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the elon musk paradox
quantifying the presence and impact of ~~twitter~~ bots
on altmetrics with focus in social sciences

1. INTRODUCTION

Elon Musk's ~~Twitter~~ bots estimation

→ 33% of accounts

→ 10% of active accounts

~~Twitter~~ estimation

→ <5% of active accounts

Literature

→ ≈9-15% of active accounts

Varol, O., Ferrara, E., Davis, C., Menczer, F., & Flammini, A. (2017).

Online human-bot interactions: Detection, estimation, and characterization. *Proceedings of the International AAAI Conference on Web and Social Media*, 11(1), 280-289.

<https://doi.org/10.1609/icwsm.v11i1.14871>



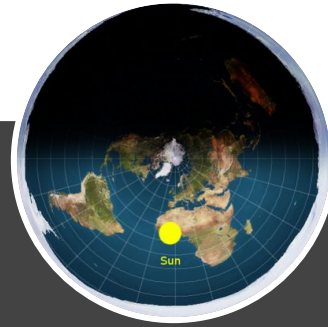
1. INTRODUCTION

The realm of ~~Twitter~~ bots is multifaceted, ranging from harmless automated accounts to those spreading fake news



arxiv
@arxiv_org

Unofficial bot posting recent scientific paper e-prints every hour, run by [@yddt](#)



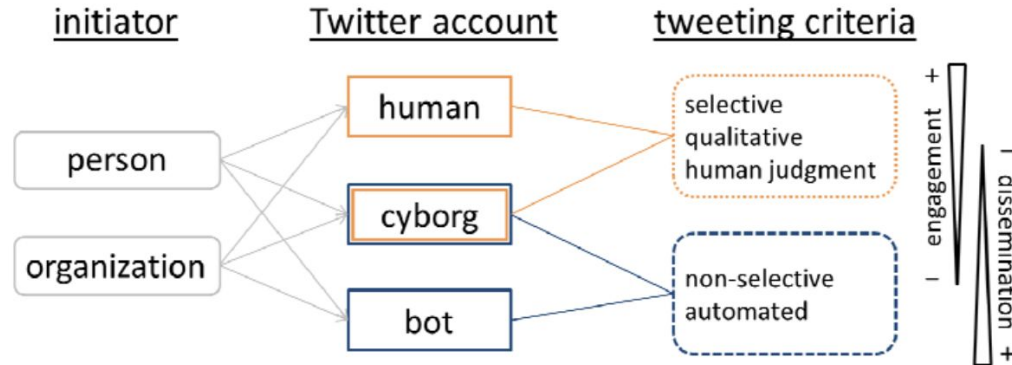
Flat Earth
@FlatEarthRT

Follow me if you want automated retweets of all mentions of our #FlatEarth on Twitter

While some bots can have negative implications, like influencing elections, not all automated accounts are malicious by nature

1. INTRODUCTION

Bots play a significant role in scientific dissemination, but their impact on science is **not necessarily negative**



Haustein, S., Bowman, T. D., Holmberg, K., Tsou, A., Sugimoto, C. R., & Larivière, V. (2016). Tweets as impact indicators: Examining the implications of automated "bot" accounts on Twitter. *Journal of the Association for Information Science and Technology*, 67(1), 232-238. <https://doi.org/10.1002/asi.23456>

There is a distinction between bots and cyborgs in science communication, yet the true influence of bots on altmetrics remains unexplored

1. OBJECTIVES

This research aims to serve as a proof of concept for the identification of the presence and influence of ~~Twitter~~ bots in science, using the Social Sciences as a case study

Specific objectives

1. Analyse bot presence and their mention volume for Social Science papers on ~~Twitter~~
2. Identify bot presence within each Social Science discipline
3. Quantify bot influence in Information Science & Library Science as a study case

2. METHODOLOGY

DATA

802,363 accounts
publishing

4,944,663 tweets
mentioning

265,999 papers_[2017-2021]

METHODS

Descriptive statistics

+

Botometer API Lite

BOTOMETER

Machine learning tool for estimating an account's probability of being a bot called **botscore**

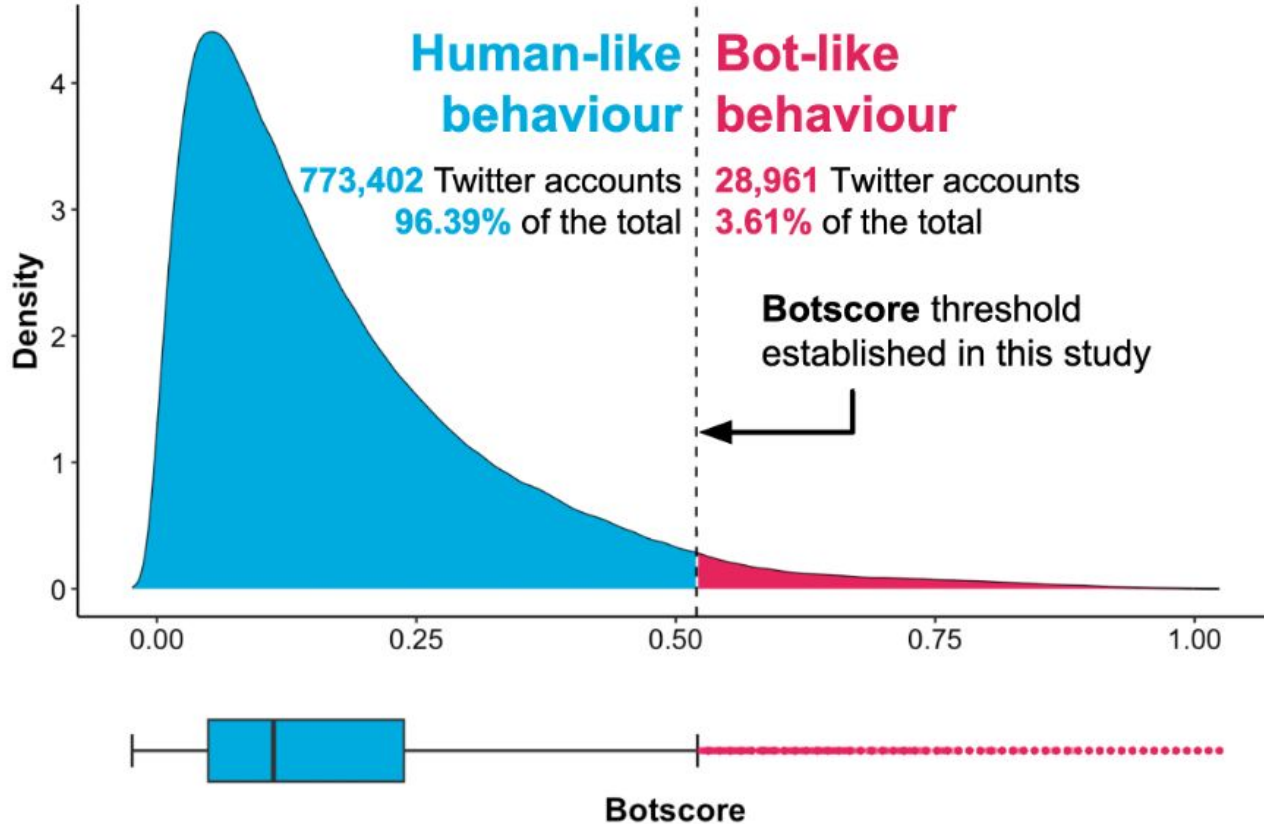


Features

- Followers
- Friends
- Description
- Tweets
- ...



2. METHODOLOGY



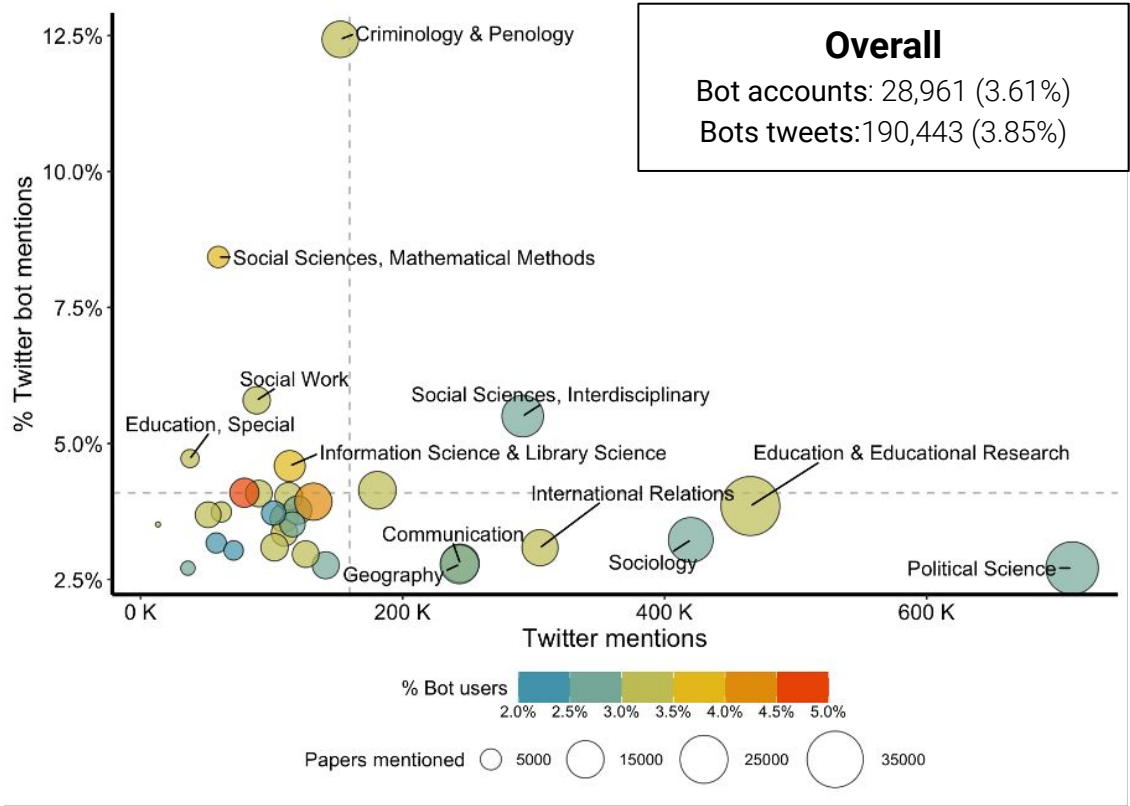
PROOF OF CONCEPT

This proposal constitutes a proof of concept for large-scale implementation

FULL
DATASE
TOF
TWEETS

Proof of concept

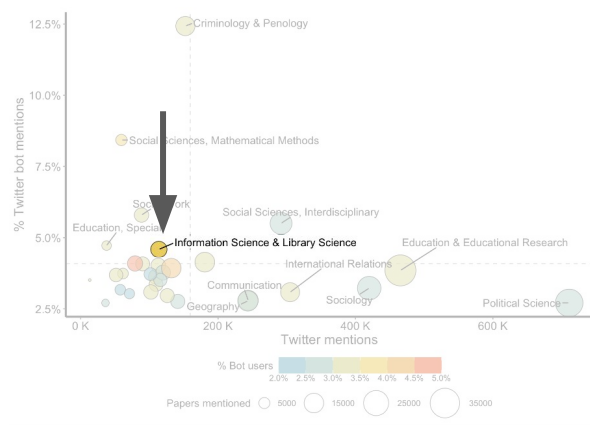
3. RESULTS// General overview



While bots play a role in Social Sciences mentions, their influence varies significantly across subjects

3. RESULTS// Study case: Information Science & Library Science

A Kendall correlation between the total mentions and mentions excluding bots yielded a strong Kendall's tau-b coefficient of **0.95**



User name	Tweets	Followers	Friends	Botscore	ISLS mentions	% Social Sciences	ISLS mentioned
@arxiv_cscl	18,1950	6121	1	0.83	133	39%	30
@ORMS_IEOM	3711	126	63	0.55	127	87%	89
@JOLIS45	200	446	301	0.59	89	100%	84
@v_i_o_l_a	133,496	2463	3133	0.72	88	73%	82
@OpenSciTalk	145,655	4280	1	0.66	87	22%	67
@ijcscl	107	339	0	0.62	81	50%	47
@HealthLitUpdate	6401	398	0	0.77	76	16%	64
@M157q_News_RS3	530,660	1098	0	0.64	73	41%	54
@ComputerPapers	42,275	613	4	0.88	68	62%	68
@OpenScienceR	4620	3037	2488	0.58	65	67%	60

Some accounts detected as bots are questionable

4. DISCUSSION

- 1.** The methodological framework has proven useful, though there have been flaws in bot detection (false positives)
- 2.** The findings from this preliminary research align with previous studies
- 3.** The presence and impact of bots seem to be dependent on the scientific discipline studied

5. FURTHER RESEARCH

1. We will enhance the methodology and incorporate a robustness check
2. We will apply this study on a large scale
3. We will share a dataset of ~~Twitter~~ bots in science

Limitations

Changes introduced in ~~Twitter~~ have influenced the ecosystem of Twitter bots



Outbreak Science
@outbreaksci



We're no longer permitted to post automated updates on preprints without paying – and we don't have a budget for this.

3:37 PM · Jun 5, 2023 · 53 Views



STI

ENID 2023

thanks for your attention!



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