

# **People are not Bots**

How Researchers Delegitimize Social Movements

@MichaelKreil

url: <https://github.com/MichaelKreil/hope2020>



# data scientist data journalist

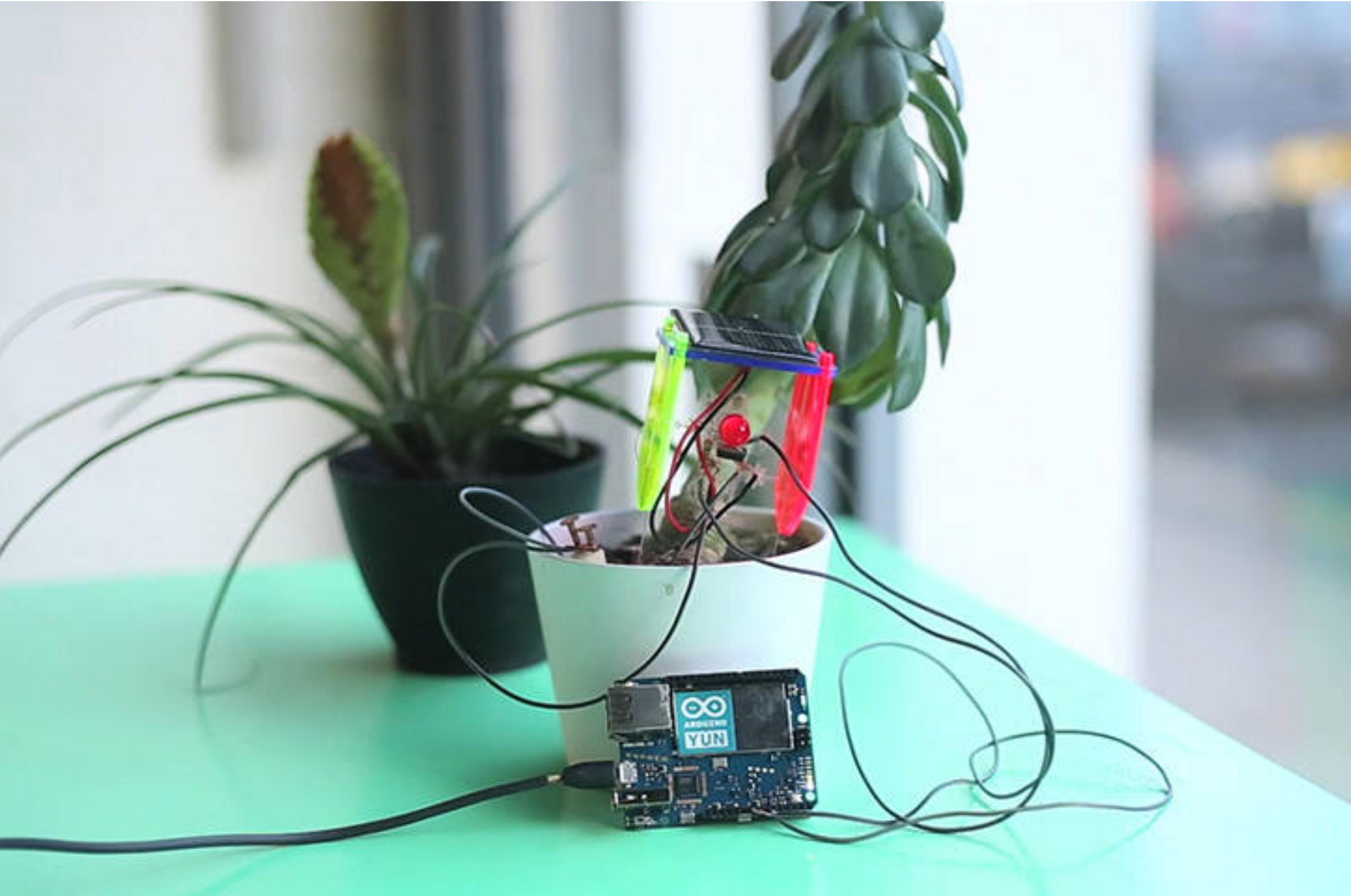
<https://michael-kreil.de>

# *Automated Pro-Trump Bots Overwhelmed Pro-Clinton Messages, Researchers Say*



**What are “Social Bots”?**

**“Social Bots” are automated accounts**



Just posted a photo [instagram.com/p/CDEb](https://instagram.com/p/CDEb)



Just posted a photo [instagram.com/p/CDEb](https://instagram.com/p/CDEb)



Just posted a photo [instagram.com/p/CDEb](https://instagram.com/p/CDEb)



Just posted a photo [instagram.com/p/CDEb](https://instagram.com/p/CDEb)



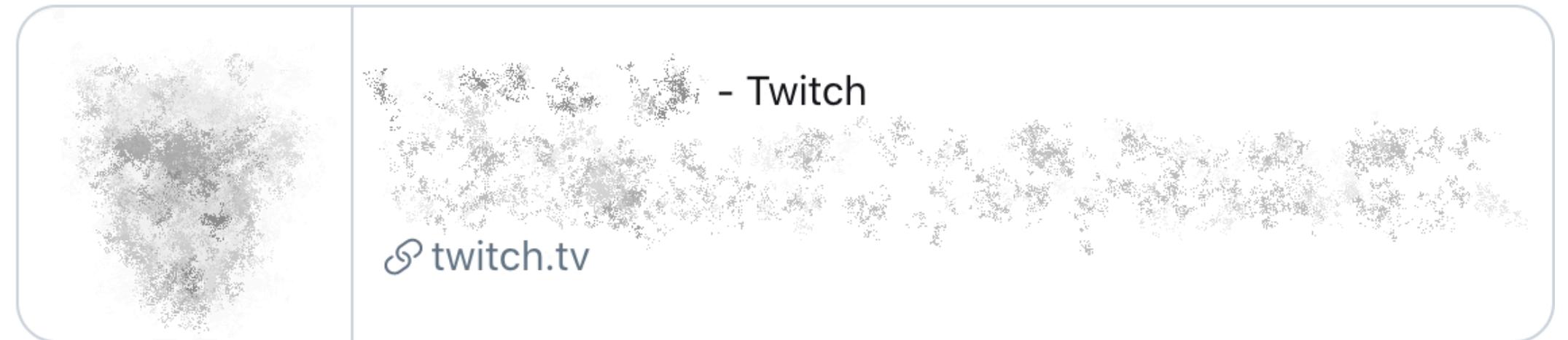
Just posted a photo [instagram.com/p/CDEb](https://instagram.com/p/CDEb)



Just posted a photo [instagram.com/p/CDEb](https://instagram.com/p/CDEb)



Check out my broadcast from my PlayStation 4! #PS4live (Fortnite) live at



· PlayStation®Network

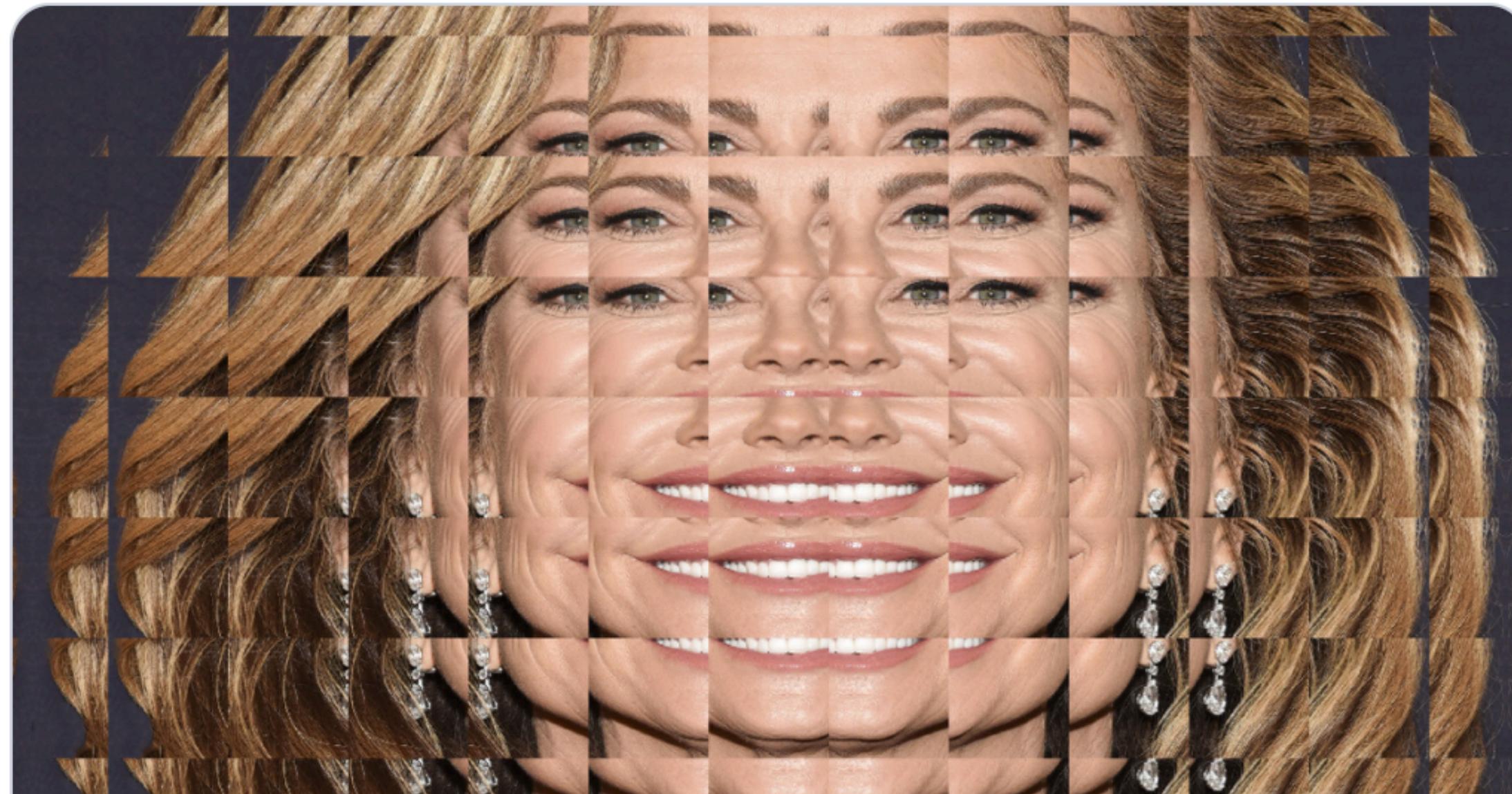
Posted:

[facebook.com/10000](https://facebook.com/10000)

· 23 Nov 2019 · Facebook



Fake accounts infest the world's social media platforms, deployed by governments, celebrities, criminals and entrepreneurs. Nearly 15% of Twitter's active users may be bots.



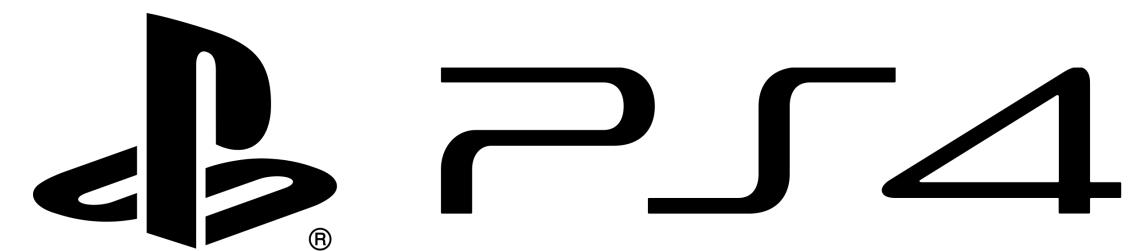
### The Follower Factory

Everyone wants to be popular online. Some even pay for it. Inside social media's black market.

[nytimes.com](http://nytimes.com)

“SocialFlow automatically delivers content to target audiences as soon as relevant conversations are gaining momentum.”

# “Social Bots” are automated accounts



**facebook**

**IFTTT**

**bitly**



**The Washington Post**

**The New York Times**

**BBC**

**The  
Guardian**

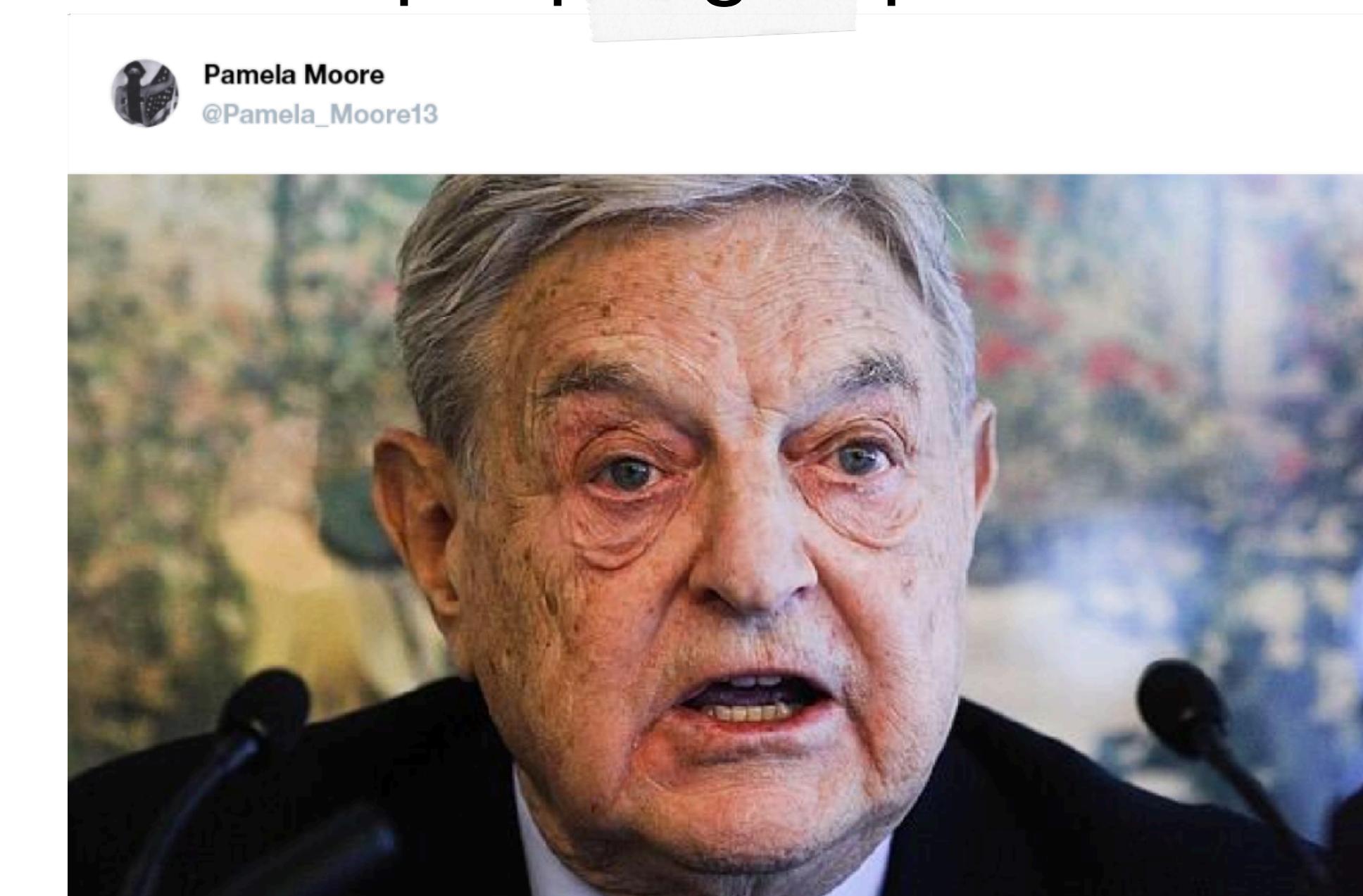
# Sock-Puppets are not “Social Bots”

Russian Internet Research Agency (IRA)  
used Sock-Puppets to impersonate people/groups.



RT if you also think that FBI Director Comey should be impeached for blocking the investigation & abetting a criminal. [pic.twitter.com/TWmpdEKaMT](https://pic.twitter.com/TWmpdEKaMT)

06 Nov 2016



RT if You think that President Trump should put George Soros on the FBI Most Wanted list!  
#MAGA [pic.twitter.com/0jKyMnEb72](https://pic.twitter.com/0jKyMnEb72)

11 Nov 2016

# The fantasy of human-like “Social Bots”

*“... mimicking human behavior ...”*

*“... elusive bots could easily infiltrate a population of unaware humans  
and manipulate them to affect their perception of reality ...”*

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## review articles

DOI:10.1145/2818717

**Today's social bots are sophisticated and sometimes menacing. Indeed, their presence can endanger online ecosystems as well as our society.**

BY EMILIO FERRARA, ONUR VAROL, CLAYTON DAVIS,  
FILIPPO MENCZER, AND ALESSANDRO FLAMMINI

# The Rise of Social Bots

BOTS (SHORT FOR software robots) have been around since the early days of computers. One compelling example of bots is chatbots, algorithms designed to hold a conversation with a human, as envisioned by Alan Turing in the 1950s.<sup>33</sup> The dream of designing a computer algorithm that passes the Turing test has driven artificial intelligence research for decades, as witnessed by initiatives like the Loebner Prize, awarding progress in natural language processing.<sup>a</sup> Many things have changed since the early days of AI, when bots like Joseph Weizenbaum's ELIZA,<sup>39</sup> mimicking a Rogerian psychotherapist, were developed as demonstrations or for delight.

Today, social media ecosystems populated by hundreds of millions of individuals present real incentives—including economic and political ones—

a [www.loebner.net/Prizef/loebner-prize.html](http://www.loebner.net/Prizef/loebner-prize.html)

to design algorithms that exhibit human-like behavior. Such ecosystems also raise the bar of the challenge, as they introduce new dimensions to emulate in addition to content, including the social network, temporal activity, diffusion patterns, and sentiment expression. A social bot is a computer algorithm that automatically produces content and interacts with humans on social media, trying to emulate and possibly alter their behavior. Social bots have inhabited social media platforms for the past few years.<sup>7,24</sup>

### Engineered Social Tampering

What are the intentions of social bots? Some of them are benign and, in principle, innocuous or even helpful: this category includes bots that automatically aggregate content from various sources, like simple news feeds. Automatic responders to inquiries are increasingly adopted by brands and companies for customer care. Although these types of bots are designed to provide a useful service, they can sometimes be harmful, for example when they contribute to the spread of unverified information or rumors. Analyses of Twitter posts around the Boston marathon bombing revealed that social media can play an important role in the early recognition and characterization of emergency events.<sup>11</sup> But false accusations also circulated widely on Twitter in the

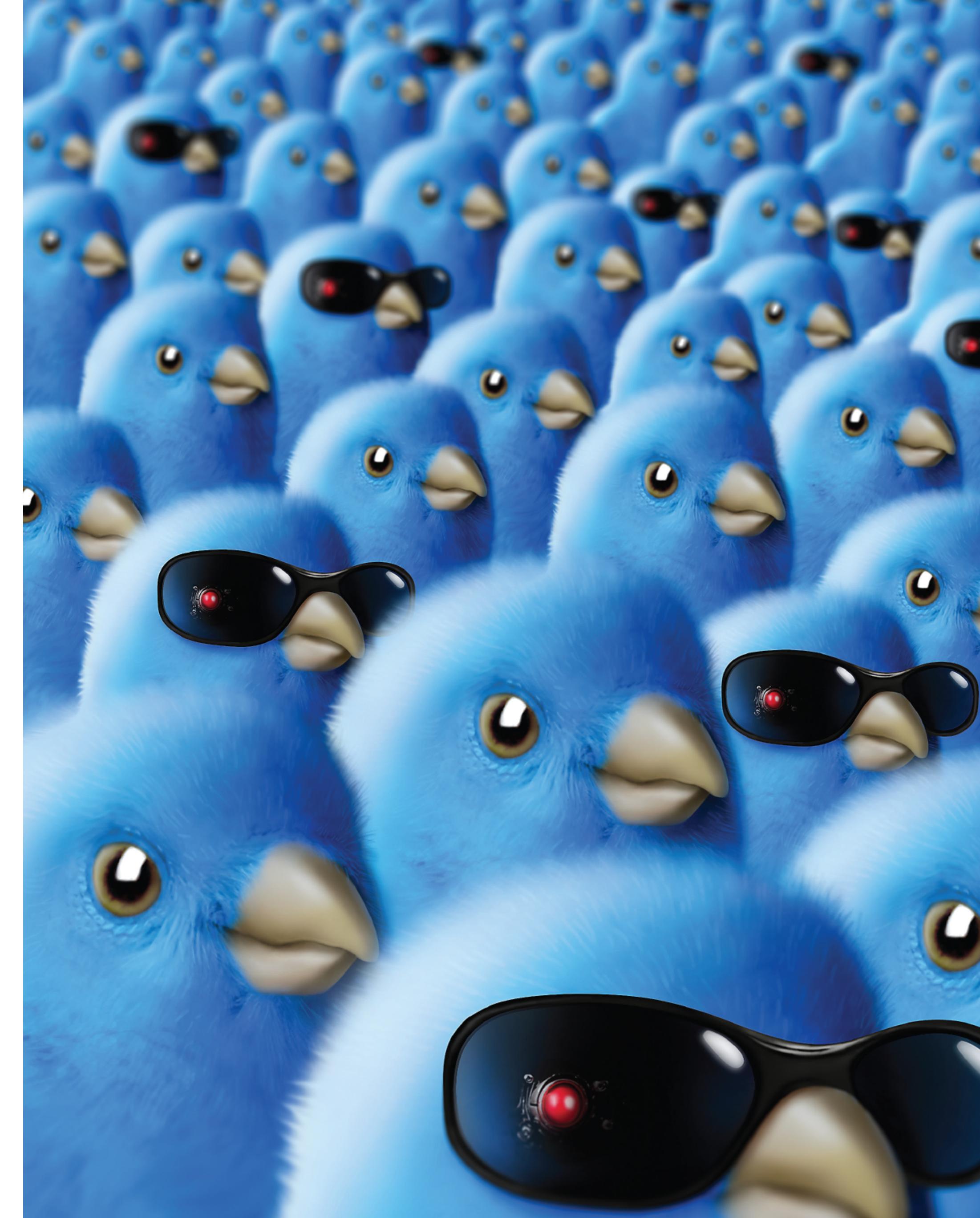
### » key insights

- Social bots populate techno-social systems: they are often benign, or even useful, but some are created to harm, by tampering with, manipulating, and deceiving social media users.
- Social bots have been used to infiltrate political discourse, manipulate the stock market, steal personal information, and spread misinformation. The detection of social bots is therefore an important research endeavor.
- A taxonomy of the different social bot detection systems proposed in the literature accounts for network-based techniques, crowdsourcing strategies, feature-based supervised learning, and hybrid systems.

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<https://moviesanywhere.com/movie/terminator-3-rise-of-the-machines>



<https://cacm.acm.org/magazines/2016/7/204021-the-rise-of-social-bots/fulltext>

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**EMILIO FERRARA / ALESSANDRO FLAMMINI**  
**THE RISE OF SOCIAL BOTS**

They mimicking human behavior,  
infiltrate the population and  
manipulate our perception of reality.



**“Social Bots”** are accounts  
that use automation.

“Social Bots” during  
Brexit referendum?

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## Beware the Brexit bots: The Twitter spam out to swing your vote



TECHNOLOGY 21 June 2016, updated 22 June 2016

By **Chris Baraniuk**



<https://www.newscientist.com/article/2094629-beware-the-brexit-bots-the-twitter-spam-out-to-swing-your-vote/>

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# Bots, #StrongerIn, and #Brexit: Computational Propaganda during the UK-EU Referendum

COMPROP RESEARCH NOTE 2016.1

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## ABSTRACT

*Bots are social media accounts that automate interaction with other users, and they are active on the StrongerIn-Brexit conversation happening over Twitter. These automated scripts generate content through these platforms and then interact with people. Political bots are automated accounts that are particularly active on public policy issues, elections, and political crises. In this preliminary study on the use of political bots during the UK referendum on EU membership, we analyze the tweeting patterns for both human users and bots. We find that political bots have a small but strategic role in the referendum conversations: (1) the family of hashtags associated with the argument for leaving the EU dominates, (2) different perspectives on the issue utilize different levels of automation, and (3) less than 1 percent of sampled accounts generate almost a third of all the messages.*

## FROM SOCIAL BOTS TO POLITICAL BOTS

A growing number of political actors and governments worldwide are employing both people and bots to engage in political conversations online.[1]–[3] Bots can perform tasks that range from legitimate, like generating a large amount of benign tweets that deliver news or update feeds, to more malicious, like spreading spam by delivering appealing text content with the link-directed malicious content. Whatever

such as screen names or profile pictures. Such accounts have become known as “Twitter eggs” because the default profile picture on the social media site is of an egg. While social media users get access from front-end websites, bots get access to such websites directly through a code-to-code connection, mainly through the site’s wide-open application programming interface (API) that enables real-time posting and parsing of information.

Bots are versatile, cheap to produce, and ever evolving. “These bots,” argues Rob Dubbin, “whose DNA can be written in almost any modern programming language, live on cloud servers, which never go dark and grow cheaper by day.”[7] Unscrupulous internet users now deploy bots beyond mundane commercial tasks like spamming or scraping sites like eBay for bargains. Bots are the primary applications used in carrying out distributed denial-of-service and virus attacks, email harvesting, and content theft. A subset of social bots are given overtly political tasks and the use of political bots varies across regime types. Political actors and governments worldwide have begun using bots to manipulate public opinion, choke off debate, and muddy political issues. Political bots tend to be developed and deployed in sensitive political moments when public opinion is polarized. How have bots been used in the political conversations about the UK’s role in the EU?

# Counting Hashtags?

Reading a hashtag has no political influence on you.

I support #brexit

I oppose #brexit

나는 당신의 가장 큰 팬이고 당신을 사랑합니다. ♥♥♥

#justinbieber #PokemonGo #brexit #GameofThrones

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ABSTRACT

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»We define “heavy automation” as accounts that post at least 50 times a day, ...«

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»We define “heavy automation” as accounts that post at least 50 times a day, ...«

some accounts with  
more than 50 tweets/day:

Starbucks (151.7)  
McDonalds (127.1)  
AskPlayStation (275.6)  
British Airways (280.8)  
journalist Glenn Greenwald (50.2)  
author Cory Doctorow (142.2)

nytimes (108.3)  
CNN (156.6)  
NBA (115)  
NFL (81.1)  
TheEconomist (92.2)  
Reuters (318.4)  
WSJ (93.3)  
TIME (78.9)  
Forbes (81.6)

# These are the “Social Bots”:



CNN **@CNN**  
On Monday alone, about 226,000 people registered to vote in the upcoming #Brexit referendum [cnn.it/1Zvi9CU](http://cnn.it/1Zvi9CU)



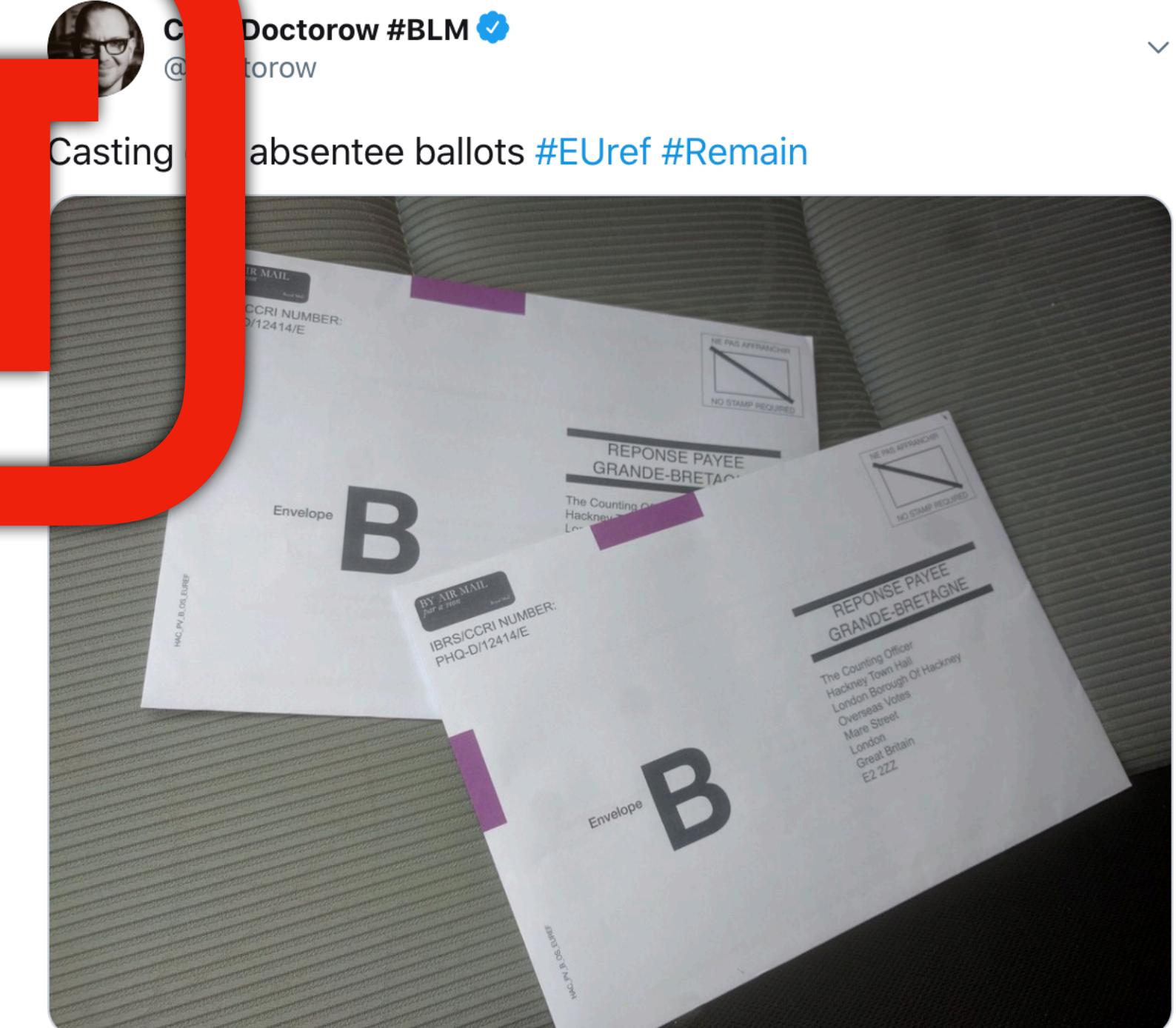
8:01 pm · 7 Jun 2016 · Sprinklr

101 Retweets 125 Likes



10:36 am · 21 Apr 2016 · SocialFlow

88 Retweets 81 Likes



2:29 am · 7 Jun 2016 · Twitter for Android

10 Retweets 27 Likes

# Bots, #StrongerIn, and #Brexit: Computational Propaganda during the UK-EU Referendum

COMPROP RESEARCH NOTE 2016.1

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Cornell University

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## ABSTRACT

*Bots are social media accounts that interact with other users, and here we examine their role in the Brexit conversation. Using Twitter, we find automated scripts generate most of the tweets, and then interact with humans. Political bots are political accounts that are particularly active in policy discussions, elections, and political crises. In this preliminary study on the use of political bots during the UK referendum on EU membership, we find that political bots are used by both human users and bots. We find that political bots have a small but strategic role in the referendum conversations: (1) the family of hashtags associated with the argument for leaving the EU dominates, (2) different perspectives on the issue utilize different levels of automation, and (3) less than 1 percent of sampled accounts generate almost a third of all the messages.*

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# BULLSHIT

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## Beware the Brexit bots: The Twitter spam out to swing your vote



TECHNOLOGY 21 June 2016, updated 22 June 2016

By [Chris Baraniuk](#)

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for good? 1

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modifying ear cells to  
respond to light 2

Quadruple-stranded DNA  
seen in healthy human  
cells for the first time 3

UK could eliminate the  
coronavirus but it might  
do more harm than good 4

Humans reached the  
Americas 15,000 years  
earlier than thought 5

Social Bots during  
2016 US presidential election?

**Brexit**

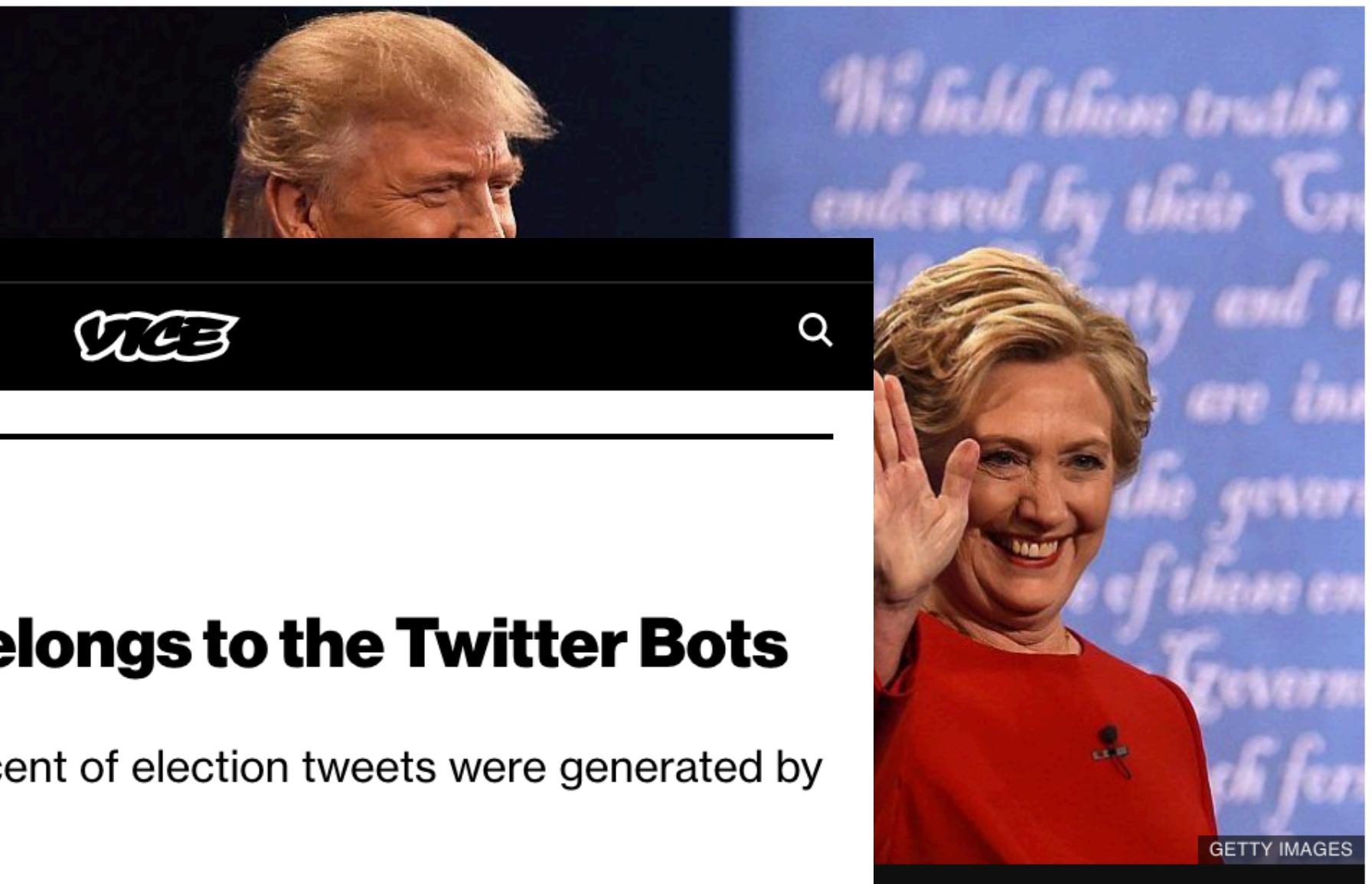
What Is Brexit? Pro-Brexit Press Praises Johnson Britain to Hold December Election E.U.

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Technology**Trump's Twitter debate lead was 'swelled by bots'**By Shiroma Silva  
BBC News

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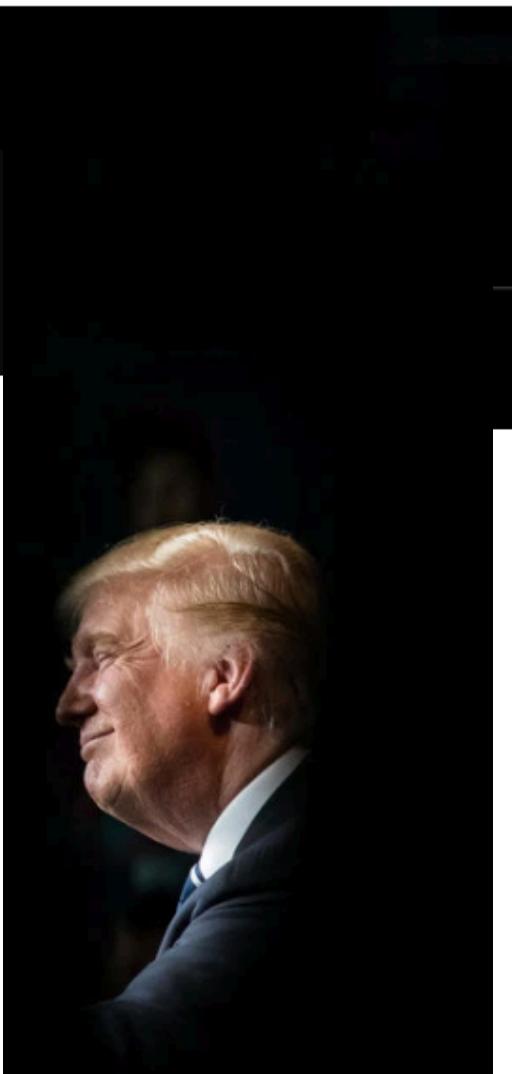
**The Washington Post**  
*Democracy Dies in Darkness*

**Technology**

# Propaganda flowed heavily into battleground states around election, study says

By **Craig Timberg**

September 28, 2017



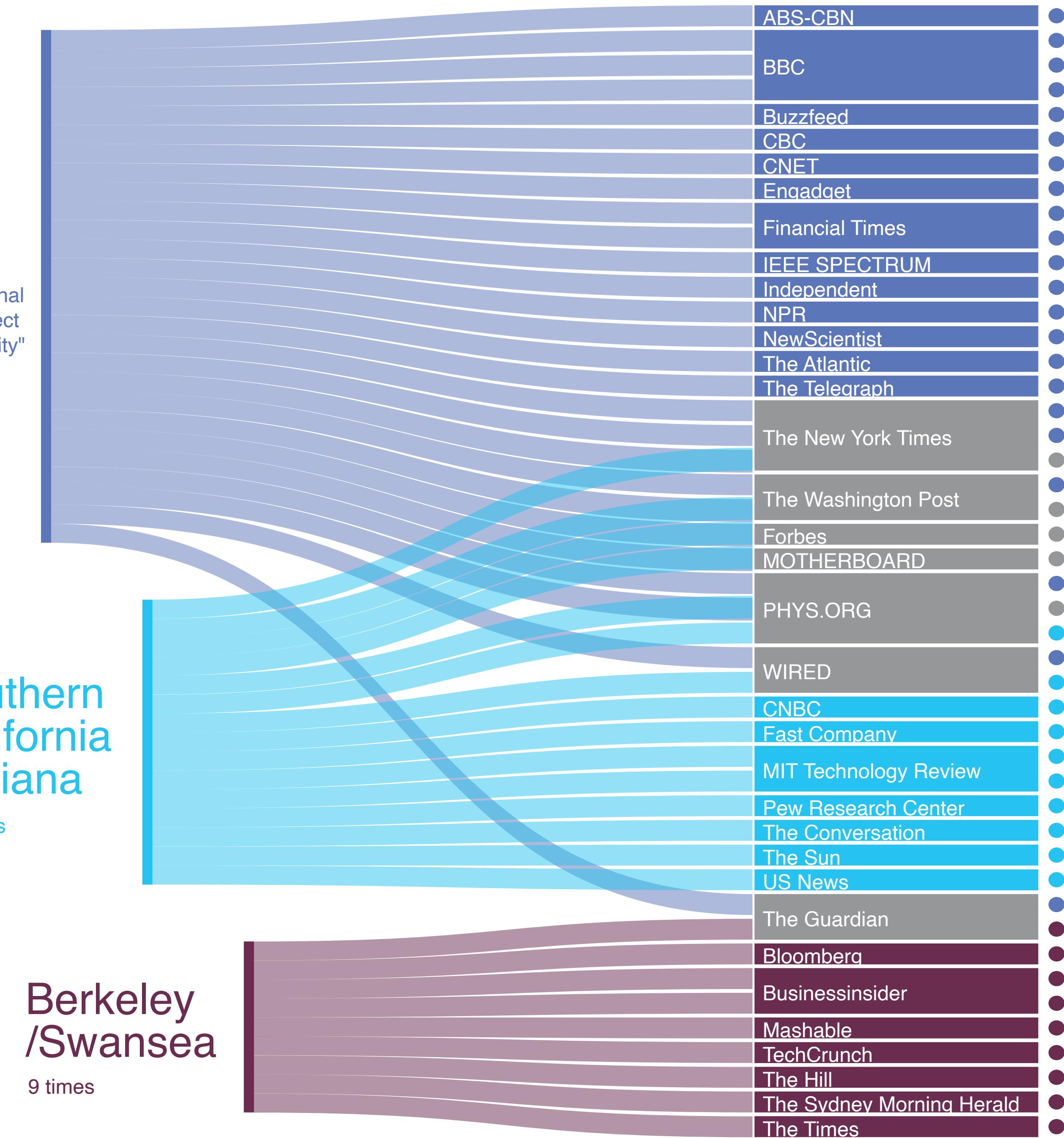
Propaganda and other forms of "junk news" on Twitter flowed more heavily in a dozen battleground states than in the nation overall in the days immediately before and after the 2016 presidential election, suggesting that a coordinated effort targeted the most pivotal voters, researchers from Oxford University [reported Thursday](#).

The volumes of low-quality information on Twitter —

By Daniel OberhausNov 7 2016, 8:50pm [f](#) [t](#) [s](#)







Oxford

27 times

"The Computational  
Propaganda Project  
of Oxford University"

Southern  
California  
/Indiana

15 times

Berkeley  
/Swansea

9 times

## Bots and Automation over Twitter during the U.S. Election

[COMPROP](#) DATA MEMO 2016.4 / 17 NOV 2016

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### ABSTRACT

*Bots are social media accounts that automate interaction with other users, and political bots have been particularly active on public policy issues, political crises, and elections. We collected data on bot activity using the major hashtags related to the U.S. Presidential Election. We find that that political bot activity reached an all-time high for the 2016 campaign. (1) Not only did the pace of highly automated pro-Trump activity increase over time, but the gap between highly automated pro-Trump and pro-Clinton activity widened from 4:1 during the first debate to 5:1 by election day. (2) The use of automated accounts was deliberate and strategic throughout the election, most clearly with pro-Trump campaigners and programmers who carefully adjusted the timing of content production during the debates, strategically colonized pro-Clinton hashtags, and then disabled activities after Election Day.*

### WHAT ARE POLITICAL BOTS?

A growing number of political actors and governments worldwide are employing both people and bots to shape political conversation. [1], [2] Bots can perform legitimate tasks like delivering news and information, or undertake malicious activities like spamming, harassment and hate speech. Whatever their uses, bots on social media platforms are able to rapidly deploy messages, replicate themselves, and pass as human users.

Networks of such bots are called “botnets,” a term combining “robot” with “networks” and a term that is generally used to describe a collection of connected computers with programs that communicate across multiple devices to perform some task. There are legitimate botnets, like the Carna botnet, which gave us our first real census of device

application programming interface (API) that enables real-time posting and parsing of information.

Bots are versatile, cheap to produce, and ever evolving. Unscrupulous Internet users now deploy bots beyond mundane commercial tasks like spamming. Bots are the primary applications used in carrying out DDoS and virus attacks, email harvesting, and content theft. A subset of social bots are given overtly political tasks and the use of political bots varies from country to country. Political actors and governments worldwide have begun using bots to manipulate public opinion, choke off debate, and muddy political issues. Political bots tend to be developed and deployed in sensitive political moments when public opinion is polarized. How were highly automated accounts used around Election Day in the United States?

## Bots and Automation over Twitter during the U.S. Election

COMPROP DATA MEMO 2016.4 / 17 NOV 2016

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### ABSTRACT

»We decided it's time to call automation as accounts into question ...«

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and bot activity on the Internet, and there are malicious botnets that are deployed to carry out a variety of attacks. Bots can be used to spread viruses, to harvest sensitive information from websites, to conduct Denial of Service (DDoS) attacks, and to manipulate public opinion by spreading fake news stories or by creating fake accounts that post misleading or inflammatory statements. They can also be used to automate certain tasks, such as monitoring political hashtags or tracking mentions of specific individuals or organizations. In recent years, there has been a significant increase in the use of bots for political purposes, particularly during elections. This report examines the role of bots in the 2016 U.S. presidential election, focusing on how they were used to spread fake news stories, to harass political opponents, and to manipulate public opinion.

Oxford

27 times

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## **Social media, sentiment and public opinions: Evidence from #Brexit and #USElection**

Yuriy Gorodnichenko  
*University of California, Berkeley*

Tho Pham  
*Swansea University*

Oleksandr Talavera\*  
*Swansea University*

*First draft:* 17.01.2017

*Current draft:* 26.04.2018

**Abstract:** This paper studies information diffusion in social media and the role of bots in shaping public opinions. Using Twitter data on the 2016 E.U. Referendum (“Brexit”) and the 2016 U.S. Presidential Election, we find that diffusion of information on Twitter is largely complete within 1-2 hours. Stronger interactions across agents with similar beliefs are consistent with the “echo chambers” view of social media. Bots have a tangible effect on the tweeting activity of humans but the degree of bots’ influence depends on whether bots provide information consistent with humans’ priors. Overall, our results suggest that the aggressive use of Twitter bots, coupled with the fragmentation of social media and the role of sentiment, could contribute to the vote outcomes.

<https://blog.plan99.net/did-russian-bots-impact-brexit-ad66f08c014a>

*Mike Hearn:*

*»I am one of the very, very few people in the world who has actually fought bots on social media platforms. As a member of the Google abuse team from 2010–2013 I spent a large amount of time working on anti-spam and anti-automation platforms.«*

**About the paper of Berkeley/Swansea:**

*»It is the most irresponsible abuse of maths I've seen for a long time.«*

## **Social media, sentiment and public opinions: Evidence from #Brexit and #USElection**

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*First draft:* 17.01.2017

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**Abstract:** This paper studies information diffusion in social media and the role of bots in shaping public opinions. Using Twitter data on the 2016 E.U. Referendum (“Brexit”) and the 2016 U.S. Presidential Election, we find that diffusion of information on Twitter is largely complete within 1-2 hours. Stronger interactions across agents with similar beliefs are consistent with the “echo chambers” view of social media. Bots have a tangible effect on the tweeting activity of humans but the degree of bots’ influence depends on whether bots provide information consistent with humans’ priors. Overall, our results suggest that the aggressive use of Twitter bots, coupled with the fragmentation of social media and the role of sentiment, could contribute to the vote outcomes.

## **Social media, sentiment and public opinions: Evidence from #Brexit and #USElection**

Yuriy Gorodnichenko  
*University of California, Berkeley*

Tho Pham  
*Swansea University*

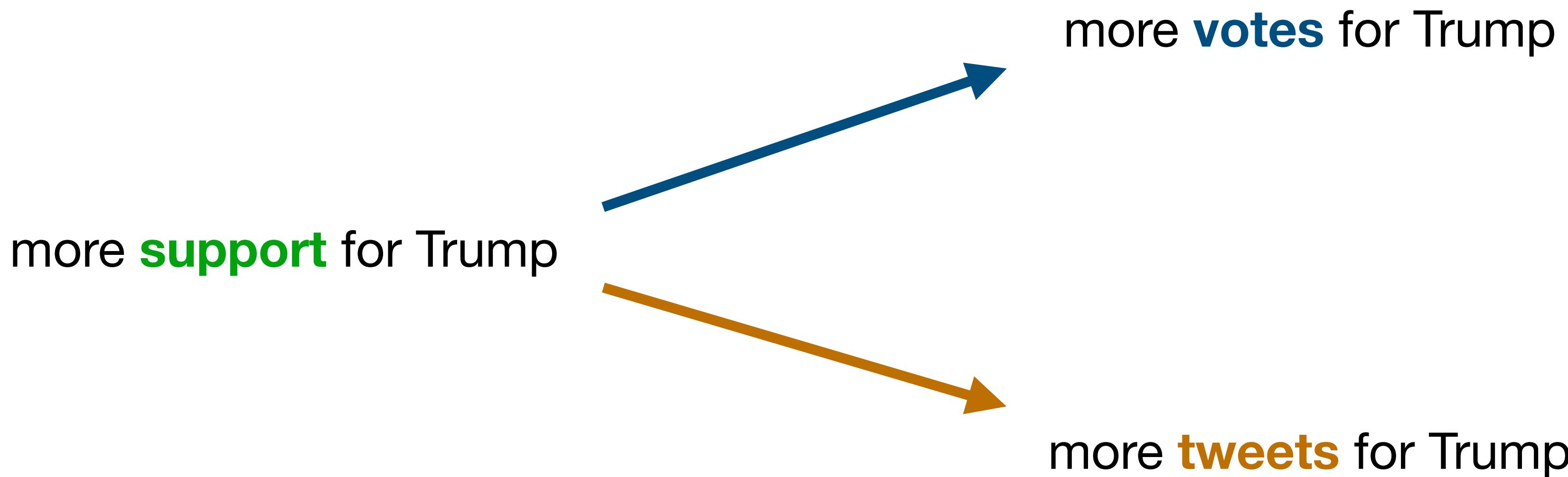
Oleksandr Talavera\*  
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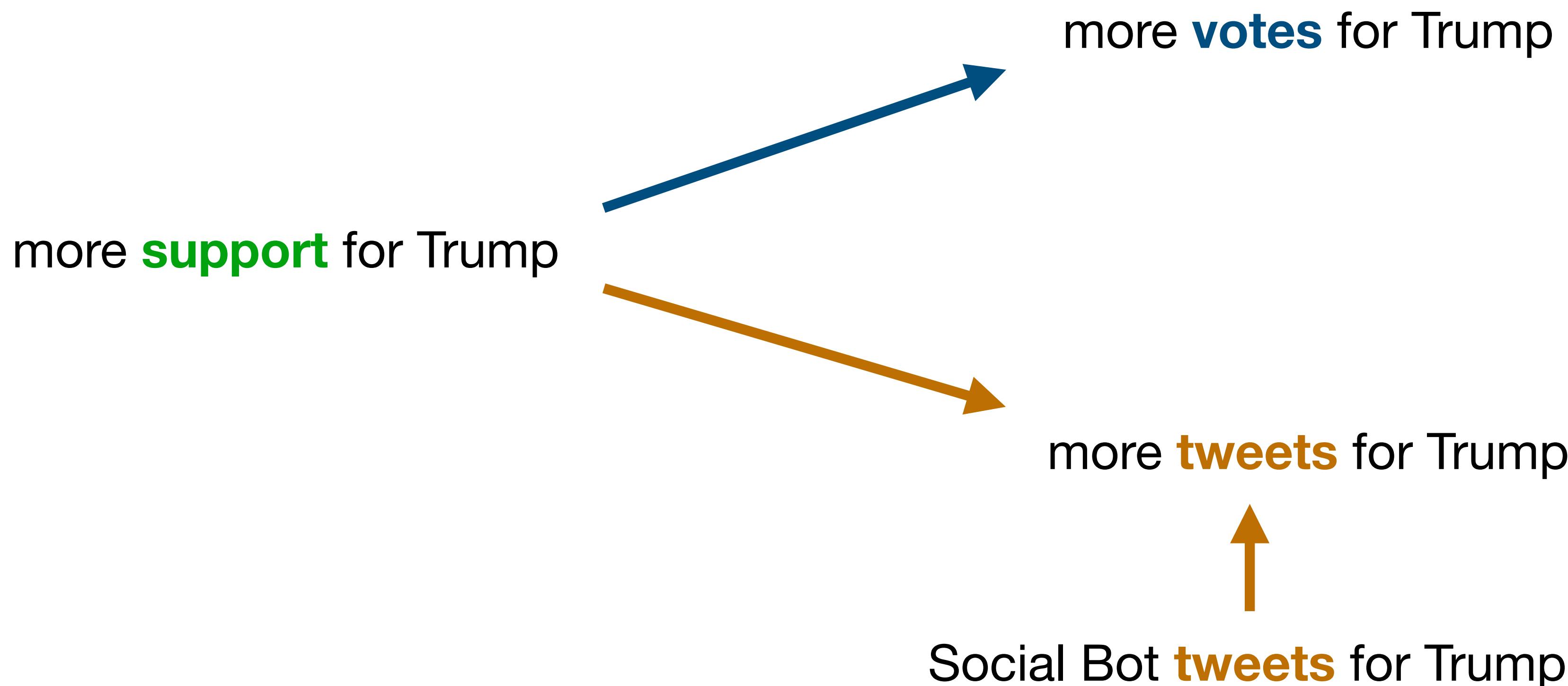


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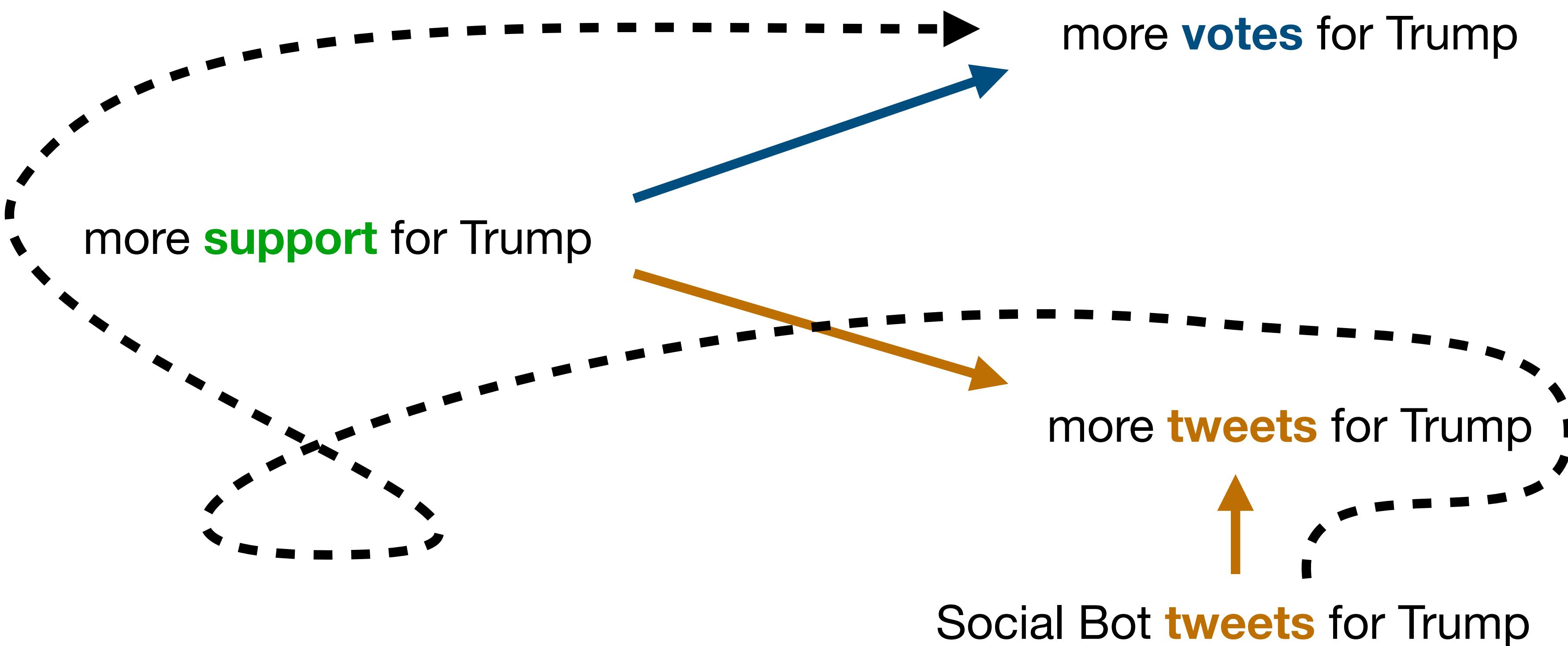


## Social media, sentiment and public opinions: Evidence from #Brexit and #USElection

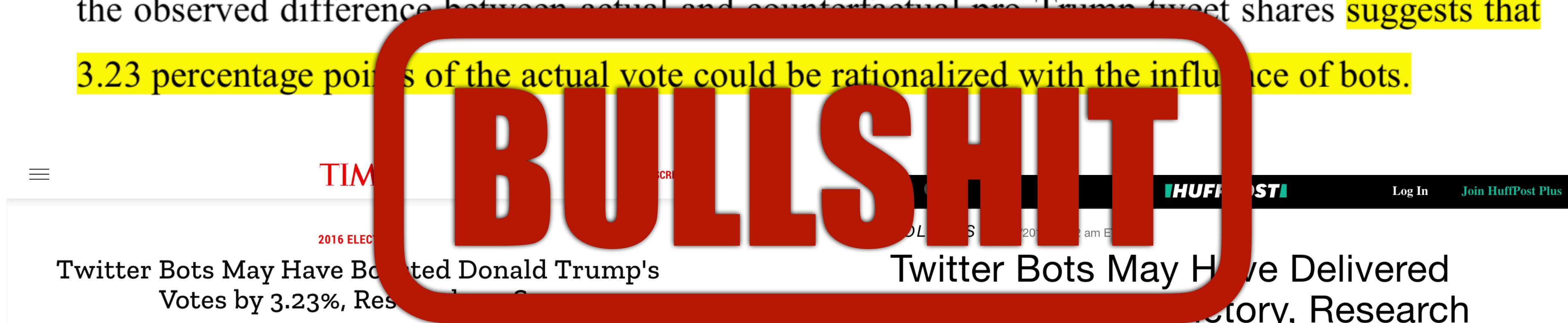
Yuriy Gorodnichenko  
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Tho Pham  
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*Swansea University*



important role in the outcome of these close-call elections. Specifically, our analysis in Section 2.5 suggests that a percentage point increase in the share of pro-Trump tweets in total tweets is associated with a 0.59 percentage point increase in the share of actual pro-Trump votes. Therefore, the observed difference between actual and counterfactual pro-Trump tweet shares suggests that 3.23 percentage points of the actual vote could be rationalized with the influence of bots.



**T**witter bots may have altered the outcome of two of the world's most consequential elections in recent years, according to an economic study.

Automated tweeting played a small but potentially decisive role in the 2016 Brexit vote and Donald Trump's presidential victory, the National Bureau of Economic Research working paper showed this month. Their rough calculations suggest bots added 1.76 percentage point to the pro-“leave” vote share as Britain weighed whether to remain in the European Union, and may explain 3.23 percentage points of the actual vote for Trump in the U.S. presidential

## Paper Says

“Our results suggest that, given narrow margins of victories in each vote, bots' effect was likely marginal but possibly large enough to affect the outcomes.”



By Mary Papenfuss

Twitter bots could have swayed the presidential election enough to account for Donald Trump's margin of victory, according to new research.

Automated tweeting played a small but potentially decisive role in Trump's win, according to a working paper released by the nonprofit National Bureau of Economic Research. The research suggests that bots touting Trump or attacking rival Hillary Clinton could have accounted for 3.23 percentage points of the vote for president, putting Trump over the top. Clinton won the popular vote, and a small added margin in critical districts could have put her over the top in some states and affected the Electoral College total.

Oxford

27 times

"The Computational  
Propaganda Project  
of Oxford University"

Southern  
California  
/Indiana

15 times

Berkeley  
/Swansea

9 times

**BULLSHIT**

**BULLSHIT**



6/6/2017

Bessi

First Monday, Volume 21, Number 11 - 7 November 2016



# Social bots distort the 2016 U.S. Presidential election online discussion by Alessandro Bessi and Emilio Ferrara

## Abstract

Social media have been extensively praised for increasing democratic discussion on social issues related to policy and politics. However, what happens when this powerful communication tools are exploited to manipulate online discussion, to change the public perception of political entities, or even to try affecting the outcome of political elections? In this study we investigated how the presence of social media bots, algorithmically driven entities that on the surface appear as legitimate users, affect political discussion around the 2016 U.S. Presidential election. By leveraging state-of-the-art social bot detection algorithms, we uncovered a large fraction of user population that may not be human, accounting for a significant portion of generated content (about one-fifth of the entire conversation). We inferred political partisanship from hashtag adoption, for both humans and bots, and studied spatio-temporal communication, political support dynamics, and influence mechanisms by discovering the level of network embeddedness of the bots. Our findings suggest that the presence of social media bots can indeed negatively affect democratic political discussion rather than improving it, which in turn can potentially alter public opinion and endanger the integrity of the Presidential election.

## Contents

[Introduction](#)  
[Methodology](#)  
[Data analysis](#)  
[Conclusions](#)

**EMILIO FERRARA / ALESSANDRO FLAMMINI**

# **THE RISE OF SOCIAL BOTS**

They mimicking human behavior,  
infiltrate the population and  
manipulate our perception of reality.



6/6/2017

Bessi

First Monday, Volume 21, Number 11 - 7 November 2016



# Social bots distort the 2016 U.S. Presidential election online discussion

## by Alessandro Bessi and Emilio Ferrara

### Abstract

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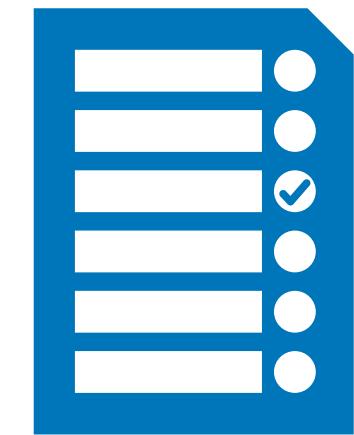
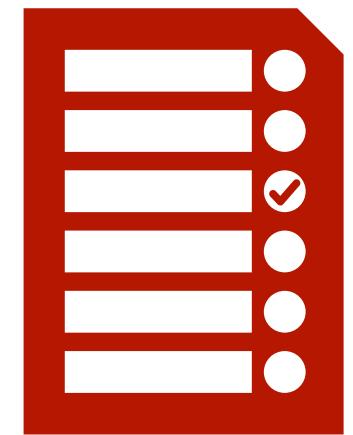
# **Botometer**

**aka BotOrNot**

# Botometer

aka BotOrNot

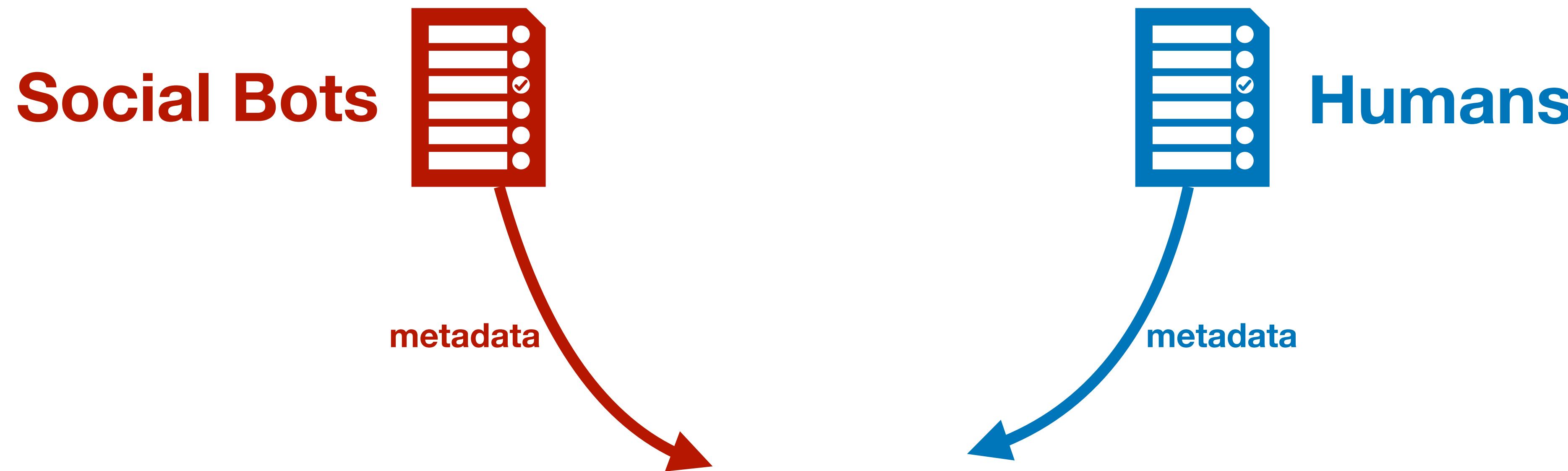
**Social Bots**



**Humans**

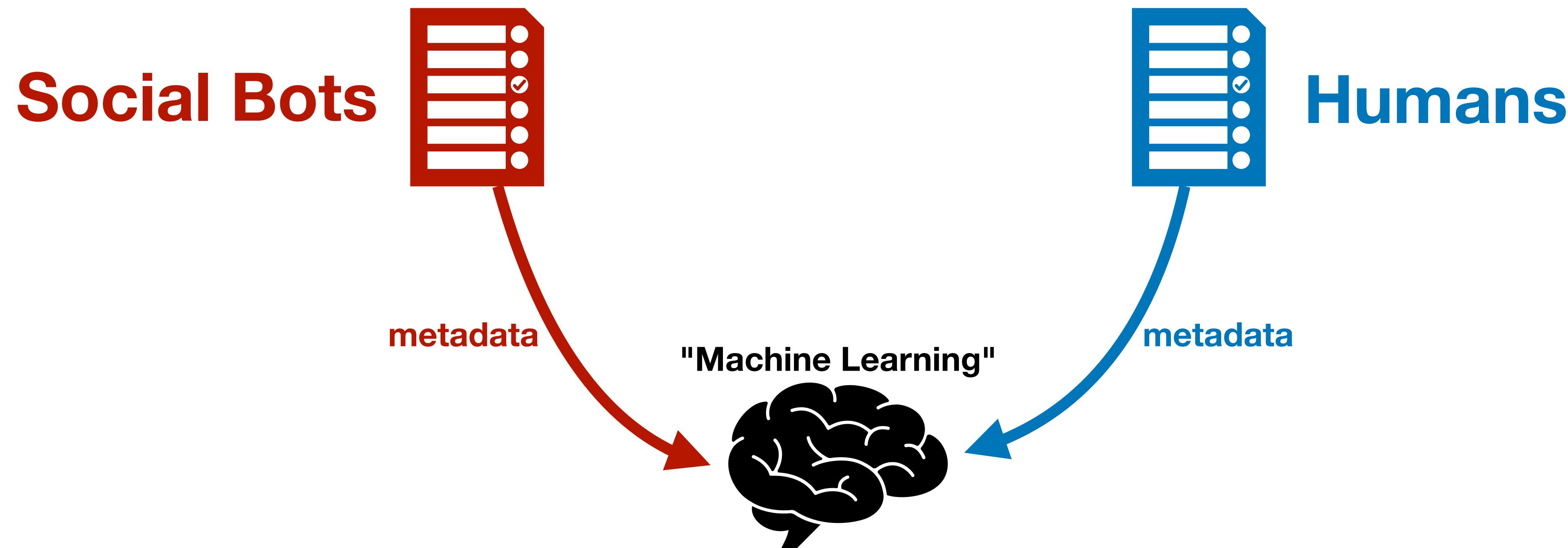
# Botometer

aka BotOrNot



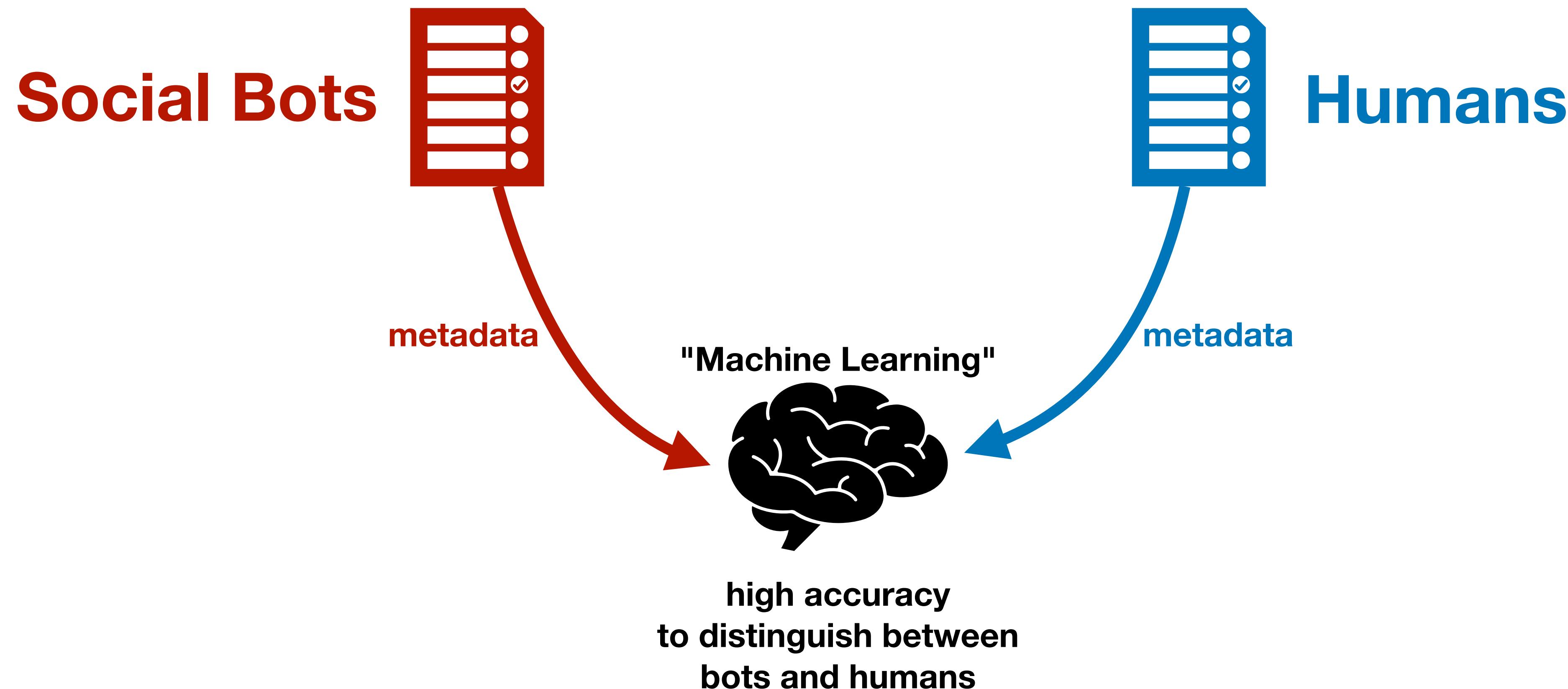
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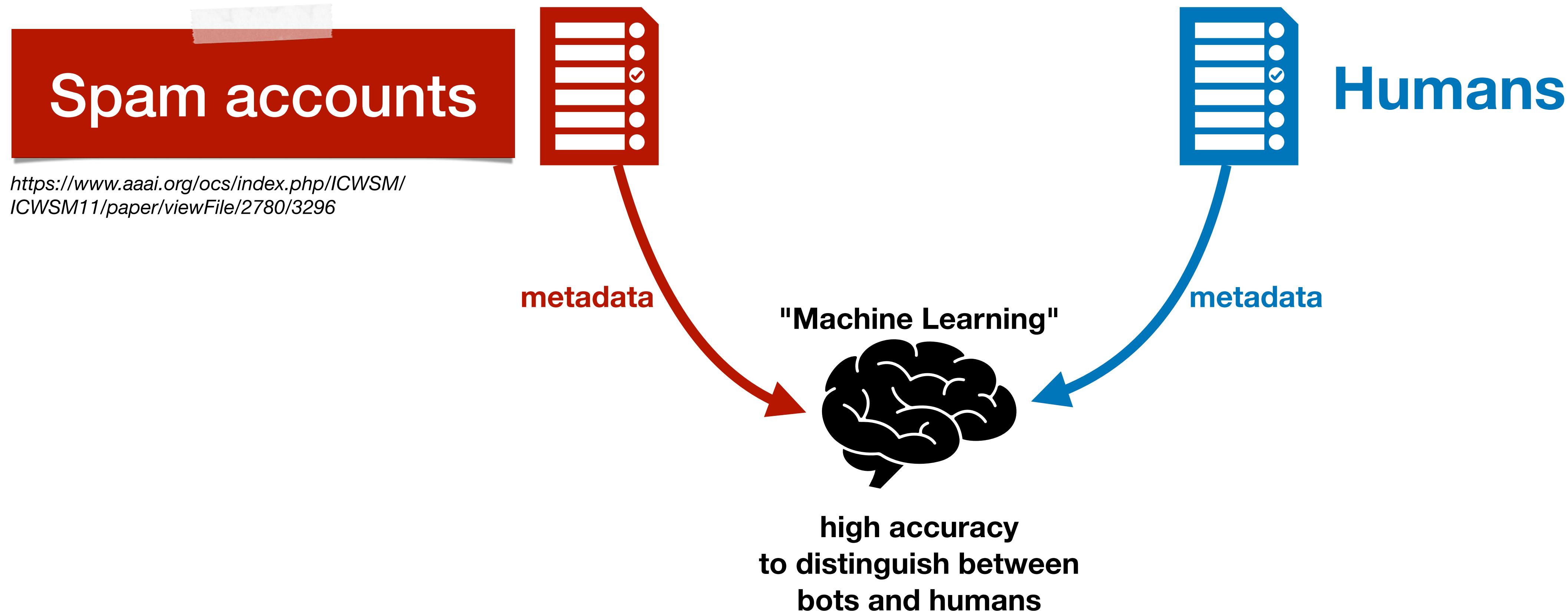
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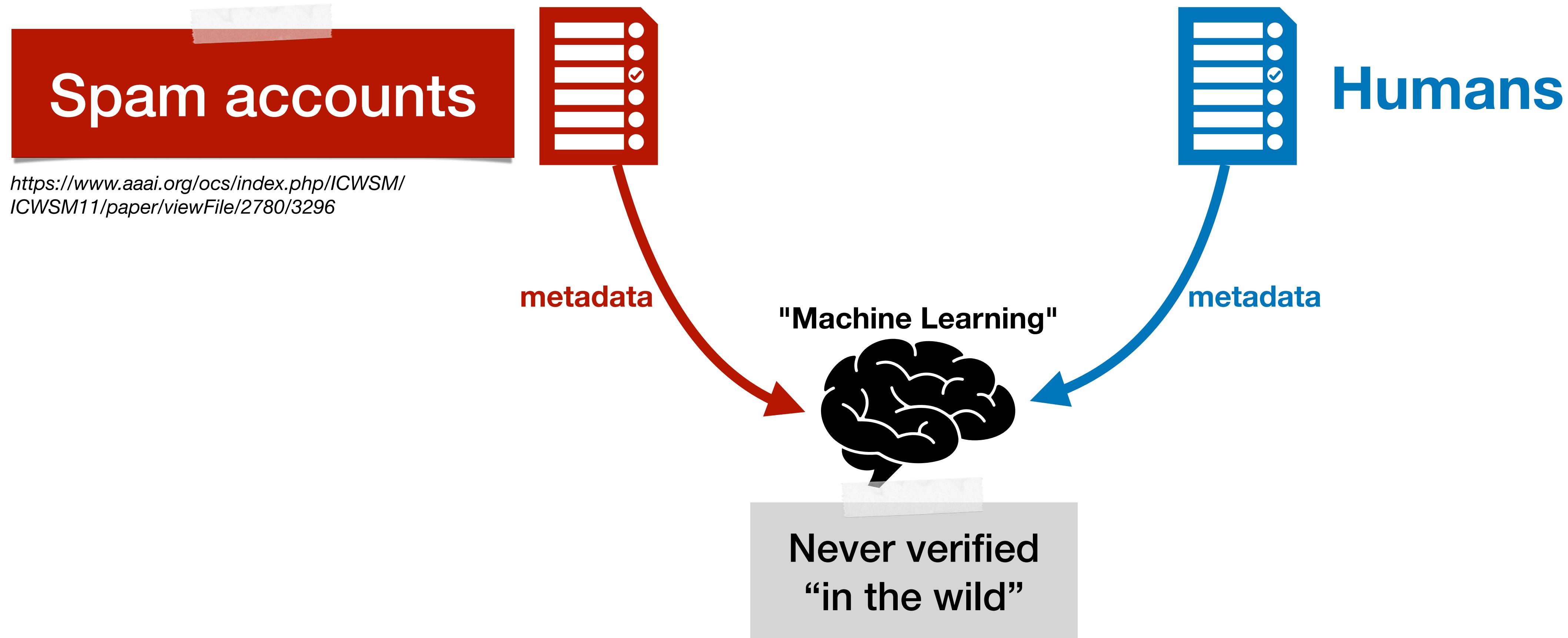
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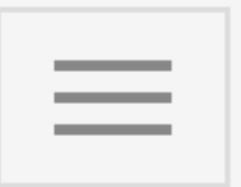


# Botometer

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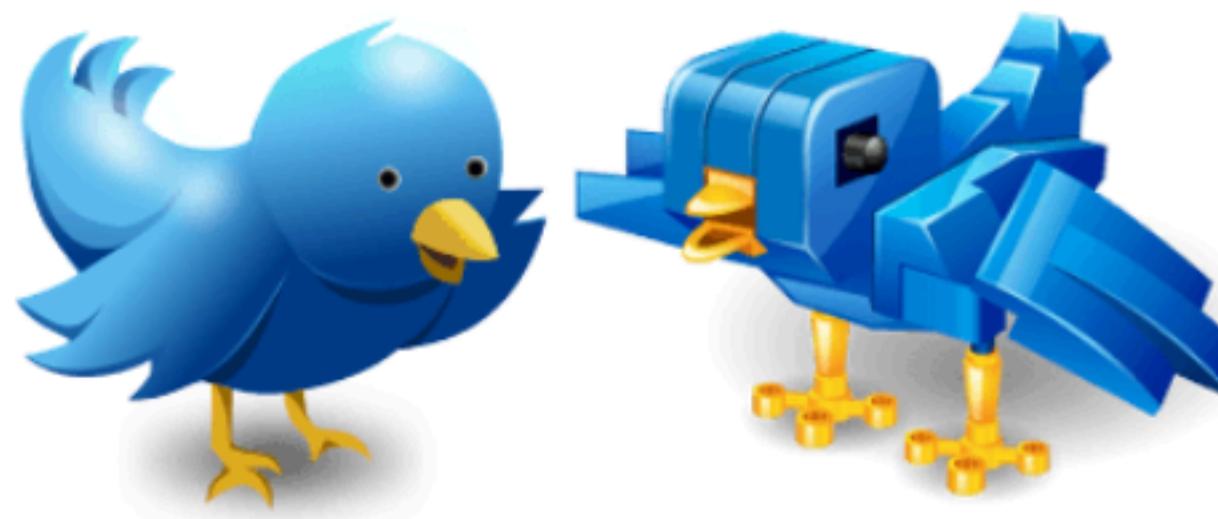


Botometer



# Botometer®

An OSoMe project (bot•o•meter)



Botometer (formerly BotOrNot) checks the activity of a Twitter account and gives it a score based on how likely the account is to be a bot. Higher scores are more bot-like.

Use of this service requires Twitter authentication and permissions. ([Why?](#))

If something's not working or you have questions, please contact us only after reading

@ScreenName

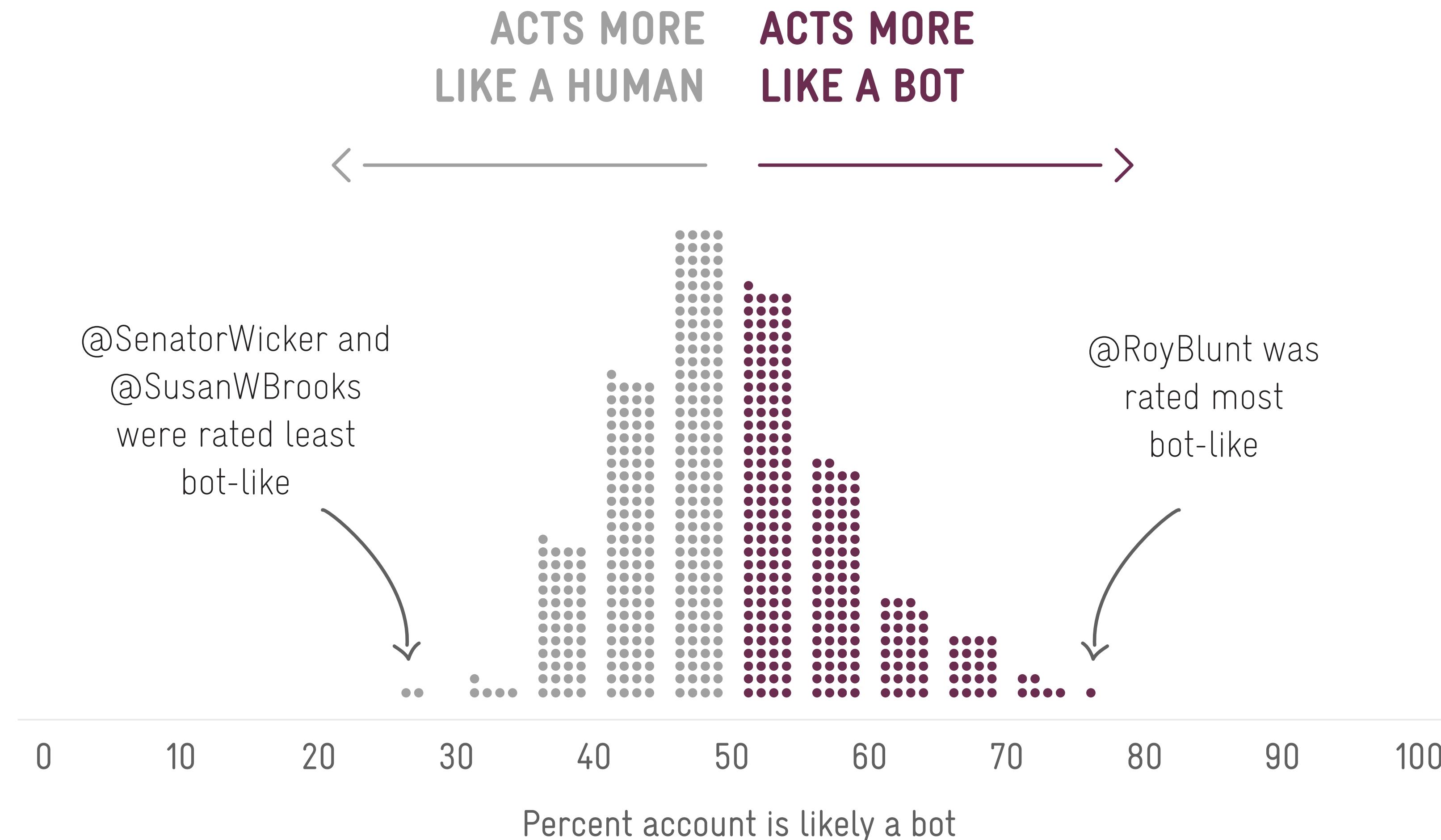
Check user

Check followers

Check friends

# US Congress on Twitter: Bots or not?

Botometer classified about half of US Congress members on Twitter as Bots.



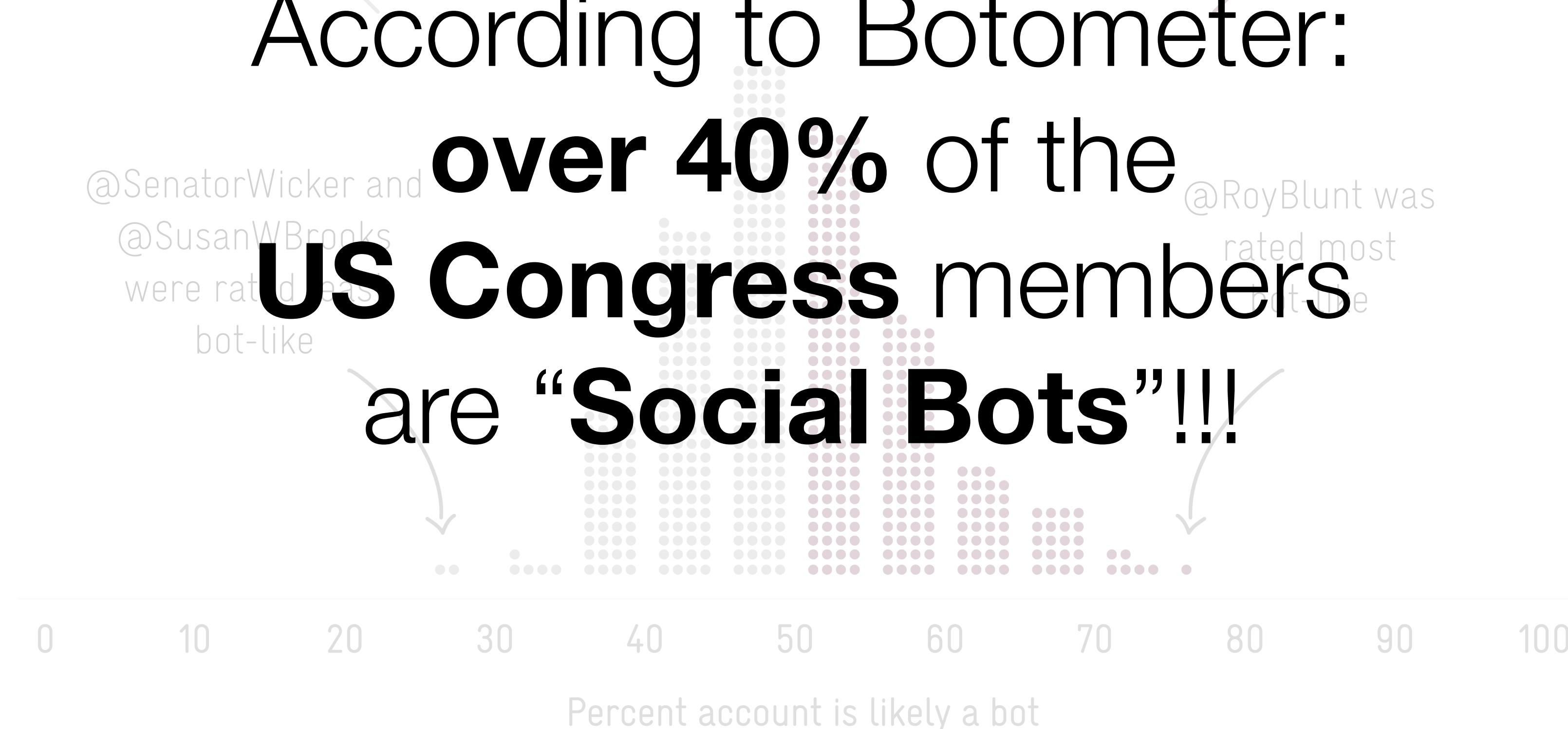
Source: Botometer®, April 2018

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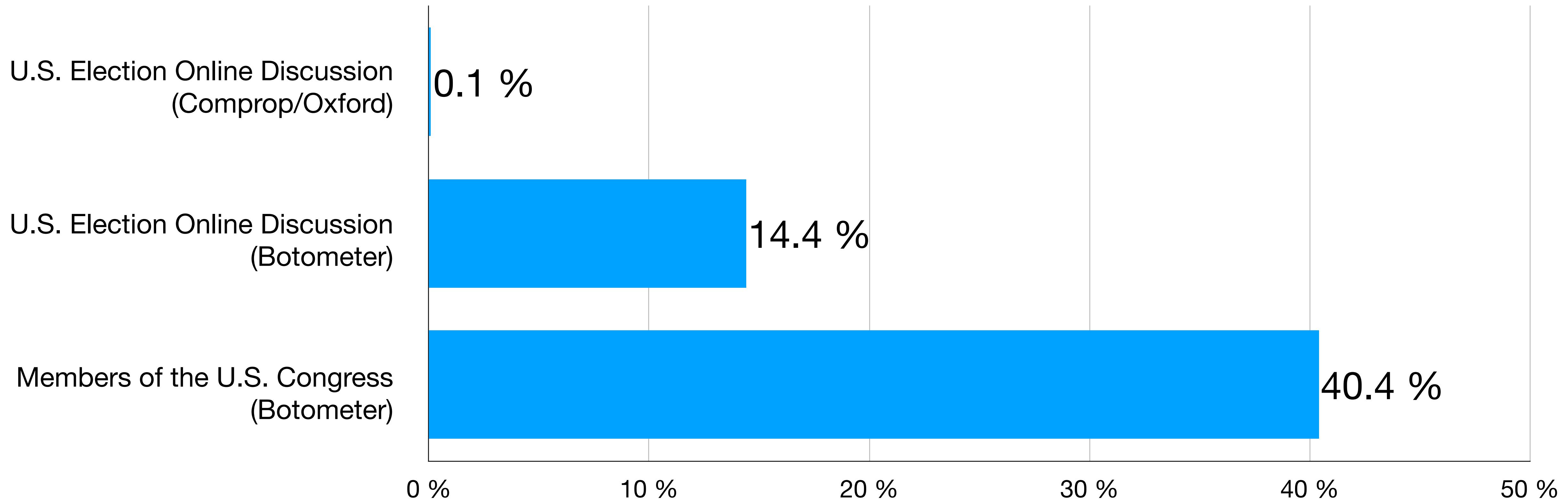
ACTS MORE ACTS MORE  
LIKE A HUMAN LIKE A BOT

According to Botometer:  
**over 40% of the**  
**US Congress members**  
**are “Social Bots”!!!**



Source: Botometer®, April 2018

# Comparison of “Social Bots” shares





**Botometer**  
@Botometer



1/12 Sadly our research project and social bot detection tool, [@Botometer](#), are under attack by some German "academic trolls", including data journalist [@MichaelKreil](#) at [@IGG\\_Berlin](#) and Dr. [@FlorianGallwitz](#) at [@TH\\_Nernberg](#).

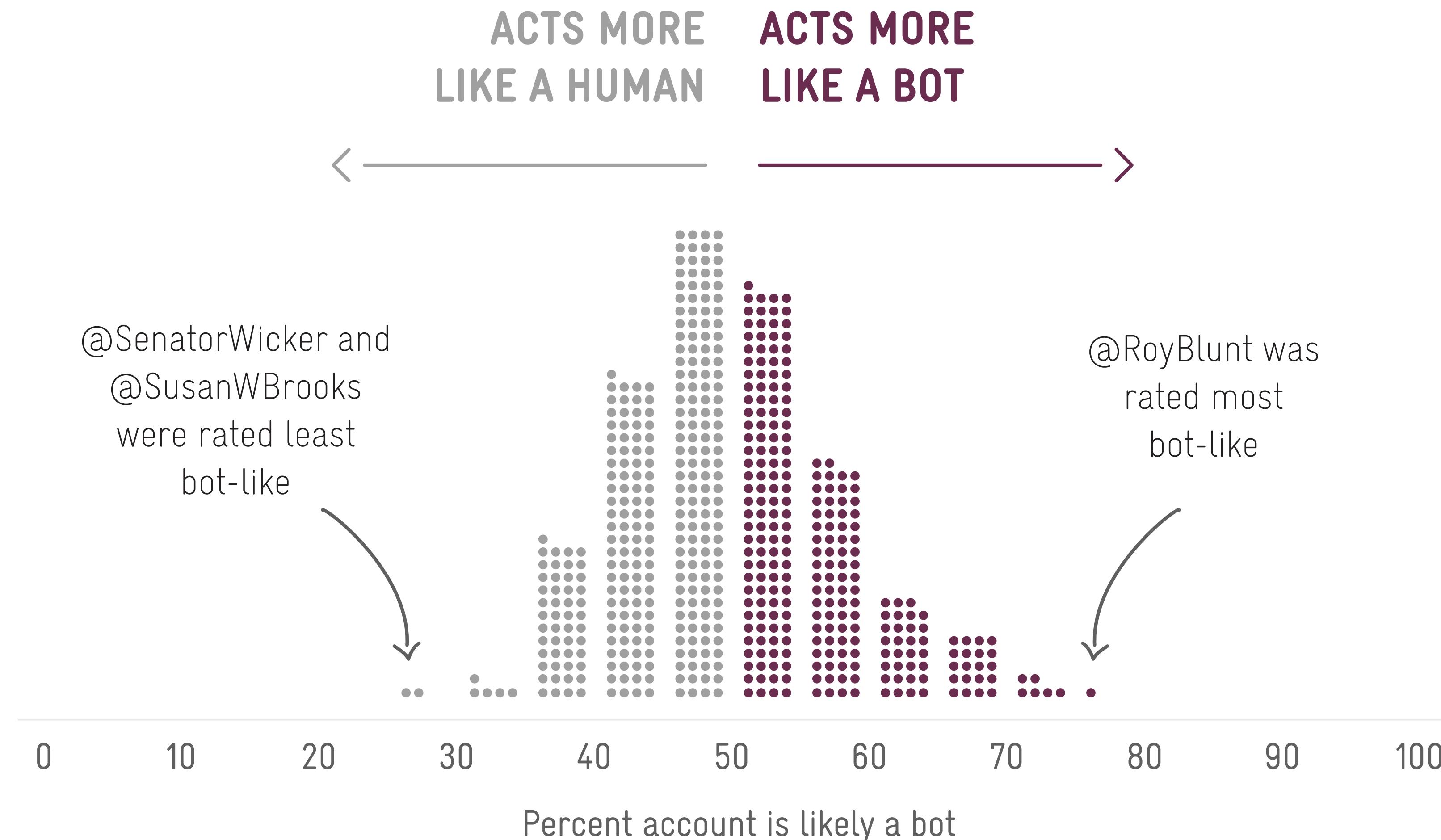
4:23 AM · May 3, 2019 · [Twitter Web Client](#)

## **Questions to Professor Emilio Ferrara and Professor Alessandro Flammini:**

1. Did your algorithm estimate during the US election that 14% of the accounts involved were social bots?
2. Did the same algorithm classify 40% of the US congress as social bots?
3. Don't you think this false positive rate is a problem, because your research had national and international political consequences?

# US Congress on Twitter: Bots or not?

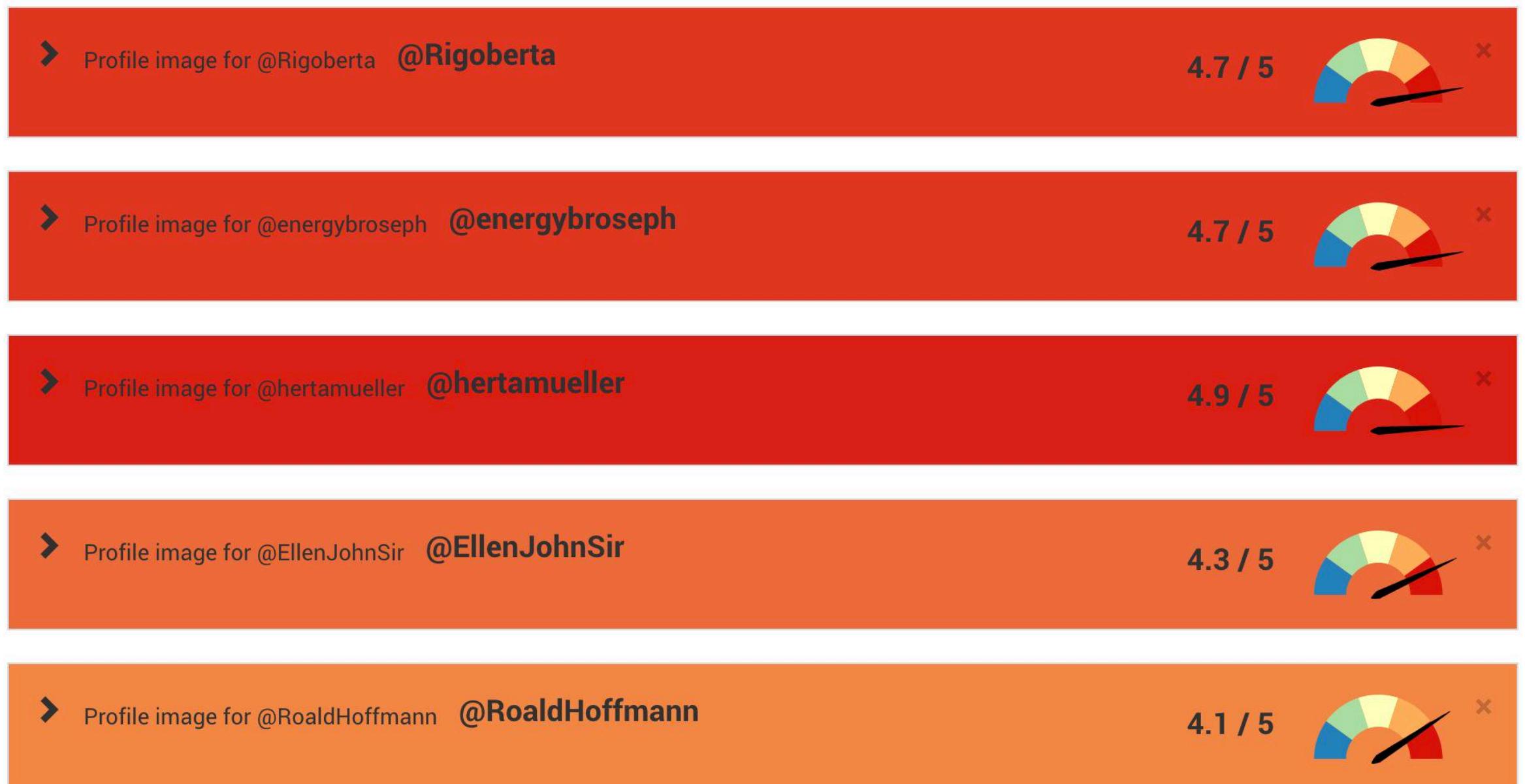
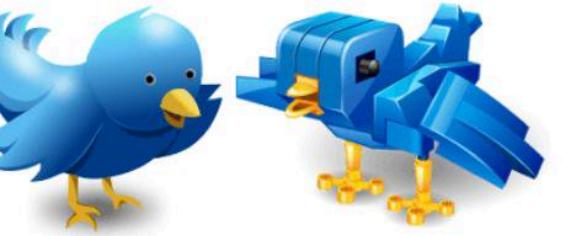
Botometer classified about half of US Congress members on Twitter as Bots.



Source: Botometer®, April 2018

# According to Botometer ...

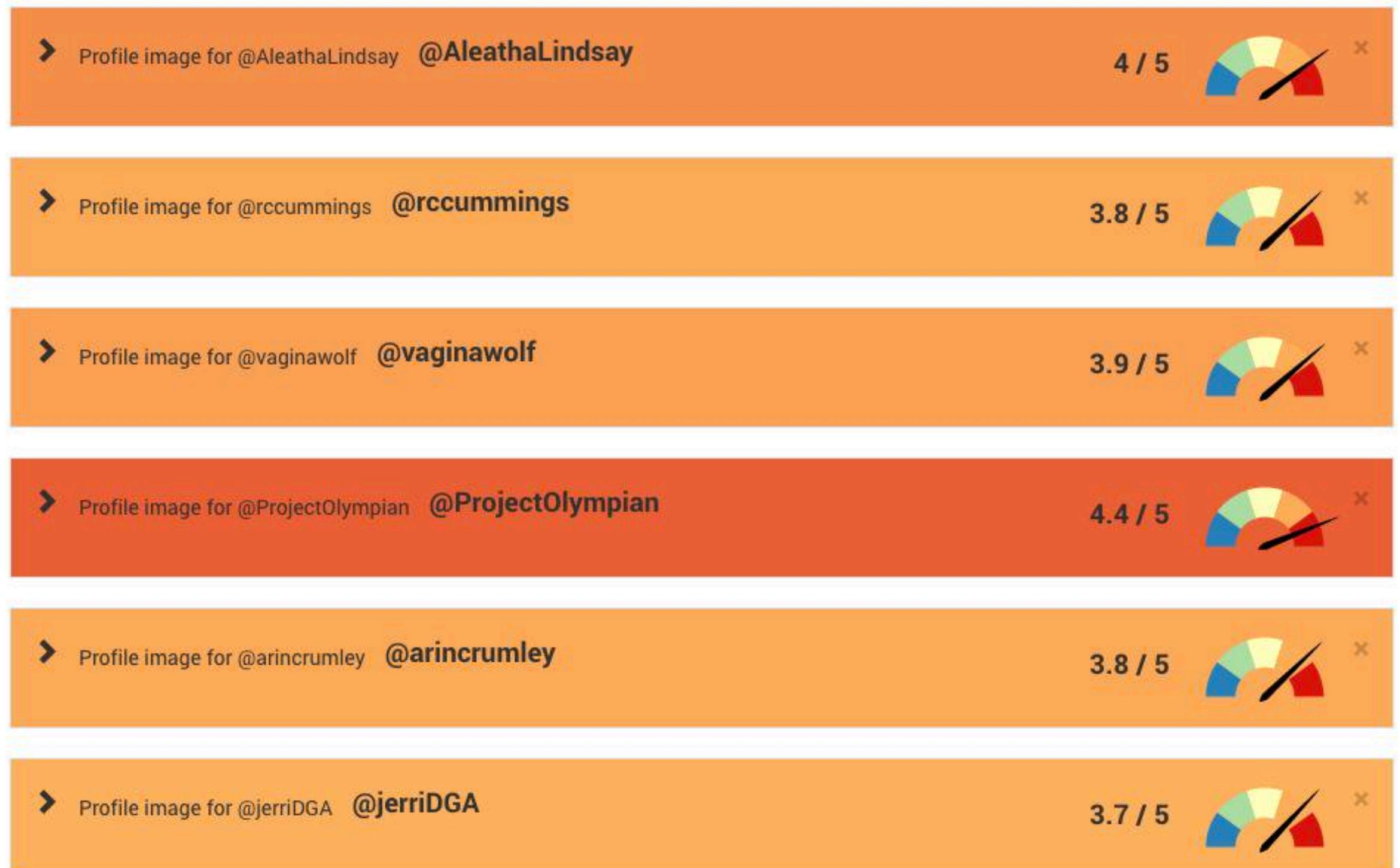
**Botometer®**  
An OSoMe project (bot•o•meter)



**65 nobel prize laureates:  
12% are bots**

# According to Botometer ...

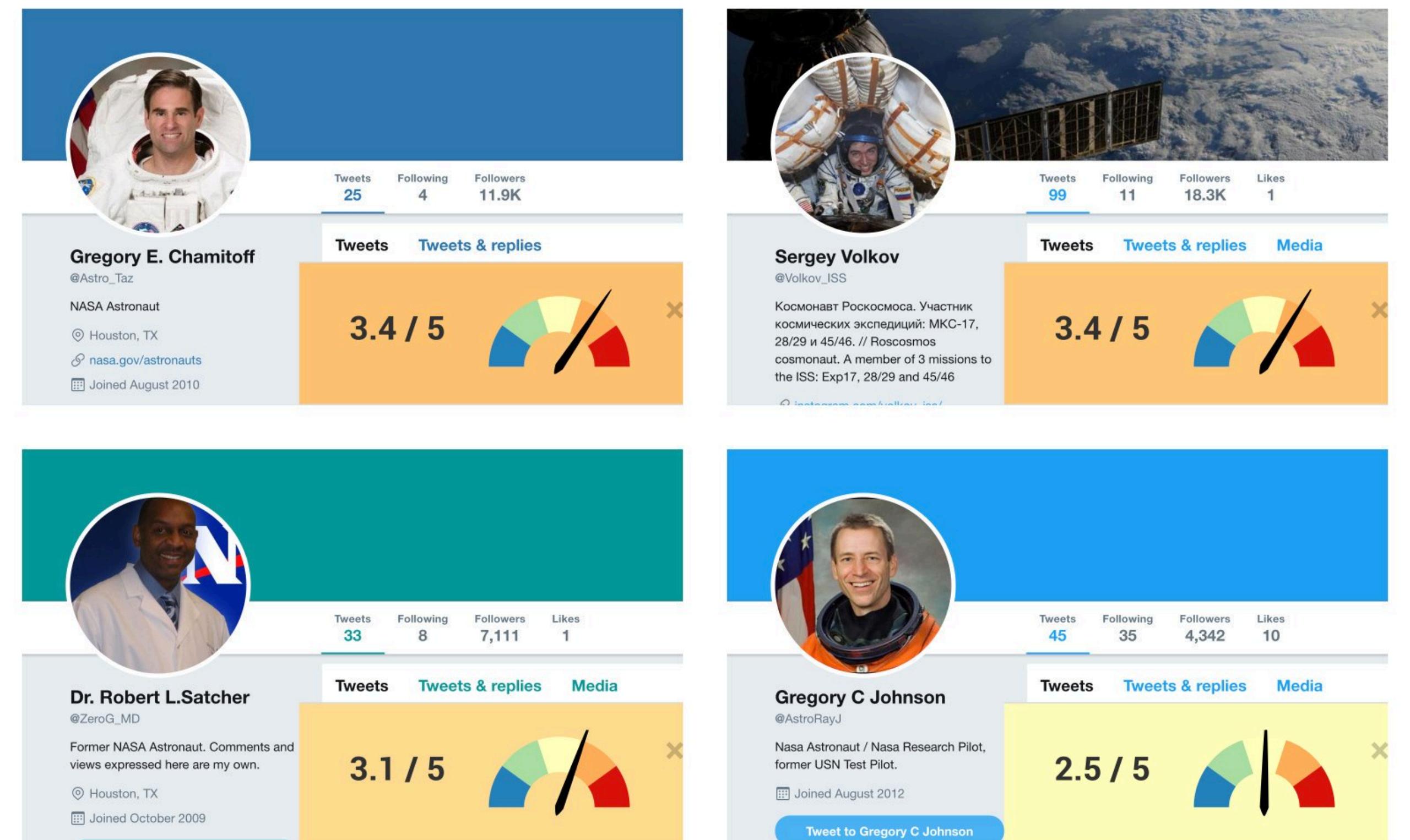
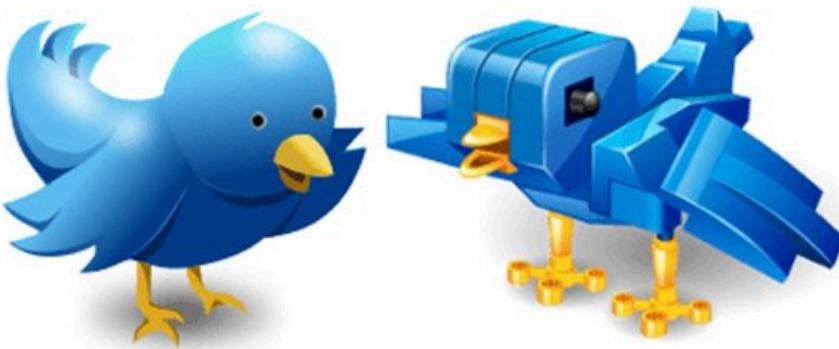
**Botometer<sup>®</sup>**  
An OSoMe project (bot•o•meter)



**3137 female directors:  
14% are bots**

# According to Botometer ...

**Botometer®**  
An OSoMe project (bot·o·meter)



**96 NASA accounts:  
14% are bots**

## According to Botometer ...

- 17.7% of @Reuters journalists are bots
- 21.9% of @UN\_Women staff are bots
- 35.9% of the staff of german news agency @dpa are bots
- 30.5% of the federal parliament of Bavaria are bots

# According to Botometer ...

**Botometer**<sup>®</sup>  
An OSoMe project (bot•o•meter)



➤ Profile image for @fallingleafbot @fallingleafbot

0.2 / 5



➤ Profile image for @birdbot4 @birdbot4

0.5 / 5



➤ Profile image for @latinonamebot @latinonamebot

0.2 / 5



➤ Profile image for @PixelMonsterBot @PixelMonsterBot

0.2 / 5



➤ Profile image for @boggle\_bot @boggle\_bot

0.3 / 5



➤ Profile image for @jakerunningbot @jakerunningbot

0.2 / 5



➤ Profile image for @cityatnightbot @cityatnightbot

0.2 / 5



➤ Profile image for @theasciartbot @theasciartbot

0.3 / 5



➤ Profile image for @BostonSnowbot @BostonSnowbot

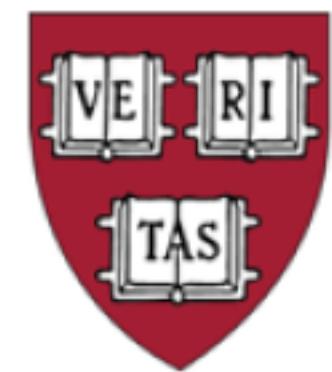
0.3 / 5



**937 bots from botwiki.org:  
61% are humans**

Botometer?





**BERKMAN  
KLEIN CENTER**  
FOR INTERNET & SOCIETY  
AT HARVARD UNIVERSITY

Research Publication No. 2020-3  
March 2020

## The False Positive Problem of Automatic Bot Detection in Social Science Research

Adrian Rauchfleisch  
Jonas Kaiser

Oxford

27 times

"The Computational  
Propaganda Project  
of Oxford University"

Southern  
California  
/Indiana

15 times

Berkeley  
/Swansea

9 times

**BULLSHIT**

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**BULLSHIT**

ABS-CBN	●
BBC	●
Buzzfeed	●
CBC	●
CNET	●
Engadget	●
Financial Times	●
IEEE SPECTRUM	●
Independent	●
NPR	●
NewScientist	●
The Atlantic	●
The Telegraph	●
The New York Times	●
The Washington Post	●
Forbes	●
MOTHERBOARD	●
PHYS.ORG	●
WIRED	●
CNBC	●
Fast Company	●
MIT Technology Review	●
Pew Research Center	●
The Conversation	●
The Sun	●
US News	●
The Guardian	●
Bloomberg	●
Businessinsider	●
Gashable	●
TechCrunch	●
The Hill	●
The Sydney Morning Herald	●
The Times	●

# “Social Bots interfered in the US elections” is based on very flawed studies.

ComProp / Oxford

Bots and Automation over Twitter during the U.S. Election  
COMPROP DATA MEMO 2016.4 / 17 NOV 2016

Bence Kollanyi  
Corvinus University  
kollanyi@gmail.com  
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Philip N. Howard  
Oxford University  
philip.howard@oii.ox.ac.uk  
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**ABSTRACT**  
Bots are social media accounts that automate interaction with other users, and political bots have been particularly active on public policy issues, political crises, and elections. We collected data on bot activity using the major hashtags related to the U.S. Presidential Election. We find that political bot activity reached an all-time high for the 2016 campaign. (1) Not only did the pace of highly automated pro-Trump activity increase over time, but the gap between highly automated pro-Trump and pro-Clinton activity widened from 4:1 during the first debate to 5:1 by election day. (2) The use of automated accounts was deliberate and strategic throughout the election, most clearly with pro-Trump campaigners and programmers who carefully adjusted the timing of content production during the debates, strategically colonized pro-Clinton hashtags, and then disabled activities after Election Day.

A growing number of political actors and governments worldwide are employing both people and bots to shape political conversation. [1] [2] Bots can perform legitimate tasks like delivering news and information, or assist in political activities. They can also have a negative effect. While real users can have their own political opinions, bots are controlled by a single individual, and can thus spread two opposing views at once. Two recent studies argued “bots” were behind the rise of “fake news” and “echo chambers” in the 2016 election. These findings were later discredited due to conflicts with other research. Some bots communicate across multiple devices to perform some task. There are legitimate bots, like the Camra botnet, which gave us our first real census of device networks, and there are malicious botnets, like those

real-time posting and parsing of information. Bots are versatile, cheap to produce, and ever evolving. Unscrupulous Internet users now deploy bots beyond mundane commercial tasks like

**BULLSHIT**

This data set contains approximately 19.4m tweets collected November 1-9, using a combination of hashtags associated with the primary Presidential candidates. Since our purpose is to discern how bots are being used to amplify political communication, the analysis focuses upon the 18.9m tweets captured.

Twitter provides free access to a sample of the public tweets posted on the platform. The platform's precise sampling method is not known, but the company itself reports that the data available through the Streaming API is at most one percent of the overall global public communication on Twitter at any given time. [6] In order to get the most complete and relevant data set, the tweets were collected by following particular hashtags identified by the team as being actively used during the debate. A few additional tags were added in the week before the election as they rose to prominence. The programming of the data collection and most of the analysis were done by using the statistics package R.

or-service (DDOS) attacks and to engineer theft of confidential information, click fraud, cyber-sabotage, and cyberwarfare. [3], [4] Over social media, botnets are interconnected automated accounts built to follow and re-message one another. These social botnets, often comprised of hundreds of unique accounts, can be controlled by one user operating from a single computer.

Social bots are particularly prevalent on Twitter, but they are found on many different platforms that increasingly form part of the system of political communication in many countries. [5] Highly automated accounts post, tweet, or message off their own accord. The most rudimentary bot profiles lack basic account information such as coherent screen names or profile pictures. Such accounts have become known as “Twitter eggs” because the default profile picture on that social media site is of an egg. While social media users get access from front-end websites, bots get access directly through a code-to-code connection, mainly through the site's wide-open

1

Southern California / Indiana

6/6/2017 Bessi  
First Monday, Volume 21, Number 11 - 7 November 2016

**f i @ s t m x ñ d @ ¥**  
PEER-REVIEWED JOURNAL ON THE INTERNET

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Social media have been extensively praised for increasing democratic discussion on social issues related to policy and politics. However, what happens when this powerful communication tools are exploited to manipulate online discussion, to change the public perception of political entities, or even to try affecting the outcome of political elections?

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**Abstract**  
This paper studies information diffusion in social media and the role of Twitter bots in the 2016 U.S. Presidential election. We analyzed 18.9 million tweets posted on Twitter during the election period, and found that Twitter bots largely dominate the political discussion on Twitter. They largely complete more than 2 hours per election day, and are more active during the election period than during the rest of the year. They are also more consistent with the general political orientation of the users they follow. Bots have negligible effect on the framing of political issues, but they are more likely to spread political information consistent with humans' priors. Overall, our results suggest that the aggressive use of Twitter bots, coupled with the fragmentation of social media and the role of sentiment, could contribute to the vote outcomes.

JEL classification: D70; D72; L86  
Keywords: Brexit; U.S. Election; Information diffusion; Echo chambers; Political Bots; Twitter

\* Corresponding author. School of Management, Swansea University, Bay Campus, Fabian Way, Swansea, SA1 8EN. E-mail: o.talavera@swansea.ac.uk. The standard disclaimer applies.

We are grateful to participants of the 2017 Royal Economics Society Conference, the 12<sup>th</sup> Annual Conference - Warsaw International Economic Meeting, and the 15<sup>th</sup> Annual Media Economics Workshop for comments.

1/14

Berkeley / Swansea

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Yuriy Gorodnichenko  
University of California, Berkeley  
The Pham  
Swansea University  
Oleksandr Talavera\*  
Swansea University

First draft: 17.01.2017 Current draft: 26.04.2018

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**BULLSHIT**

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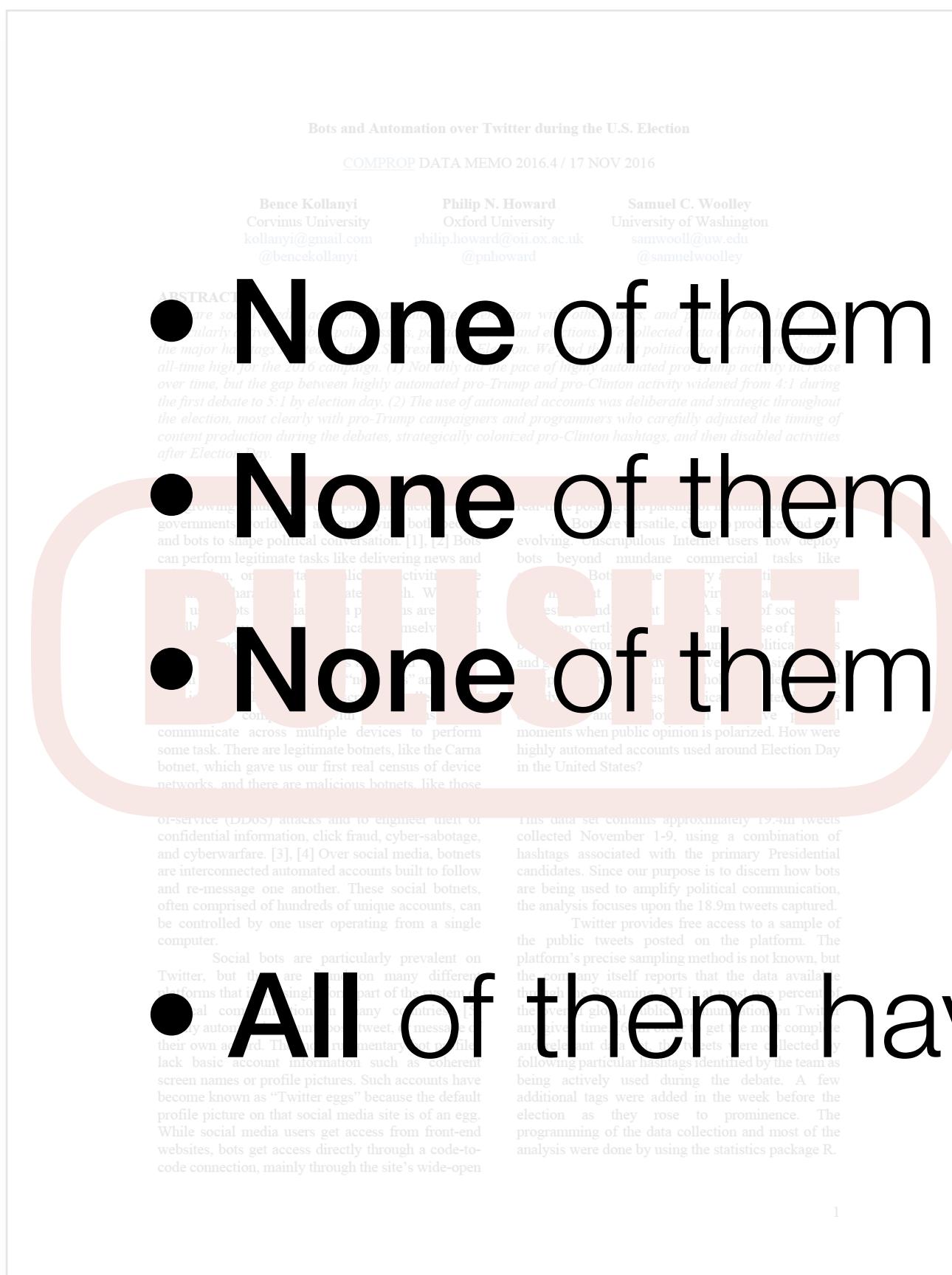
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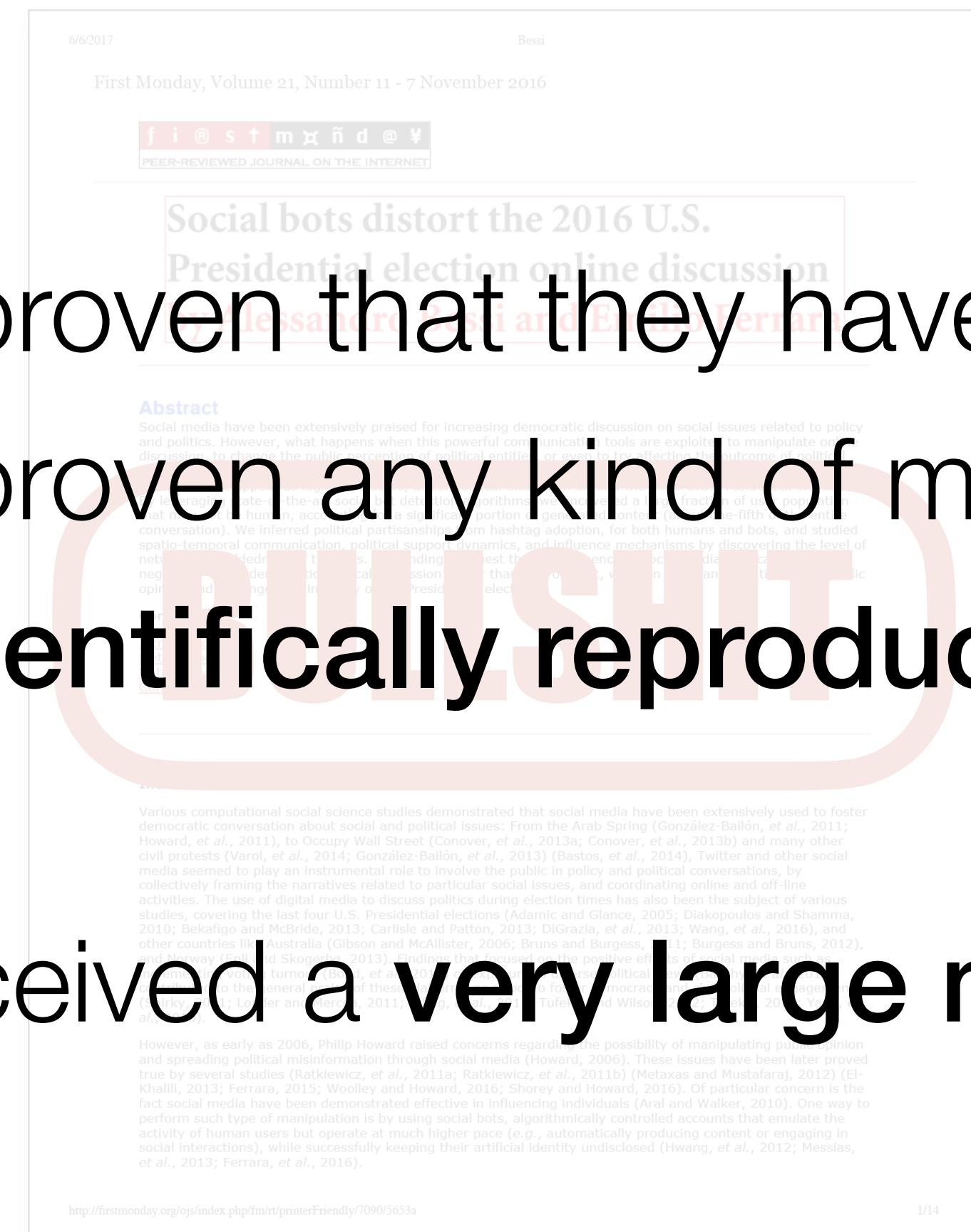
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ComProp / Oxford

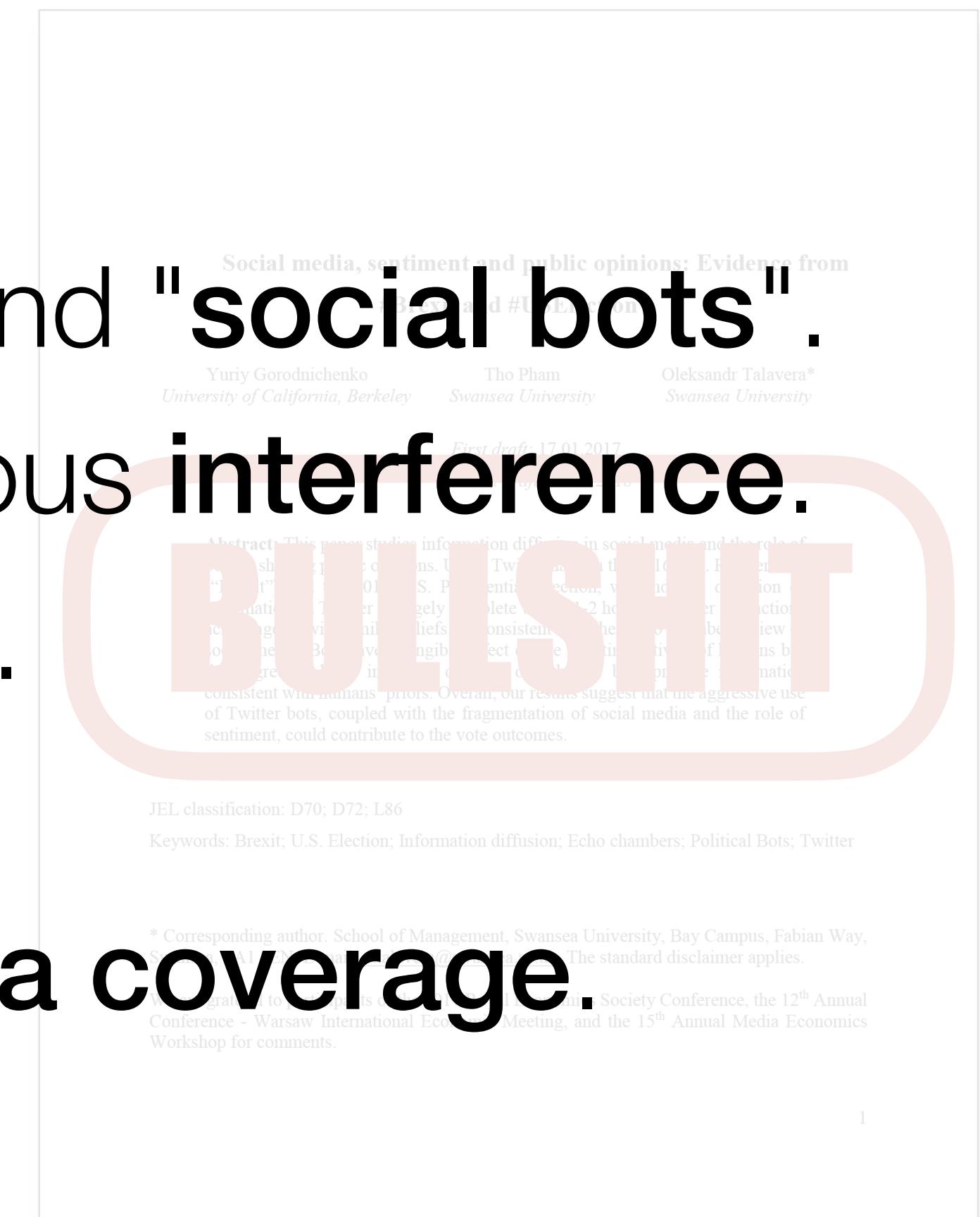


- None of them has proven that they have found "social bots".
- None of them has proven any kind of malicious interference.
- None of them is scientifically reproducible.
- All of them have received a very large media coverage.

Southern California / Indiana



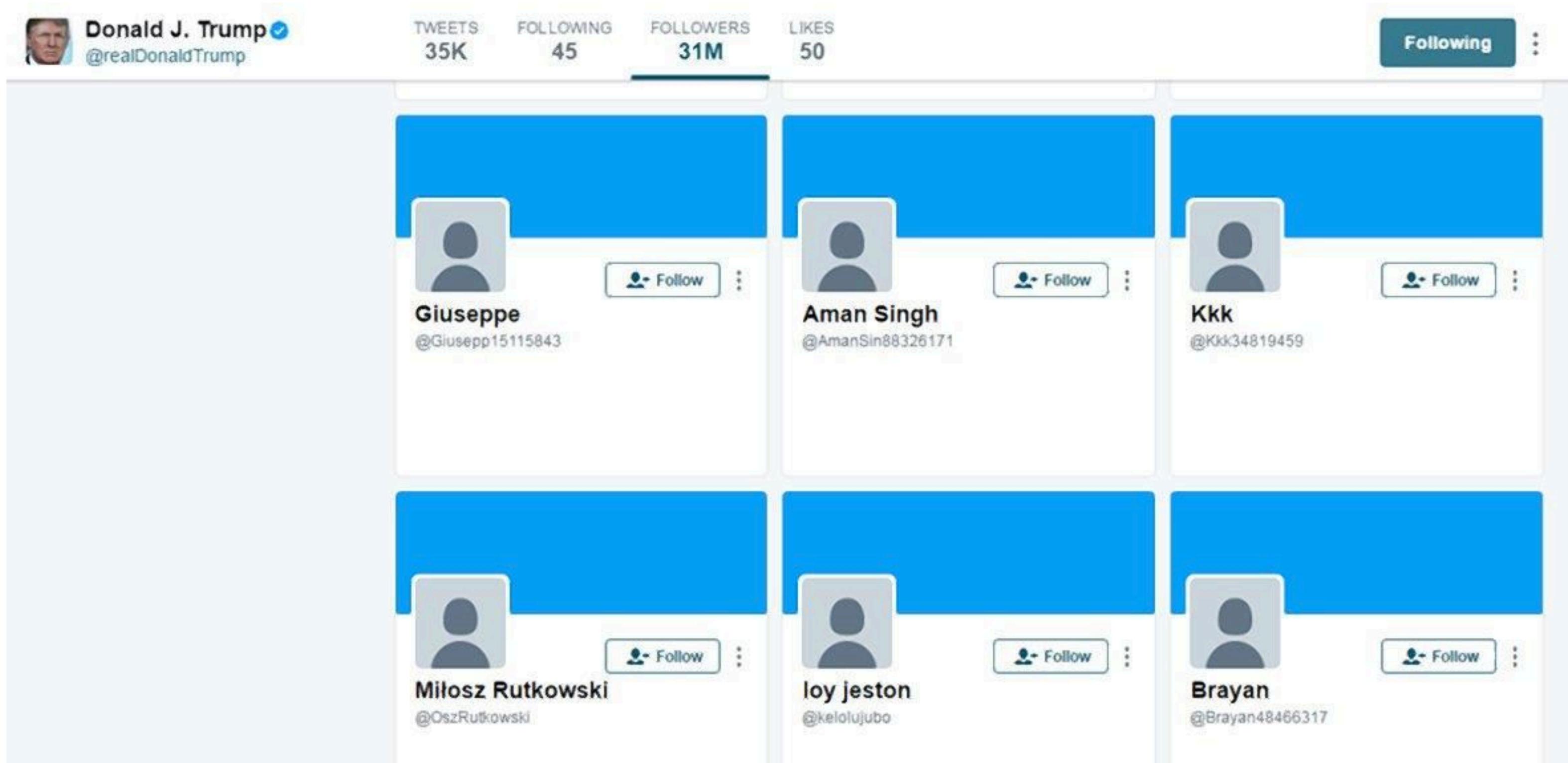
Berkeley / Swansea



# FAQ

# FAQ

**Question:** But many Trump followers are social bots because they are egg accounts without profile pictures.



# FAQ

**Question:** But many Trump followers are social bots because they are egg accounts without profile pictures.

**Answer:** No. Many new users are passive use Twitter like a feed reader. Therefore they have no tweets, no picture and no followers.

# FAQ

**Question:** But a friend of mine knows a guy who said that he can influence elections with social bots.

# FAQ

**Question:** But a friend of mine knows a guy who said that he can influence elections with social bots.

**Answer:** First of all, that's not a question, that's a comment. Second, the brother-in-law of my dentist says that this guy is a liar.

# FAQ

**Question:** But didn't Twitter admit that there are millions of "Social Bots" on the platform and is deleting them all?

*<https://www.techtimes.com/articles/250614/20200625/twitter-to-join-bot-or-not-weekly-challenge-to-resolve-millions-of-fake-accounts.htm>*

# FAQ

**Question:** But didn't Twitter admit that there are millions of "Social Bots" on the platform and is deleting them all?

**Answer:** No. The @NYTimes will not be deleted! Twitter announced that they are fighting malicious activities like spam, fake accounts or artificial amplification. But they are not fighting automation.

Journalists should check the accuracy of their quotes.

# FAQ

**Question:** There are millions of very young accounts like  
[@Mark75712704](#), [@Megan98110753](#), [@Mike63456499](#)!  
Of course these are "Social Bots"!

# FAQ

**Question:** There are millions of very young accounts like @Mark75712704, @Megan98110753, @Mike63456499! Of course these are "Social Bots"!

**Answer:** No, this is the default pattern for new Twitter account names. You don't believe me? Create a new account and see for yourself.

# FAQ

**Question:** There are millions of “Social Bot” accounts out there, but you can't see them because they look and act exactly like people.

# FAQ

**Question:** There are millions of “Social Bot” accounts out there, but you can't see them because they look and act exactly like people.

**Answer:** People who believe that also believe: “There are millions of reptilioids out there, but you can't see them because they look and act exactly like people.”

“Social Bots” want you  
to smoke e-cigarettes?

# Social Media Bots Deceive E-cigarette Users

Social media bots promote unproved benefits of e-cigarettes

By Mark Fischetti



Vaping is hot. A clever analysis of Twitter posts reveals one possible reason: automated accounts, or bots, may be convincing people that electronic cigarettes are beneficial. Researchers analyzed 2.2 million tweets about vaping and discovered that hashtags used in tweets by humans differ from those in tweets by bots.

Bots focus on new products and on vaping as an effective way to stop smoking tobacco even though “there is limited scientific evidence for that,” says study

Original Paper

## E-Cigarette Surveillance With Social Media Data: Social Bots, Emerging Topics, and Trends

Jon-Patrick Allem<sup>1</sup>, MA, PhD; Emilio Ferrara<sup>2</sup>, PhD; Sree Priyanka Uppu<sup>3</sup>, MS; Tess Boley Cruz<sup>1</sup>, PhD; Jennifer B Unger<sup>1</sup>, PhD

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tables to detect if hashtags varied by source (social bot vs human user) using the Fisher exact test to determine statistical significance.

**Results:** Clusters found in the corpus of hashtags from human users included behaviors (eg, #vaping), vaping identity (eg, #vapelife), and vaping community (eg, #vapenation). Additional clusters included products (eg, #eliquids), dual tobacco use (eg, #hookah), and polysubstance use (eg, #marijuana). Clusters found in the corpus of hashtags from social bots included health (eg, #health), smoking cessation (eg, #quitsmoking), and new products (eg, #ismog). Social bots were significantly more likely to post hashtags that referenced smoking cessation and new products compared to human users. The volume of tweets was highest in the Mid-Atlantic (eg, Pennsylvania, New Jersey, Maryland, and New York), followed by the West Coast and Southwest (eg, California, Arizona and Nevada).

**Conclusions:** Social media data may be used to complement and extend the surveillance of health behaviors including tobacco product use. Public health researchers could harness these data and methods to identify new products or devices. Furthermore, findings from this study demonstrate the importance of distinguishing between Twitter posts from social bots and humans when attempting to understand attitudes and behaviors. Social bots may be used to perpetuate the idea that e-cigarettes are helpful in cessation and to promote new products as they enter the marketplace.

(JMIR Public Health Surveill 2017;3(4):e98) doi: [10.2196/publichealth.8641](https://doi.org/10.2196/publichealth.8641)

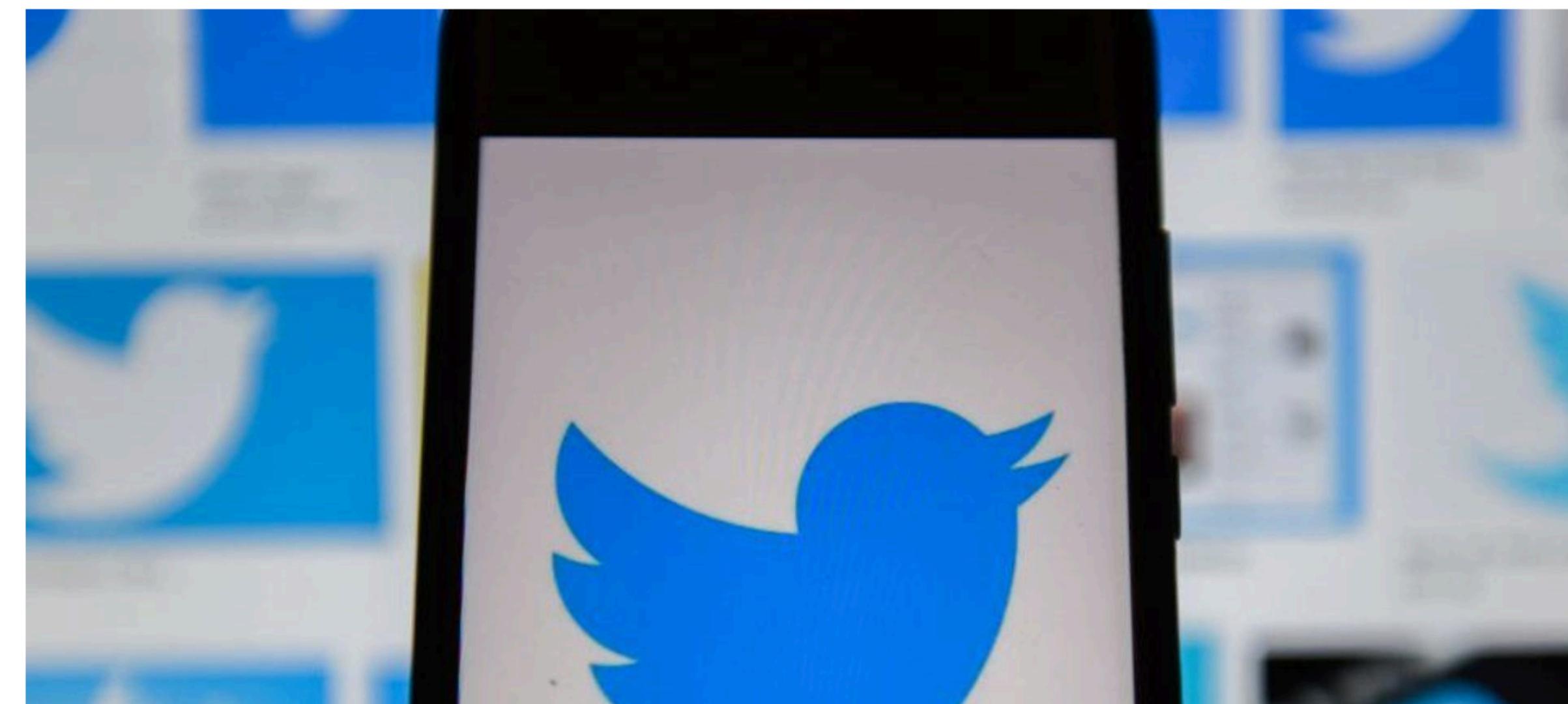
**“Social Bots”  
deny climate change?**

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# Study finds quarter of climate change tweets from bots

🕒 22 February 2020

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Twitter Discourses on Climate Change: Exploring Topics, Presence of Bots

Authors: Thomas Marlow<sup>1</sup>, Sean Miller, J. Timmons Roberts<sup>2</sup>

## Abstract

This study explores the role of Twitter bots (automated users) in online discourse on climate change. We examined 6.5 million tweets posted during the days leading up to and the month following President Donald Trump's June 1, 2017 announcement of the United States'

**BULLSHIT**

impact of mechanized bots in amplifying denialist messages about climate change, including support for Trump's withdrawal from the Paris Agreement.

## Acknowledgements

We gratefully acknowledge the Brown University Data Science Initiative who provided funding to support the purchase of historical Twitter data.

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**“Social Bots”  
deny climate change?**

▲ DOW -0.68%

▲ S&amp;P 500 -0.62%

▲ NASDAQ 100 -0.94%

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# Roughly half the Twitter accounts pushing to 'reopen America' are bots, researchers found

Aaron Holmes

May 22, 2020, 4:19 PM

**Kathleen M Carley**Carnegie Mellon University | CMU · Institute for Software Research  
✉ 41.01 · Ph.D.

## Scientific paper?

Nope!  
Just claims,  
no proof!

“Social Bots” and  
**#BlackLivesMatter?**

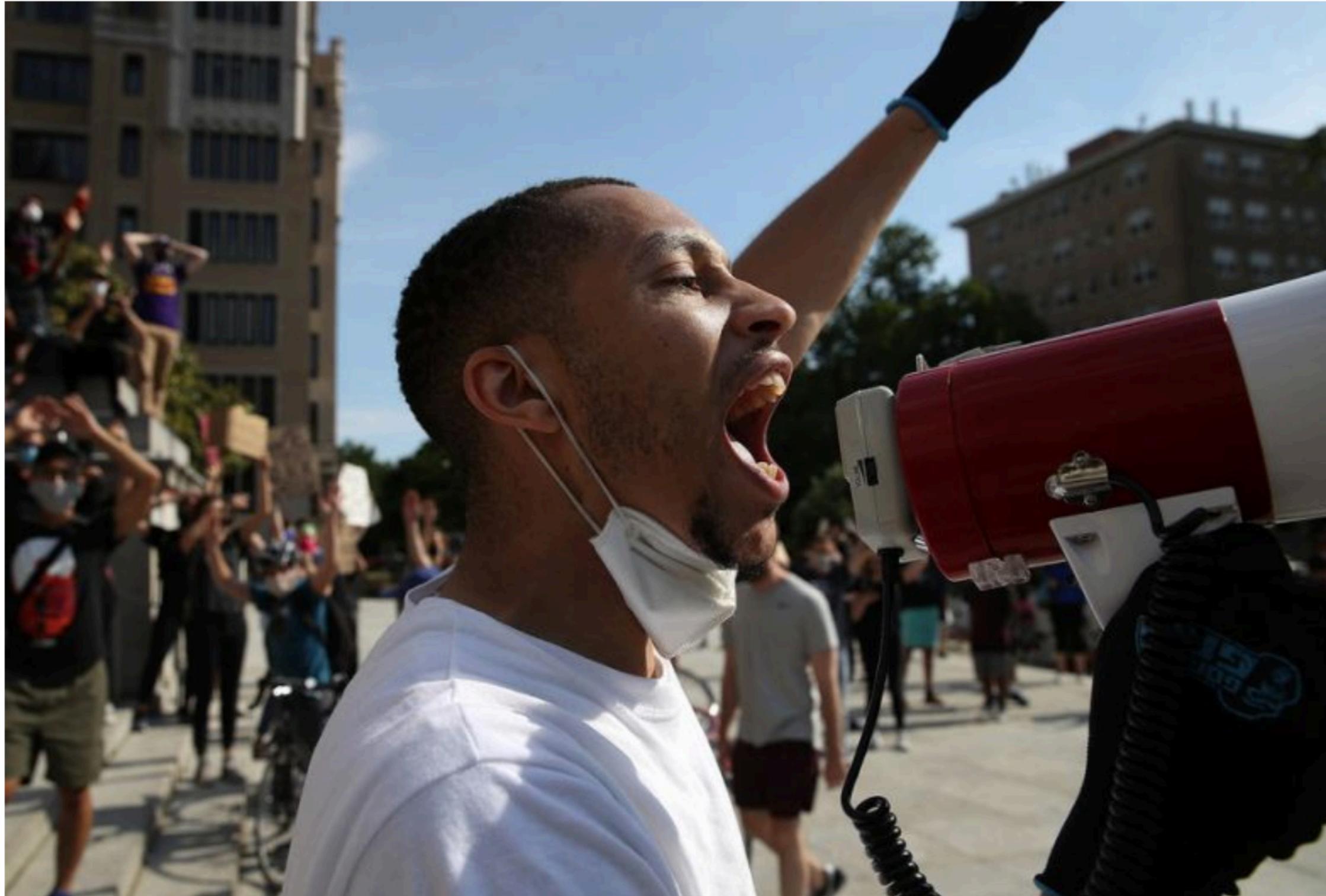


## Researchers: 1 in 3 accounts tweeting about BLM protests are 'guaranteed to be bots'



Maya Shwayder

Digital Trends June 3, 2020

**Kathleen M Carley**Carnegie Mellon University | CMU · Institute for Software Research  
Jill 41.01 · Ph.D.

## Scientific paper?

Nope!  
Just claims,  
no proof!

“Social Bot Research”  
is a Desaster!

# **EU-Copyright reform**

# Directive on Copyright in the Digital Single Market

From Wikipedia, the free encyclopedia

*This article is about the 2019 Directive. For the 2001 Directive, see [Information Society Directive](#).*

The **Directive on Copyright in the Digital Single Market**, formally the **Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC** is a [European Union \(EU\)](#) directive which has been adopted and came into force on 7 June 2019. It is intended to ensure "a well-functioning marketplace for copyright".<sup>[1]</sup> It extends existing [European Union copyright law](#) and is a component of the EU's [Digital Single Market](#) project.<sup>[2]</sup> The [European Council](#) (EC) describes their key goals with the Directive as protecting press publications; reducing the "value gap" between the profits made by Internet platforms and by content creators; encouraging collaboration between these two groups, and creating [copyright exceptions](#) for text- and data-mining.<sup>[3]</sup>

The directive was introduced by the [European Parliament Committee on Legal Affairs](#) on 20 June 2018, and a revised proposal was approved by the parliament on 12 September 2018. The final version, which resulted from negotiations during [formal trilogue meetings](#), was presented to the parliament on 13 February 2019.<sup>[4]</sup> The measure was approved by on 26 March 2019<sup>[5][6][7]</sup> and the directive was approved by the [Council of the European Union](#) on 15 April 2019.<sup>[8]</sup> Member states have two years to pass appropriate legislation to meet the

## Directive 2019/790

European Union directive

Text with EEA relevance



### Title

Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC

### Made under

Articles 53(1), 62 and 114

#SaveYourInternet

=



**#SaveYourInternet**

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The #SaveYourInternet fight against Article 17 [ex Art. 13]

LAST UPDATED



**Sven Schulze**   
@schulzeeuropa



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[Translate Tweet](#)

5:25 pm · 15 Feb 2019 · Twitter for Android

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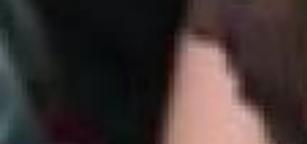
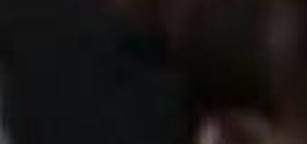
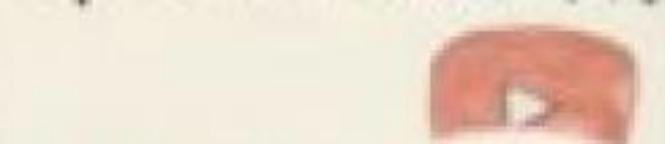
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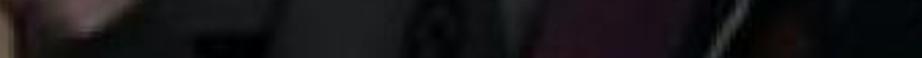
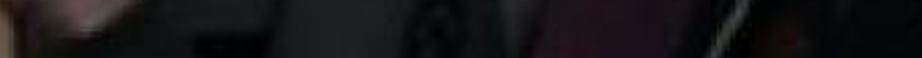
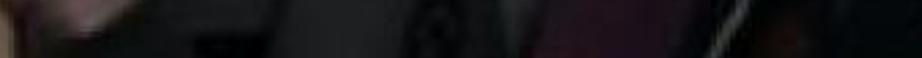
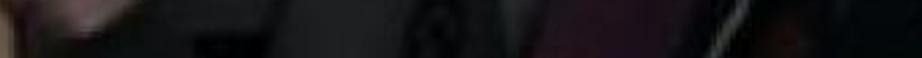
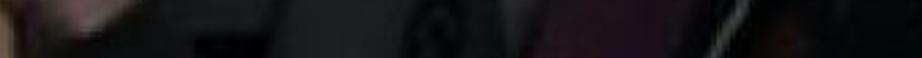
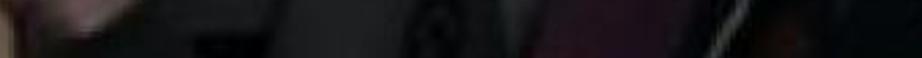
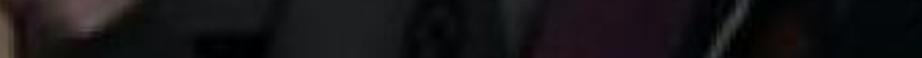
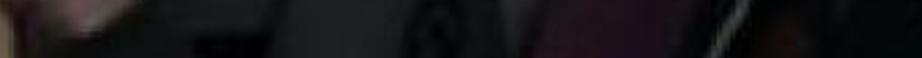
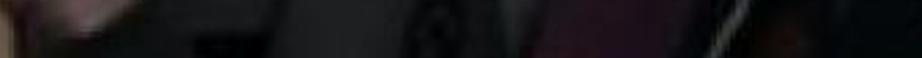
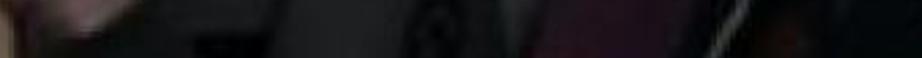
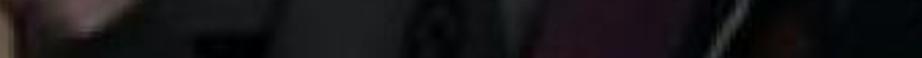
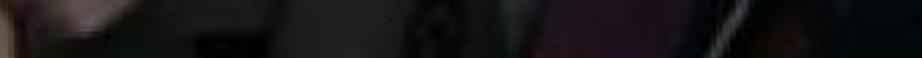
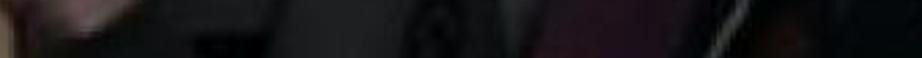
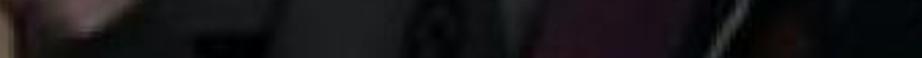


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SAVE  
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INTERNET







▶ ▶ 🔍 2:29 / 3:08

<https://www.youtube.com/watch?v=ukf9PBz1q6Q>

CC HD □ [ ]

#wirsindkeinebots #artikel13 #Bots

WILLBOY - WIR SIND KEINE BOTS ✕ (Artikel 13 Demosong) prod. KYA

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Up next

AUTOPLAY



BESTER Remix EVER 😅 |  
Tanzverbot + Robbe + Willboy

Rezo ja lol ey

The bot narrative  
is just a new way of  
dehumanizing opposition.

›The **binary judgments** of who's a “bot or not”,  
has real potential to **poison our public discourse**  
particularly when they are pushed  
out through the media.«

There are proprietary, closed-source  
and **unscientific algorithms**  
that decide which **social movement is legitimate**  
and which one is not.

This is a **new dangerous dystopia**.

Please, start a debate on the scientific validity  
of “social bots research” in the United States.

# **People are not Bots**

How Researchers Delegitimize Social Movements

@MichaelKreil

<https://github.com/MichaelKreil/hope2020>