UCL

THE ALAN TURING INSTITUTE

Data-driven studies of fringe communities & their nefarious impact on the greater web

Emiliano De Cristofaro

IDRAMA LAB

European Commission

ENCISE
ENhancing seCurity and privAcy in the Social wEb

WARNING
CONTENT IN THIS TALK IS
OFFENSIVE
AND UNCENSORED

What is 4chan?

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An image-board forum

Organized in boards (70 at the moment)

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Single image attached

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Single image attached

Other users can reply:

With or without images, possibly add references to previous posts, quote text, etc.

What is 4chan?

An image-boa

Organized in b

An "original p

Single image a

Other users c

With or without

Boards filter ▼

Japanese Culture	Interests	Creative	Other	Adult (NSFW)
Anime & Manga	Comics & Cartoons	Oekaki	Business & Finance	Sexy Beautiful Women
Anime/Cute	Technology	Papercraft & Origami	Travel	Hardcore
Anime/Wallpapers	Television & Film	Photography	Fitness	Handsome Men
Mecha	Weapons	Food & Cooking	Paranormal	Hentai
Cosplay & EGL	Auto	Artwork/Critique	Advice	Ecchi
Cute/Male	Animals & Nature	Wallpapers/General	LGBT	Yuri
Flash	Traditional Games	Literature	Pony	Hentai/Alternative
Transportation	Sports	Music	Current News	Yaoi
Otaku Culture	Alternative Sports	Fashion	Worksafe Requests	Torrents
Video Games	Science & Math	3DCG	Very Important Posts	High Resolution
Video Games	History & Humanities	Graphic Design	Misc. (NSFW)	Adult GIF
Video Game Generals	International	Do-It-Yourself	Random	Adult Cartoons
Pokémon	Outdoors	Worksafe GIF	ROBOT9001	Adult Requests
Retro Games	Toys	Quests	Politically Incorrect	
			International/Random	
			Cams & Meetups	
			Shit 4chan Says	

Heard of 4chan?

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Hea

Hea

I CAN HAS
CHEEZBURGER?

ANONYMOUS
Because none of us are as cruel as all of us.

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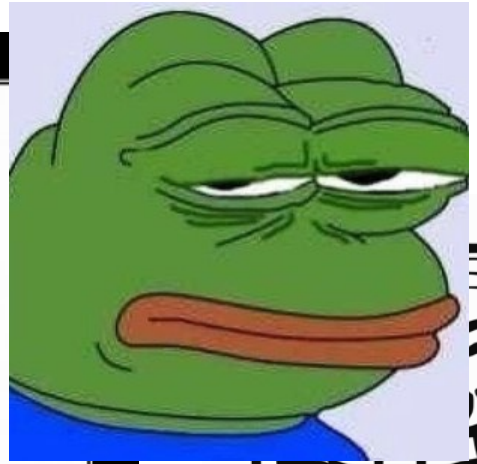
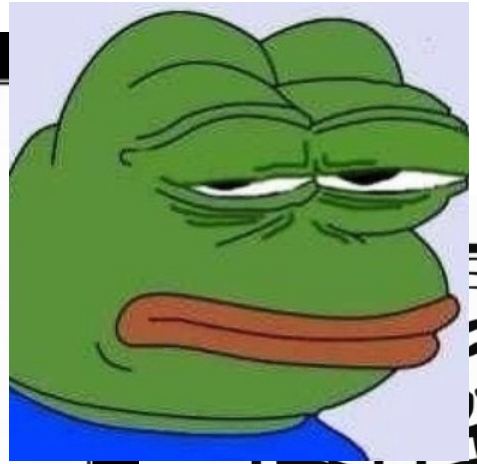


Hea

I CAN HAS
CHEEZBURGER?

Donald J. Trump
@realDonaldTrump
Follow
"@codyave: @drudgereport @BreitbartNews @Writeintrump "You Can't Stump the Trump" youtube.com/watch?v=MKH6PA… "

ANONYMOUS
Because none of us are as cruel as all of us.



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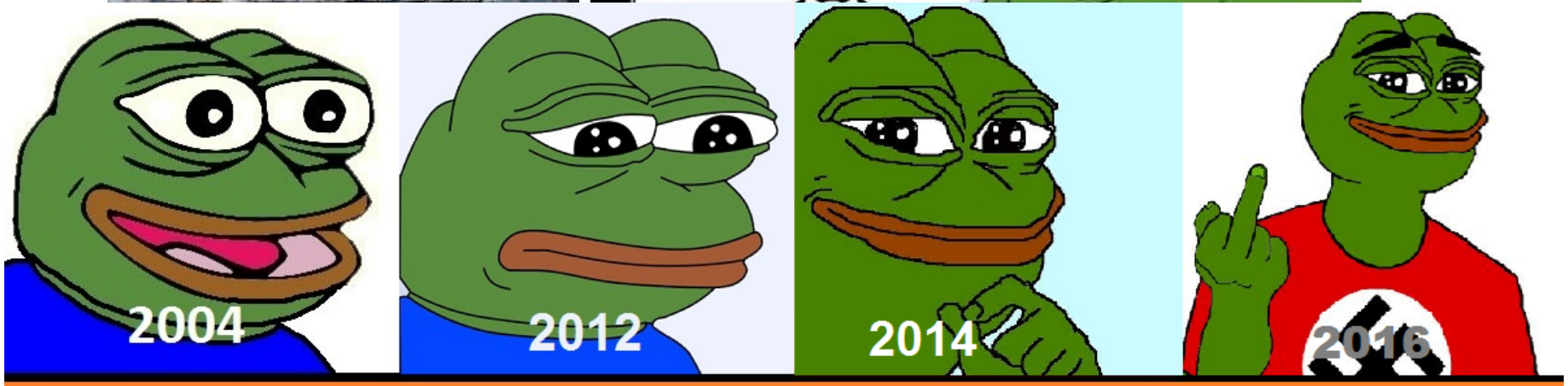

WHERE DID EVERYTHING

GO SO REICH

Why Do We Care About 4Chan?

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How a racist, sexist hate mob forced Leslie Jones off Twitter

By Kristen V. Brown

FilmMagic

SHARE TWEET TUMBLR EMAIL

Over the past 24 hours, Leslie Jones has been inundated with racist, hateful vitriol on Twitter.

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TAYWARD YOUTH 3/24/16 3:10 PM

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BUSINESS

French fear Putin and Trump followers are using 4chan to disrupt presidential election

CHRIS O'BRIEN @OBRIEN MAY 5, 2017 3:40 AM

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#MediasNextTrumpLie: Inside 4chan's pro-Trump spam campaign to derail the media

By Melanie Ehrenkranz
October 14, 2016

GET MIC DAILY: Enter your email address Sign up

/pol/ – Politically Incorrect Board

/pol/ – Politically Incorrect Board

File: sticky.jpg (571 KB, 1600x1131)

Welcome to /pol/ - Politically Incorrect

Anonymous (ID: Iv9eTFJC) 01/08/15(Thu)23:40:44 No.40489590 [Reply] ▶

This board is for the discussion of news, world events, political issues, and other related topics.

Off-topic and /b/-tier threads will be deleted (and possibly earn you a ban, if you persist). Unless they are quality, well thought out, well written posts, the following are examples of off-topic and/or /b/-tier threads:

>Red pill me on X. (with no extra content or input of your own)
>Are X white?
>Is X degeneracy?
>How come X girls love Y guys so much?
>If X is true, then how come Y? Checkmate Z.

The variety of threads allowed here are very flexible and we believe in freedom of speech, but we expect a high level of discourse befitting of the board. Attempts to disrupt the board will not be tolerated, nor will calls to disrupt other boards and sites.

/pol/ – Politically Incorrect Board

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Extremely lax moderation

Almost anything goes

Anonymity & Ephemerality

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Users do not need to register an account to participate

Anonymity is the default (and preferred) behavior

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“Some” degree of permanence and identifiability is supported

Can enter a name along with their posts (no authentication though)

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Threads get “archived” after a while

Actually all posts deleted after a week

Challenges of Measuring 4chan (and other fringe communities)

1. Not your typical social network (anonymous/ephemeral)
2. Their actions not limited to 4chan, need to look at other platforms to measure their impact
3. Knowing what they're talking about is not easy
4. You might get raided, doxxed, etc.
5. Protecting your students

Datasets

	/pol/	/sp/	/int/	Total
Threads	217K	14.4K	24.9K	256K
Posts	8.3M	1.2M	1.4M	10.9M
June 30 to September 12, 2016				

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Methodology:

- Visit the “catalog”
- Snapshot every 5 mins
- Once a thread is archived, retrieve full/final contents from 4plebs.org

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We’re still crawling…

Hate Speech?

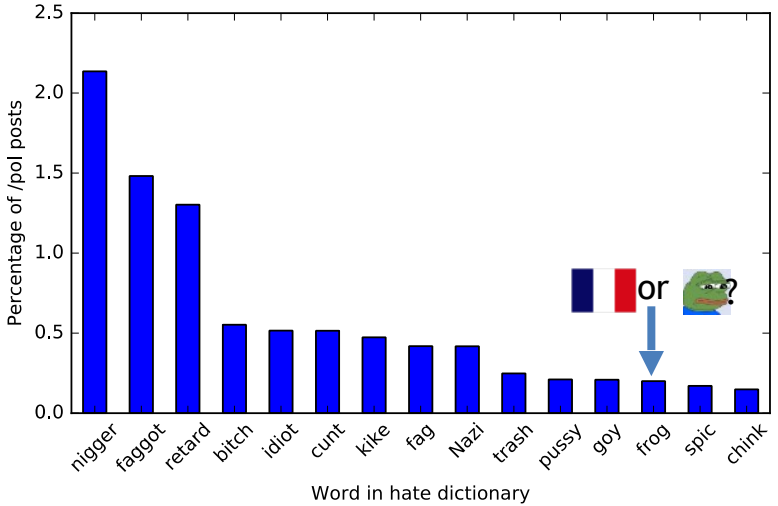
HATEBASE

Crowdsourced dictionary

Manually filtered a bit

/pol/ by far most hate speech use

/pol/	12%
/sp/	7.3%
/int/	6.3%
Twitter	2.2%



Raids on other platforms (e.g., YouTube)

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Thread is an aggregation point for raiders

- E.g., “Hah! I called that person a nigger!”

Raids on other platforms (e.g. YouTube)

Hans2k4ever 1 month ago
When will the normies learn?
Reply • 181
View all 3 replies

Jack Harper 1 month ago
mfw he accidentally redpills his whole class, they all found the memes funny even the so called "hate speech" he talks about
Reply • 13

Jack Harper 1 month ago
I guess I haven't tightened my fedora enough to be as enlightened by my own enlightenment as you sir. Carry on brave knight!
Reply •

Adem Adiyaman 1 month ago
23:21 "the victory of donald trump and the rise of ultra nazi people"
you dense fuck, nice brain washing
Reply • 227
View all 16 replies

Sz

Szgerle 1 month ago
Not even just your regular nazi but ULTRA NAZI!
Reply • 1

Drakewood 1 month ago
+Potato Jenova A FUCKING LEAF!
Reply •

Thought Criminal 1 month ago
Holy fuck, ((((they)))) are actually intimidated by the powers of Kek.
Reply • 169

Raids on other platforms (e.g., YouTube)

Someone posts a YouTube link

- Maybe with a prompt like “you know what to do”

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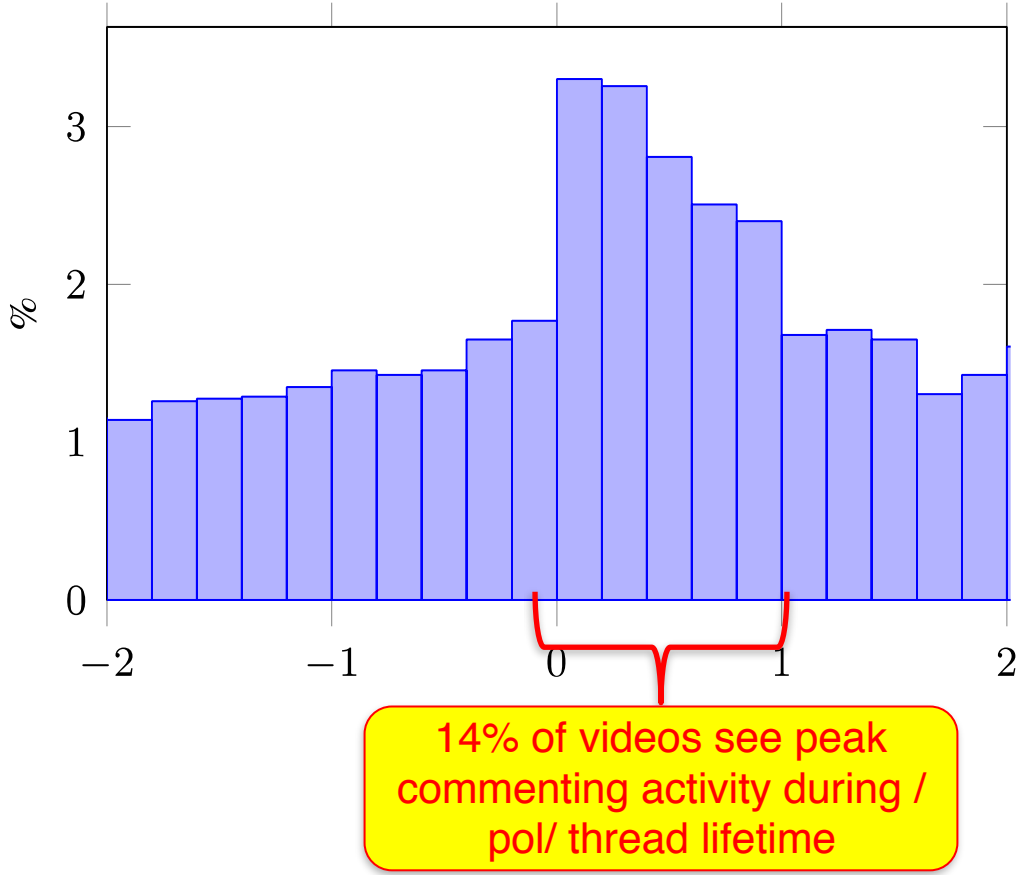
If raid is taking place:

- Peak in YouTube comments while thread alive?
- /pol/ thread and YT comments *synchronized?*

Activity Peaks

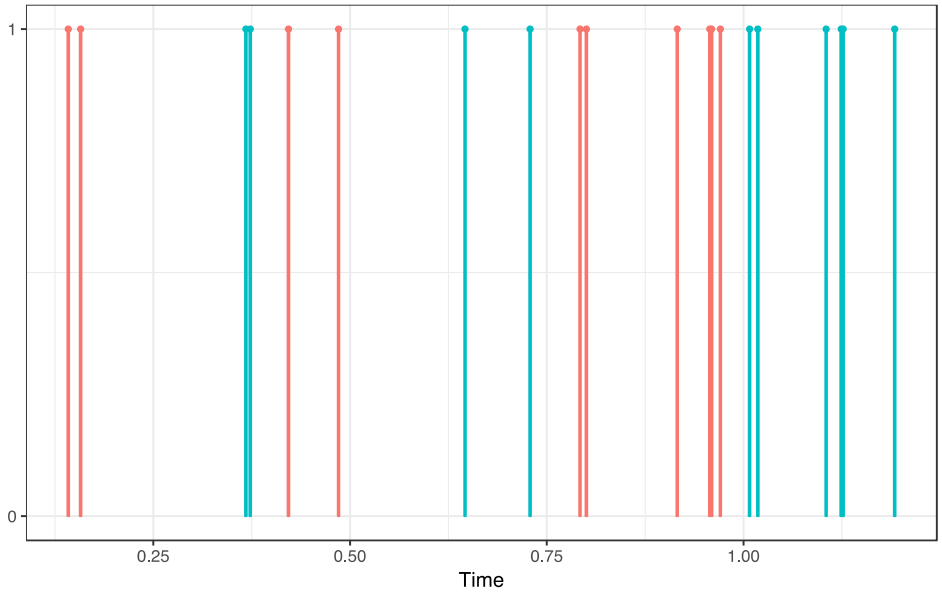


YT videos with peaks during 4chan thread

Determined via PDF of commenting timeseries

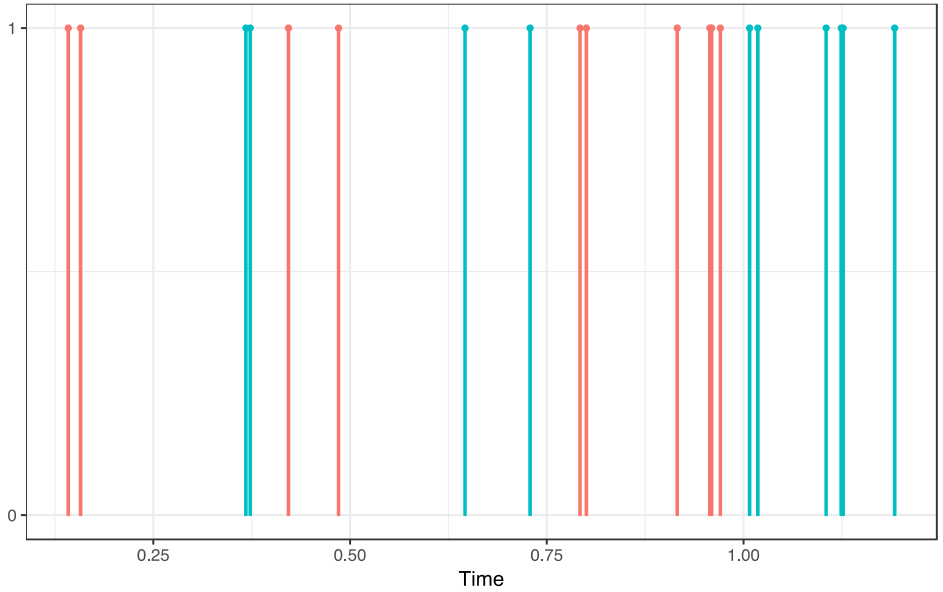
Synchronization

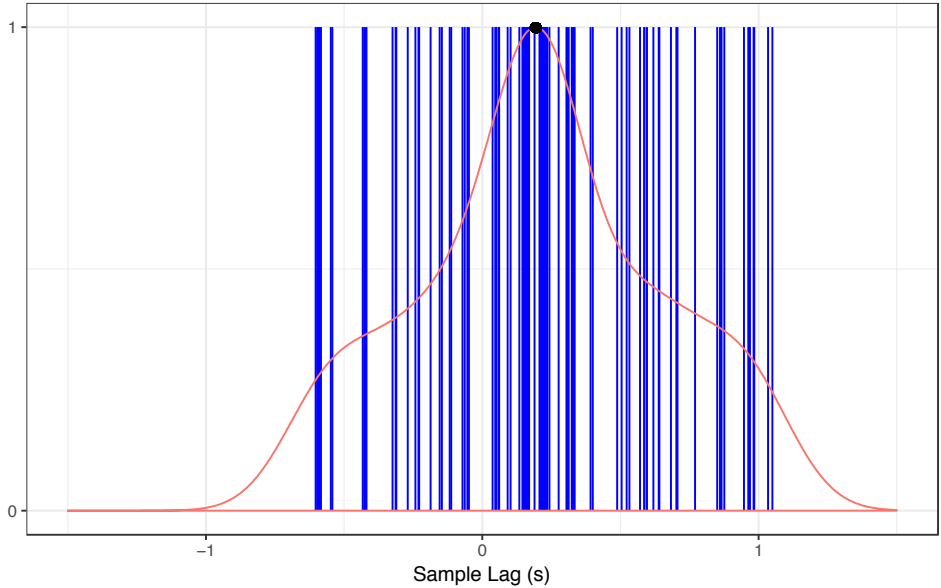
Synchronization



Two series, second randomly shifted from first by 0.2s on avg

Synchronization

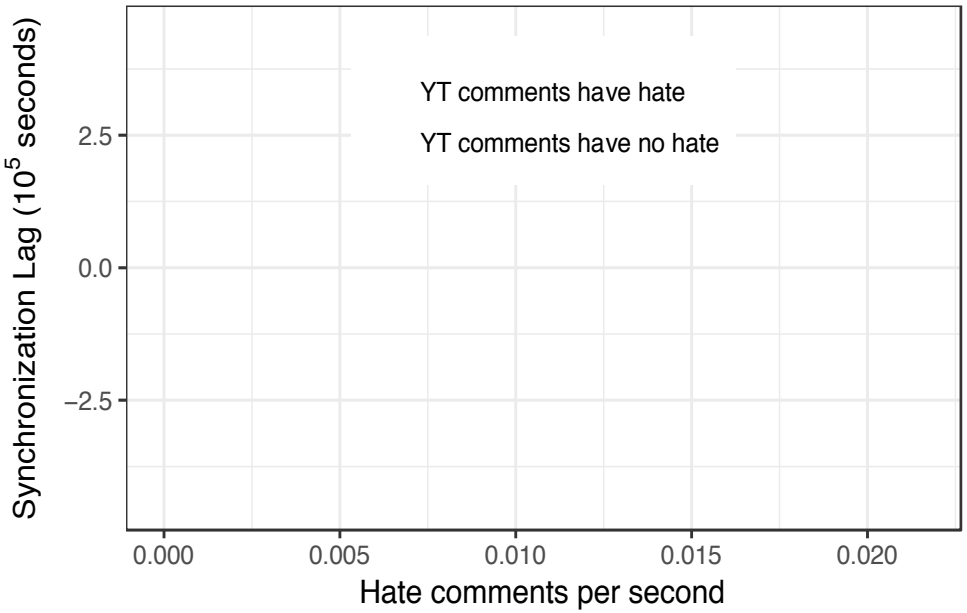


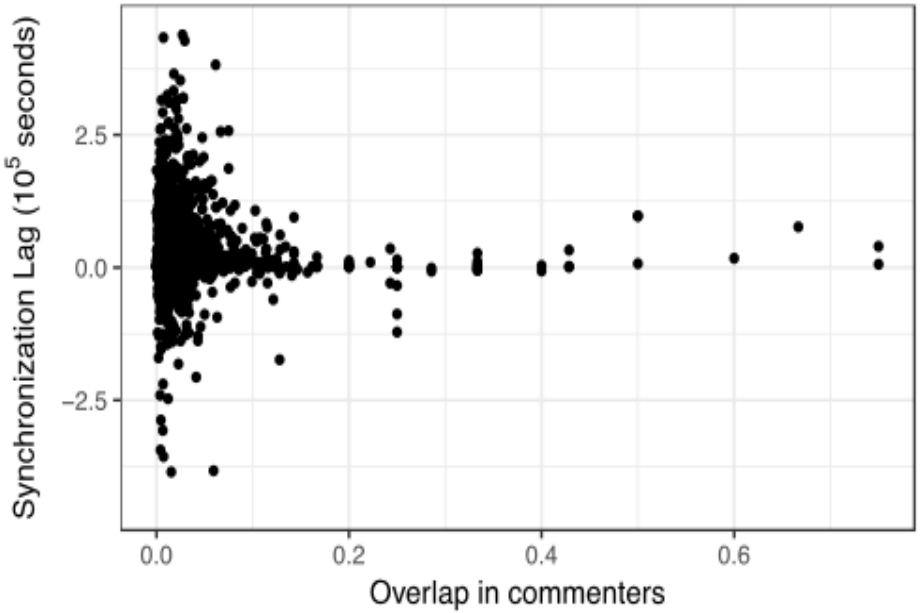


Two series, second randomly shifted from first by 0.2s on avg

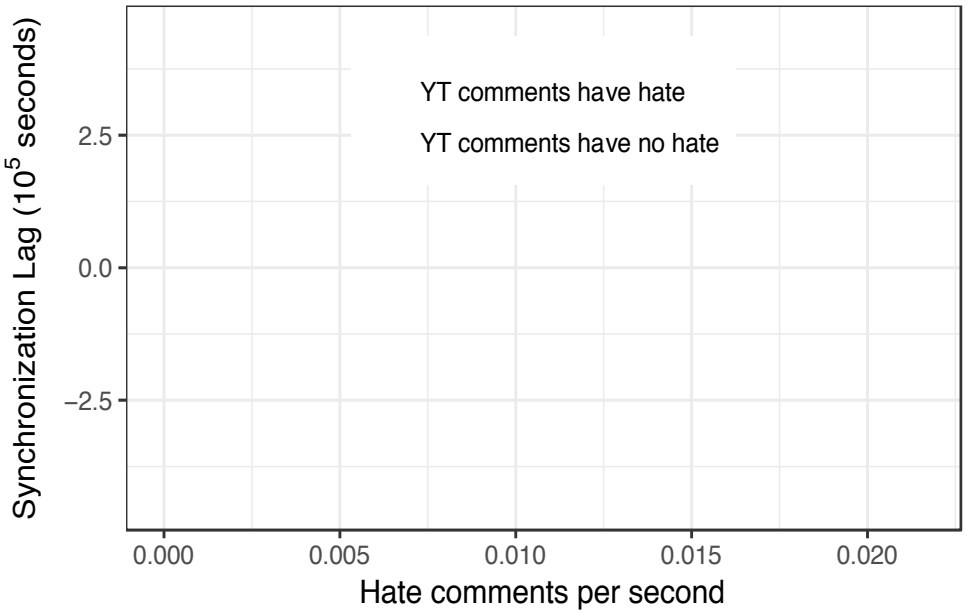
Blue lines → per-sample lag
Red area → density of the lags
Peak of density curve = 0.2s

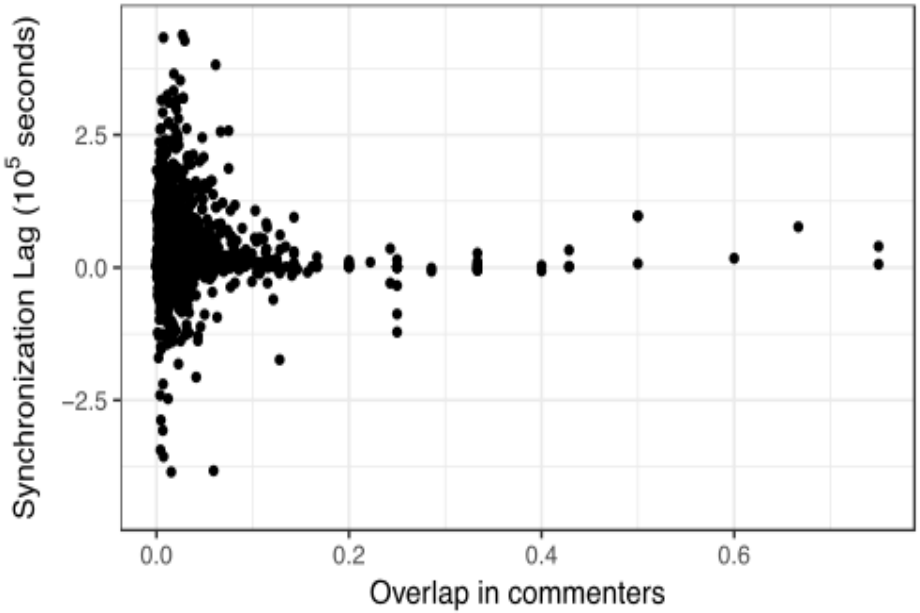
Validation


YT comments have hate
YT comments have no hate
Synchronization Lag (10^5 seconds)
2.5
0.0
−2.5
0.000
0.005
0.010
0.015
0.020
Hate comments per second


Synchronization Lag (10^5 seconds)
2.5
0.0
−2.5
0.0
0.2
0.4
0.6
Overlap in commenters

Validation





Anonymous (ID: DaWZlbeh) 10/13/16(Thu)20:08:55 No.92772435

>>92765569
Physicist finalist here, can confirm the maths is legitimate. Holy fuck

Besides raids… we have studied a bunch of stuff!

(and in fact not only 4chan but also Reddit and Gab)

1. Influence on misinformation
2. Discussions (and abuse) of genetic testing
3. Weaponization of memes

More work on online hate, cyberbullying, state-sponsored trolls, etc: https://emilianodc.com/idrama

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Memes are fun!

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Not always though…

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Annotated: the Trump memes stuck to Cesar Sayoc's van

The vehicle seized by law enforcement in Florida was covered in strange propaganda

▲ Cesar Sayoc's van is seen in Boca Raton, Florida, on 18 October 2018 in this picture obtained from social media. Photograph: Social Media/Ed Kennedy via Reuters

most viewed in US

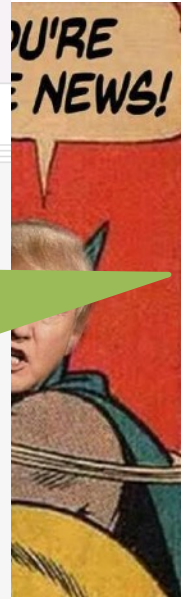
Pittsburgh synagogue shooting: suspect held after at least four killed

'I bet $500 they are lying': Trump fans sceptical about pipe bomb arrest

'Why is that racist?' Trump greets young black leaders with freewheeling rant

Barack Obama takes aim at Donald Trump for 'making stuff up'

Muncy hits walk-off homer as Dodgers win longest ever World Series game



Memes have become a popular, and seemingly effective, method to transmit ideology.

Memes have been *weaponized*

Research Questions

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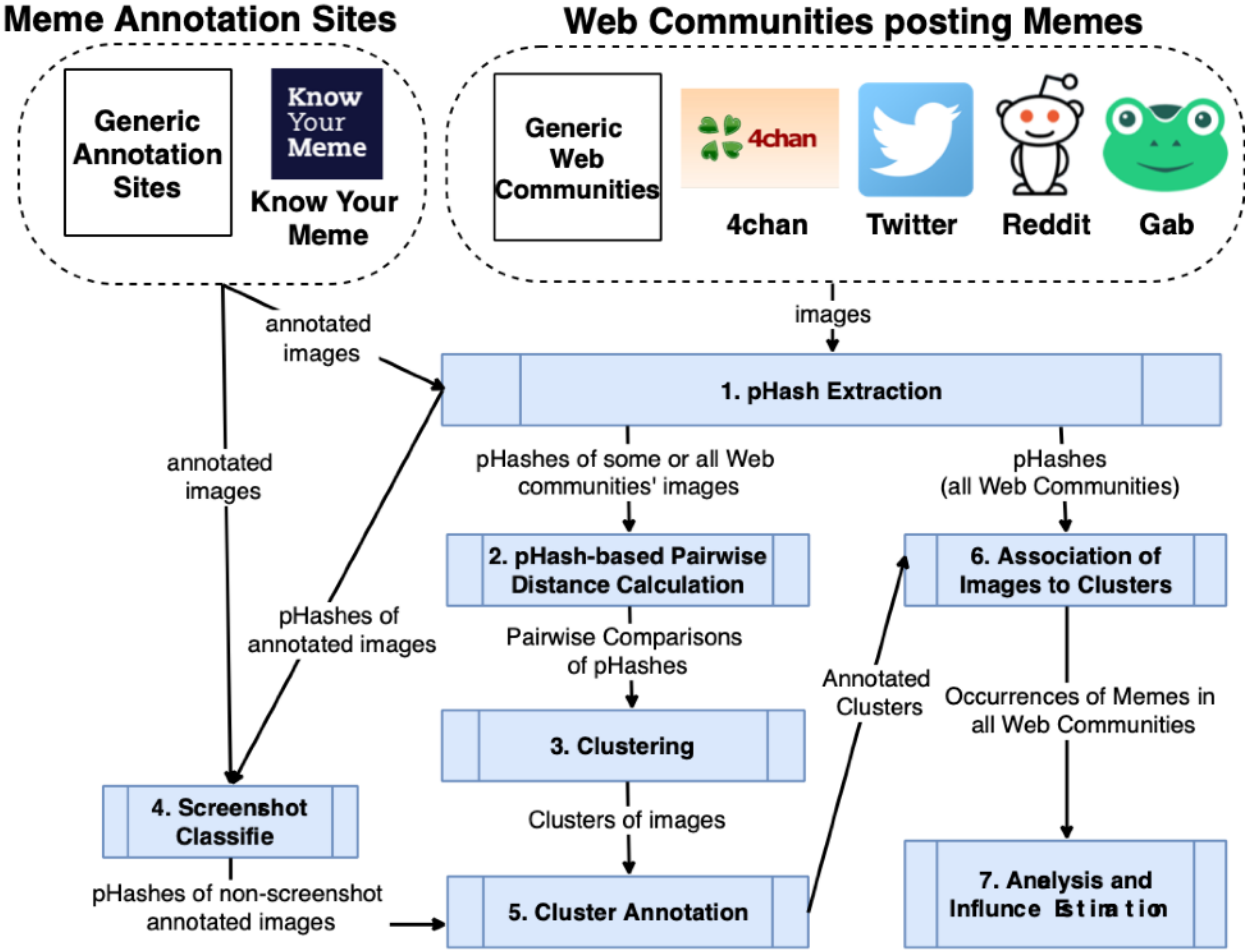
- How can we characterize variants of the same meme?
- Can we characterize Web communities through their memes?
- Can we measure the influence of Web communities with respect to memes they share?

Memes processing pipeline



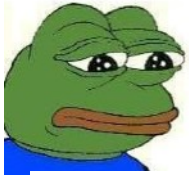
Datasets

# of posts	1.4B	1.0B	48M	12M	15K
# of posts with images	242M	62M	13M	955K	15K
# of Images	114M	40M	4M	235K	706K
# of unique pHashes	74M	30M	3M	193K	597K

Top memes per Web community

/pol/		Reddit		Gab		Twitter	
Entry	**Posts (%)**	**Entry**	**Posts (%)**	**Entry**	**Posts (%)**	**Entry**	**Posts(%)**
Feels Bad Man/Sad Frog	64,367 (4.9%)	Manning Face	12,540 (2.2%)	Jesusland **(P)**	454 (1.6%)	Roll Safe	55,010 (5.9%)
Smug Frog	63,290 (4.8%)	That's the Joke	7,626 (1.3%)	Demotivational Posters	414 (1.5%)	Evil Kermit	50,642 (5.4%)
Happy Merchant **(R)**	49,608 (3.8%)	Feels Bad Man/ Sad Frog	7,240 (1.3%)	Smug Frog	392 (1.4%)	Arthur's Fist	37,591 (4.0%)
Apu Apustaja	29,756 (2.2%)	Confession Bear	7,147 (1.3%)	Based Stickman **(P)**	391 (1.4%)	Nut Button	13,598 (1,5%)
Pepe the Frog	25,197 (1.9%)	This is Fine	5,032 (0.9%)	Pepe the Frog	378 (1.3%)	Spongebob Mock	11,136 (1,2%)
Make America Great Again **(P)**	21,229 (1.6%)	Smug Frog	4,642 (0.8%)	Happy Merchant **(R)**	297 (1.1%)	Reaction Images	9,387 (1.0%)
Angry Pepe	20,485 (1.5%)	Roll Safe	4,523 (0.8%)	Murica	274 (1.0%)	Conceited Reaction	9,106 (1.0%)
Bait this is Bait	16,686 (1.2%)	Rage Guy	4,491 (0.8%)	And Its Gone	235 (0.9%)	Expanding Brain	8,701 (0.9%)
I Know that Feel Bro	14,490 (1.1%)	Make America Great Again **(P)**	4,440 (0.8%)	Make America Great Again **(P)**	207 (0.8%)	Demotivational Posters	7,781 (0.8%)
Cult of Kek	14,428 (1.1%)	Fake CCG Cards	4,438 (0.8%)	Feels Bad Man/ Sad Frog	206 (0.8%)	Cash Me Ousside/Howbow Dah	5,972 (0.6%)
Laughing Tom Cruise	14,312 (1.1%)	Confused Nick Young	4,024 (0.7%)	Trump's First Order of Business **(P)**	192 (0.7%)	Salt Bae	5,375 (0.6%)
Awoo	13,767 (1.0%)	Daily Struggle	4,015 (0.7%)	Kekistan	186 (0.6%)	Feels Bad Man/ Sad Frog	4,991 (0.5%)
Tony Kornheiser's Why	13,577 (1.0%)	Expanding Brain	3,757 (0.7%)	Picardia **(P)**	183 (0.6%)	Math Lady/Confused Lady	4,722 (0.5%)
Picardia **(P)**	13,540 (1.0%)	Demotivational Posters	3,419 (0.6%)	Things with Faces (Pareidolia)	156 (0.5%)	Computer Reaction Faces	4,720 (0.5%)
Big Grin / Never Ever	12,893 (1.0%)	Actual Advice Mallard	3,293 (0.6%)	Serbia Strong/Remove Kebab	149 (0.5%)	Clinton Trump Duet **(P)**	3,901 (0.4%)
Reaction Images	12,608 (0.9%)	Reaction Images	2,959 (0.5%)	Riot Hipster	148 (0.5%)	Kendrick Lamar Damn Album Cover	3,656 (0.4%)
Computer Reaction Faces	12,247 (0.9%)	Handsome Face	2,675 (0.5%)	Colorized History	144 (0.5%)	What in tarnation	3,363 (0.3%)
Wojak / Feels Guy	11,682 (0.9%)	Absolutely Disgusting	2,674 (0.5%)	Most Interesting Man in World	140 (0.5%)	Harambe the Gorilla	3,164 (0.3%)
Absolutely Disgusting	11,436 (0.8%)	Pepe the Frog	2,672 (0.5%)	Chuck Norris Facts	131 (0.4%)	I Know that Feel Bro	3,137 (0.3%)
Spurdo Sparde	9,581 (0.7%)	Pretending to be Retarded	2,462 (0.4%)	Roll Safe	131 (0.4%)	This is Fine	3,094 (0.3%)
Total	**445,179 (33.4%)**		**94,069 (16.7%)**		**4,808 (17.0%)**		**249,047 (26.4%)**

Top memes per Web community



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Cult of Kek	14,428 (1.1%)	Fake CCG Cards	4,438 (0.8%)	Feels Bad Man/ Sad Frog	206 (0.8%)	Cash Me Ousside/Howbow Dah	5,972 (0.6%)
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Wojak / Feels Guy	11,682 (0.9%)	Absolutely Disgusting	2,674 (0.5%)	Most Interesting Man in World	140 (0.5%)	Harambe the Gorilla	3,164 (0.3%)
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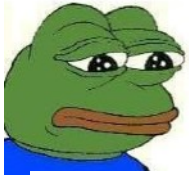
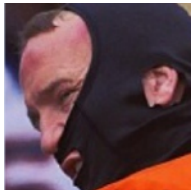
Top memes per Web community





/pol/		Reddit		Gab		Twitter	
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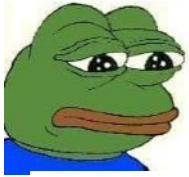

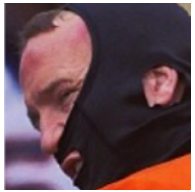

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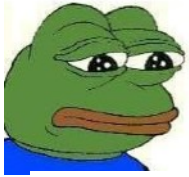

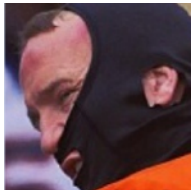

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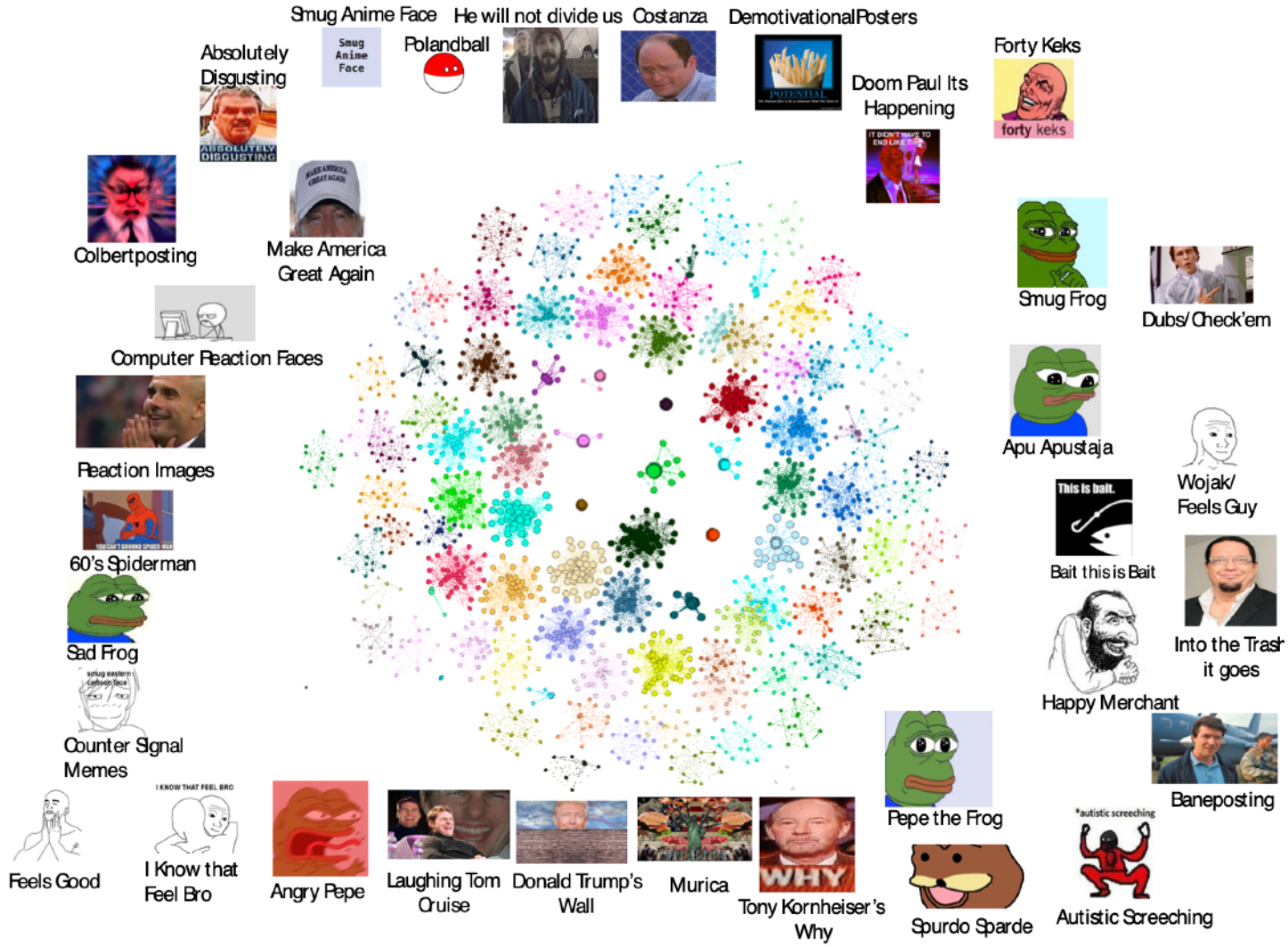
Who are the most popular people in memes?

/pol/		Reddit		Gab		Twitter	
Entry	**Posts (%)**	**Entry**	**Posts (%)**	**Entry**	**Posts (%)**	**Entry**	**Posts(%)**
Donald Trump	60,611 (4.6%)	Donald Trump	34,533 (6.1%)	Donald Trump	1,665 (6.1%)	Donald Trump	10,208 (1.3%)
Adolf Hitler	8,759 (0.6%)	Steve Bannon	3,733 (0.6%)	Mitt Romney	455 (1.7%)	Barack Obama	5,187 (0.6%)
Mike Pence	4,738 (0.3%)	Stephen Colbert	3,121 (0.6%)	Bill Nye	370 (1.3%)	Chelsea Manning	4,173 (0.5%)
Jeb Bush	4,217 (0.3%)	Chelsea Manning	2,261 (0.4%)	Adolf Hitler	106 (0.4%)	Kim Jong Un	3,271 (0.4%)
Vladimir Putin	3,218 (0.2%)	Ben Carson	2,148 (0.4%)	Barack Obama	104 (0.4%)	Anita Sarkeesian	2,764 (0.3%)
Alex Jones	3,206 (0.2%)	Bernie Sanders	1,757 (0.3%)	Isis Daesh	92 (0.3%)	Bernie Sanders	2,277 (0.3%)
Ron Paul	3,116 (0.2%)	Ajit Pai	1,658 (0.3%)	Death Grips	91 (0.3%)	Vladimir Putin	1,733 (0.2%)
Bernie Sanders	3,022 (0.2%)	Barack Obama	1,628 (0.3%)	Eminem	89 (0.3%)	Billy Mays	1,454 (0.2%)
Massimo D'alema	2,725 (0.2%)	Gabe Newell	1,518 (0.3%)	Kim Jong Un	87 (0.3%)	Adolf Hitler	1,304 (0.2%)
Mitt Romney	2,468 (0.2%)	Bill Nye	1,478 (0.3%)	Ajit Pai	76 (0.3%)	Kanye West	1,261 (0.2%)
Chelsea Manning	2,403 (0.2%)	Hillary Clinton	1,468 (0.3%)	Pewdiepie	73 (0.3%)	Bill Nye	968 (0.2%)
Hillary Clinton	2,378 (0.2%)	Death Grips	1,463 (0.3%)	Bernie Sanders	71 (0.3%)	Mitt Romney	923 (0.1%)
A. Wyatt Mann	2,110 (0.2%)	Adolf Hitler	1,449 (0.3%)	Alex Jones	70 (0.3%)	Filthy Frank	777 (0.1%)
Ben Carson	1,780 (0.1%)	Mitt Romney	1,294 (0.2%)	Hillary Clinton	59 (0.2%)	Hillary Clinton	758 (0.1%)
Filthy Frank	1,598 (0.1%)	Eminem	1,274 (0.2%)	Anita Sarkeesian	54 (0.2%)	Ajit Pai	715 (0.1%)


Smug Anime Face
He will not divide us
Costanza
DemotivationalPosters
Absolutely Disgusting
Polandball
Doom Paul Its Happening
Forty Keks
Colbertposting
Make America Great Again
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Dubs/Check'em
Computer Reaction Faces
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Apu Apustaja
Wojak/ Feels Guy
60's Spiderman
Bait this is Bait
Sad Frog
Into the Trash it goes
Happy Merchant
Counter Signal Memes
Baneposting
Pepe the Frog
Feels Good
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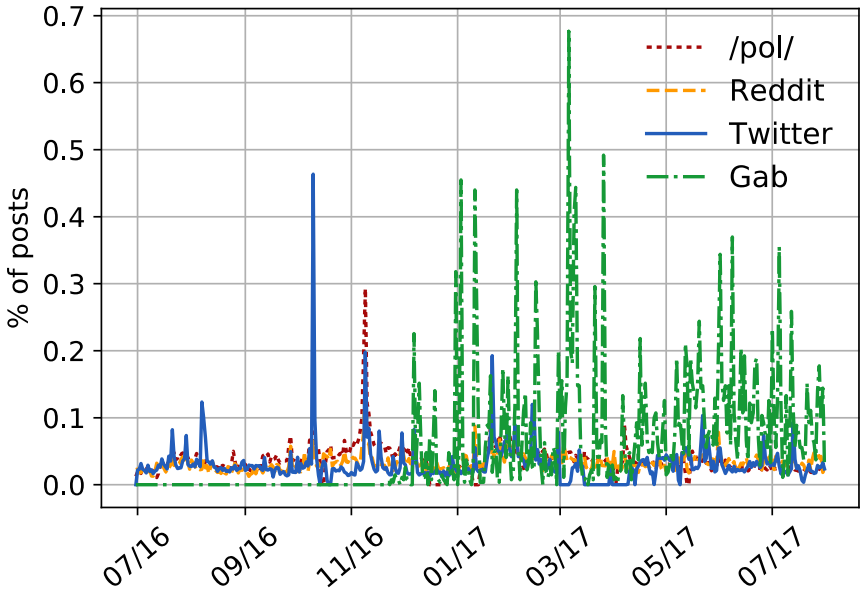
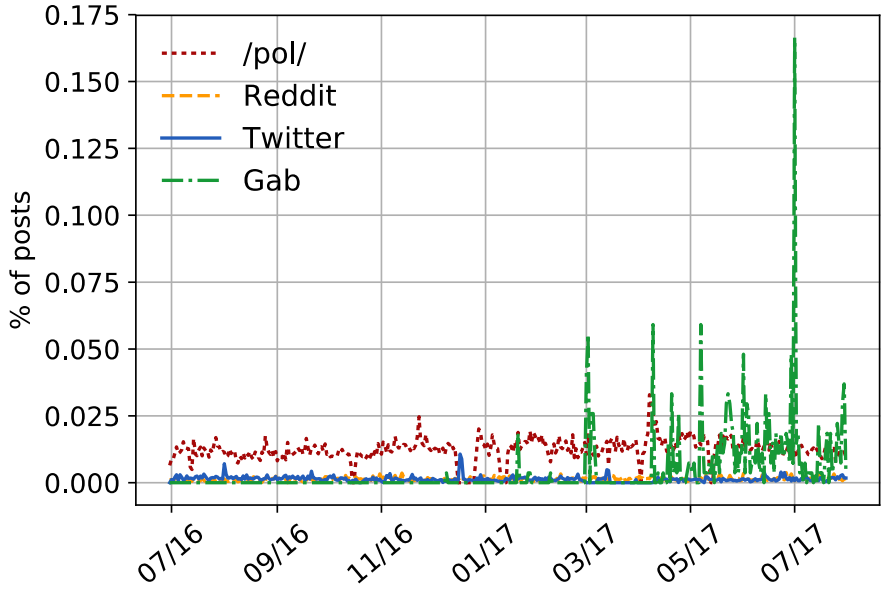
Spurdo Sparde
Autistic Screeching

How are memes shared over time?



Political Memes



Racist Memes

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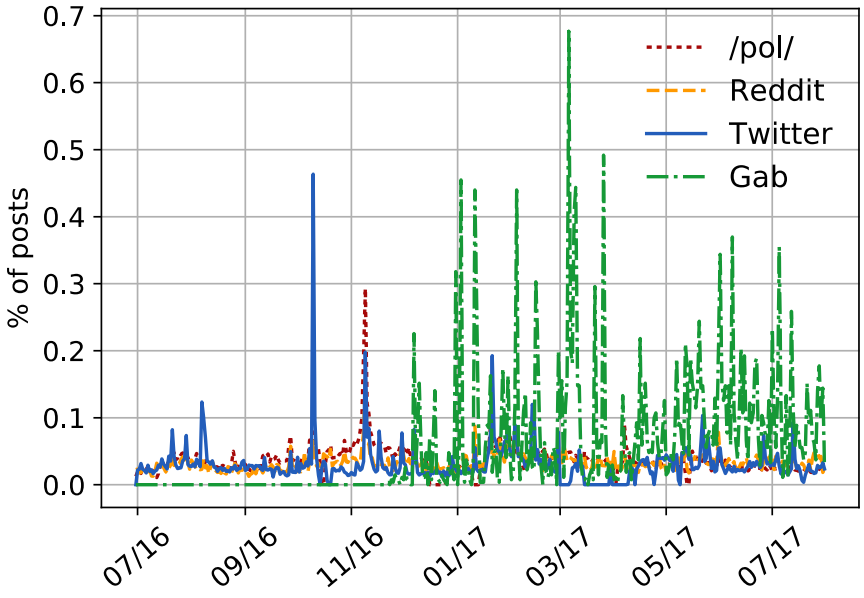

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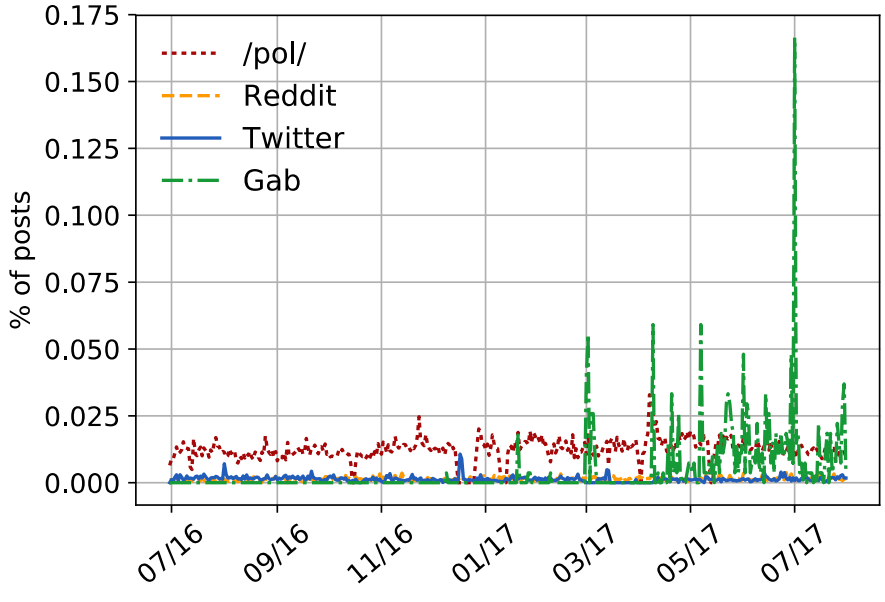

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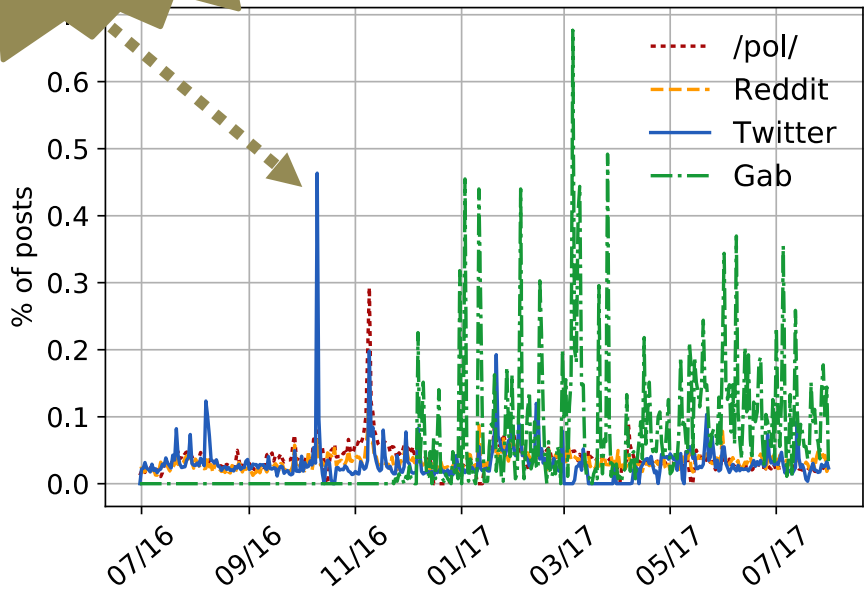
How are memes shared over time?

2nd US presidential debate



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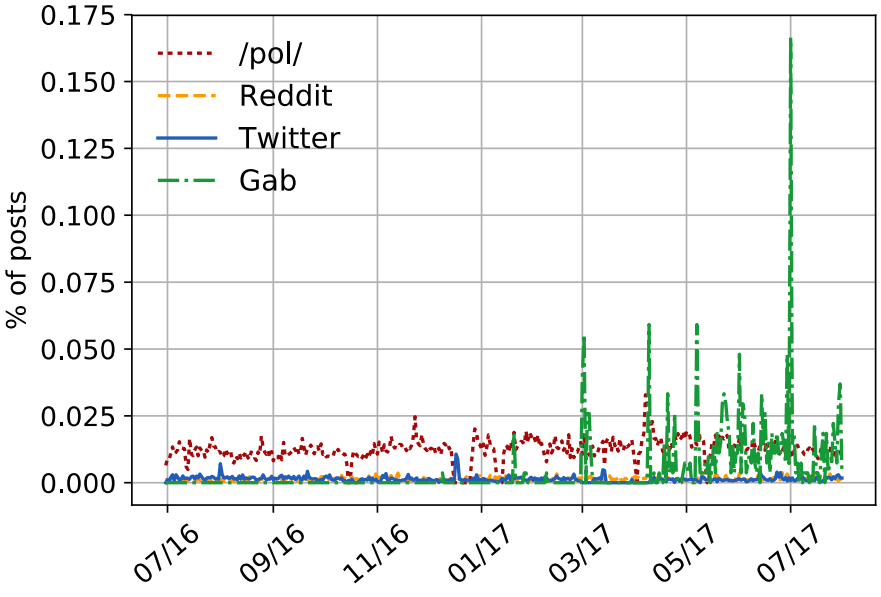

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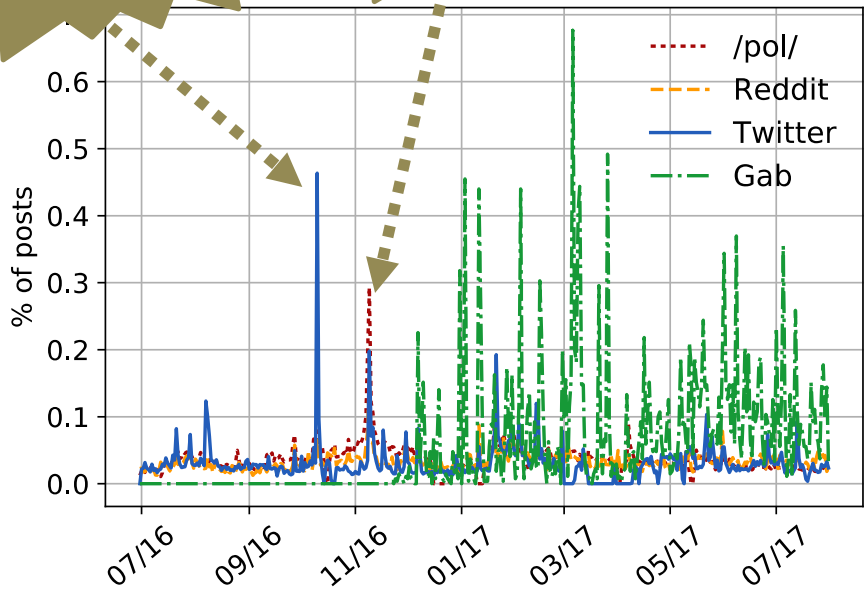

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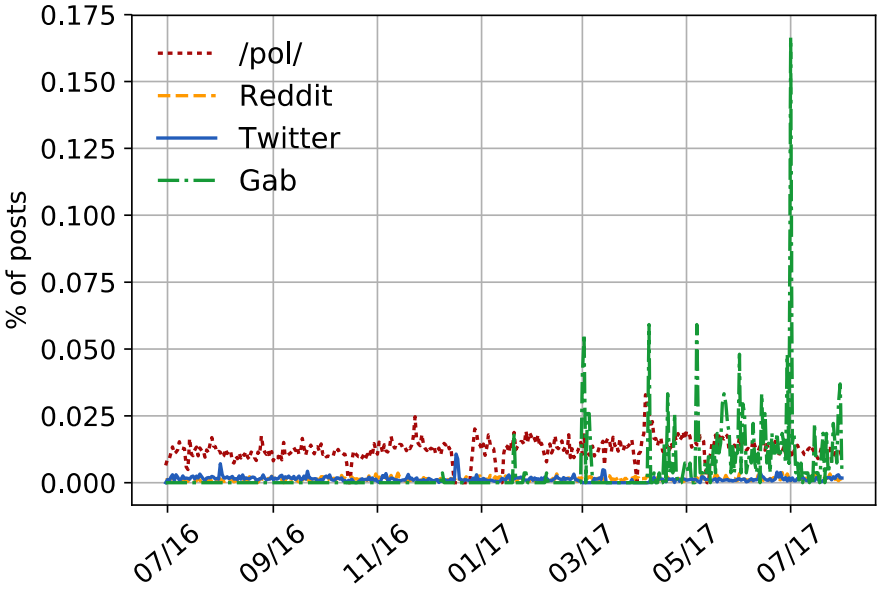

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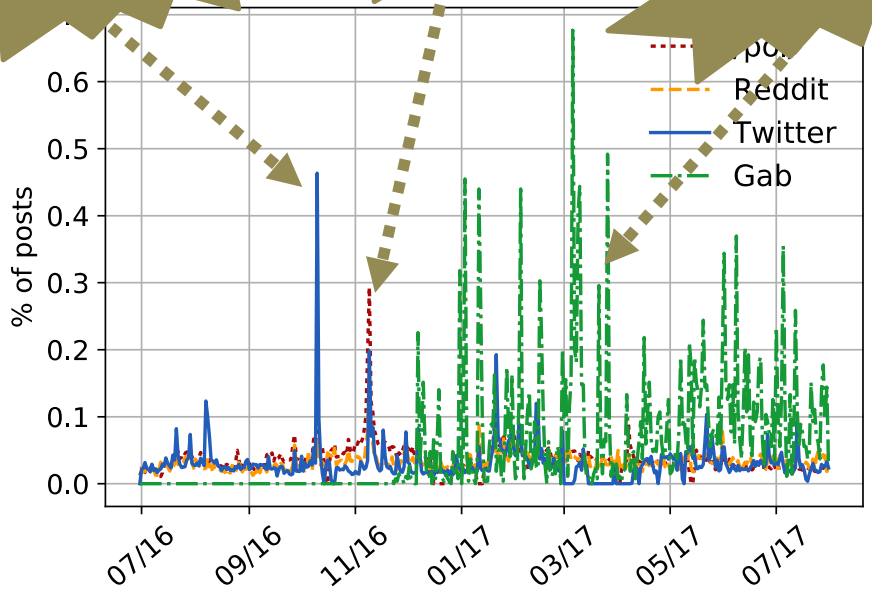
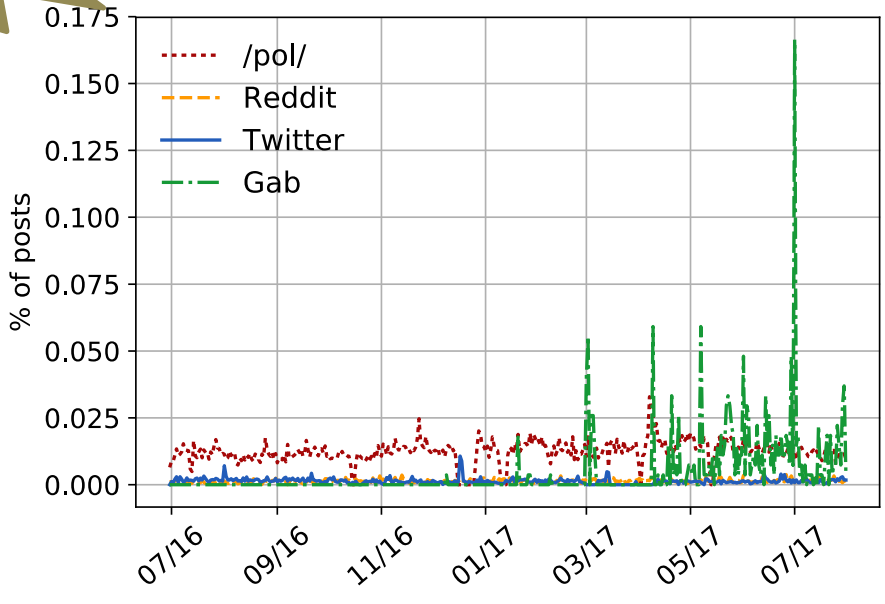
Gab activity increase 2017

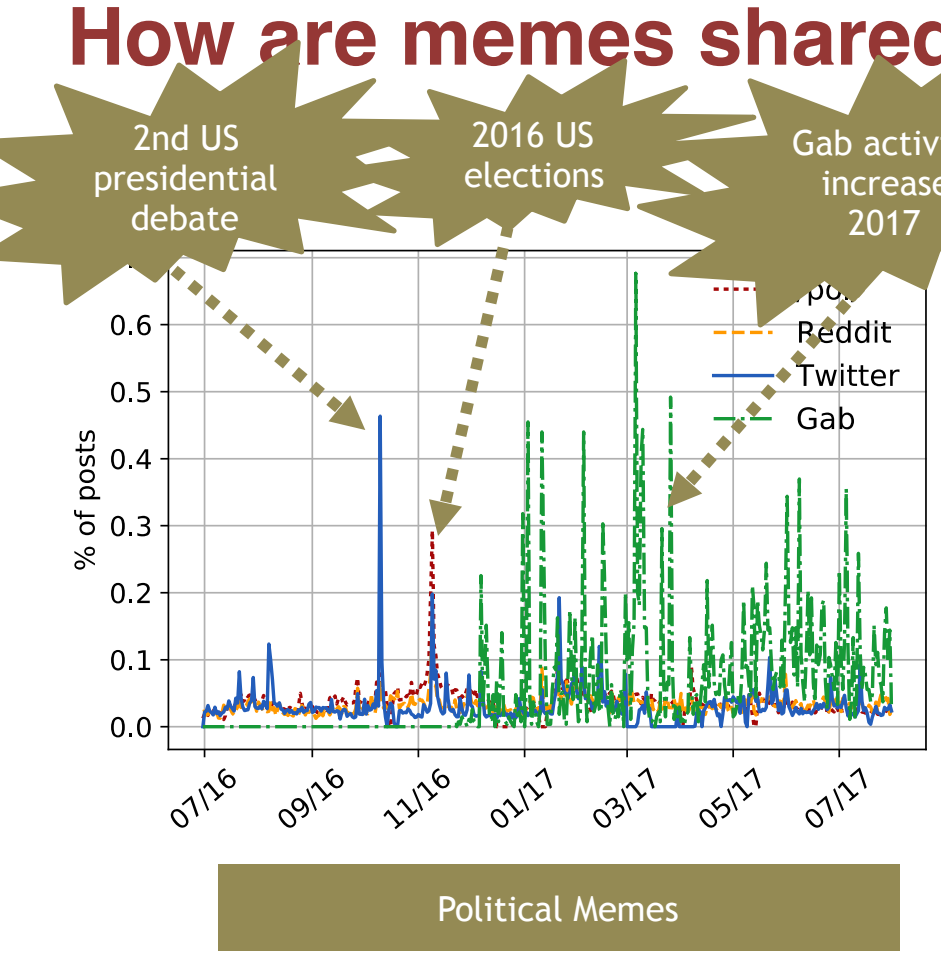


Political Memes

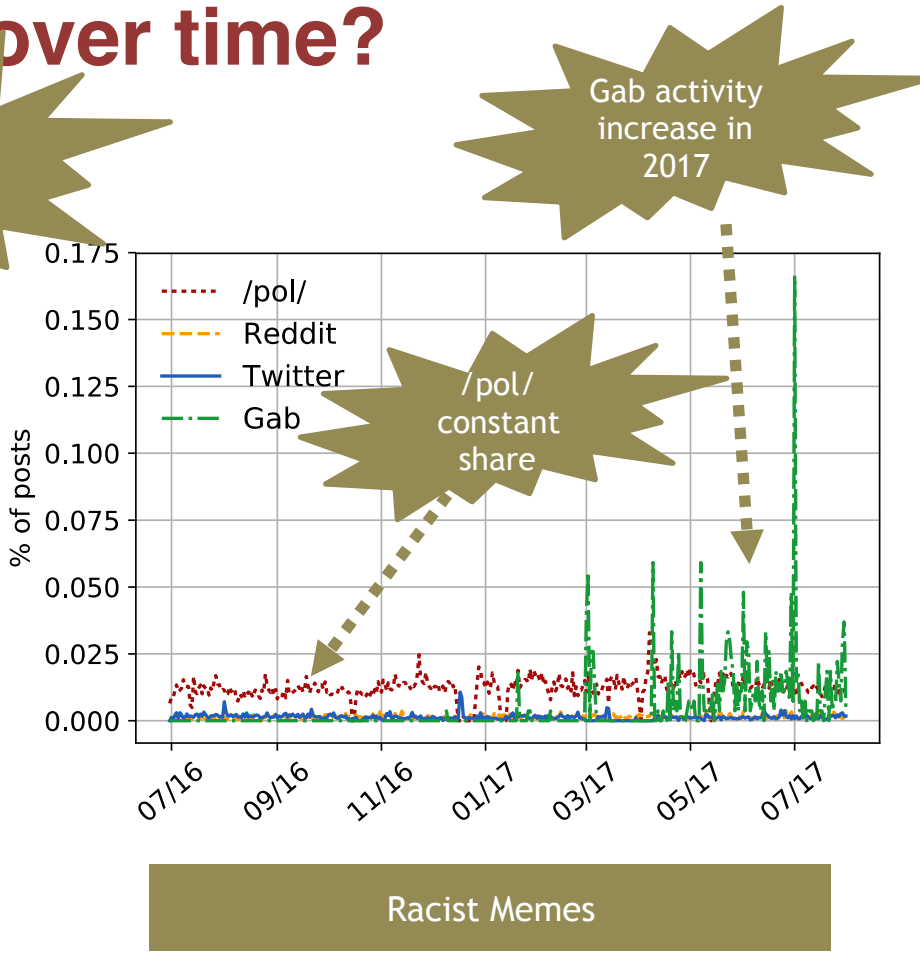


Racist Memes

How are memes shared over time?



Political Memes



Racist Memes

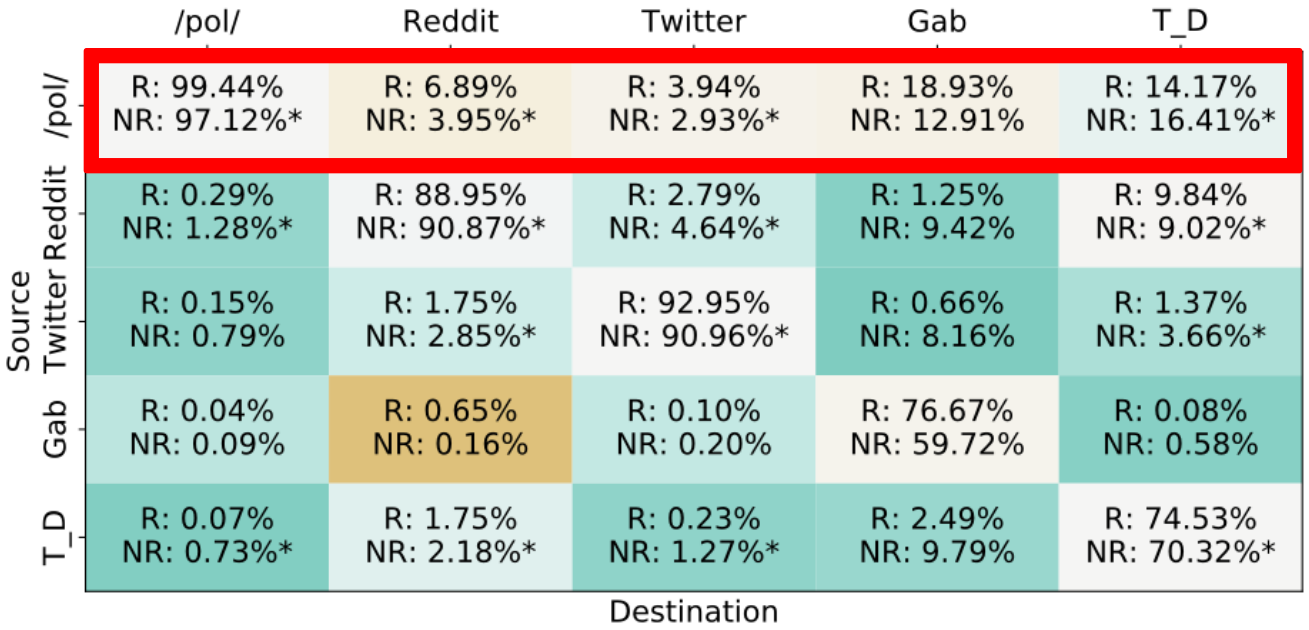
Top subreddits

All Memes		Racism-Related Memes		Politics-Related Memes	
Subreddit	**Posts (%)**	**Subreddit**	**Posts (%)**	**Subreddit**	**Posts (%)**
The_Donald	82,698 (12.5%)	The_Donald	359 (9.3%)	The_Donald	24,343 (26.4%)
AdviceAnimals	35,475 (5.3%)	AdviceAnimals	87 (2.2%)	politics	2,751 (3.0%)
me_irl	15,366 (2.3%)	conspiracy	76 (2.0%)	EnoughTrumpSpam	2,679 (2.9%)
politics	8,875 (1,3%)	me_irl	70 (1.8%)	TrumpsTweets	2,363 (2.5%)
funny	8,508 (1.3%)	funny	56 (1.4%)	AdviceAnimals	1,740 (1.9%)
dankmemes	7,744 (1,1%)	CringeAnarchy	43 (1.1%)	USE2016	1,653 (1.8%)
EnoughTrumpSpam	6,973 (1.1%)	EDH	43 (1.1%)	PoliticsAll	1,401(1.5%)
pics	5,945 (0.9%)	magicTCG	42 (1.1%)	dankmemes	881 (0.9%)
AskReddit	5,482 (0.8%)	dankmemes	40 (1.0%)	pics	877 (0.9%)
HOTandTrending	4,674 (0.7%)	ImGoingToHellForThis	39 (1.0%)	me_irl	873 (0.9%)

Table 6: Top ten subreddits for all memes, racism-related memes, and politics-related memes.

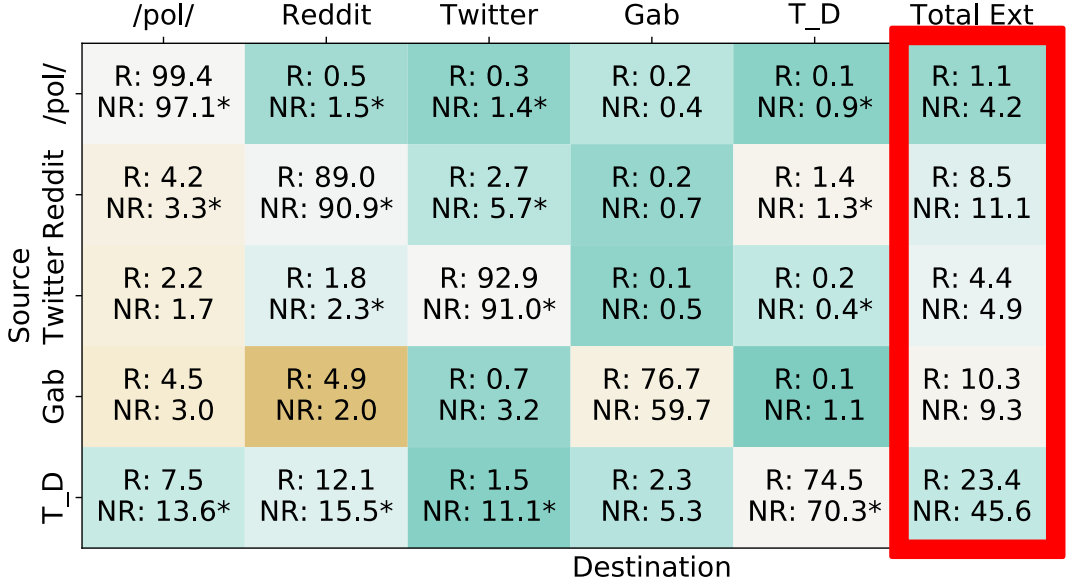
Communities' influence (racist memes)

/pol/ is most influential in terms of spreading racist memes



Communities' efficiency (racist memes)

If we look at the influence normalized to the number of memes posted, the The_Donald is most *efficient* in terms of disseminating memes



Looking ahead

- New models for social networks, like Gab and Mastodon, prompt new and important challenges in this space
- In particular, decentralized infrastructures are harder to study and monitor… ongoing work:
  1. Analyzing hate in decentralized social networks like Mastodon
  2. Designing decentralized algorithms that can aggregate and weight info for multiple instances to better identify fake news

Thank you!

IDRAMA LAB

ENCASE
ENhancing seCurity and
privAcy in the Social wEb

File: well spend money.jpg (127 KB, 1013x586)

A Longitudinal Measurement Study of 4chan's Politically Incorrect Forum and its Effect on the Web

ABSTRACT

UN WASTED MONEY ON A /pol/ STUDY Anonymous (ID: IYtnR5XJ)

10/13/16(Thu)07:31:17 No.92707709 >>92708226 >>92708494 >>92708807 >>92708920 >>92708964 >>92709004 >>92709055 >>92709458 >>92709504 >>92709671 >>92709689 >>92709707 >>92709752 >>92709763 >>92709772 >>92709836 >>92709859 >>92709901 >>92710035 >>92710191 >>92710347 >>92710410 >>92710492 >>92710713 >>92711326 >>92711414 >>92711436 >>92711936 >>92712405 >>92713026 >>92713224 >>92713468 >>92713749 >>92713994 >>92714051 >>92714304 >>92714890 >>92714945 >>92715027 >>92715081 >>92715163 >>92715226 >>92715425 >>92715526 >>92716103 >>92716697 >>92717080 >>92717254 >>92717388 >>92717738 >>92718263

https://arxiv.org/pdf/1610.03452v1.pdf

get in here fellow niggers, post your least rare Pepes

Sam Hyde

2016-11-17 at 22:05 UTC

When U.N. sends its Pepes, they're not sending their best. They're not sending Kek, they're not sending rares. They're sending Pepes that have lots of copies, and they're bringing those copies with us. They're bringing tumblr. They're bringing facebook. They're common. And some, I assume, are rare Pepes.

boards.4chan.org/pol/thread/92700473

[Return] [Catalog] [Bottom]

Archived / 1 / 0

File: Cucks.png (209 KB, 1181x535)

The Cuckademics, A Study Anonymous (ID: zw8wNrfR) 10/13/16(Thu)06:18:21 No.92700473

Jeremy Blackburn
>his work on the contagious aspects of cheating and understanding and learning about cyberbullying/toxic behavior in online games represent the largest scale studies of such behavior, providing insite useful not just for the gaming community, but in understanding anti-social behavior in the real-world as well.
http://www.tid.es/research/researchers/j-blackburn

Gianluca Stringhini
>Twitter Cuck e.g. "But #brexit has nothing to do with xenophobia, right?"
>Retweets Hillary
https://twitter.com/gianluca_string

Riginos Samaras
>actually seems ok and quite attractive so ill give him a pass

Ilias Leontiadis
>bizarre that they would include this guy because his papers are all related to internet privacy and ad revenue.
>Oh wait... Two factors that may have an influence on such interactions are cultural differences between individuals in highly multicultural workplaces, and the layout and physical spaces of the workplace itself. In this work, we investigate how these two factors may facilitate or hinder inter-group interactions in the workplace.
http://www.tid.es/research/researchers/ilias-leontiadis

>> **Anonymous** (ID: zw8wNrfR) 10/13/16(Thu)06:18:40 No.92700514

Nicolas Kourtellis
>Just a henchman

Emiliano De Cristofaro
>globalist
>Italian national Dr Emiliano De Cristofaro, a senior lecturer in computer science at University College London, criticised the comments.
>"Quite frankly. I am very upset. It inherently discriminates against a portion of the population living in this country, making us feel like second-class individuals. Nobody should be used as a negotiating chip, let alone people who are working hard, paying taxes and strongly contributing to the country," he said.
>"I also fear that statements like this will further encourage hate crime, discrimination and racism against EU citizens."
https://inews.co.uk/essentials/news/politics/eu-citizens-living-uk-express-upset-liam-fox-describes-negotiating-card/

Jeremiah Onaolapo
>Just a henchman but...
>Recent or forthcoming papers: "What Happens After You Are Pwnd: Understanding The Use Of Leaked Webmail Credentials In The Wild."
>In that paper: "We leaked 100 honey accounts on paste sites, underground forums, and virtual machines infected with malware, and provided detailed statistics of the activity of cybercriminals on the accounts, together with a taxonomy of the criminals. Our findings help the research community to get a better understanding of the ecosystem of stolen online accounts, and potentially help researchers to develop better detection systems against this malicious activity."
http://www0.cs.ucl.ac.uk/staff/J.Onaolapo/papers/imc16gmail.pdf

Gabriel Emile Hine
>no juice

In conclusion my research indicates that the three most responsible Jews for this vicious hate crime against our culture are:
>Jeremy Blackburn
https://twitter.com/jhblackb?ref_src=twsrc%5Egoogle%7Ctwcamp%5Eserp%7Ctwgr%5Eauthor
>Emiliano De Cristofaro
https://twitter.com/emilianodc_
>Gianluca Stringhini
https://twitter.com/gianluca_string

onymous (ID: IYtnR5XJ)

8226 >>92708494 >>92708807 >>92708920
504 >>92709671 >>92709689 >>92709707
359 >>92709901 >>92710035 >>92710191
026 >>92711414 >>92711436 >>92711936
749 >>92713994 >>92714051 >>92714304
163 >>92715226 >>92715425 >>92715526
388 >>92717738 >>92718263

ng their best. They're
hey're sending Pepes
those copies with us.
cebook. They're com-