NSS-SocialSec 2023

Twitter Bots Influence on the Russo-Ukrainian War During the 2022 Italian General Elections

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14 August, 2023 – Canterbury, UK

Background - The Russo-Ukrainian War

24th February - Begin of "Special Military Operation" from Russia over Ukraine

28th February - Italy sided with Ukraine --> Many consequences:

- Cyber attacks From Russia

- Public Opinion Divided on how to act

- The war became a major campaign issue for Italian General

  Election on 25th September

Source: Institute for the Study of War (21:00 GMT, 26 July)

Background - The Russo-Ukrainian War

People and Politicians use social media platforms to communicate

Information is often manipulated by social bots:

- Japan General Elections 2014

- Spain General Elections 2019

- USA Presidential Elections 2016/2020

- ...

Carlo
@Carlo824335821

Replying to @matteosalvinimi and @TheEconomist
Translated from Italian by Google
With Ukraine we slipped into a sewer, just as a favor to mom USA who doesn't want us to associate with the very bad Russians. And the ox people obey. After all, the decline of Europe began and continues as the decline of its people

6:48 PM · Aug 25, 2022

Contributions

- Overview on how Italian politicians discussed the war during February-December 2022 on Twitter

- Analysis on Bots' influence during the last month of the General Elections

- Dataset of 39,611 Tweets and 105,603 comments will be made publicly available

Data Collection

Analyses conducted on **six major parties**:

- Democratic Party (PD), Five Stars Movement (M5S)

- Italian Green-Left party (SiVe)

- Coalition that won the 2022 elections:

Brothers of Italy (FdI), League for

Salvini Premier (Lega), Forward Italy (FI)

Data Collection

$$D_i = [P, L, p_1, \ldots, p_6]$$

D_i is the Dataset, $i = 1, \ldots, 6$, one for each party

P is the "Party account", e.g., @FratellidItalia

L is the "Leader account", e.g., @GiorgiaMeloni

$p_1, \ldots, p_6$ are six "major political figures" in that party

General political discussions: Tweets from 24 February to 31 December 2022

Bots' influence: Tweets from 23 August until 23 September 2022

Data Collection

Table 1. Complete overview of the dataset.

Party	Leader	Members	Total Followers	Posted Tweets	Replies to Secretary	Unique Users Replying
PD	Letta	Serracchiani Orlando Madia Provenzano Boldrini Gentiloni	3.511M	4357	158747	35571
FdI	Meloni	La Russa Santanche Lollobrigida Fidanza Rampelli Rauti	2.471M	6610	60237	22670
M5S	Conte	Fico Taverna Appendino Sibilia Grillo Maiorino	2.419M	3672	47886	14255
Lega	Salvini	Fontana Arrigoni Pillon Rixi Centinaio Bongiorno	1.898M	15797	59317	20159
FI	Berlusconi	Tajani Bernini Gasparri Fitto Casellati Ronzulli	804.2K	4172	29597	9962
SiVe	Fratoianni	Bonelli Soumahoro Alemanni Evi Marcon Pellegrino	411K	5003	5038	2986

The Russo-Ukrainian War in Italian Politics

"How did Italian politicians discuss the war?"

Fig. 2. Word Clouds for the tweets of parties captured.

The Russo-Ukrainian War in Italian Politics

Topic Analysis

1. Tweets embeddings from Sentence-Bert

2. UMAP and HDBSCAN to create clusters (i.e., topics)

3. Words importance by <u>class-based</u> TF-IDF:

   - Sanctions for PD, M5S, Lega, FI

   - Weapons for PD and SiVe

   - Solidarity for M5S and FDI

Table 2. Top-7 topics and the number of tweets for each party.

PD %	PD Topic	M5S %	M5S Topic	SiVe %	SiVe Topic	FdI %	FdI Topic	Lega %	Lega Topic	FI %	FI Topic
29.11	RU-UA War	20.96	Italy	80.98	Vote Left	28.30	Italy	32.09	Italy	90.14	Berlusconi
17.96	Salary	18.56	Energy	12.48	Do	18.75	Vote	20.82	Energy	5.17	RU-UA War
13.04	Truth	14.19	RU-UA War	3.08	RU-UA War	14.76	Meloni	12.93	RU-UA War	1.25	Agenda
12.19	Italy	13.21	Mafia	1.83	Education	11.83	Do	10.39	Immigrants	1.07	Pandemic
10.49	Europe	11.68	Salary	0.65	Military Exp.	9.78	RU-UA War	8.53	Taxes	0.91	Italy
8.98	Vote	11.24	Agenda	0.49	Iran Women	9.61	Taxes	7.79	Rome	0.86	Foreign wars
8.23	Fascism	10.16	Courage	0.49	Climate	6.97	Energy	7.45	Vote	0.60	Europe

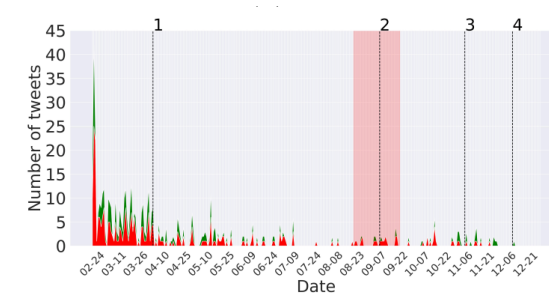# The Russo-Ukrainian War in Italian Politics

Temporal Analysis

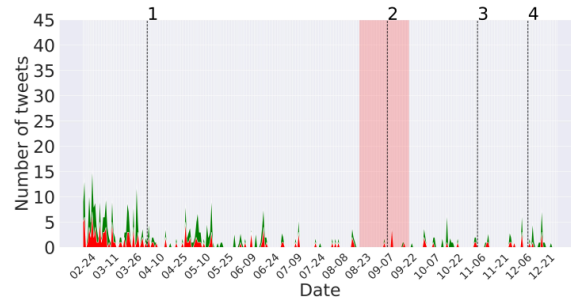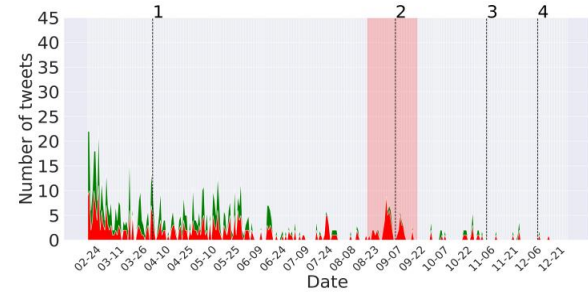Frequency of tweets using bag of words approach (Ukraine, Zelensky, Russia, Putin, …)
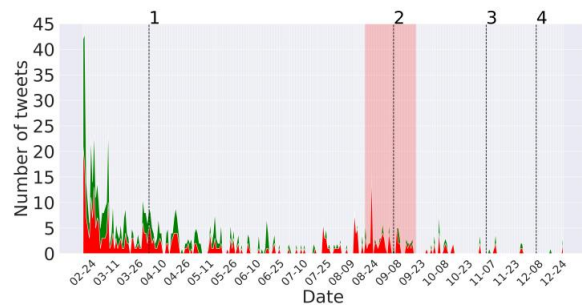
(a) PD
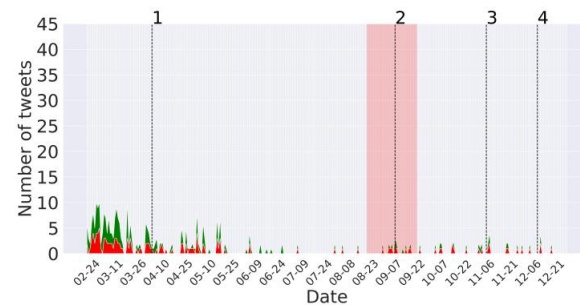
(b) M5S

(c) SiVe

(d) FdI

(e) Lega
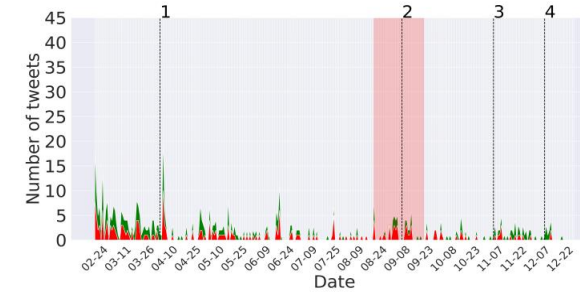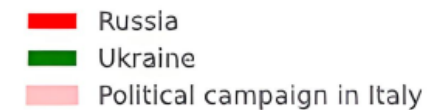
(f) FI

Legend:
- Russia (red)
- Ukraine (green)
- Political campaign in Italy (pink)

The Russo-Ukrainian War in Italian Politics

Recap

The war was a major political issue for almost each of the biggest parties in Italy

Many tweets at the beginning of the war, and then depends on the party:

- PD, Lega, FI significant involve throughout the whole campaign, focusing more on Russia

- Noticeable decline after the election, except for FdI and FI, which focused more on Ukraine

How did bots influence the Discussion?

Bots Presence

Analysis on replies of each party's secretary tweets,
from August 23 to September 23

Detection using **Botometer**

Table 3. Percentages of bots and non-bots for each profile.

Profile	Unique Users	Bots (%)	Non-bots (%)
Letta	35,571	10.76	89.24
Conte	14,255	12.20	87.80
Fratoianni	2,986	9.61	90.39
Meloni	22,670	15.08	84.92
Salvini	20,159	11.12	88.88
Berlusconi	9,962	12.92	87.08

Table 4. Categories of bots distribution replying to the tweets of the leaders.

Profile	Number of Bots	Financial (%)	Fake-followers (%)	Spammers (%)	Self-declared (%)	Astroturf (%)	Other (%)
Letta	3828	0.06	25.33	0.15	33.07	35.83	5.56
Conte	1739	0.08	33.87	0.08	31.27	32.04	2.67
Fratoianni	287	0.00	19.44	0.00	42.78	31.67	6.11
Meloni	3418	0.04	30.03	0.15	33.53	31.50	4.75
Salvini	2242	0.06	39.35	0.11	27.97	27.69	4.83
Berlusconi	1287	0.44	26.40	0.00	31.79	34.43	6.93

How did bots influence the Discussion?

Bots Co-Operation

(a) Center-Left coalition

(b) Center-Right coalition
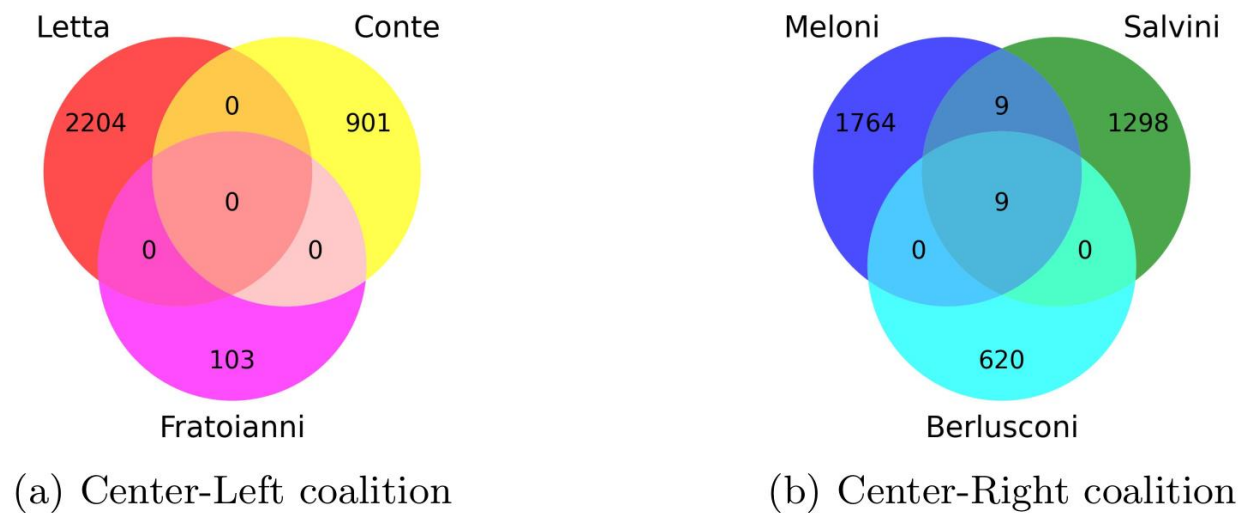
Fig. 4. Number of shared bots between profiles belonging to the same coalition. Colors are representative of the parties, according to the Italian press.

How did bots influence the Discussion?

Bots Topics Distortion

How frequently war-related topics appear together in a tweet?

1. Trained a Word2Vec model on our tweets (words with similar vectors are likelier to appear together)

2. Define M

$$M = \begin{pmatrix} m_{1,1} & m_{1,2} & \dots & m_{1,9} & m_{1,10} \\ m_{2,1} & m_{2,2} & \dots & m_{2,9} & m_{2,10} \\ m_{3,1} & m_{3,2} & \dots & m_{3,9} & m_{3,10} \end{pmatrix}$$

Where $m_{i,j}$ = cosine similarity(v_i , w_j), i = 1, 2, 3 and j = 1, . . . , 10

Words v_i are **seeds words**: {"Russia", "Ukraine", "War"}

Words w_j are **conflict-related words**: {"USA", "EU", "NATO", "Europe", "Italy", "weapons", "conflict", "invasion", "aggression", "gas"}

How did bots influence the Discussion?

Bots Topics Distortion
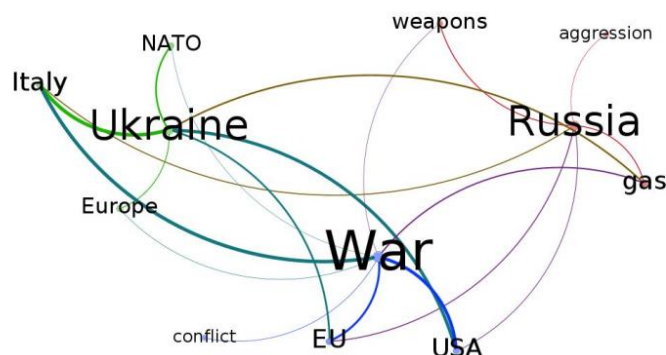
(a) PD - Complete

(b) PD - No Bots
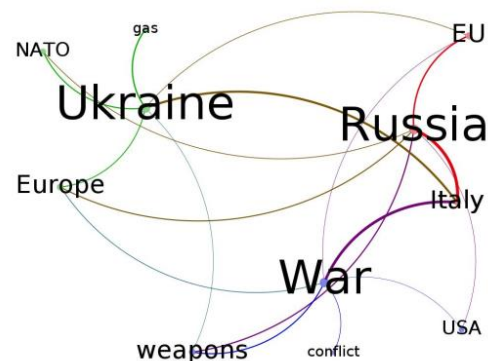
(c) M5S - Complete
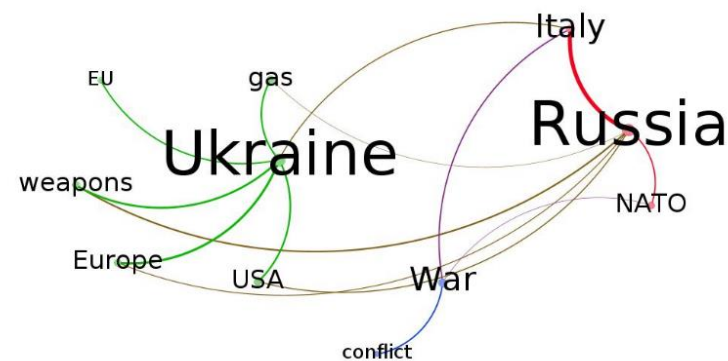
(d) M5S - No Bots

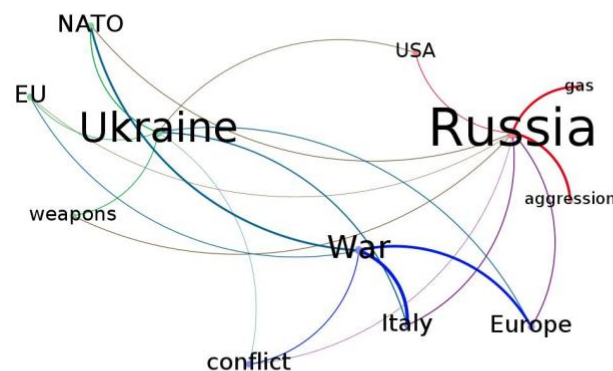# How did bots influence the Discussion?

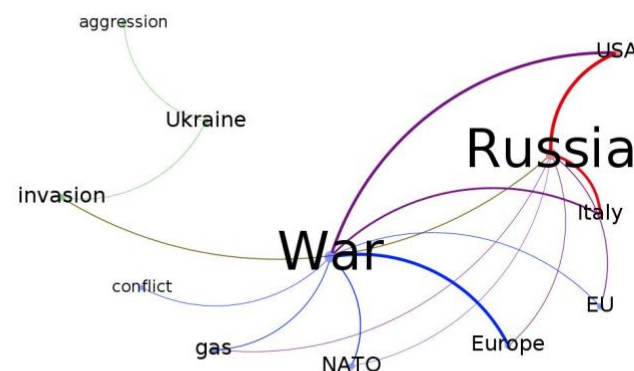## Bots Topics Distortion
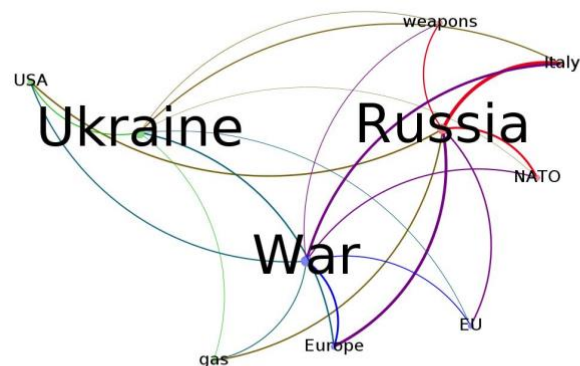
(e) SiVe - Complete
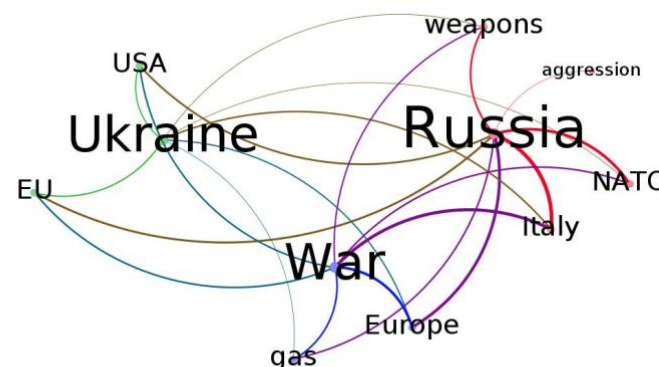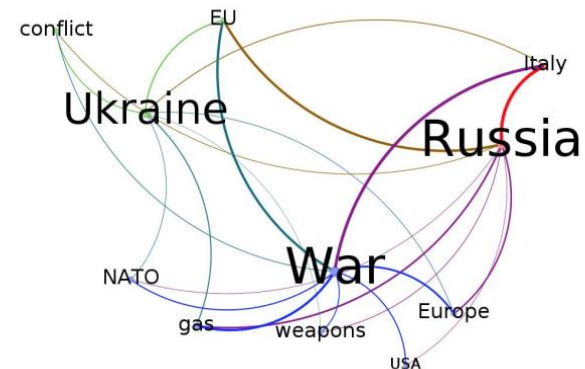
(f) SiVe - No Bots

(a) FdI - Complete

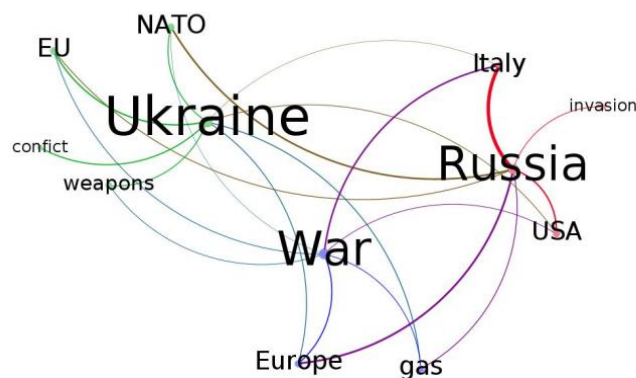(b) FdI - No Bots

How did bots influence the Discussion?

Bots Topics Distortion

(c) Lega - Complete

(d) Lega - No Bots

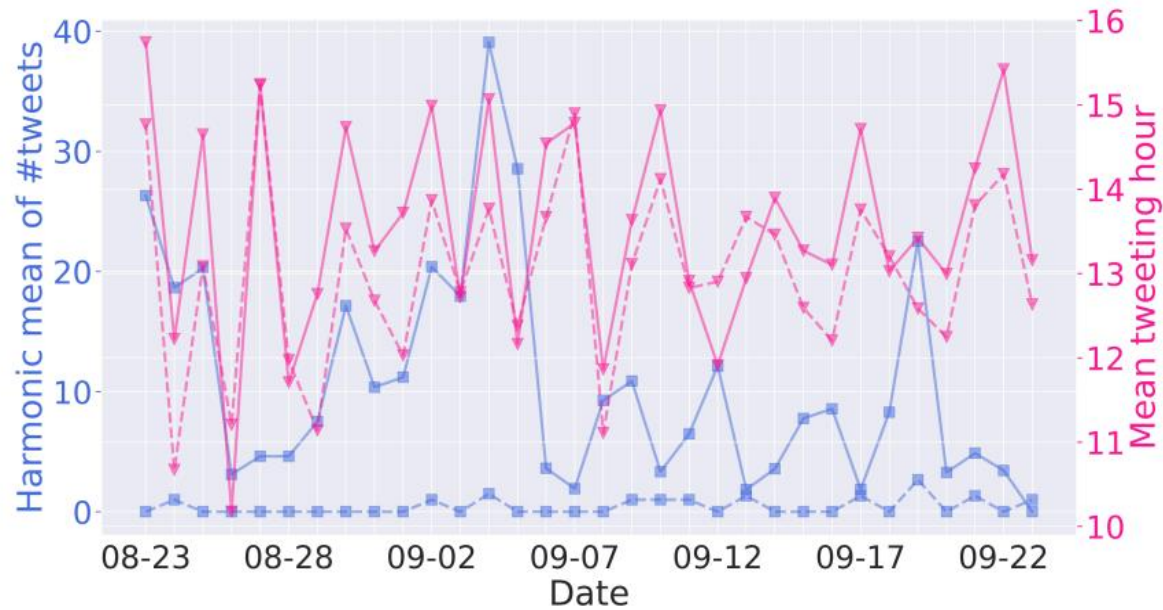(e) FI - Complete

(f) FI - No Bots
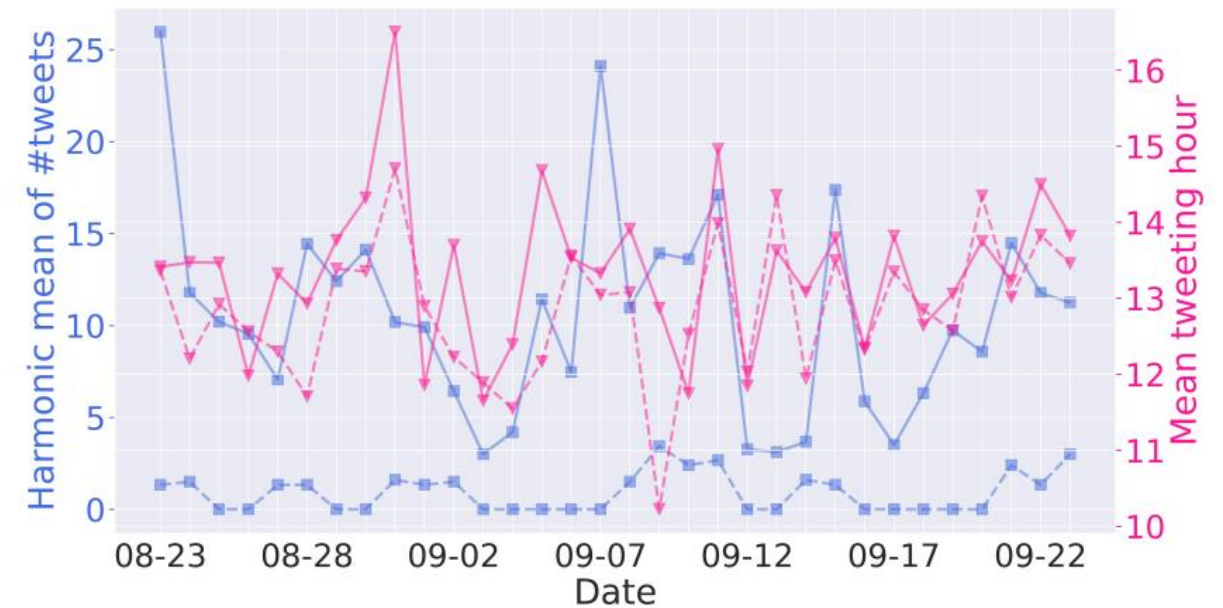
How did bots influence the Discussion?

Bots Temporal Influence

Legend:
- Harmonic mean bots
- Harmonic mean real users
- Mean tweeting hour bots
- Mean tweeting hour real users

$$h_{\mathrm{freq}} = 2 \times \frac{\mathrm{Ukraine\_frequency} \times \mathrm{Russia\_frequency}}{\mathrm{Ukraine\_frequency} + \mathrm{Russia\_frequency}}$$

(b) Conte

(d) Meloni

How did bots influence the Discussion?

Bots Temporal Influence

$$h_{\text{freq}} = 2 \times \frac{\text{Ukraine\_frequency} \times \text{Russia\_frequency}}{\text{Ukraine\_frequency} + \text{Russia\_frequency}}$$
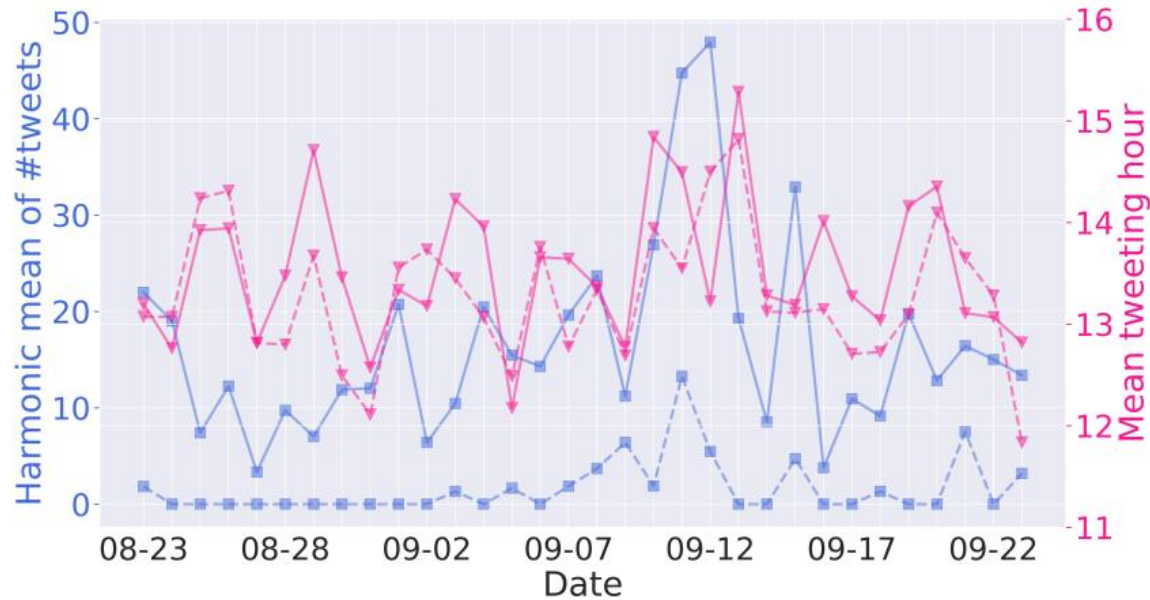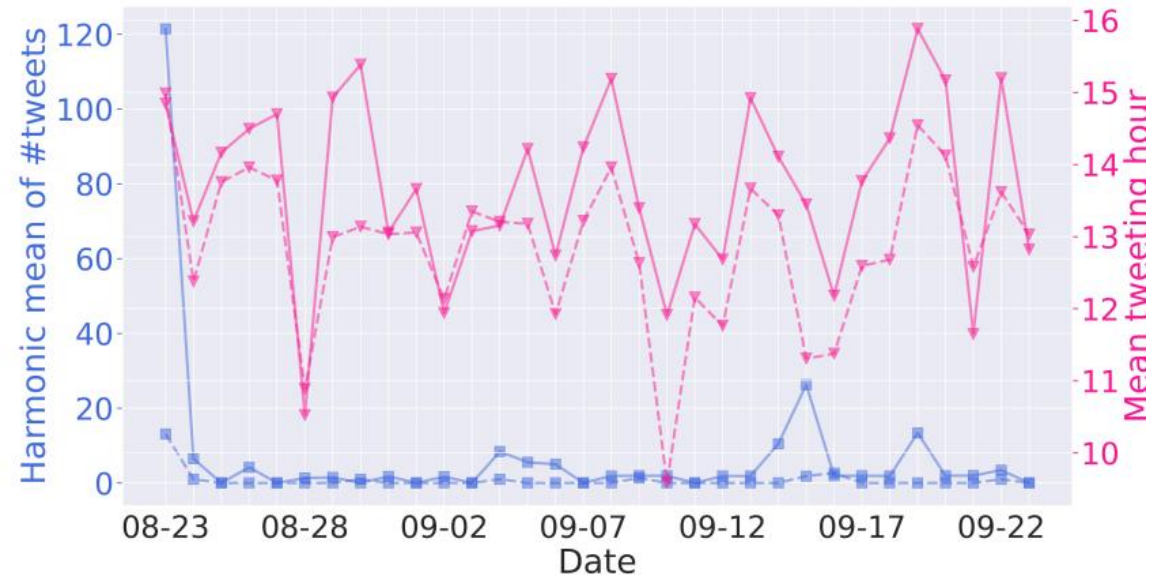

(e) Salvini

(f) Berlusconi

Discussion

Italian Politics has actively considered the conflict in their campaigns

External events can significantly impact local political events

Limitations:

- Few NLP models for Italian

- Bounded to Botometer accuracy →the impact might be even higher!

- It is unknown who was driving the bots, and causal analysis is needed

Takeaway

Bots influenced discussion on Russo-Ukrainian War during the

2022 Italian political elections:

- Distorting the topics

- Driving Discussions

More research is needed on non-English Languages/Countries!

Thank you!
Questions?

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