

# Tracking Discourse on Social Media

Archives Unleashed: Web Archive Hackathon  
Toronto, Ontario

*Team Critical Load Average*

# TRACKING DISCOURSE ON SOCIAL MEDIA

Two events:

- Charlie Hebdo shooting (Jan 7, 2015)
- Bataclan attack (Nov 13, 2015)

Two social media sites:

- Reddit
- Twitter



Four approaches:

The diagram consists of two thin grey lines. One line starts at the top right of the 'Two events' section and points towards the 'Four approaches' section. The other line starts at the bottom right of the 'Two social media sites' section and also points towards the 'Four approaches' section.

- Attention span
- Information flow
- Topic modeling
- Network analysis

# REDDIT COMMENT:



[–] [Anakinss](#) 14 points 1 year ago

Very honestly... Satirical isn't the word that comes to my mind when talking about Charlie Hebdo. It's not intellectual, rarely smart, and always made to be offensive to everybody.

I read a few issues, but it always left a bitter taste that there was no denunciation, only insults.

[permalink](#) [source](#) [save](#) [save-RES](#) [give gold](#)

# TWEET:

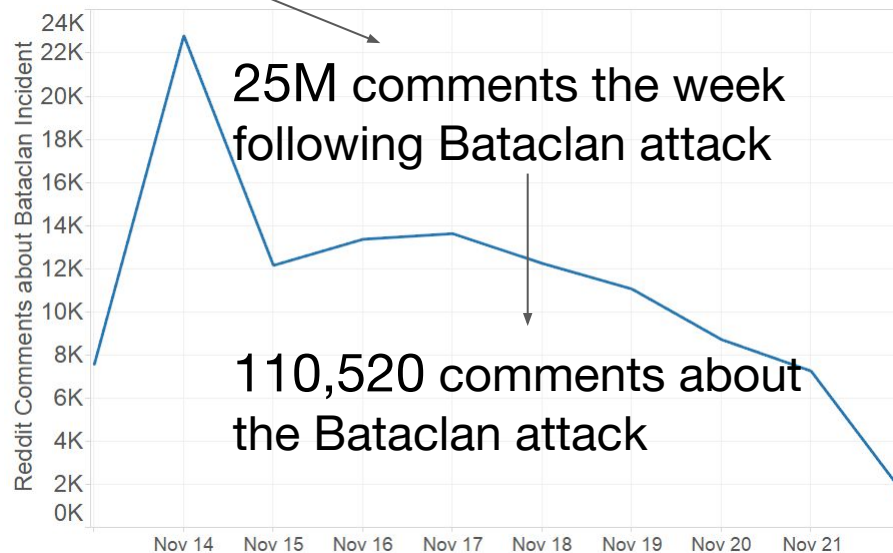
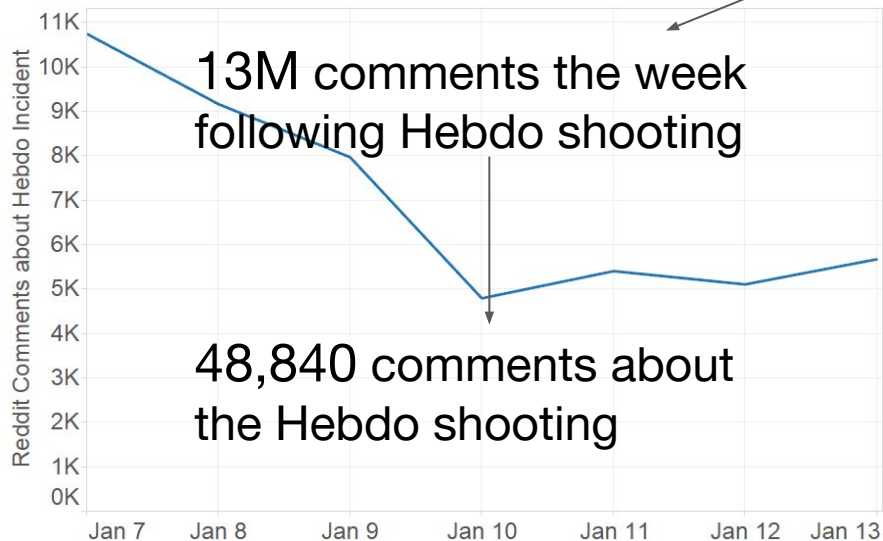


**lone dude** @de\_lone\_dude · Feb 24

so much for [#Freedomofexpression](#) or it only suits when criticising [#islam](#)  
[#CharlieHebdo](#) [#hypocrites](#)

# REDDIT DATA

~50M comments a month on Reddit



6,964,831 bataclan tweets  
(english, nov. 13 - nov. 19)

4,280,030 hebdo tweets  
(english, jan. 7 - jan 13)





```
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Dublin. Connemara."}]},"followers_count":5429,"protected":false,"location":"Nth London. Dublin. Connemara."},"default_profile_image":false,"id_str":"139643092"},"lang":"en-gb","utc_offset":0,"statuses_count":76110,"description":"TV maven. Former BBC One exec; BBC Creative Director & Editor; Director of RTE TV. Matters cultural, political, trivial, nonsensical. Dubliner in London."},"friends_count":1342,"profile_background_image_url_https":"https://pbs.twimg.com/profile_background_images/581573183586762752/-2r4fZZH.jpg"},"profile_link_color":"ABB8C2","profile_image_url":"http://pbs.twimg.com/profile_images/660227176420216832/K2B1SRsl_normal.jpg"},"notifications":false,"geo_enabled":true,"profile_background_color":"3B94D9","profile_banner_url":"https://pbs.twimg.com/profile_banners/139643092/1399501651"},"profile_background_image_url":"http://pbs.twimg.com/profile_background_images/581573183586762752/-2r4fZZH.jpg"},"name":"Helen O'Rahilly","is_translation_enabled":false,"profile_background_tile":true,"favourites_count":3855,"screen_name":"HelenORahilly","url":null,"created_at":"Mon May 03 07:19:25 +0000 2010"},"contributors_enabled":false,"time_zone":"London","profile_sidebar_border_color":"FFFFFF","default_profile":false,"following":false,"listed_count":172},"geo":null,"in_reply_to_user_id_str":null,"lang":"en","created_at":"Fri Nov 13 21:59:17 +0000 2015"},"in_reply_to_status_id_str":null,"place":null,"metadata":{"iso_language_code":"en","result_type":"recent"},"user":{"follow_request_sent":false,"has_extended_profile":false,"profile_use_background_image":true,"id":181521084,"verified":false,"profile_text_color":"333333","profile_image_url_https":"https://pbs.twimg.com/profile_images/1543684130/Photo_7_normal.jpg"},"profile_sidebar_fill_color":"DDEEF6","is_translator":false,"entities":{"description":{"urls":[{"indices":[{"1,10}],"text":"Hornets fan. Traveler, India, Burma and many more countries. Born in Poole, moved around ever since. Slowly turning in to a Northerner. Life is a rollercoaster."}]},"followers_count":745,"protected":false,"location":"","default_profile_image":false,"id_str":"181521084"},"lang":"en","utc_offset":null,"statuses_count":47190,"description":"Hornets fan. Traveler, India, Burma and many more countries. Born in Poole, moved around ever since. Slowly turning in to a Northerner. Life is a rollercoaster."},"friends_count":1248,"profile_background_image_url_https":"https://abs.twimg.com/images/themes/theme1/bg.png"},"profile_link_color":"0084B4","profile_image_url":"http://pbs.twimg.com/profile_images/1543684130/Photo_7_normal.jpg"},"notifications":false,"geo_enabled":true,"profile_background_color":"C0DEED","profile_banner_url":"http://abs.twimg.com/images/themes/theme1/bg.png"},"name":"Tracey Who an I?","is_translation_enabled":false,"profile_background_tile":false,"favourites_count":1846,"screen_name":"Traceyspacey1","url":null,"created_at":"Sun Aug 22 12:08:39 +0000 2010"},"contributors_enabled":false,"time_zone":null,"profile_sidebar_border_color":"C0DEED","default_profile":true,"following":false,"listed_count":29},"geo":null,"in_reply_to_user_id_str":null,"lang":"en","created_at":"Fri Nov 13 22:03:27 +0000 2015"},"in_reply_to_status_id_str":null,"place":null,"metadata":{"iso_language_code":"en","result_type":"recent"}}
```

[nruest@rho:hackfest]\$



explosions over the noise of the crowd at the stadium...Video shows moment explosion is heard during France vs Germany game in #Parislet's see how funny Charlie Hebdo thinks this isUPDATE: Police of ficial: Around 100 hostages taken at #Paris theatre; 35 dead.Aren't we supposed to be the most intelligent beings on the planet? We haven't even learned to get on with each other yet.\n...The video contains the sound of an explosion audible from the Stade de France in #ParisOh my god. The sound of the detonation heard at le Stade de France... #Paris #FRAGER #FRAALLThis is what has to say about the #Paris attacksBREAKING: U.S. security officials believe #Paris attacks were coordinated:Fucking bastards. #ParisIf you're out in Paris and need somewhere safe to go/stay use #PorteOuverte to find ki nd Parisians opening their homes t...Everyone's thinking the same thing #ParisIf you're in Paris looking for shelter, use hashtag #PorteOuverte. Parisians will let you in their home.Sending #LOVE to al l the beautiful people in #Paris, France. ♦♦♦ #Prayers #Light #LoveDear people of Twitter. I beg of you, please do NOT show the bodies of the innocent victims of the #Paris attacks.Thoughts and prayers for #Paris.#BREAKING: according to Europe 1 there is now a shooting at the Les Halles which is near the Centre Pompidou and Louvr...An estimated 1,200 #France nationals operate in #ISIL's ranks. #Pa risShocked. Not shocked. #ParisAttacksThoughts and wishes with all my friends, their families, and everyone else in #ParisLive Updates: Massacre in #Paris Leaves at Least 26 Dead, 100 Hostages Still TrappedIf you're in Paris looking for shelter, use hashtag #PorteOuverte. Parisians will let you in their home.The French Military Has Been Deployed on the Streets of #Paris\n\nLIVESTREAM COVERAGE M an's inhumanity to man, will it never end...very sad and pointless, achieving nothing. #Paris#Paris My thoughts are with you. Je suis désolé.Please\* Any non-French speakers/natives in #Paris check #p orteouverte if you need shelter/place to stay temporarily #...This is reportedly a live stream of area outside concert hall in #Paris where around 100 hostages are being held. https://...Thoughts and p rayers are with those held hostage, wounded, and the friends and family of those lost in #ParisFind out who did it... fuck human rights put an end them all anyone to do with it. #ParisIf there are any Irish people caught up in the events in Paris tonight could they please make contact or DM me. #Parisatt...[From our archives] Why 'urban-warfare' attacks might be the future of terrorism: #ParisParis iens are using the hashtag #PorteOuverte for those who need shelter in Paris right nowBREAKING: '40 DEAD and 100 taken hostage' in #Paris terror attacksIf you are in Paris, and need somewhere safe to stay, or can offer a safe haven. Parisiens are using hashtag #PorteOuvert.Switched over to on the #ParisAttacks - excellent coverageAll of my friends in #Paris, please know you are in my thoughts and prayers right now.Thoughts are with those in Paris tonight ♦ we pray one day there will be total world peace. #Parisvideo shows ambulance and police rushing to respond inMy heart goes out to everyone in Paris in the wake of these terrorist attacks. Please be safe. #ParisTUNE IN: Attacks in #Paris; CNBC live special 6 p.m. ETPeople in #Paris are told not to leave their homes or exit metro & r estaurants but to stay inside. Chaos in the city a...#PARIS LIVE UPDATES: Many killed and injured in 3 separate attacks, hostages takenHas anybody actually thought that religion is just a myth? #ParisP aris shooting - Continuing coverage #ParisattacksUpdate - Reuters: around 60 people said to be inside #Bataclan concert hall in #Paris in hostage situationMy thoughts & prayers are with the peopl e of #Paris. They myriad attacks have cast dark shadows on the #CityOfLights https://...Terror grips #Paris in night of attacks; hostages being held in theater, police sayOMG the death toll is now 40 in #Paris ♦ please God no more no more...may the hostages get out without getting killed ♦#Breaking : At least 35 reported dead, 100 hostages taken in #Paris attacks via the Android appIf you are in Pa ris, and need somewhere safe to stay, or can offer a safe haven. Parisiens are using hashtag #PorteOuvert.If you are in Paris and want to help people on the street find shelter use the hashtag #PorteOu verteLots of love to the city of love. #WeAreParis #Paris #StopKilling #JeSuisParisIrish embassy in #Paris+33144176700\nBritish embassy in #Paris +33144513100#BREAKING: French police confirm that hos tages are being held at the Bataclan concert hall in #Paris.what's wrong with the world ? paris under attack! #Parisattacks #ParisShootingSpoke to best friend who lives in 11th arr.She says streets a re empty,sirens everywhere,neighbors gathering in front o... Paris attacks: What we know so far ♦ #Paris ♦ ♦ ♦ Commentator on France 24 \Even if we had multiplied the number of police in Paris by t h, how could we have prevented thi...People in Paris tweeting #PorteOuverte offering shelter to anybody stranded as a result of tonight's #ParisAttacksConfused fans have flooded the pitch here in #Pari sIf you're in Paris and trying to find shelter, browse the #PorteOuverte hashtag. People are welcoming you! Don't stay outs.Are they in Paris? #svpol #eu #terrorism #migpol #islam #shooting #dead Liv e Feed: Shooting and Explosion in #ParisThis is what has to say about the #Paris attacksOMG #Paris Crazy! \Nstade de France right now.\n#ParisAttacksCrazy! \Nstade de France right now.\n#ParisAttacks Praying for the people of #ParisIf you're in Paris and trying to find shelter, browse the #PorteOuverte hashtag. People are welcoming you! Don't stay outs.My heart and thoughts go out to #Paris tonig ht. Terrible terrible sad news. Thinking back to my Paris...Thinking of everyone in Paris ... Police in #Paris are urging people to remain indoors right now. If you are safe, stay whe...Paris shooting - Continuing coverage #ParisattacksBodies littered in the streets of central #Paris like in a war zone. Police now say 20 dead but death toll rising. https://...Paris no claim of responsibility yet but isl amic State supporters are praising the attack on social media with 'Paris in ...French media saying 40 are now dead in Paris #ParisattacksFuck. All my love going out to the innocent people in #ParisAs an american I can't tell if people are screaming or just talking loud in french. #paris #ParisattacksThinking of everyone in Paris ... Police in #Paris are urging people to remain indoors right now. If you are safe, stay whe...If you're out in Paris, many Parisians are opening their doors to help you stay safe. #PorteOuverte#BREAKING: reported shooting heard at Les Halles shopping mall #Parisatta cksIf you're in Paris looking for shelter, use hashtag #PorteOuverte. Parisians will let you in their home.Terror grips #Paris in night of attacks; hostages being held in theater, police saySo more t han 40 killed, probably over a hundred injured, and over a hundred taken hostage!! #ParisIf you are in Paris, and need somewhere safe to stay, or can offer a safe haven. Parisiens are using hashtag # PorteOuvert.Figaro reports at least 30 dead in #Paris shooting #Fussillades.Unconfirmed reports of suicide bombers. Sound of explosion outside Stadium reportedly caught on TV cameras.\n#Paris \nht...Got t he answer #Paris.Wish meathades tweeting crap would understand the difference between a Muslim and a terrorist #ffs #ParisConfused fans have flooded the pitch here in #ParisVideo shows moment explosi on is heard during France vs Germany game in #ParisWatching the news about the terror attacks in #paris is terrifying, death toll and hostage toll just continuing to rise #scarystuff #parisIf death t oll being reported is correct, this wld already be more than double the toll in the Charlie Hebdo attack. & this...If you're in Paris looking for shelter, use hashtag #PorteOuverte. Parisians will let you in their home.DETAILS: Around 100 hostages at #Paris #Bataclan theater; 35 killed in shootouts, blastsFormer head of the CIA used BBC airwaves to attempt to link #Paris attacks to Iran.Irish embassy #Paris can be called at +33144176700\nBritish consulate #Paris can be called at +33 (0)1 44 51 31 00#porteouverte fuck you terroristsThinking of everyone in Paris ... Police in #Paris are urging people to remain indoors right now. If you are safe, stay whe...This world has lost its humanity. #Paris #Beirutcan't believe what's happened in Paris #ParisattacksThis is so horrible! #Parisatt acks #Paris If you're in Paris looking for shelter, use hashtag #PorteOuverte. Parisians will let you in their home.Cauchemar #éveillé #fusillade #Paris #CeMondeEstFouWatch the moment an explosion ro cked the soccer match in #ParisSeveral simultaneous shootings in #Paris, casualties reportedhttps://f24.my/1QnMfadThe french people are using #PorteOuverte to offer people without places to stay refug e for the night. Vive la France!Reports of use of Kalashnikovs in shooting incidents in #ParisattacksStay safe out there. It's looking wild in #ParisIronic that all the \civilized\ are \praying for t hem\, when I'm sure they were sending their own prayers right before the attack #ParisResidents near locations of shootings offering protection under hashtag #PorteOuverte. Paris is great.#ParisAttac ks There really are some awful things going on in the world, my thoughts are with those affected xParisie^C [nruest@rho:hackfest]\$ █



From nagios@nagios.library.yorku.ca <lcswatch@gmail.com> ☆

↩ Reply

➡ Forward

📁 Archive

🗑 Junk

🗑 Delete

More ▾

Subject **\*\* PROBLEM Service Alert: rho.library.yorku.ca/Current Load is CRITICAL \*\***

02:29 PM

To nick ruest ☆

\*\*\*\*\* Nagios \*\*\*\*\*

Notification Type: PROBLEM

Service: Current Load  
Host: rho.library.yorku.ca  
Address: 10.0.0.18  
State: CRITICAL

Date/Time: Sat Mar 5 14:29:37 EST 2016

Additional Info:

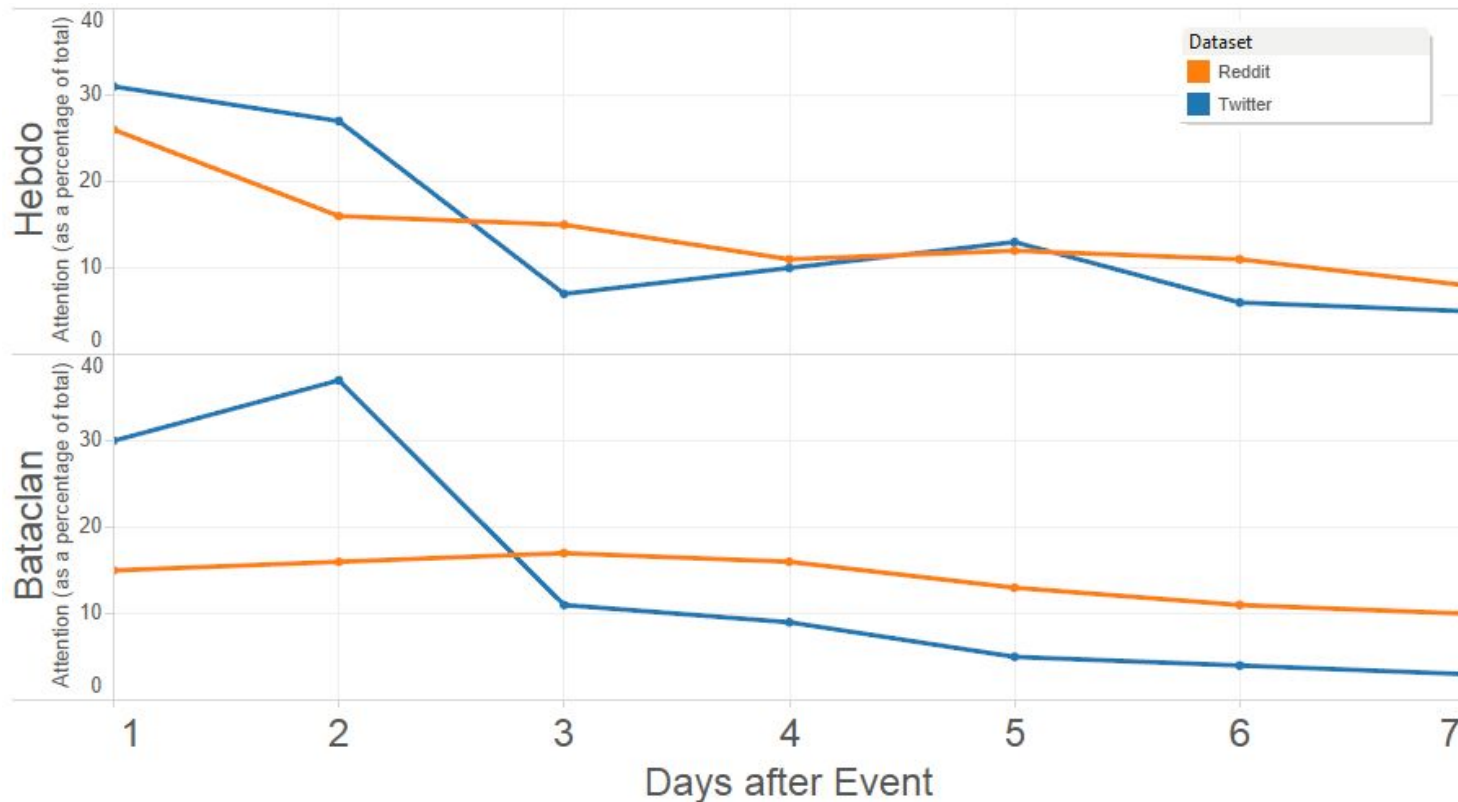
CRITICAL - load average: 101.76, 91.85, 61.45

# Use **ALL** available resources

```
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4.0K drwxrwxr-x 2 nruest nruest 4.0K Mar  5 14:55 .
20K drwxr-xr-x 7 nruest web    20K Mar  4 13:33 ..
183M -rw-rw-r-- 1 nruest nruest 183M Mar  5 12:54 bataclan-20151113-english_ct.txt
236M -rw-rw-r-- 1 nruest nruest 236M Mar  5 12:56 bataclan-20151114-english_ct.txt
73M  -rw-rw-r-- 1 nruest nruest 73M  Mar  5 07:11 bataclan-20151115-english_ct.txt
57M  -rw-rw-r-- 1 nruest nruest 57M  Mar  5 06:45 bataclan-20151116-english_ct.txt
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18M  -rw-rw-r-- 1 nruest nruest 18M  Mar  5 07:57 hebdo-20150112-english_ct.txt
17M  -rw-rw-r-- 1 nruest nruest 17M  Mar  5 07:53 hebdo-20150113-english_ct.txt
16M  -rw-rw-r-- 1 nruest nruest 16M  Mar  5 06:45 hebdo-20150114-english_ct.txt
[nruest@rho:hackfest]$
```

60GB of JSON -> 1GB of txt

# Attention on social media





# Longitudinal Analysis (spread of information/misinformation)

## Charlie Hebdo Twitter Dialog: Longitudinal Analysis of Important Terms

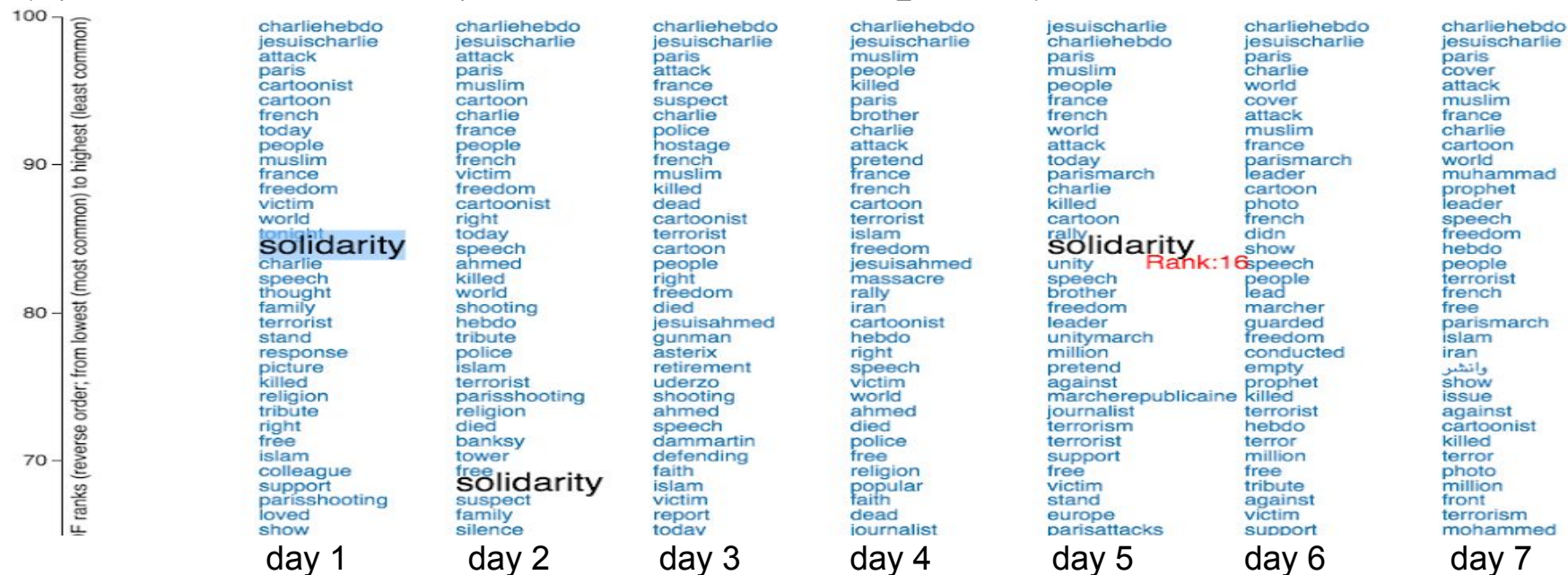
([http://www.cs.odu.edu/~anwala/files/temp/archivesUnleashedHackathon/Bataclan\\_Twitter.html](http://www.cs.odu.edu/~anwala/files/temp/archivesUnleashedHackathon/Bataclan_Twitter.html))



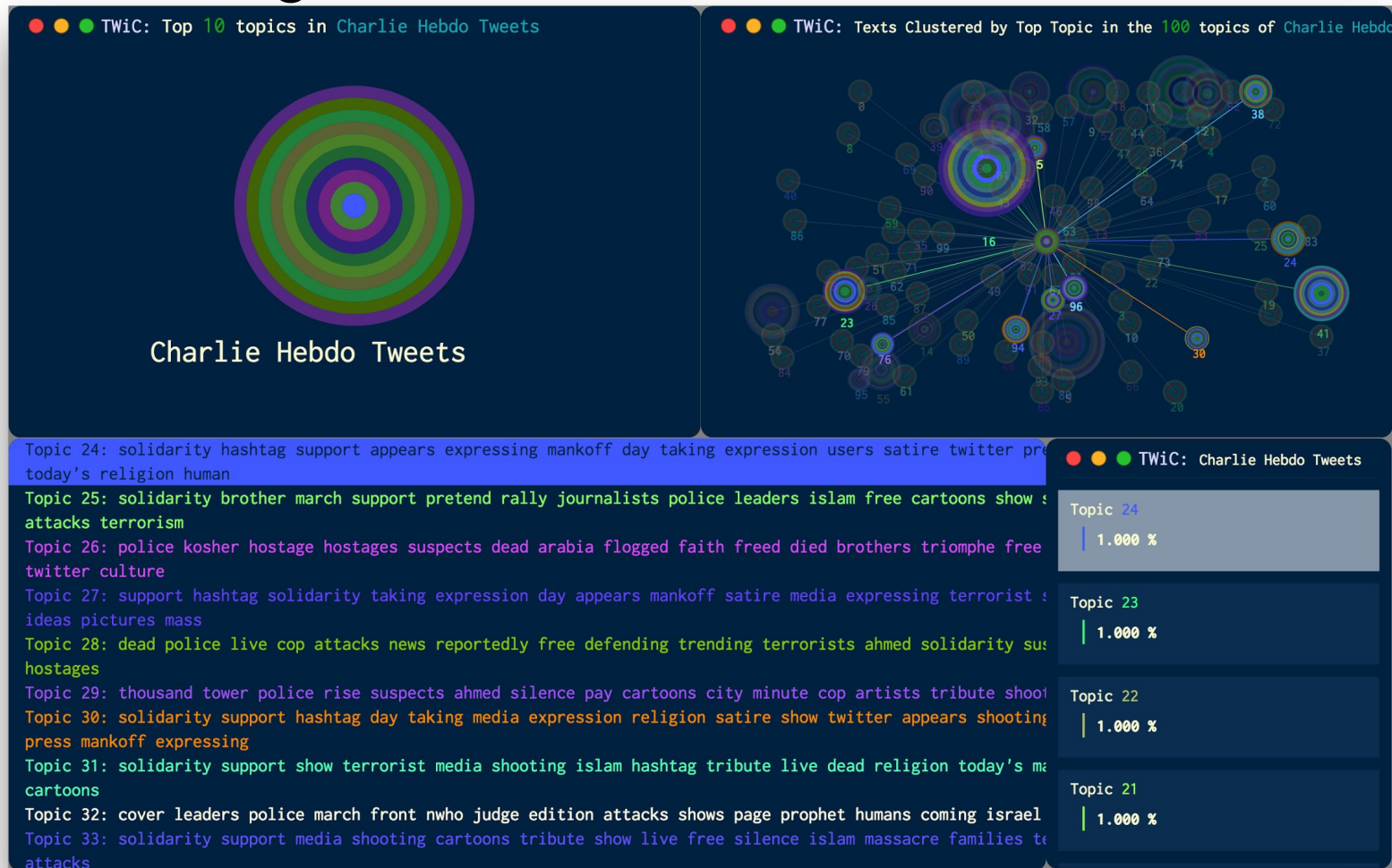
# Longitudinal Analysis (evolution of conversation)

## Charlie Hebdo Twitter Dialog: Longitudinal Analysis of Important Terms

([http://www.cs.odu.edu/~anwala/files/temp/archivesUnleashedHackathon/Bataclan\\_Twitter.html](http://www.cs.odu.edu/~anwala/files/temp/archivesUnleashedHackathon/Bataclan_Twitter.html))

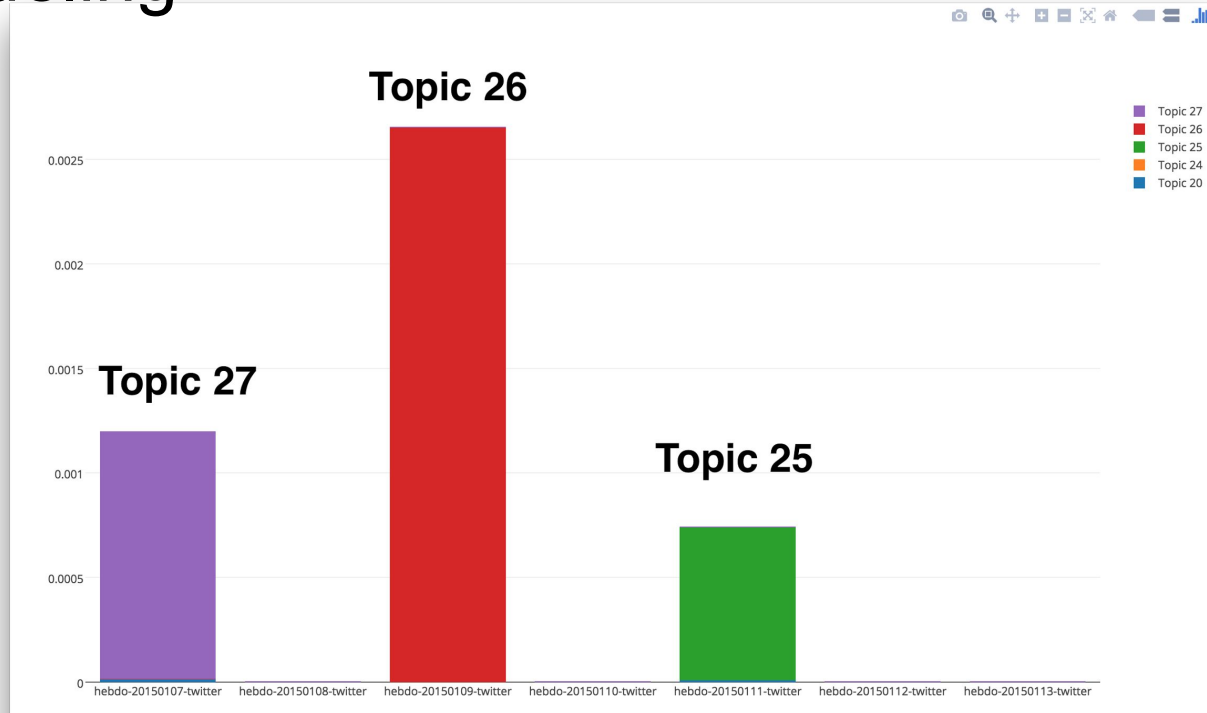


# Topic Modeling





# Topic Modeling



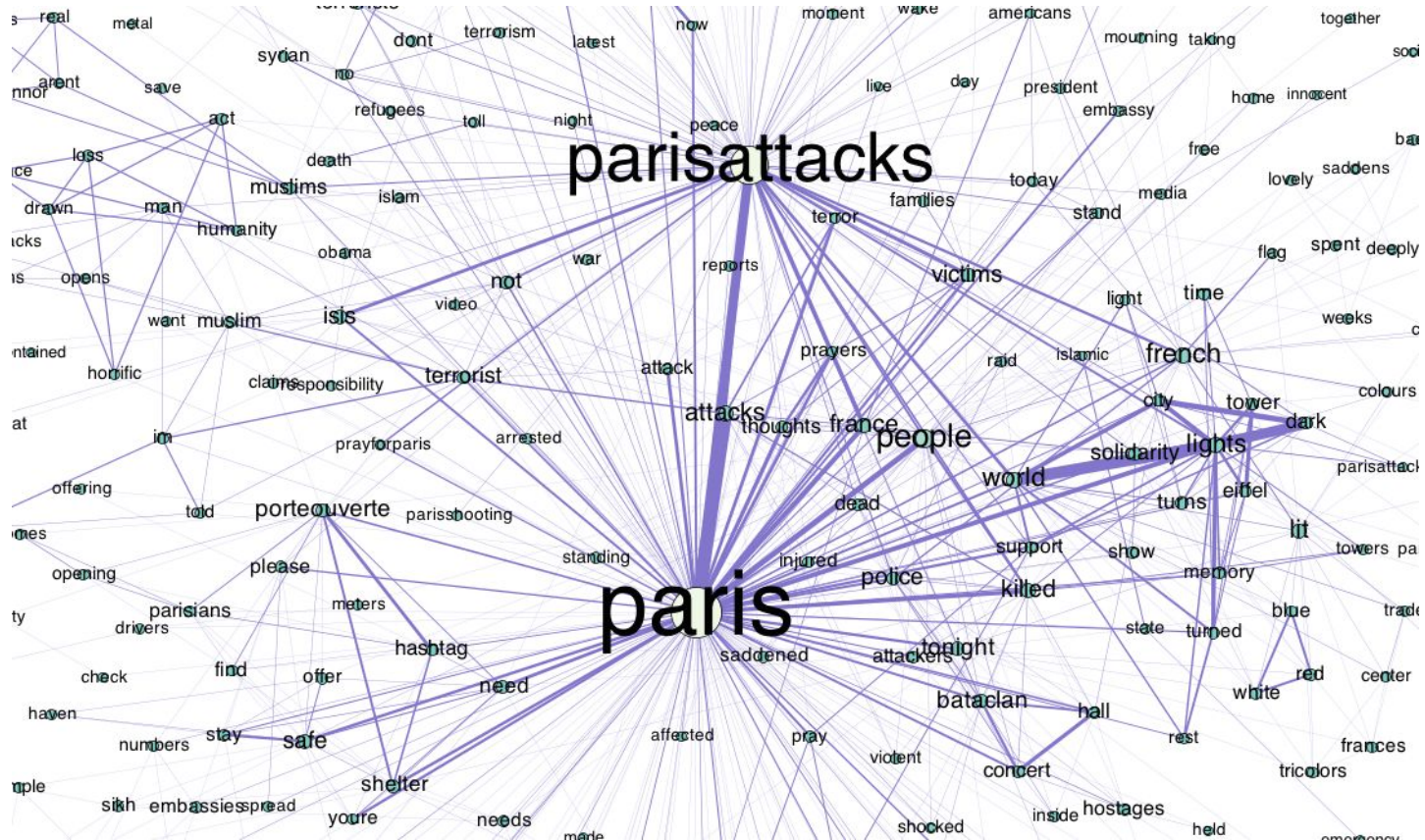
Topic 25: solidarity brother march support pretend rally journalists police leaders islam free cartoons show stand unity square million front attacks terrorism

Topic 26: police kosher hostage hostages suspects dead arabia flogged faith freed died brothers triumph free ridiculed brilliant gunmen attacks twitter culture

Topic 27: support hashtag solidarity taking expression day appears mankoff satire media expressing terrorist showing religion users events twitter ideas pictures mass



# NETWORK ANALYSIS: Word co-occurrence pattern for Bataclan





# FURTHER RESEARCH

- Longer time spans
- Other types of events
- Categorization (hashtags or subreddits)

This project brought to you by  
**Team Critical Load Average:**

Alexander Nwala, *Old Dominion University*

Allison Hegel, *UCLA*

Federico Nanni, *University of Bologna*

Jonathan Armoza, *NYU*

Kelsey Utne, *Cornell University*

Nick Ruest, *York University*

Yu Xu, *USC*