CS 4873: Computing, Society & Professionalism

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Week 14: Algorithms, Manipulation, and (Lack of) Control
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A Lack of Control

- Tech companies owning profuse amounts of data
    - Companies control monopolies (Amazon, Facebook, and Google)

- Tech companies opaquely sharing data with partners

- Algorithms influencing our experiences online

Some Examples

- Today algorithms can shape what you buy, where you live, whether you get a job or a bank loan, and many other aspects of your life.

- Autocomplete now predicts your words in text messages, Gmail, and search terms.

- Even Tinder is controlled by algorithms — did you pick your love or did Tinder?

- Do you pick what you watch or buy if more than 80 percent of what you watch on Netflix and 30 percent of purchases on Amazon are the result of an algorithm?

- **Do we still have free will?**

How Algorithms Are Shaping
Our Lives and How We
Can Stay in Control

A HUMAN'S
GUIDE TO MACHINE
INTELLIGENCE

KARTIK HOSANAGAR

Why?

- Nature vs. nurture
  - Algorithmic decisions hardwired by an engineer
  - Now, machine learning – we don't have to hard code in all the rules, let the system learn the relevant rules by learning from data

- Nature is the human code, the code that is essentially given to the algorithm or that's part of the algorithm, like the equivalent of genetic code. So it's the nature of the algorithm. And nurture is the data from which it learns.

Case Study 1

Impacting Real World Outcomes: The Positive Side

- The use of digital media to discuss politics during election times has also been the subject of various studies, covering the last four U.S. Presidential elections (Adamic and Glance, 2005; Diakopoulos and Shamma, 2010; Bekafigo and McBride, 2013; Carlisle and Patton, 2013; DiGrazia, et al., 2013; Wang, et al., 2016)

- Most work focuses on the positive effects of social media such as incrementing voting turnout (Bond, et al., 2012) or exposure to diverse political views (Bakshy, et al., 2015) contributed to the general praise of these platforms as a tool to foster democracy and civil political engagement (Shirky, 2011; Loader and Mercea, 2011; Effing, et al., 2011; Tufekci and Wilson, 2012; Tufekci, 2014; Yang, et al., 2016)

Social bots distort the 2016 US Presidential Election Online Discussion

- Quantitative investigation of how the presence of social media bots, defined as algorithmically driven entities that on the surface appear as legitimate users, affected political discussion around the 2016 U.S. Presidential election

- Data: over 20 million tweets generated between 16 September and 21 October 2016 by about 2.8 million distinct users; data prior to the three Presidential debates

- Findings:
  - One fifth of Twitter conversations related to the election generated by bots
  - Network analysis and embeddedness of human and bot connections revealed that bots hampered democratized discussion

Ecosystem of social media bots

- Search Twitter for phrases/hashtags/keywords and automatically and retweet them
- Automatically reply to tweets that meet a certain criteria
- Automatically follow any users that tweet something with a specific phrase/hashtag/keyword
- Automatically follow back any users that have followed the bot
- Automatically follow any users that follow a specified user
- Automatically add users tweeting about something to public lists
- Search Google (and other engines) for articles/news according to specific criteria and post them, or link them in automatic replies to other users
- Automatically aggregating public sentiment on certain topics of discussion
- Buffer and post tweets automatically
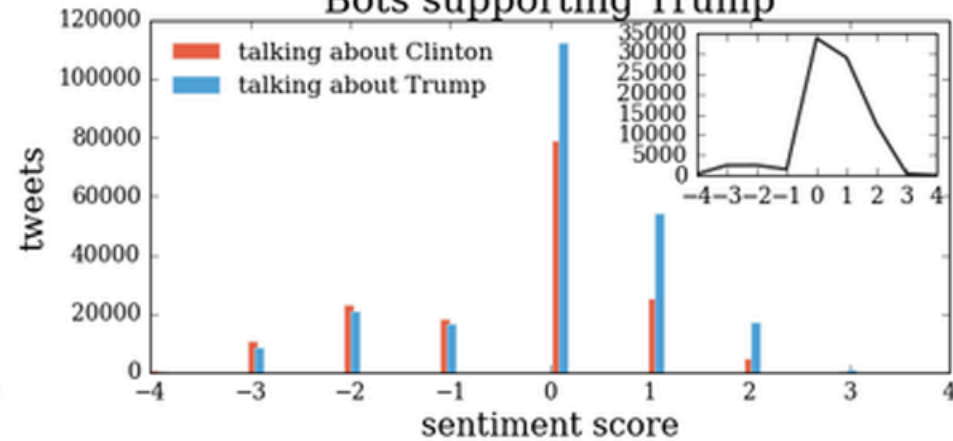
The challenges of bots

- Bots are almost entirely anonymous and can be easily bought in secret from companies or individual programmers

- Source code available for developing your own bot

- Can be employed as part of an organized effort
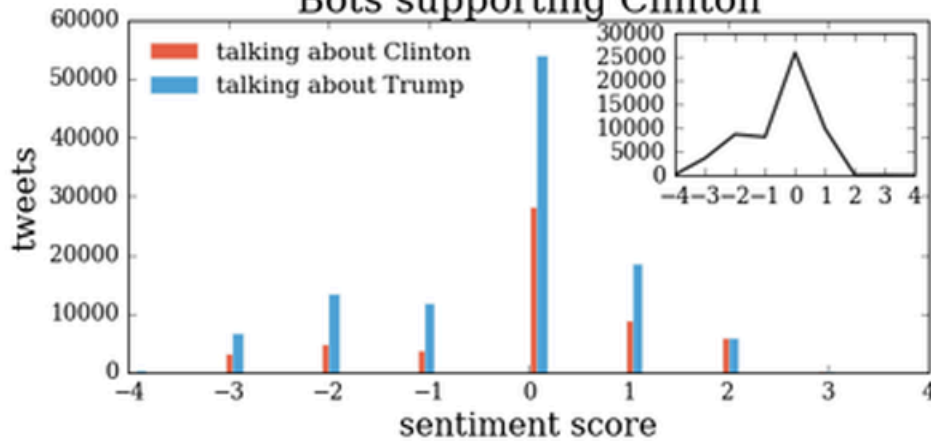
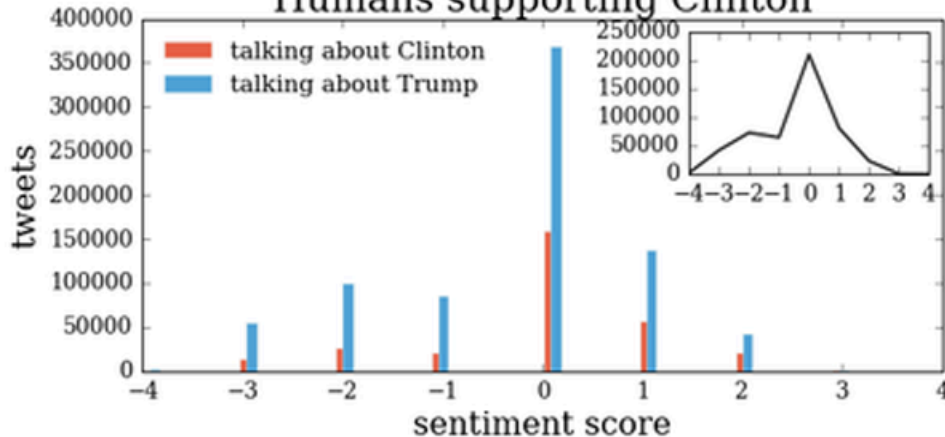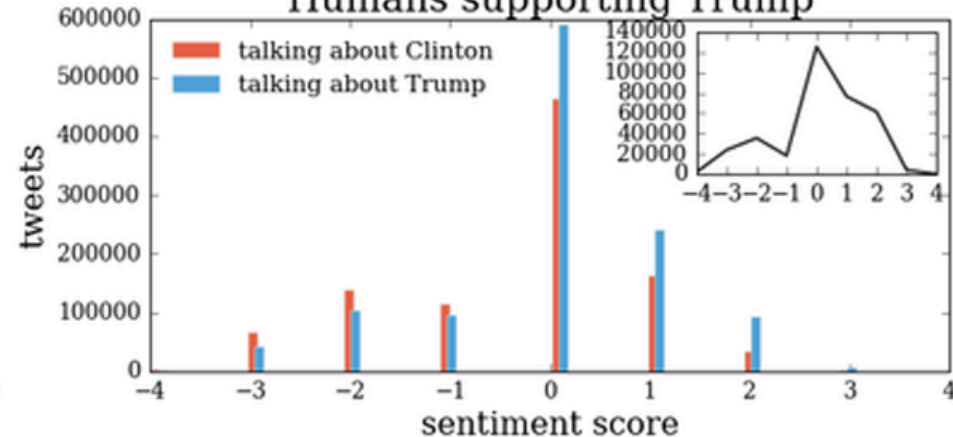# Similar results

- Oxford researchers found that "highly automated accounts — the accounts that tweeted 450 or more times with a related hashtag and user mention during the period before election — generated close to 18 percent of all Twitter traffic about the presidential election."

- They also noted that bots tend to circulate negative news much more effectively than positive reports.

Connectivity

First Evidence That Social Bots Play a Major Role in Spreading Fake News

Automated accounts are being programmed to spread fake news, according to the first systematic study of the way online misinformation spreads

by Emerging Technology from the arXiv   August 7, 2017

Fake news and the way it spreads on social media is emerging as one of the great threats to modern society. In recent times, fake news has been used to manipulate stock markets, make people choose dangerous health-care options, and manipulate elections, including last year's presidential election in the U.S.

Clearly, there is an urgent need for a way to limit the diffusion of fake news. And that raises an important question: how does fake news

But we still don't quite know if the bots really influenced election outcomes…. We will perhaps never know (don't have data on a counter-factual situation)

Discussion Point 1:

Should social media platforms censor the "free speech" of harmful bots?

Bots Generate False News

- Shao et al identified false news sites: infowars.com, breitbart.com, politicususa.com, and theonion.com.

- Authors then monitored some 400,000 claims made by these websites and studied the way they spread through Twitter. They did this by collecting some 14 million Twitter posts that mentioned these claims.

- At the same time, the team monitored some 15,000 stories written by fact-checking organizations and over a million Twitter posts that mention them.

- Next, they looked at the Twitter accounts that spread this news

- Social bots play a key role in the spread of false news

Media's Next Challenge: Overcoming the Threat of Fake News

Jim Rutenberg

MEDIATOR   NOV. 6, 2016

Spielberg
Turbulent

A Failure

In AT&T
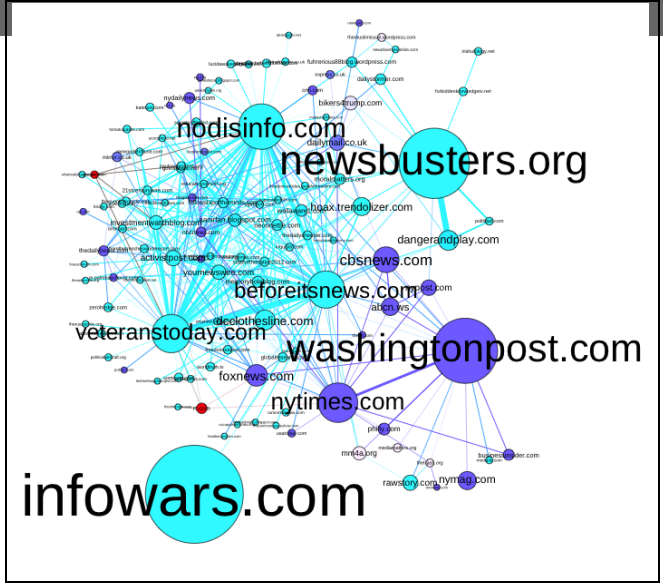With Trun

Terrorism

Russia Ind

See More

- Lazer et al. defined fake news outlets as those that have the trappings of legitimately produced news but "lack the news media's editorial norms and processes for ensuring the accuracy and credibility of information."

- The attribution of "fakeness" is thus not at the level of the story but at that of the publisher.

o The context: in recent years, alternative media outlets have appropriated social media platforms for their perceived economic and political reach and for hosting inaccurate or under-sourced content

o Goals:

- Provide a systematic lens for exploring the production of a certain type of "fake news"—alternative narratives of man-made crisis events

- Examine the production of alternate narratives (rumors, conspiracy theories) through Twitter and across the external websites that Twitter users reference as they engage in these narratives

	497
	313
86	177
91	153
53	117

Purple = mainstream media; Aqua = alternative media; Red = government controlled media

Leaning	Description
U.S. Alt Right	U.S. focused, anti-mainstream media, pro-Christian, anti-LGBT, anti-feminist, anti-globalist, climate change denying
U.S. Alt Left	U.S. focused, anti-mainstream media, anti-corporatist, critical of police, pro-prison reform, pro-BlackLivesMatter
International Anti-Globalist	Internationally focused, anti-globalist or anti-New World Order/Cabal, anti-corporatist, conspiracy-focused
White Nationalist and/or Anti-Semitic	primarily white-nationalist or anti-Semitic positions
Muslim Defense	primarily challenges mainstream narratives of terrorist attacks by Muslims
Russian Propaganda	primarily supports Russian interests, anti-globalist

ink = U.S. Alt-Right; Aqua = U.S. Alt-Left; Green = Intl. Anti-Globalist; Black = White Nationalist/Anti-Semitic; White = other

- Strong political agendas underlying many of alternative narratives and the domains that hosted them
- More than half of the alternative media sites were coded as primarily motivated by a political agenda— with the conspiracy theories serving a secondary purpose of attracting an audience and reflecting or forwarding that agenda

Fake news on Twitter during the 2016 U.S. presidential election

Nir Grinberg[1,2]*, Kenneth Joseph[3]*, Lisa Friedland[1]*,
Briony Swire-Thompson[1,2], David Lazer[1,2]†

The spread of fake news on social media became a public concern in the United States after the 2016 presidential election. We examined exposure to and sharing of fake news by registered voters on Twitter and found that engagement with fake news sources was extremely concentrated. Only 1% of individuals accounted for 80% of fake news source exposures, and 0.1% accounted for nearly 80% of fake news sources shared. Individuals most likely to engage with fake news sources were conservative leaning, older, and highly engaged with political news. A cluster of fake news sources shared overlapping audiences on the extreme right, but for people across the political spectrum, most political news exposure still came from mainstream media outlets.

I n 1925, *Harper's Magazine* published an article titled "Fake news and the public," decrying the ways in which emerging technologies had made it increasingly difficult to separate rumor from fact (*1*). Nearly a century later, fake news has again found its way social media have described its spread within platforms (*5*, *6*) and highlighted the disproportionate role played by automated accounts (*7*), but they have been unable to make inferences about the experiences of ordinary citizens.

Outside of social media, fake news has been

We distinguished among three classes of fake news sources to allow comparisons of different operational definitions of fake news. The three classes correspond to differences in methods of generating lists of sources as well as perceived differences in the sites' likelihoods of publishing misinformation. We labeled as "black" a set of websites taken from preexisting lists of fake news sources constructed by fact-checkers, journalists, and academics (*8*, *9*) who identified sites that published almost exclusively fabricated stories [see supplementary materials (SM) section S.5 for details]. To measure fake news more comprehensively, we labeled additional websites as "red" or "orange" via a manual annotation process of sites identified by Snopes.com as sources of questionable claims. Sites with a red label (e.g., Infowars.com) spread falsehoods that clearly reflected a flawed editorial process, and sites with an orange label represented cases where annotators were less certain that the falsehoods stemmed from a systematically flawed process. There were 171 black, 64 red, and 65 orange fake news sources appearing at least once in our data.

Voters on Twitter

To focus on the experiences of real people on Twitter, we linked a sample of U.S. voter reg-

MEDIA 09/27/2017 08:53 pm ET

Mark Zuckerberg: 'I Regret' Rejecting Idea That Facebook Fake News Altered Election

He admitted this after Donald Trump claimed that Facebook was "always anti-Trump."

By Carla Herreria

Facebook CEO Mark Zuckerberg admitted on Wednesday that he was wrong to dismiss the idea that fake news shared on the giant social network affected last year's presidential election.

Zuckerberg's statement came in response to a tweeted attack from President Donald Trump hours earlier. Trump claimed that Facebook was "always anti-Trump" and accused it of colluding with news outlets that the president has deemed to be "fake news."

Steps being taken

- Google announced in Nov 2016 that it would ban websites that peddle fake news from using its online advertising service.

- Facebook after initial denial, announced updating the language in its Audience Network policy, which already says it will not display ads in sites that show misleading or illegal content, to include fake news sites.
  - Currently a significant research agenda to assess veracity of information shown on News Feed

Case Study 2

The Cambridge Analytica-Facebook Scandal

- The data analytics firm used personal information harvested from more than 50 million Facebook profiles without permission to build a system that could target US voters with personalized political advertisements based on their psychological profile

- Facebook received a number of warnings about its data security policies in recent years and had known about the Cambridge Analytica data breach since 2015, but only suspended the firm and the Cambridge university researcher who harvested user data from Facebook earlier this month

Brexit and 2016 Presidential election links

- During the Brexit referendum, a digital services firm linked to Cambridge Analytica received a £625,000 payment from a pro-Brexit campaign organization

- In the summer of 2016 Cambridge Analytica caught traction in Trump Tower. One of the top campaign officials reached out to Cambridge for help building a general election-style data operation.
  - Trump son-in-law Jared Kushner suggested that was at his direction in a post-campaign interview with Forbes magazine.

Consequences

- Billions of dollars have been wiped off Facebook's stock market valuation as a growing #DeleteFacebook movement and regulatory fears have spooked investors.

- Facebook is being invested by the FTC.

- Advertisers are pulling ads from Facebook, companies are eliminating Facebook log-in functions.
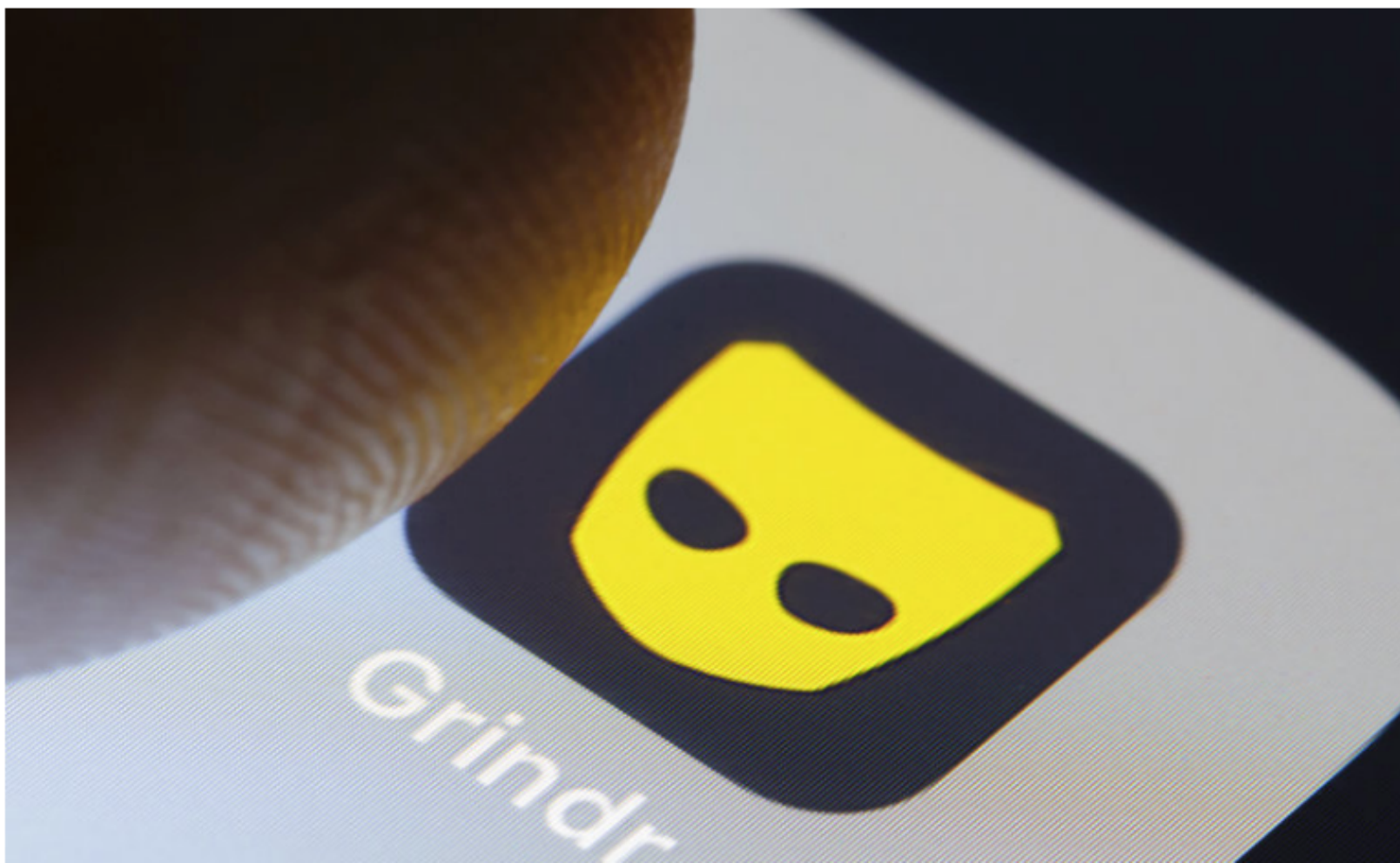
Grindr Admits It Shared HIV Status Of Users

April 3, 2018 · 3:47 AM ET

SCOTT NEUMAN 🐦

CAMILA DOMONOSKE 🐦

A Privacy-Focused Vision for Social Networking

MARK ZUCKERBERG · WEDNESDAY, MARCH 6, 2019 🌐

My focus for the last couple of years has been understanding and addressing the biggest challenges facing Facebook. This means taking positions on important issues concerning the future of the internet. In this note, I'll outline our vision and principles around building a privacy-focused messaging and social networking platform. There's a lot to do here, and we're committed to working openly and consulting with experts across society as we develop this.

•••

Over the last 15 years, Facebook and Instagram have helped people connect with friends, communities, and interests in the digital equivalent of a town square. But people increasingly also want to connect privately in the digital equivalent of the living room. As I think about the future of the internet, I believe a privacy-focused communications platform will become even more important than today's open platforms. Privacy gives people the freedom to be themselves and connect more naturally, which is why we build social networks.

Discussion Point 2:

Is it the social media corporations' job to figure out if their platform is really having a negative (or positive) impact on real world outcomes? Is it unethical if they don't do so?

Analyze using an act utilitarian and a social contract theory perspective.

Hosanagar's Algorithmic Bill of Rights

- The Algorithmic Bill of Rights addresses some key protections consumers can and should expect

Hosanagar's Algorithmic Bill of Rights

- Transparency of data appropriation
  - Use of Facebook data in hiring

- Transparency with regard to the actual decisions
  - Why was the loan denied?

- User control
  - Users at the very least should have some ability to turn on or turn off some of these systems, for example, to be able to tell a smart speaker 'Don't listen to me right now' or 'Don't listen until I say I'm ready for you to listen.'
  - This third pillar is essentially around some feedback loop where users can have some impact on algorithmic choice

- Formal audits
  - For large companies, before they deploy their algorithms they actually should audit