

CS 4001: Computing, Society & Professionalism

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Week 13: Algorithms and Control
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Ethics of Algorithms

Algorithms, Control, and Manipulation

- What happens when powerful communication tools (e.g., social media, digital technologies) are exploited to
 - manipulate social engagement and discussion
 - to change the public perception
 - to manipulate what we see, read, consume, and learn
 - to change real world outcomes and events, e.g., politics



Case Study 1

Reasoning about invisible algorithms in the News Feed

- What we see on social media platforms is not the raw information, but rather curated by “invisible” algorithms
 - E.g., Facebook’s News Feed
- These algorithms shape (even manipulate?) users’ experiences but many users remain unaware of their presence
- Study with 40 users about their perceptions of the News Feed algorithm

Findings

- More than half (62%) were not aware of the presence of the algorithm
- Initial reactions were surprise and anger
- Developed a system FeedViz to show the differences between the raw feed and the curated feed
- Users were upset when content from close friends and family were not shown
- Missing stories attributes to friends' decision to exclude them
- Longitudinal study (2-6 months later), algorithmic awareness led to more more active engagement on the platform

“It’s kind of intense, it’s kind of waking up in ‘the Matrix’ in a way. I mean you have what you think as your reality of like what they choose to show you. [...] So you think about how much, kind of, control they have...” (P19).

“I feel like I’m a mouse, a little experiment on us. To me, that’s the price I pay to be part of this free thing. It’s like we’re a part of their experiment and I’m okay with it” (P21).

“I have like 900 and some friends and I feel like I only see 30 of them in my News Feed. So I know that there’s something going on, I just don’t know what it is exactly” (P26).

“[My friends] all don’t get to see everything, and I’ve always been suspicious of [Facebook], on how they choose who gets to see it, who doesn’t” (P28).

“I have never seen her post anything! And I always assumed that I wasn’t really that close to that person, so that’s fine. What the hell?!” (P3).

“Well, I’m super frustrated [pointing to a friend’s story], because I would actually like to see their posts” (P3).

“I think she needs support for that; if I saw it, then I would say something [to support her]” (P8).

Algorithm Awareness

How the news feed on Facebook decides what you get to see.

October 21, 2014

Increasingly, it is algorithms that choose which products to recommend to us and algorithms that decide whether we should receive a new credit card. But these algorithms are buried outside our perception. How does one begin to make sense of these mysterious hidden forces?

The question gained resonance recently when Facebook revealed a scientific study on “emotion contagion” that had been conducted by means of its news feed. The study showed that displaying fewer positive updates in people’s feeds causes them to post fewer positive and more negative messages of their own. This result is interesting but disturbing,



Connected by the Cloud

The Cloud ▾

What Exactly Is The Internet of Things?

This Budding Startup Is Changing How You Buy Flowers

Why This Is the Most Important New Technology in Decades

BUSINESS FACEBOOK

Here's How Facebook's News Feed Actually Works

Victor Luckerson @VLuck | July 9, 2015



How a controversial feature grew into one of the most influential products on the Internet

There are two very important rooms that will help determine the



In defense of algorithmic curation

Class Discussion Point 1

All platforms use algorithmic curation that is invisible to the user – Netflix was the first. Do you expect such shock if the same study was done for the algorithms in Netflix and Amazon? Why or why not?



Class Activity 1



Case Study 2

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

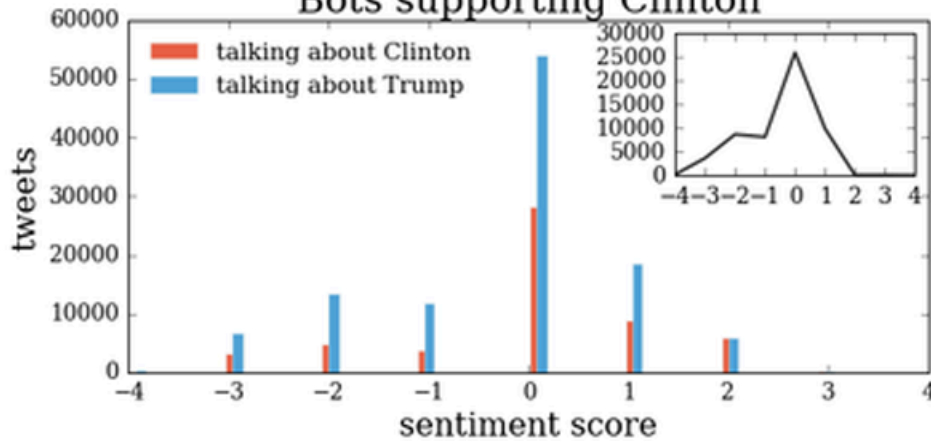
- Search Twitter for phrases/hashtags/keywords and automatically and retweet them
- Automatically reply to tweets that meet a certain criteria
- Automatically follow any users that tweet something with a specific phrase/hashtag/keyword
- Automatically follow back any users that have followed the bot
- 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

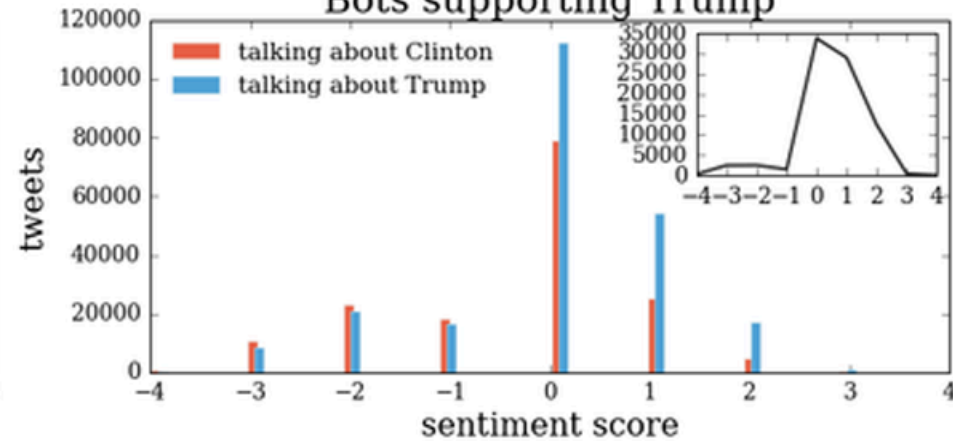
- Bots are almost entirely anonymous and can be easily bought in secret from companies or individual programmers
- Source code available for developing your own bot
- Can be employed as part of an organized effort

Results

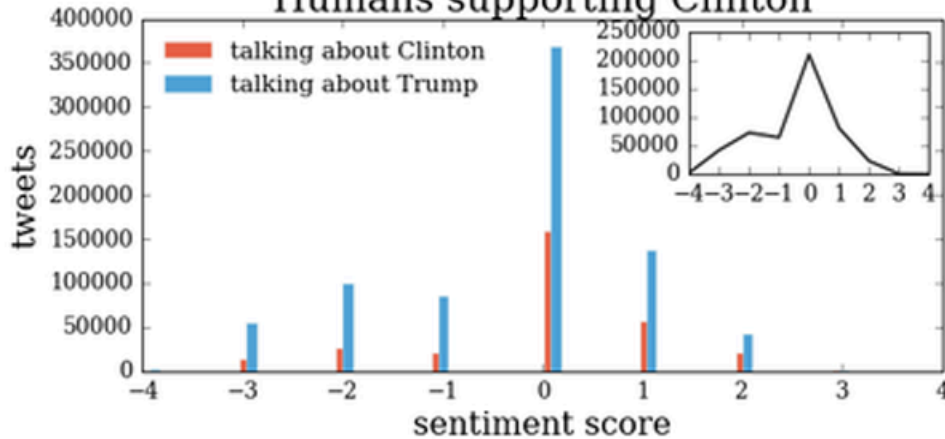
Bots supporting Clinton



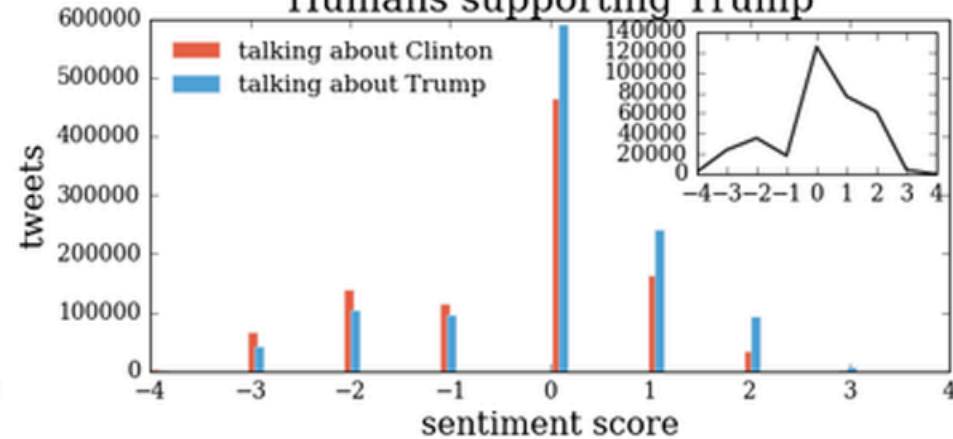
Bots supporting Trump



Humans supporting Clinton



Humans supporting Trump



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)



Class 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?

Bots Generate False News

- Shao et al identified false news sites: infowars.com, Breitbart.com, PoliticusUSA.com, and The Onion.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 Tru

Terrorism

Russia In

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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




Class Discussion Point 3

But should the algorithms behind social media platforms (e.g., those that spread false news) be regulated in some common/principled way? Who should define what these regulations should be?



Class Discussion Point 4

If these regulations take the form of formal legislation, is that enough? What challenges still remain?



Legislation does not overcome international borders. Given the recent conjectures and evidence around how foreign powers have manipulated the spread of false news prior to the 2016 Presidential elections, it's hard to see how this would work.



Case Study 3

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 investigated by the FTC.
- Advertisers are pulling ads from Facebook, companies are eliminating Facebook log-in functions.



Hilary Mason ✓

@hmason

Following

Ever used evite? Here's the data they are selling about you:
[oracle.com/webfolder/asse ...](https://oracle.com/webfolder/asse...) (via @mshron)

2:12 PM - 14 Aug 2015

236 Retweets 173 Likes



16

236

173





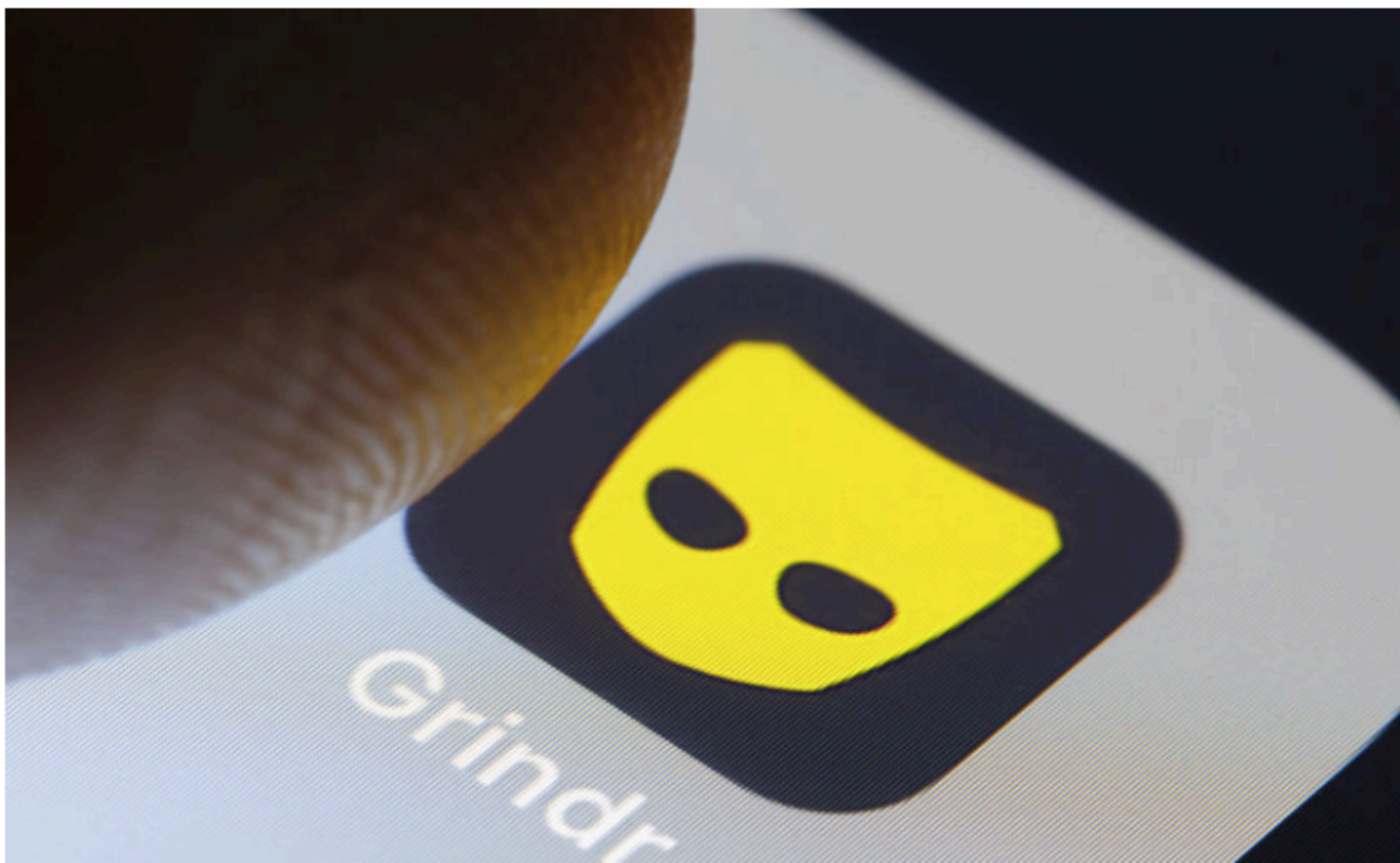
Grindr Admits It Shared HIV Status Of Users

April 3, 2018 · 3:47 AM ET

SCOTT NEUMAN



CAMILA DOMONOSKE





Class Activity 2