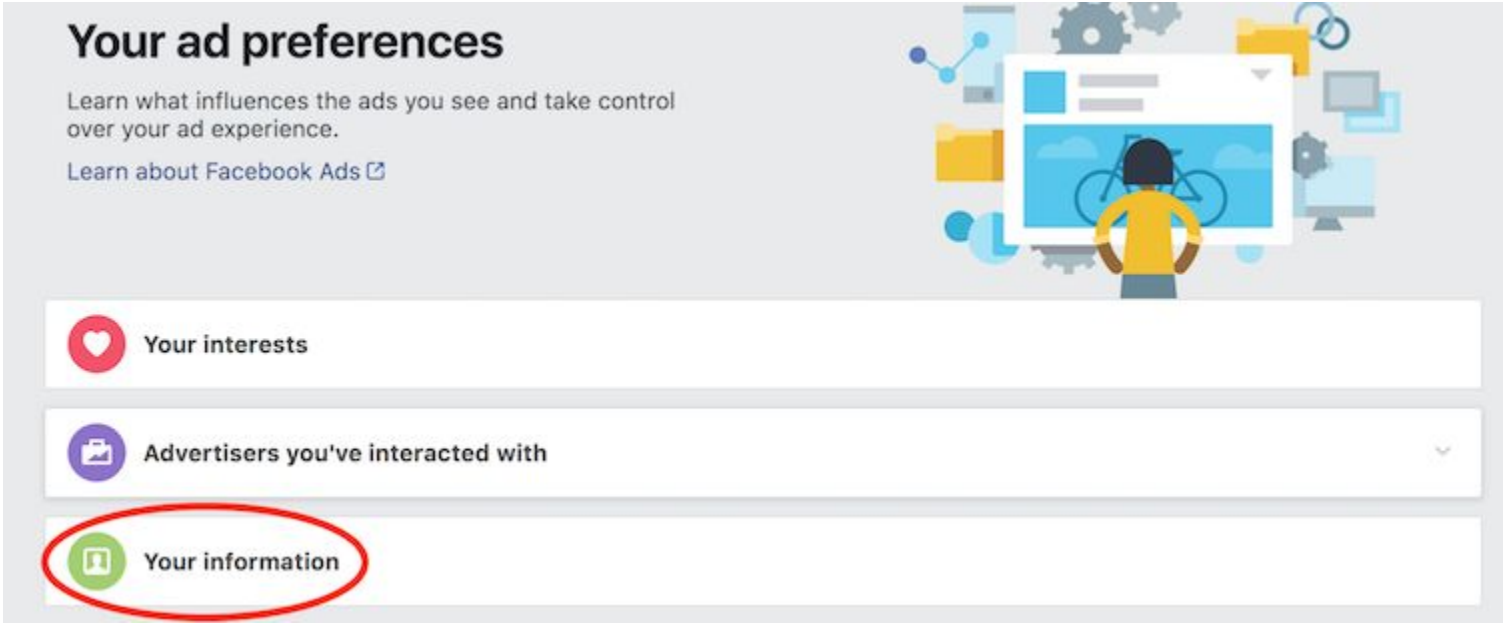

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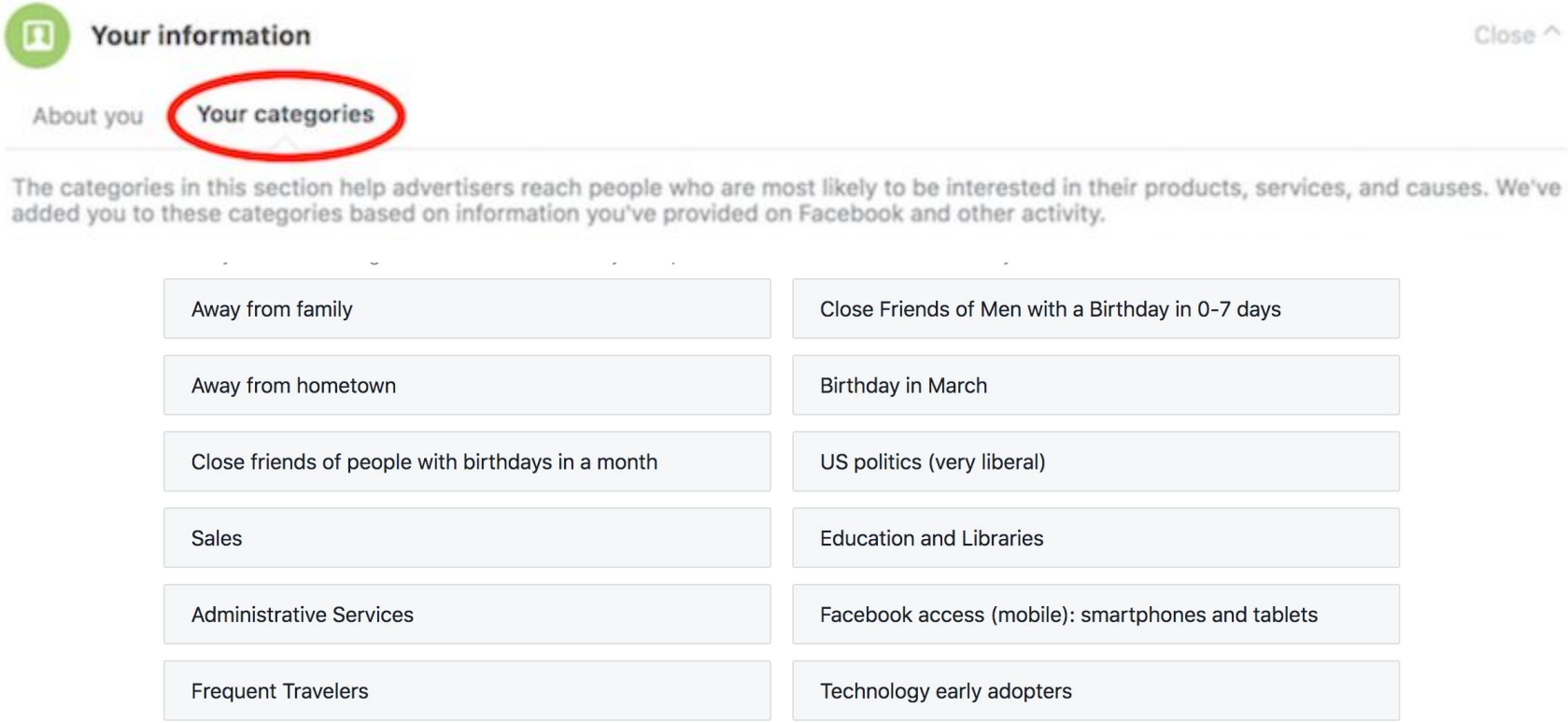

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AWARENESS | SCIENCE & TECH | AUG 3, 2019 AT 11:08 AM.

Google's File on You is 10 Times Bigger Than Facebook's — Here's How to View It

Google, Amazon, Apple, and Microsoft are all central players in "surveillance capitalism" and prey on our data.

THE ANTI-MEDIA

Example: If you have **location services** turned on for Google (like if you use Google maps), Google can track your every move. Go to:

https://www.google.com/maps/timeline

Downloading Your Data

Facebook: Settings > Your Facebook Information > Download your Information

Google: https://support.google.com/accounts/answer/3024190?hl=en

Instagram app: Settings > Privacy and Security > Data download/Request Download

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DIY Cybersecurity and Tightening your Privacy

Want to make your life more private? Follow this “DIY Guide to Feminist Cybersecurity”

https://hackblossom.org/cybersecurity/

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“Big Data” Unbounded - Ethical Issues

- Controversies in the recent years:
  - Cambridge Analytica 2016 elections controversy
  - Clearview AI: facial recognition “services” in 2020
  - General use of facial recognition in policing in recent years
  - Place of algorithms in racially differential health outcomes
  - Using algorithms in grading in the UK in 2020
  - And many many more all across the world...
- “Big data” raises questions of power, autonomy, anonymity, privacy, discrimination, and bias.

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Facial recognition in policing and beyond

- Case of Robert Williams, wrongfully arrested in 2019
- Most algorithms have been found to contain gender and racial bias when tested on accuracy of face recognition
- These issues were present from the onset of implementation of these technologies, but they still go introduced
- These biases are reproduced both in the programing of algorithms, and in collection of datasets from which algorithms are trained

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Class Activity: Algorithms and Bias

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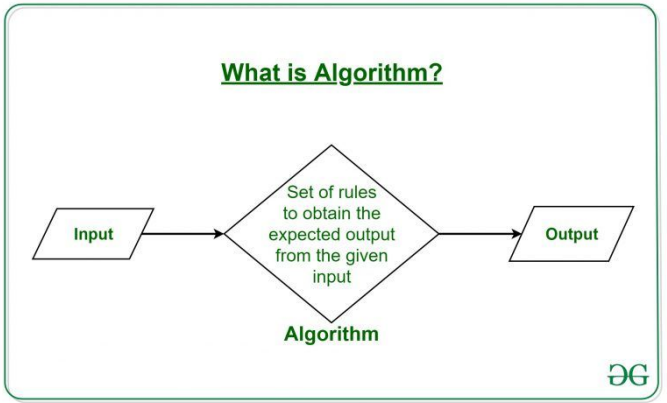
Algorithms

Do you rely on algorithms in your everyday life? Any examples?

An algorithm is a process of instructions provided, usually for computers to interpret and follow. There is usually an **input**, which is determined by the programmer; then there is a set of rules (the algorithm) that help lead to the **output**, or the results of the program following instructions.

Algorithms can be fairly simple, but they can also be much more complex.



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Activity: Data deciding dog adoption

You will be assigned into small groups. You work for an adoption agency and have to decide if someone can adopt a dog. On your handouts, please read the four previous adoption applications and decide if the new adoption applicant can adopt or not.

Do you think this new applicant should be allowed to adopt a dog? Why or why not?

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Discussion

- Would you ACCEPT or REJECT their application? Why?
- What questions from the application did you weigh more? Why?
- What might be some implicit biases in this application form, the process, and in your choices?

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Algorithms and Applicants: Machine Learning

Algorithms "read" through data such as these applications, and often help us make decisions. Here are some questions to think about when assessing algorithms:

- Where might you see these algorithms being used to make decisions? Why are they being used? What are they replacing or adding on to?
- What biases may be ingrained in the data collected for the algorithms? What biases may be ingrained in the actual process of using the algorithm?
- In what ways might the algorithm prevent or reinscribe human bias?

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Want to learn more about accountability and best practices when creating algorithms?

Visit https://www.fatml.org/, or Fairness, Accountability, and Transparency in Machine Learning

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So what do ‘big data’ & algorithms have to do with research?

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Questions Researchers Must Ask

- What **information** is being collected and from where? To whom does this data **belong**?
- How is it being **collected**? Do **participants** know that it is collected, how it will be collected, and how will it be used?
- **How** will the data be analyzed? What **biases** and **ideologies** may be implicit in this analysis?
- Who will this research impact? Who will it **benefit**? Who will it potentially **harm**?

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Discussion

- What are some benefits and what are some risks coming with the increased focus on “big data” in research and policy?
- Do you see any commonalities among the risks and how would you address them?
- Finally, big data is a vague term and refers to many different phenomena at once. What are some other terms you would use in order to think about these issues more precisely?

Feel free to ask questions at any point during the presentation!

Thank you!

If you have any questions, contact DITI at nulab.info@gmail.com

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Schedule an appointment with us! **https://calendly.com/diti-nu**

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