Misinformation: going antiviral
CS 278 | Stanford University | Michael Bernstein
Last time

Social computing systems are great at eliciting a lot of opinions, but generally terrible and helping produce consensus toward a decision.

Different elicitation methods such as voting, liquid democracy, rating and comparison ranking provide possible solutions.

Deliberation is challenging because there are no stopping criteria. Structuring the rules of the debate can help overcome stalling and friction.

Crowdsourced democracy offers new tools for public participation, but need to be bought into by those in power.
Russian propaganda effort helped spread ‘fake news’ during election, experts say.

Russian President Vladimir Putin, in an interview with RT in 2013, said that he wanted to “break the Anglo-Saxon monopoly on the global information streams.”

How Syria's White Helmets became victims of an online propaganda machine.
Just recently…

Rumble Sends Viewers Tumbling Toward Misinformation
Research shows the emergent video platform can recommend conspiracy theories and other harmful content more often than not.

‘Belonging Is Stronger Than Facts’: The Age of Misinformation
Social and psychological forces are combining to make the sharing and believing of misinformation an endemic problem with no easy solution.

Facebook, Looking to Curb Misinformation, Is Starting to Prompt Users to Read Articles Before Sharing
By Todd Spangler
Social computing is in the thick of it

Social media didn’t create misinformation, but it did lower the friction associated with sharing and it made it easier for groups to find each other and share disinformation.

And even if we didn’t start the fire, we bear responsibility for what happens in our spaces.
The opportunity

“The digitization of information exchange, however, also makes the practices of disinformation detectable, the networks of influence discernable, and suspicious content characterizable.”
Today’s scope

Misinformation combines a number of threads in technology, design, politics, communication, and many other disciplines

I’ll be focusing on its intersection with the topics of this course: the design of social computing systems

Outline

How does misinformation originate and propagate?
Can we detect misinformation?
Can design help?
Poll: which design will better reduce the spread of disinformation?
From Whence Disinformation?
Let’s talk terms

When will I be referring to misinformation and when to disinformation throughout this lecture?

Misinformation = anything false

Might be a rumor, or something not necessarily intentionally false

Disinformation = the specific intent is to deceive

Often built around a true or plausible core, wrapped up in a misleading way
Why now?

What does the internet actually change here, compared to offline interaction?

The effort required to connect groups together has lowered, making it possible for identity-based groups to connect that might otherwise have not...

...where there might not otherwise have been a critical mass of members

...where it might otherwise have been too much effort
Why now?

This reduction in activation energy carries positives and negatives:

Positive: social movements that are forced underground, such as LGBTQ military service members, can connect with each other online [Sheng 2020]

Negative: hate groups can also connect with each other online
Why now?

When groups can convene and push their own narrative, it enables “common knowledge attacks on democracy” [Farrell and Schneir 2018]

In other words, it can destabilize democracy by flooding public debate and confusing our shared understandings and expectations, which are required for democracy to function.
Fingers pointed 👉

#1, “It’s trolls”: misinformation factories such as the Russian Internet Research Agency generate misinformation to harm us [Bail et al. 2020]

#2, “Post truth”: people default to motivated reasoning, which means that we are inclined to believe information that is consistent with our political views, and disinclined to believe information that contradicts our political views [Kahan 2017]. We are more loyal to political party than loyal to truth [Van Bavel and Pereira 2018]

While these explanations are not wrong, they are also not the explanations with the strongest evidence.
Yes, state actors exist.

Twitter retweet network for Black Lives Matter in 2016: Russian IRA (orange) both posed as BLM activists on the left, and infiltrated anti-BLM communities on the right  
[Arif, Stewart, and Starbird 2018; Elsden et al. 2019]
But is it just state actors?

Context is the Syrian Civil War and the White Helmets, a humanitarian response group. Anti-White Helmet accounts — pink — are dominant in volume, delegitimizing the White Helmets’ claims.

Not just bots and trolls: lots are journalists aligned with Syrian and Russian government interests, Syrian and Russian government members, and alt. media.

It looks more like activism than “just” disinformation.
But is it just state actors?

Disinformation campaigns often involve many **unwitting agents** who are unaware of their role and whose views and behaviors have been shaped by motivated actors [Bittman 1985, Starbird 2019, Elsden et al. 2019]

Cold War-era Soviet technique: sell journalists on anonymous tips aligned with their beliefs. Once one journalist took the bait, others became interested.
Orange arcs = blue accounts retweeting content from orange accounts = unwitting agents
Participatory Disinformation
The “Big Lie” during the 2020 Election and the January 6, 2021 Attack on the U.S. Capitol

[Starbird 2021: https://twitter.com/katestarbird/status/1390408145428643842]
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Repeated “rigged” messaging sets an expectation of voter fraud. This becomes a “frame” through which events are interpreted.

Online “crowds” generate false/misleading stories of voter fraud, reinforcing the frame. Sometimes intentionally. But often through misinterpretation.

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Political elites begin to mobilize and organize the audiences.

Participatory Disinformation

The “Big Lie” during the 2020 Election and the January 6, 2021 Attack on the U.S. Capitol

presented by
Kate Starbird, UW, HCDE
Center for an Informed Public

Rallies

#StopTheSteal

Protests

January 6 Attack on Capitol

[Starbird 2021: https://twitter.com/katestarbird/status/1390408145428643842]
Misinformation is a collaborative effort between producers and the audience. [Elsden et al. 2019]

Political Elites

Repeated "rigged" messaging sets an expectation of voter fraud. This becomes a "frame" through which events are interpreted.

"Grassroots" activities and social media can help amplifying the frame up to the political elites.

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Political elites echo false/misleading stories of voter fraud, reinforcing the frame.

Protests and "Stop the Steal" begin to mobilize and organize the audiences.

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January 6 Attack on Capitol

#StopTheSteal
While we are more likely to believe news that is concordant with our beliefs, the larger effect is whether we engage with higher-level reasoning instead of automatic reasoning [Pennycook and Rand 2021].

Better discernment of true vs. false news

Across a bunch of studies

Engaged in higher-level reasoning (= bigger effect) vs. Saw belief-concordant news (= smaller effect)
More like post-attention…

[Pennycook et al. 2021]

People rate accuracy as the single most important factor when deciding whether to share.

However, whether a headline is politically concordant has a much larger effect on sharing intention than the headline’s accuracy.

[Grinberg et al. 2019]

So what gives?
More like post-attention...

[Pennyc0ok et al. 2021]

Theory: we don’t pay attention to accuracy, and are more focused on pleasing followers or signaling group membership.

Evidence: focusing participants’ attention on accuracy before seeing a headline reduces sharing of false headlines by half.

<table>
<thead>
<tr>
<th></th>
<th>% of people likely to share false headline</th>
</tr>
</thead>
<tbody>
<tr>
<td>control</td>
<td>30%</td>
</tr>
<tr>
<td>primed</td>
<td>20%</td>
</tr>
</tbody>
</table>

More like post-attention…

[Pennycook et al. 2021]
What about deepfakes?

Generative AI models can create potentially plausible fakes

But people can still distinguish fakes from real images three quarters of the time, even with state of the art models [Zhou, Gordon, et al. 2019]

And very simple transformations can convince easily
How much do we consume?

Most people rarely see misinformation.

National sample of mobile, desktop, and TV consumption: misinformation is 0.15% of Americans’ media diet [Allen et al. 2020]

The average US adult saw ~1 misinformation story in the 2016 election [Hunt and Gentzkow 2017]

Exposure to misinformation is highly concentrated [Guess, Nyhan, and Reifler 2020]: 1% of people account for 80% of exposures to misinformation [Grinberg et al. 2019]

This exposure is typically pro-attitudinal [Guess, Nyhan and Reifler 2020]
How much do we share?

It's rare: most never share disinformation

In the 2016 election, >65 year olds were 7x more likely than teenagers to share disinformation, and conservatives were more likely to share than liberals [Guess, Nagler, and Tucker 2019]
Mainstream media amplify the message

Analysis of mail-in voter fraud disinformation suggested that social media played a smaller role than mainstream media in 2020:

1) Trump tweets

2) Mainstream media, trying to be neutral and avoid claims of anti-conservative bias, cover Trump’s claims and thereby spread them

[Benkler et al. 2020]
So, from whence disinformation?

Finger #1: “It’s trolls.”
Actually: “It’s motivated actors, who activate unwitting agents.”

Finger #2: “Post-truth”
Actually: “People care about being accurate, but generally aren’t paying attention to accuracy when they share.”

“It’s everywhere”
Actually: “Exposure and sharing is rare, but very concentrated.”
Classification
Machine learning

Some categories of misinformation (e.g., near copies of flagged articles) can be flagged automatically

Using AI to detect COVID-19 misinformation and exploitative content

May 12, 2020

The COVID-19 pandemic is an incredibly complex and rapidly evolving global public health emergency. Facebook is committed to preventing the spread of false and misleading information on our platforms. Misinformation about the disease can evolve as rapidly as the headlines in the news and can be hard to distinguish from legitimate reporting. The same piece of misinformation can appear in slightly different forms, such as an image modified with a few pixels cropped or augmented with a filter. And these variations can be
Factcheckers

Twitter and Facebook have started relying on third party fact checkers to decide whether an article is misinformation.

Facebook's Third-Party Fact-Checking Program

Fighting misinformation is an ever-evolving problem and we can't do it alone. In 2016, we started our third-party fact-checking program, working with IFCN-certified fact-checkers around the world to rate and review the accuracy of content on our platform.

The fact-checking program is one part of the three-part approach we take to addressing problematic content across the Facebook family of apps.

Updating our approach to misleading information

By Yoel Roth and Nick Pickles

Monday, 11 May 2020

In serving the public conversation, our goal is to make it easy to find credible information on Twitter and to limit the spread of potentially harmful and misleading content. Starting today, we’re introducing new labels and warning messages that will provide additional context and information on some Tweets containing disputed or misleading information related to COVID-19.
Factcheckers

Twitter and Facebook have started relying on third party fact checkers to decide whether an article is misinformation. However, this does not cover the long tail: Facebook’s partners comprise 26 fact checkers who cover 200 articles per month.

Fact checkers can also take days to do the research, by which time the article or video has spread widely.
Are there alternatives?

Representative samples of “crowd jurors” can be as accurate as fact checkers and much faster [Allen et al. 2020]

But, allowing anyone to participate can make the flagging another lever for politically motivated groups.
Why is classification so hard?

For one, fact checkers are thorough. More centrally, much disinformation isn’t entirely made up. It’s often a slant on a true story, walking the line between truth and falsehood.

So what do we do, if most stories don’t have a clear “true”/“false” line? What do we remove?
### Twitter’s criteria

<table>
<thead>
<tr>
<th>Misleading Information</th>
<th>Propensity for Harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>Removal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Disputed Claim</th>
<th>Propensity for Harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Label</td>
<td>Warning</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unverified Claim</th>
<th>Propensity for Harm</th>
</tr>
</thead>
<tbody>
<tr>
<td>No action</td>
<td>No action*</td>
</tr>
<tr>
<td>Moderate</td>
<td>Severe</td>
</tr>
</tbody>
</table>
Disinformation campaigns
[Starbird, Arif, and Wilson 2019]

Instead of classifying individual pieces of content, we can study and classify disinformation campaigns — a collection of information actions.

1) Is this campaign pushing a false narrative?

Then, classify:

2) Is this article a part of this disinformation campaign?

This way, the decision can be made on the aggregation of actions, and a classifier only needs to assign the story to the campaign.
Interventions
Reduce feed ranking

Platforms can (temporarily) reduce the feed ranking of links that might be disinformation, slowing their spread while fact checkers review it.

Ex: Article is lower in your Facebook feed, video is recommended less often on YouTube.

Pros: walks a line between removal and unconstrained spread.

Cons: opaque, unclear when it’s happening, likely too late once other media start reporting on it.
Correction: “Well actually”

Early research suggested that fact corrections could backfire and reinforce incorrect beliefs [Nyhan and Reifler 2010].

But, recent work fails to replicate the effect and suggests that people do revise beliefs after a correction [Wood and Porter 2019; Guess and Coppock 2018].

There does seem to be one negative of correction, though: getting corrected leads people to decrease the quality and increase the political slant and toxicity of future content [Mosleh et al. 2021].
An intervention gallery
An intervention gallery
An intervention gallery
An intervention gallery

CHRISTINA BOBB: Trump won. MSM hopes you don’t believe your eyes.
Implied truth effect

Labeling some stories as false leads people to believe that everything not explicitly labeled as false...is true. [Pennycook et al. 2020]

This is problematic when fact checkers can only check a tiny percentage of all content on the site.
Priming accuracy

Bringing attention to the accuracy of information shared on Twitter improves the quality of news shared later [Pennycook et al. 2021]

Why? Recall: we’re not in a post-truth world, where people don’t care about accuracy. We instead tend to be more focused on other motivators, like pleasing our followers.
Priming accuracy in practice

IrrationalLabs @IrrationalLabs · Feb 3
We put a short prompt on videos that reminded people to think about the accuracy of the content they were watching. And then - when people went to share the video - we reminded them again that the video was flagged & asked them if they were sure they wanted to share. 3/7

IrrationalLabs @IrrationalLabs · Feb 3
In addition to successfully reducing shares by 24%, our intervention also reduced likes by 7%, and views by 5%. 6/7

https://twitter.com/IrrationalLabs/status/1357033901311451140
Back to our question: which design will better reduce the spread of disinformation?
Facebook’s arc

fact check

related articles

fact check

Jeff Smith shared a link
9:37 AM
Possibly false headline about aliens coming to Earth
False News Site
Disputed by Fact Checker A and Fact Checker B

Like
Comment
Share

Jeff Smith shared a link
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Possibly false headline about aliens coming to Earth
False News Site

Like
Comment
Share

Related Articles
Fact Checker A
Headline disputing false article about aliens
Fact Checker B
Another headline disputing false article about aliens

Alex Raj posted a photo
Thursday at 2:04 PM
False Information
Checked by independent fact-checkers
See Why
There’s much more to say on this topic...

What do you think the platforms should do?

There exists vastly more conservative-leaning disinformation than liberal-leaning disinformation [Hunt and Gentzkow 2017]. So the issue is hot-button political.

There are not enough fact checkers to test more than a minuscule percentage of all reported stories. What do we do?

This question intersects freedom of speech issues and regulation.
Summary

misinformation != disinformation

Misinformation is often created and amplified collectively by motivated actors and their audience

People share misinformation when they are not paying enough attention to accuracy cues

Fact checkers are often slow; but, it might be possible to classify campaigns rather than information items
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