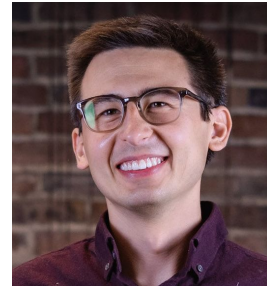


Happenstance: Utilizing Semantic Search to Track Russian State Media Narratives about the Russo-Ukrainian War on Reddit¹

HANS W. A. HANLEY, DEEPAK KUMAR, ZAKIR DURUMERIC



The Russian Invasion of Ukraine

On February 24, 2022, the Russian Federation announced a “special military operation” to “demilitarize and denazify” Ukraine.



Russian Propaganda and Disinformation has abounded

EUROPE

On Victory Day, Putin defends war on Ukraine as fight against ‘Nazis’

By [Robyn Dixon](#), [Mary Ilyushina](#), [Max Bearak](#), [Isabelle Khurshudyan](#) and [Louisa Loveluck](#)

Yesterday at 7:15 a.m. EDT | Updated yesterday at 5:48 p.m. EDT

Russian Propaganda and Disinformation has abounded

EUROPE

On Victory Day, Putin defends war on Ukraine as fight against ‘Nazis’

By [Robyn Dixon](#), [Mary Ilyushina](#), [Max Bearak](#), [Isabelle Khurshudyan](#)
[Louisa Loveluck](#)

Yesterday at 7:15 a.m. EDT | Updated yesterday at 5:48 p.m. EDT

EUROPE

Russia claims U.S. labs across Ukraine are secretly developing biological weapons

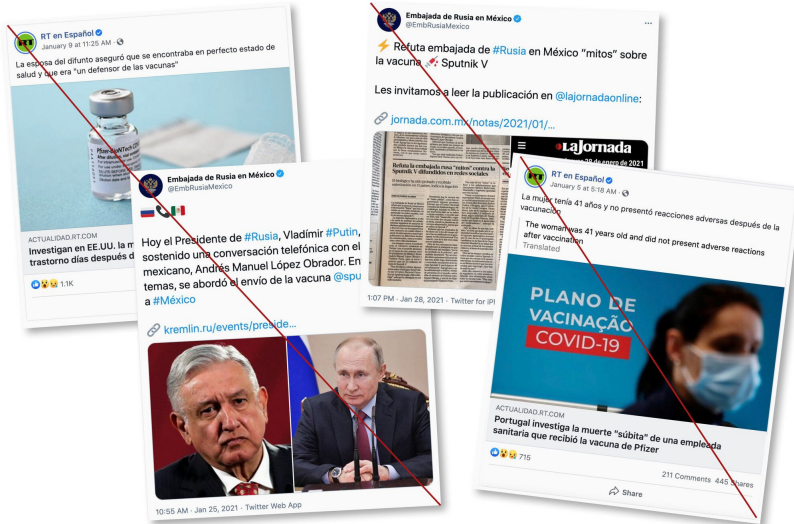
March 22, 2022 · 5:05 AM ET
Heard on [Morning Edition](#)

Russian Propaganda and Disinformation has abounded

EUROPE

On Victory Day, Putin defends war on Ukraine as fight against ‘Nazis’

By [Robyn Dixon](#), [Mary Ilyushina](#), [Max Bearak](#), [Isabelle Khurshudyan](#) EUROPE



claims U.S. labs across Ukraine are developing biological weapons

MEET
IN

Western Response to Russian Disinformation

On March 1, 2022, Reddit quarantined the **r/Russia** subreddit.



Telegram banned many of the accounts of Russian news outlets.

Are you sure you want to view this community?

Communities that are dedicated to shocking or highly offensive content are [quarantined](#). Content in this community may be upsetting. Are you certain you want to continue?

NO THANK YOU

CONTINUE

RT was banned throughout the EU and the UK.



Posted by u/_Okio_ 1 hour ago

Vote **News** RU Pianist Valentina Lisitsa gives an impromptu performance in liberated Mariupol after arriving from Moscow.

0 Comments Share ...

(Lugansk People's Republic)

LPR

Ministry of Defence of the RF

[Our Telegram channel](#)

URGENT!
LIES ABOUT
BUCHA

- English
- Français
- Español
- 中文 (中国)
- العربية

[Search](#)

Manifest

Welcome to the "War on Fakes" project. We are the owners and administrators of several Russian non-political telegram channels.

What happened in Bucha? A full analysis of the Ukrainian provocation

We don't do politics. But we consider it important to provide unbiased information about what is happening in Ukraine and on the territories of Donbass, because we see signs of an information war launched against Russia.

Our mission is to make sure that there are only objective publications in the information space.

Fake: Ukraine doesn't use antipersonnel landmines

We do not want ordinary people to feel anxious and panicked because of

Key Questions...

Most reporting on Russian state media narratives is ad hoc...

1. Is there a way to identify Russian state media narratives automatically?
2. Can we automatically determine (beyond Russian state-controlled websites) where on the Internet Russian state media narratives are being spread or discussed?

We propose Happenstance

We gather set of 2,683 articles about Ukraine from a list of 10 Russian propaganda websites and then utilize sentence-level topic analysis with a large language model **fine-tuned on semantic similarity with unsupervised contrastive learning**.



We propose Happenstance

We gather set of 2,683 articles about Ukraine from a list of 10 Russian propaganda websites and then utilize sentence-level topic analysis with a large language model **fine-tuned on semantic similarity with unsupervised contrastive learning**.

We utilize semantic search to identify cross-platform Reddit comments that conform to these narratives.



Sentence-Level Topic Analysis

Example Sentence 1: A subversive group of militants of the Ukrainian Neo-nazi Azov formation attacked Russian troops.

Example Sentence 2: Asov is a far-right organization that welcomed all sorts of neonazis.

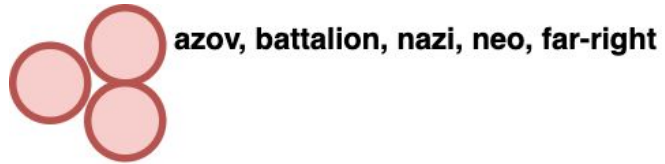
Example Sentence 3: Ukraine neo-nazi battalion has built a state within a state.

Example Sentence 4: Ukraine was developing biological weapons with the assistance of the US government

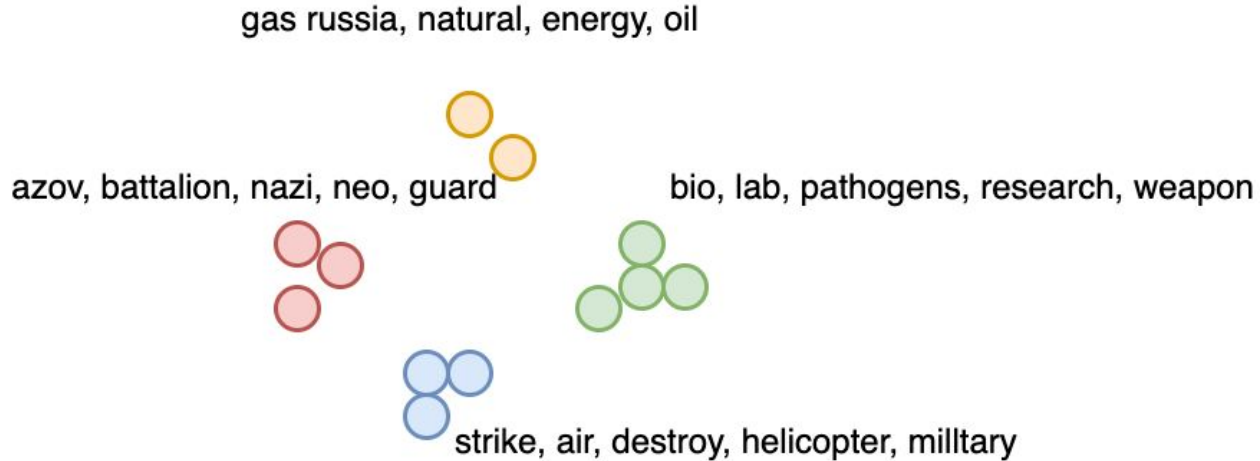
Sentence-Level Topic Analysis



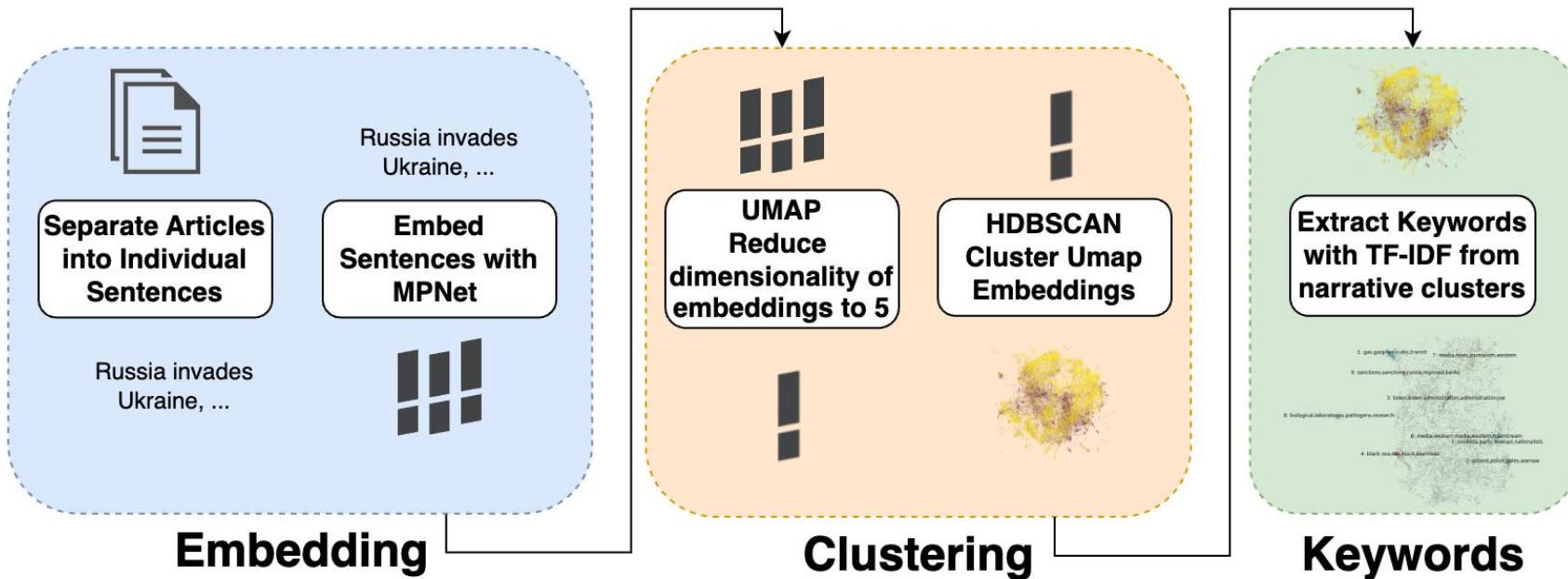
Sentence-Level Topic Analysis



Sentence-Level Topic Analysis



Sentence-Level Topic Analysis



Sentence-Level Topic Analysis Evaluation

We identify 753 separate topics across our 2,683 news articles.

We manually evaluate our method across thirty different topics.

98.9% precision of sentences matching their topics!

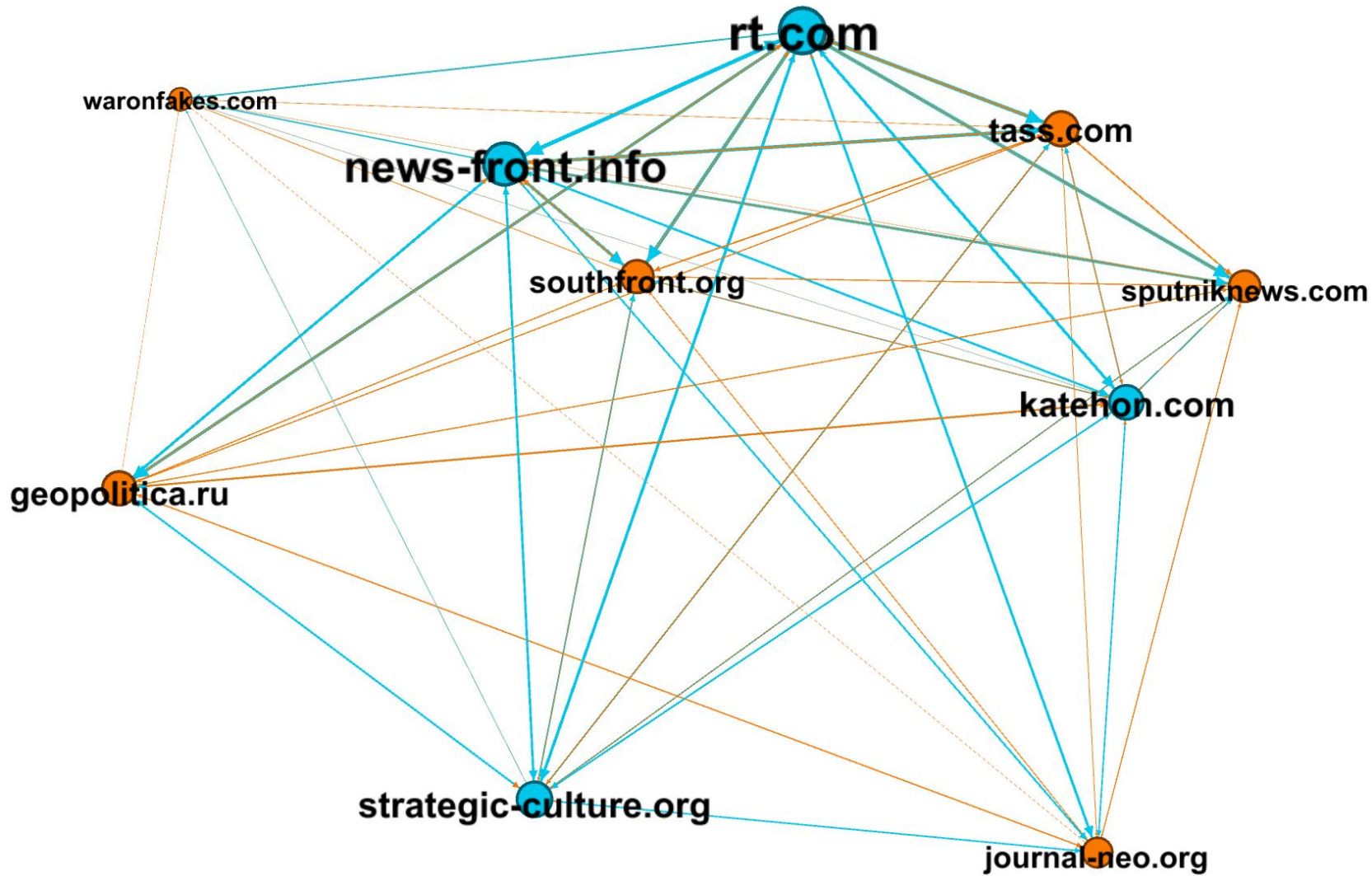
	Keywords	# Artl.	# Sent.	Prec.
1	joe biden	204	520	100
2	biological,laboratories	200	749	97.5
3	negotiations,talks	200	387	99.4
4	media, western	182	417	100
5	sanctions, individuals	131	210	100
6	join nato	116	143	100
7	kyiv forces	112	278	97.2
8	gas, russia gas	100	419	99.3
9	demilitarize, denazification	96	120	100
10	evacuate,evacuation	89	101	96.0
14	bloody crimes	81	85	97.6
50	emotions, inexcusable	57	74	95.9
111	operation, responses	48	48	100
16	embassy, evacuate	74	140	98.6
264	russian borders	27	28	100
127	cuba, kennedy	17	44	100
122	boris, scandals	18	45	100
382	contact, heavy shelling	20	22	100
378	invades, inadvertent, bloomberg	15	22	100
26	serbia, yugoslavia	43	108	98.1
312	ukraine lose	20	26	96.1
781	territory heartland	12	13	100
281	launched special	35	35	100
191	delegation, belarus	17	23	100
160	bucha, crimes, withdrew	27	38	97.3
Overall Precision:				98.9

Originating Topics and Narratives within the Russian State Media Ecosystem

On March 6, 2022, the Russian news agency Tass reported that the US and Ukraine had attempted to eliminate samples of “plague, anthrax, tularemia, cholera and other deadly diseases”.

The accusation that the United States was helping fund biological weapons research in Ukraine was later echoed by other news reports.

Website	# Articles
rt.com	35
sputniknews.com	44
news-front.info	10
tass.com	37
strategic-culture.org	13
katehon.com	5
geopolitca.ru	11
journal-neo.org	11
southfront.org	20
waronfakes.com	5



Mapping Reddit Comments

We map 53K Reddit comments from r/Russia to the same embedding space as our article sentences.

We assign each Reddit comment to the topic cluster that is most similar to it; essentially semantic search!



Are you sure you want to view this community?

Communities that are dedicated to shocking or highly offensive content are [quarantined](#). Content in this community may be upsetting. Are you certain you want to continue?

NO THANK YOU

CONTINUE



Mapping Reddit Comments

Example Reddit Comment

Ukraine was developing biological weapons with the assistance of the U.S. government

Mapping Reddit Comments

Example Reddit Comment

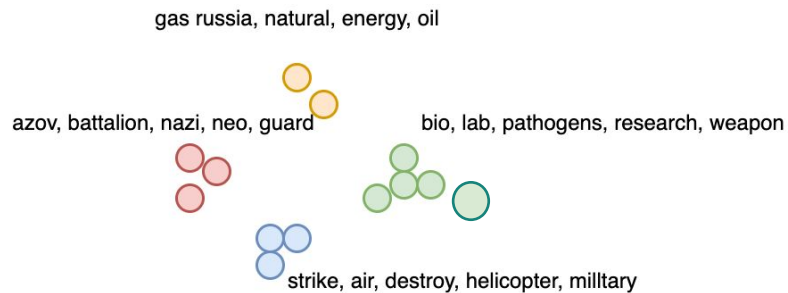
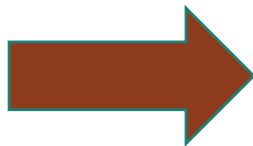
Ukraine was developing biological weapons with the assistance of the U.S. government



Mapping Reddit Comments

Example Reddit Comment

Ukraine was developing biological weapons with the assistance of the U.S. government



Mapping Reddit Comments

We find that a minimum cosine similarity of 0.60 allows Reddit comments to closely match their assigned topic (99.8%)

39.6% of r/Russia comments get mapped to topics from Russian news articles!



Are you sure you want to view this community?

Communities that are dedicated to shocking or highly offensive content are [quarantined](#). Content in this community may be upsetting. Are you certain you want to continue?

NO THANK YOU

CONTINUE



r/Russia Reddit Comments Matching Russian Articles



Mapping Reddit Comments

We map another 5.37 million Reddit comments from 10 political subreddits to understand how other subreddits discussed narratives similar to those promoted on Russian state media

We again assign each Reddit comment to the topic cluster that is most similar to it



Are you sure you want to view this community?

Communities that are dedicated to shocking or highly offensive content are [quarantined](#). Content in this community may be upsetting. Are you certain you want to continue?

NO THANK YOU

CONTINUE



Subreddit	# Comments	% Russian Narrative	Top Topic
r/democrats	25,313	8.82%	biden, joe, admin
r/geopolitics	33,382	61.8%	warning, geo, crimea
r/socialism	35,492	22.4%	capitalist, bourgeois
r/republican	42,761	8.87%	biden, joe, admin
r/russia	53,569	39.6%	biden, joe, admin
r/libertarian	321,439	9.66%	conservative, democrats
r/ukpolitics	517,487	13.2%	johnson, boris, scandal
r/politics	1,747,381	8.86%	biden, joe, admin

Subreddit	# Comments about Ukrainian Bio Labs	# Comments about Ukrainian Nazi
r/democrats	16	4
r/geopolitics	9	38
r/socialism	0	131
r/republican	2	8
r/russia	13	147
r/libertarian	42	97
r/ukpolitics	23	115
r/politics	1132	262

Conclusion

We identify major narratives being touted by Russian state media/propaganda websites.

We perform fine grained analysis to identify the spread of specific disinformation narratives across social media.

Within our paper we also:

- Map out the spread of specific Russian state media narratives
- Document the role of the new Russian disinformation website waronfakes.com
- Identify the role of different types of Reddit accounts in spreading Russian propaganda
- And much more!

Conclusion

Future Work: Completed & In Progress

- Use of Different LLMs for different topics
 - We found worse behavior for medical-related topics
 - See our paper Specious Sites- Also extends to millions of articles!
- Zero Shot Stance Detection across different topics
 - Understanding how different actors are write about different topics (e.g., anti-Putin vs pro-Putin)
 - Paper to be released on arxiv.
- Multilingual models
 - See our new ICWSM paper Partial Mobilization
 - See our other work examining the spread of narratives about the war to Weibo from Russian, Ukrainian, Chinese, and American websites

Website: hanshanley.com

Twitter/X: [@Hans_Hanley](https://twitter.com/Hans_Hanley)

Blog: themarginoferror.com

hhanley@stanford.edu