CSE 291/DSC 291
Information Manipulation:
Trustworthiness of Information in Cyberspace

Molly Roberts & Stefan Savage, Winter 2023

Misinformation: Overview of the Problem
December 2016: Pizzagate
Trump, social media and “fake news”

This Analysis Shows How Viral Fake Election News Stories Outperformed Real News On Facebook

A BuzzFeed News analysis found that top fake election news stories generated more total engagement on Facebook than top election stories from 19 major news outlets combined.

Craig Silverman
BuzzFeed Founding Editor, Canada

Posted on November 16, 2016 at 2:15 pm
Trump, social media and “fake news”

- 20 top-performing false election stories vs. the 20 best-performing election stories from 19 major news websites (Silverman 2016)
Director of National Intelligence: Worries of Russian interference in 2016 Election

Assessing Russian Activities and Intentions in Recent US Elections
What do we mean by misinformation and disinformation?

- **Misinformation:**
  - “publishing wrong information without meaning to be wrong or having a political purpose in communicating false information” (Benkler, Faris, and Roberts)
  - “constituting a claim that contradicts or distorts common understandings of verifiable facts” (Guess and Lyons)

- **Disinformation:**
  - “manipulating or misleading people intentionally to achieve political ends” (Benkler, Faris, and Roberts)
  - “The subset of misinformation that is deliberately propagated” (Guess and Lyons)

- Other terms the authors refer to: propaganda, fake news, rumor, conspiracy, bullshit, disorientation, network propaganda.
Actors

- Fake news story creators (clickbait fabricators)
- Foreign interference (e.g. bots/hackers from Russia)
- Social media companies (the newsfeed algorithm, echo chambers)
- Targeted advertising (e.g. Cambridge Analytica)
- Extremists (e.g. White supremacists, far Right/Left media)
- Mainstream news
- Elite rhetoric (e.g. Donald Trump)
Is this a new crisis? If so, why?

▪ Benkler, Faris and Roberts: It is new, an “Epistemic crisis”

▪ Benkler, Faris and Roberts: “Our argument is that the crisis is more institutional than technological, more focused on U.S. media ecosystem dynamics than on Russia, and more driven by asymmetric political polarization than by commercial advertising systems.”

▪ Argument: It is *not* driven by technological change.
Is misinformation new to the current time period?

- Invention of the printing press in the 15th century led to circulation of many false pamphlets
- Explosion of newspapers in the 19th Century in the U.S. also created false news
  - E.g. “Great Moon Hoax” -- New York paper The Sun claim that there was a civilization on the moon – boosted circulation
- John Adams, Benjamin Franklin: planted false news stories to support the American Revolution
- U.S./Soviets both engaged in disinformation campaigns during the Cold War
- Many examples throughout history of misinformation about crimes sparking hate crimes against minority groups
Discussion

How would we know if misinformation were “increasing”? How would we measure it?
Is the spread of misinformation specific to the U.S. context?

A Genocide Incited on Facebook, With Posts From Myanmar’s Military

The New York Times

A border police officer at a repatriation center for Rohingya returning to Myanmar. Human rights groups blame anti-Rohingya propaganda online for fueling violence and displacement. Adam Dean for The New York Times

German coup plot fueled by conspiracy claims, COVID measures

By FRANK JORDANS, Associated Press, Updated December 9, 2022, 6:19 p.m.

A police officer secures the grounds of Wachau’s hunting lodge near Bad Lauterberg, Germany. The lodge is owned by Heinrich von der Schulenburg, a German aristocrat who is a member of the Bodo Club, a right-wing social club. The club’s founder has been accused of running a Nazi-era concentration camp.

BERLIN (AP) — An alleged plot to topple the German government, led by a self-styled prince, a retired paratrooper, and a Berlin judge, had its roots in a murky mixture of post-war grudges, antisemitic conspiracy theories, and anger over recent pandemic restrictions, experts say.
Discussion

How might we compare countries in degree of misinformation spread? What problems might we have with measurement?

If the spread of misinformation were correlated with some political institutions/characteristics, what would that tell us?
Computer scientists, data scientists, social scientists have a lot to add

New Data
- While misinformation may be old, it used to be difficult to quantify
- Much of human communication is digitized → misinformation easier to study

New Technology
- Ability to process data at scale, helps us sort through information quickly
- New advances in experiments, natural experiments, making causal inferences with observational data → helps us inform policy

Important Challenges:
- Literature is relatively new
- Data that is available is not representative of communication
- Proprietary nature of much of the data
- Dynamism of the information environment
- Ethical concerns
Course is structured around open questions

- We will give examples of empirical papers in each open question
- We hope you will choose one question, or a related question to focus on for your research project
- Can use the empirical papers as a template for your research project, though yours will likely be more limited
How prevalent is misinformation?

- **Exposure**
  - How many people were exposed to misinformation on a certain platform or during a certain time period?
  - How many times did people engage with that content?

- **Sources**
  - How many accounts spread false news?
  - How many followers do these accounts have?

- **Comparison of false vs. true news**
  - Does false news spread faster than true news?
Do people believe misinformation?

- Do people state that they believe something false? Can we distinguish being misinformed from being uninformed?

- With how much certainty do people hold misinformed beliefs?

- How well do surveys measure belief in misinformation?
  - Preference falsification
  - Partisan cheerleading
  - Inattentive survey respondents
What psychological factors predict belief in misinformation?

- Intuitive vs. Analytical thinking
- Numeracy
- Emotion
- Personality – how do people view authority?
- Motivated reasoning
- Does the number of times people encounter information affect their propensity to believe it?
- Do beliefs persist after correction?
How do elites and social networks influence belief in misinformation?

▪ “Echo chambers ringing with false news make democracies ungovernable.” – Benkler, Faris, and Roberts

▪ Does social media produce echo chambers?

▪ Are these echo chambers more or less isolated than life outside of social media?

▪ How do elite signals about information credibility affect belief in information?

▪ How damaging is it for politicians to lie or spread false information?
Do the incentives and algorithms of social media companies drive misinformation?

- Social media companies optimize engagement
- Misinformation is more engaging
- Does this optimization problem train algorithms to prioritize misinformation and extremist content?
- Does targeted advertising increase the efficacy of misinformation over truth?
What are the commercial incentives to create and distribute misinformation?

▪ How much money do distributors of misinformation make?

▪ What types of strategies do websites use to profit off of misinformation?

▪ How does the structure of online advertising affect the profitability of misinformation?
Who are the international political actors spreading misinformation?

- What are the incentives for foreign actors to spread misinformation?
- How often do we see foreign actors trying to influence domestic information spaces through misinformation?
- What are the strategies these actors use in their information campaigns?
- How successful are these campaigns?
- How can we detect coordinated political misinformation?
Does misinformation affect political behavior in ways that are consequential?

• How consequential is misinformation?

• How much exposure to misinformation does a person need to change their behavior, as well as their beliefs?

• Does it affect turnout? Vote choice? Political donations? Participation in protests?

• What is the relationship between misinformation and political violence?

• How does misinformation affect general trust in the media environment, affective polarization, and extremism?
What can be done to stop the spread of misinformation? Do

- Fact checking
- Content moderation
- Shadow-banning
- Education
- Flagging
- Do these strategies work?
- If so, for what populations?
Types of inference important in studying these questions

- Description
- Prediction
- Causal Inference
Description

- Inferring a **population parameter** from a sample
- Inferring a **latent variable** from observed data

Research design considerations

- Adjusting for the representativeness of the sample
- Building models that estimate latent traits
- Qualitative research: ethnography, grounded theory
Description, Example questions

▪ How much of the U.S. voting age public believes that Barack Obama was not born in the U.S.? How has this changed over time?

▪ How frequently did Twitter users encounter misinformation in the two months before the 2016 election?

▪ How susceptible are people in different countries to conspiratorial thinking? What characteristics correlate with conspiratorial thinking?

▪ What rhetorical strategies did coordinated disinformation campaigns on Twitter led by China take during the Taiwan 2021 election?
Prediction

- Inferring what will happen in the **future**
- Getting **as close as possible** to a future number

Research design considerations

- Beware of bias/variance tradeoff
- Cross validation
- Real time prediction
Prediction, Example questions

▪ Which accounts are likely to share misinformation in the 2024 Presidential election?

▪ Which social media posts would be flagged by human content moderators as misinformation?

▪ How widely will a particular piece of information spread?
Causal Inference

▪ Inferring the effect of one or more variable on the outcome
▪ Estimating what **would have happened** under different circumstances
▪ **Explaining** the impact of a policy or intervention

Research Design Considerations

▪ Experiments
▪ Natural Experiments
▪ Controlling for Confounding
▪ Beware of: Multiple Testing, Heterogeneous Effects, Conflating Causality and Prediction
Causal Inference, Example questions

▪ What is the impact of flagging content on the spread of misinformation?

▪ Do educational interventions reduce people’s belief in misinformation?

▪ Did misinformation in the 2016 election affect voting behavior?

▪ How does elite rhetoric impact belief in misinformation?
Potential Data Sources

- Twitter, Reddit, Facebook, other social media sites
- Data on disinformation campaigns shared by companies
- Lists of misinformation websites
- Metrics of engagement with websites
- Newsletters from misinformation websites we subscribed to (Spring 2022-Today)
- Replication data from existing work on misinformation
- Surveys -- Lucid, Mechanical Turk, etc. (Get in touch and we can pool questions)