The US elections through the eyes of TikTok

• • •

DH-500 Computational Social Media

Elisa Michelet, Ravinithesh Annapureddy, Maxime Jan

Outline

- Motivations and research question
- Data Collection - HREC
- Data description
- Methods
- Results
- Conclusion

Background & RQ

Election and Social Media

- Message to voters
- Posters, flyers, Newspaper and Television ads to Social Media
- SNS gives chance to do targeted campaign.

- 2008 election in US first used SNS
- Obama greatly used twitter to talk with votes and Youtube to publish ads
- 2016 election broke controversies
- SNS media continues to remain the essential way to reach to millions of people including the voters

US 2020 election

- World's oldest Democracy
- Largest Economy
- Leader of the free world
- Trumpian politics
- Era changing
  - BLM
  - COVID 19

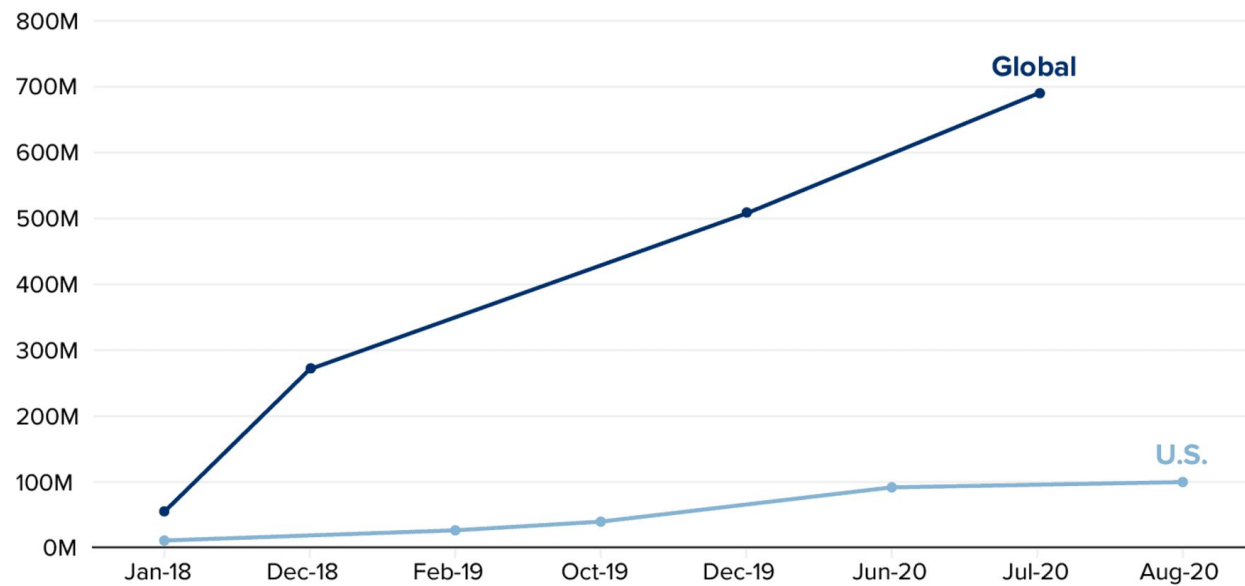Clay Banks on Unsplash

LIVE

US Elections 2020
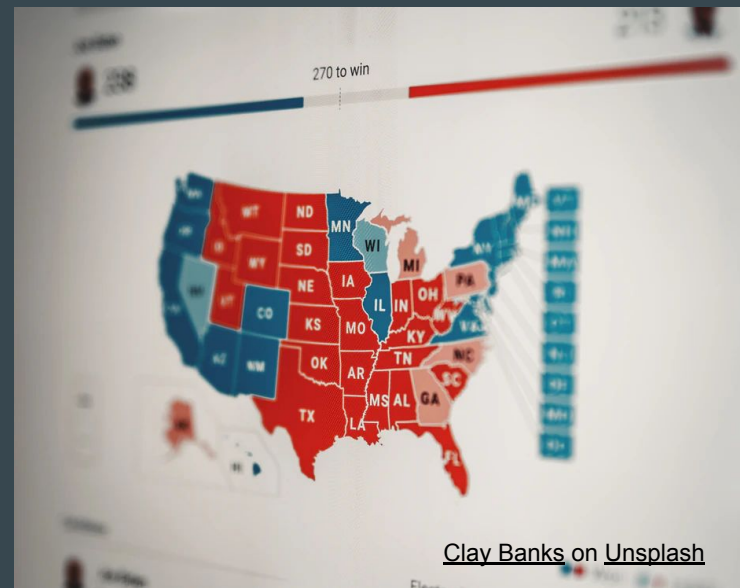
TikTok

- App for short videos
- Launched as Douyin in September 2016, in China
- Launched as TikTok by ByteDance in 2017 for outside China after merging Musical.ly
- With 2 Billion downloads, as of January 2021, 689 million monthly active users worldwide (DataReportal, 2021).
  - 7th platform in terms of users
  - When combined with Douyin, it will be nearly 1.3 Billion
- What Twitter did to blogging, TikTok did that for the videos.

Growth in 2020

TikTok user growth
Monthly active users on dates provided by the company

800M	
700M	**Global**
600M	
500M	
400M	
300M	
200M	
100M	**U.S.**
0M	

Jan-18   Dec-18   Feb-19   Oct-19   Dec-19   Jun-20   Jul-20   Aug-20

SOURCE: TikTok

CNBC

TikTok in the US

- Quarter of the users are teens
- 45% between the age of 20 and 40

Distribution of TikTok users in the United States as of March 2021, by age group

Share of users

- 10-19: 25%
- 20-29: 22.4%
- 30-39: 21.7%
- 40-49: 20.3%
- 50+: 11%
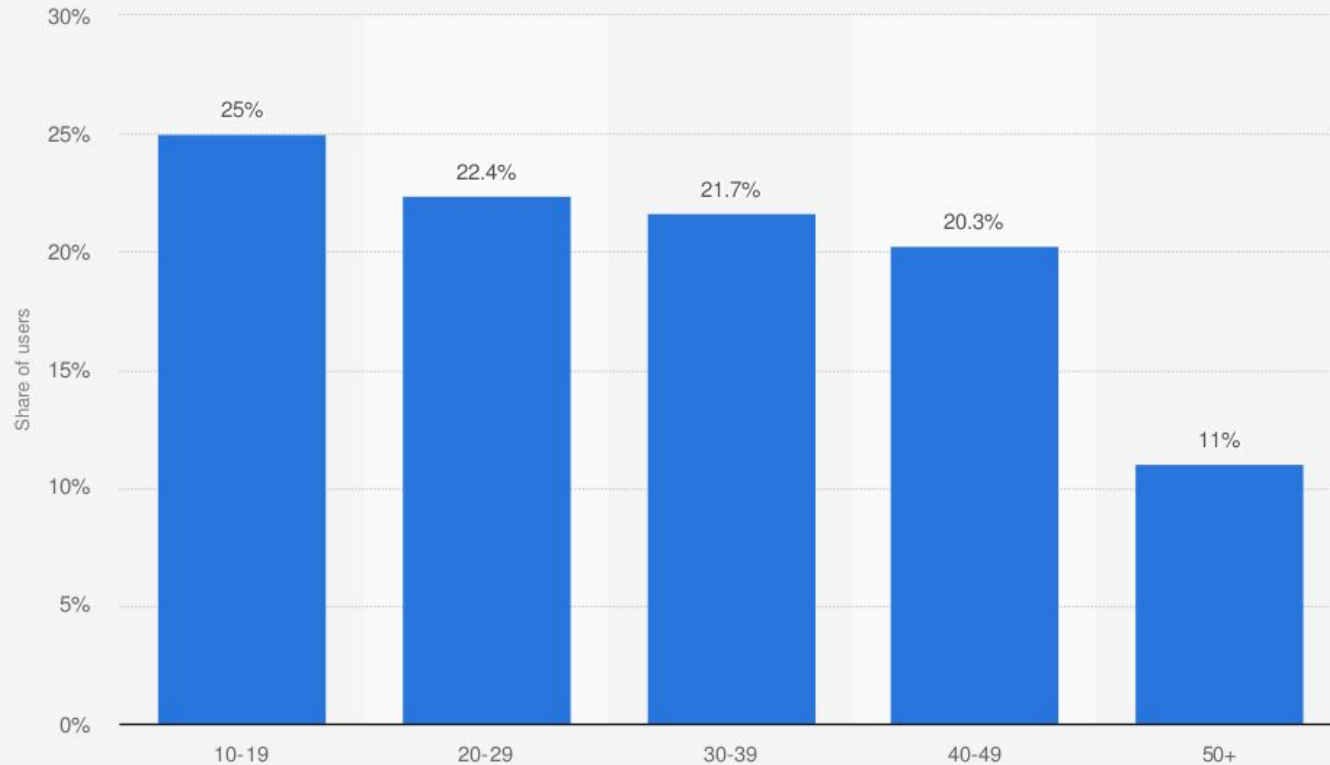
Source
App Ape
© Statista 2021

Additional Information:
United States; App Ape; March 2021; active users only; Android users

2020 Election and the young

- Current affairs coupled with the pandemic crisis attracted attention of young people to the election.
- Paid political ads are banned on TikTok
- Parties or candidates did not have official presence on the platform
- But TikTok contributed to shaping the election

Research Questions

- Research Questions
  - How did the momentum to the election culminate on TikTok over time?
  - What kind of hashtags are used together and how were they used in the videos?
  - What are the topics of discussion in the election discourse through TikTok?

Methods

- How did the momentum to the election culminate on TikTok over time?
  - Hashtag appearance count in videos
- What kind of hashtags are used together and how were they used in the videos?
  - Hashtag occurrence and Hashtag Network analysis for hashtag community detection
- What are the topics of discussion in the election discourse through TikTok?
  - Videos graph partitioning and Topic modelling

Ethic Committee Submission

Laws Applicable

- EPFL and Swiss laws
  - EPFL (Art.36c ETH Act) authorizes processing of personal data in context of research
- GDPR
  - Information obligation (Art. 14 par. 1 GDPR)
  - 2 exceptions :
    - already informed (Art. 14 par. 5 lit. 1 GDPR)
    - information would involve a disproportionate effort (Art. 14 par. 5 lit. b GDPR)
- US privacy laws
  - No information obligation
  - States that "your content [...] may also be accessed by [...] third parties"

Using an API to collect data

- Not explicitly authorized - not clearly forbidden by TikTok

- US : can't use automated scripts to collect information

- Swiss : not for commercial purposes

TikTokApi 3.9.9

`pip install TikTokApi`

Inferring new data

Creation of sensitive data

Data Collection

| Select Hashtags | Query for videos | Store metadata after hashing |

Select Hashtags
- #Biden2020 (13.1B)
- #biden (9.3B)
- #joebiden (2.8B)
- #trumpout (19.9M)
- #democrat (4.0B)
- #voteblue (1.8B)

Query for videos
- #Trump2020 (22.3B)
- #trump (7.2B)
- #donaldtrump (5.5B)
- #maga (5.2B)
- #republican (6.6B)
- #votered (218.3M)

Store metadata after hashing
- #election2020 (2.7B)
- #2020election (708.1M)
- #trumpvsbiden (131.7M)
- #bidenvstrump (35.4M)

# What's inside the Data?

5232 unique videos

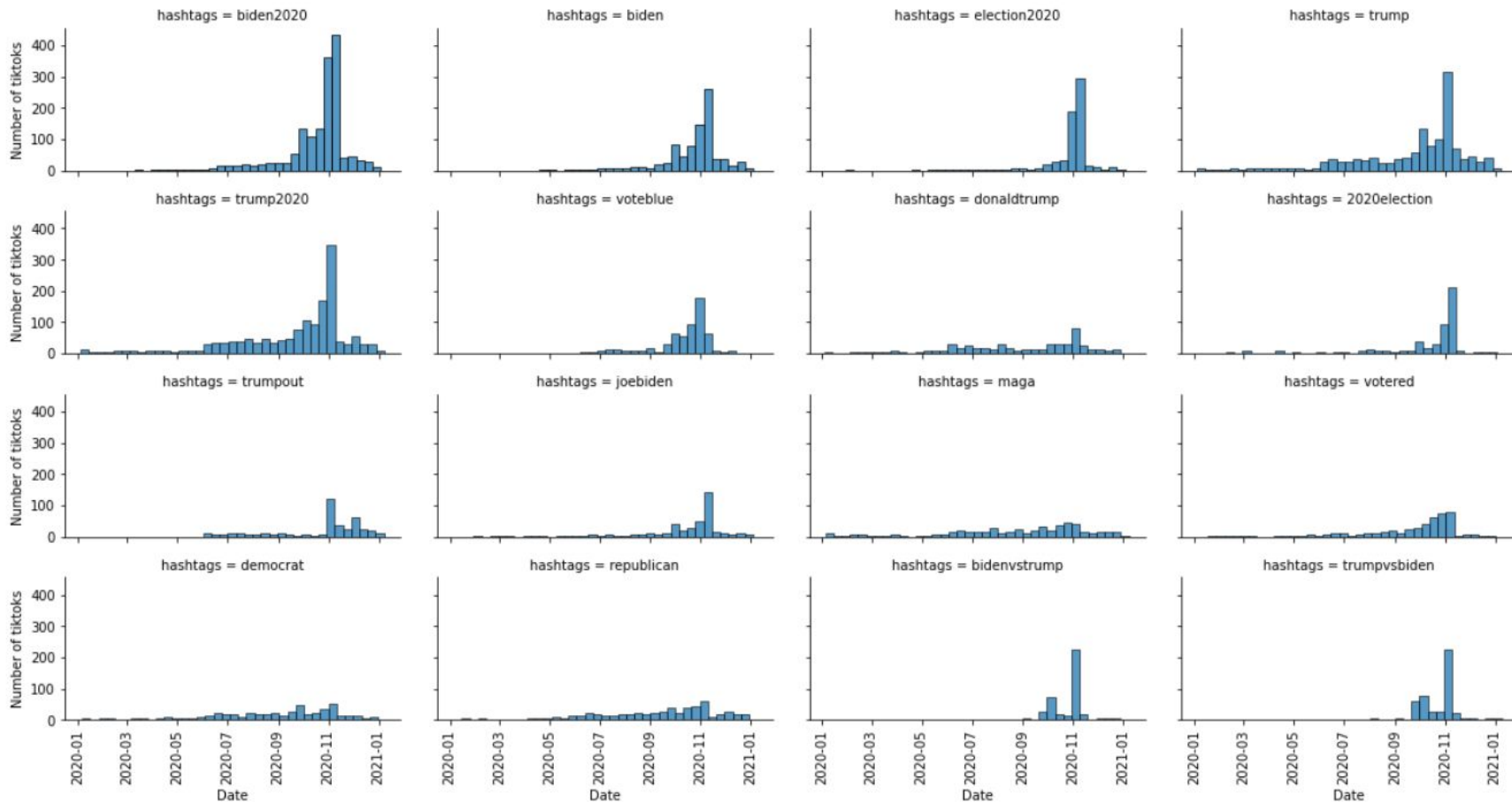| video_id	hashtags	date
-49374569309301	[aussie, biden2020, bidenharris2020, straya]	2020-11-07 01:51:07
28378852204966	[biden, biden2020, election2020, fyp, fürdich]	2020-11-06 18:11:03
-76166906306051	[biden2020, fyp]	2020-10-19 18:41:40
...	...	...

RQ 1

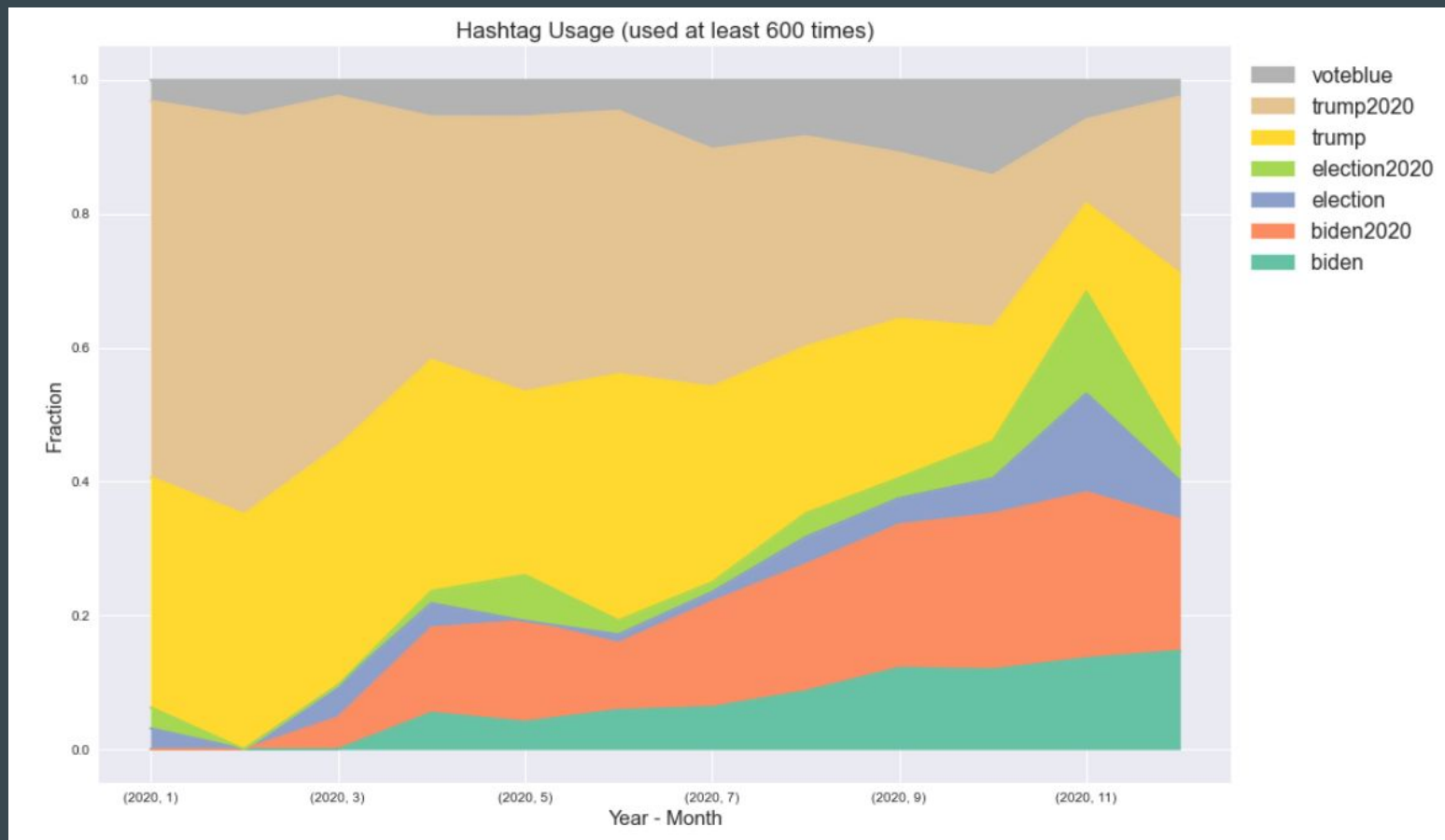How did the momentum to the election culminate on TikTok over time?

Evolution of Hashtags over time
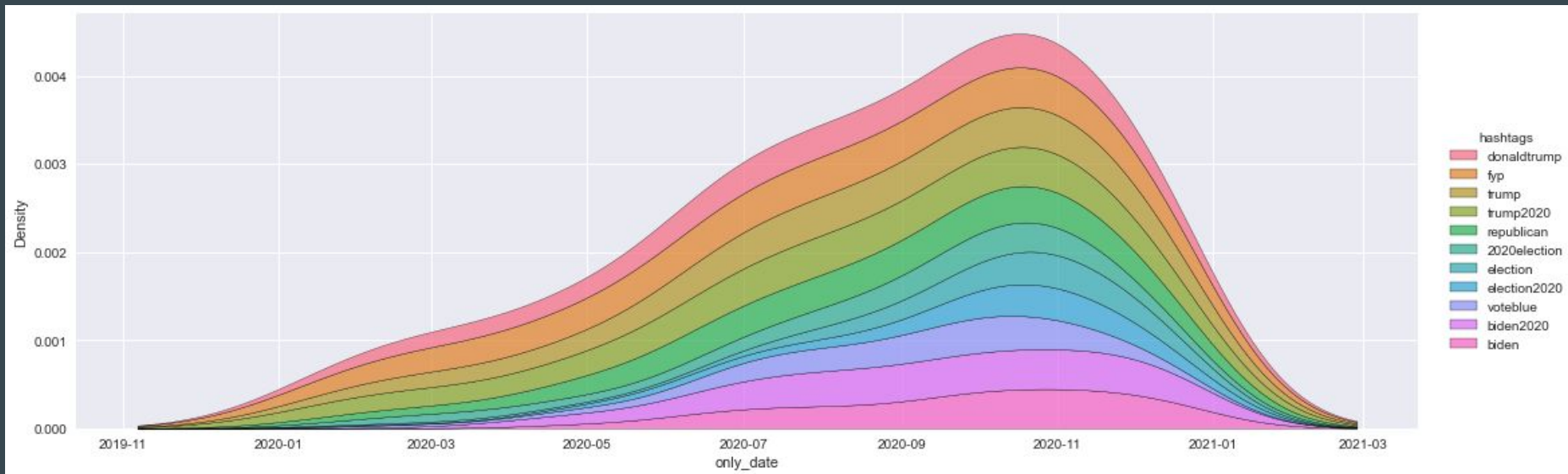
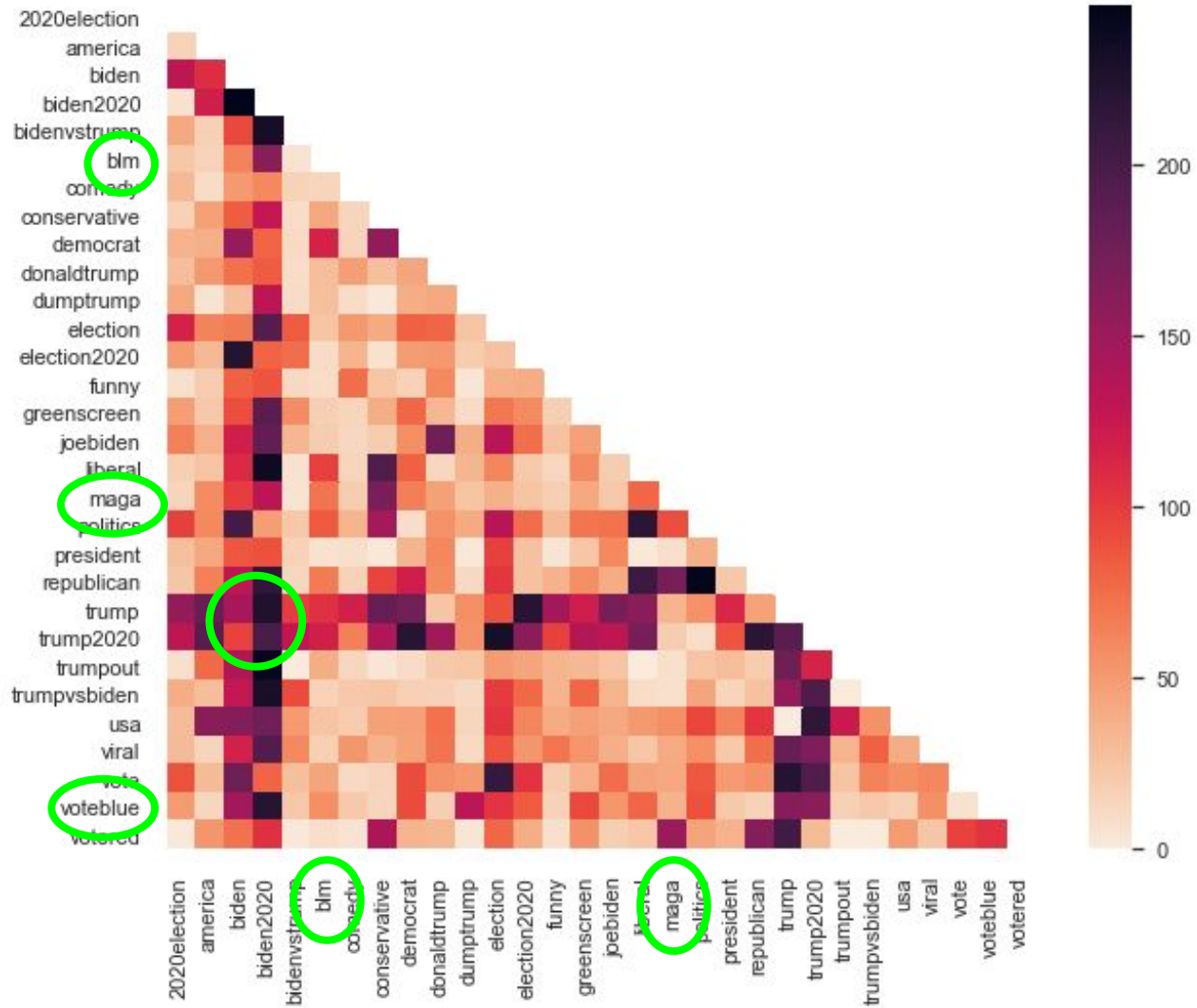# Evolution of Hashtags over time

Evolution of Hashtags over time

RQ 2

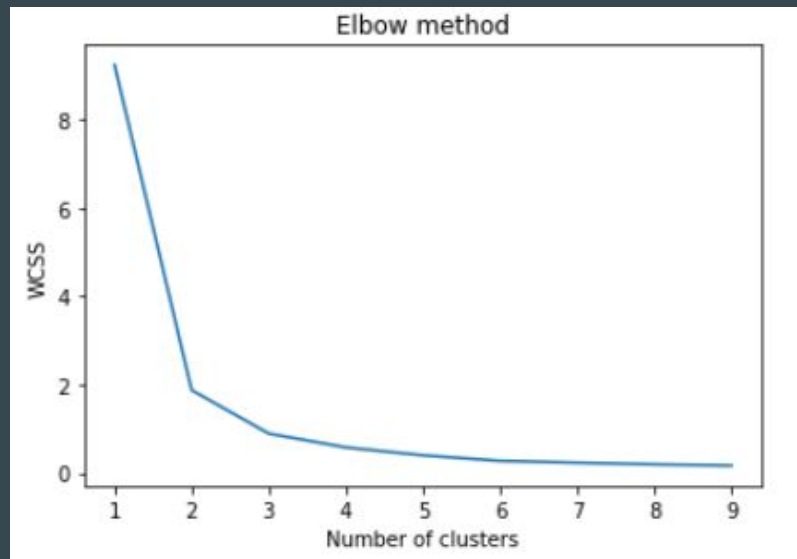What kind of hashtags are used together and how were they used in the videos?
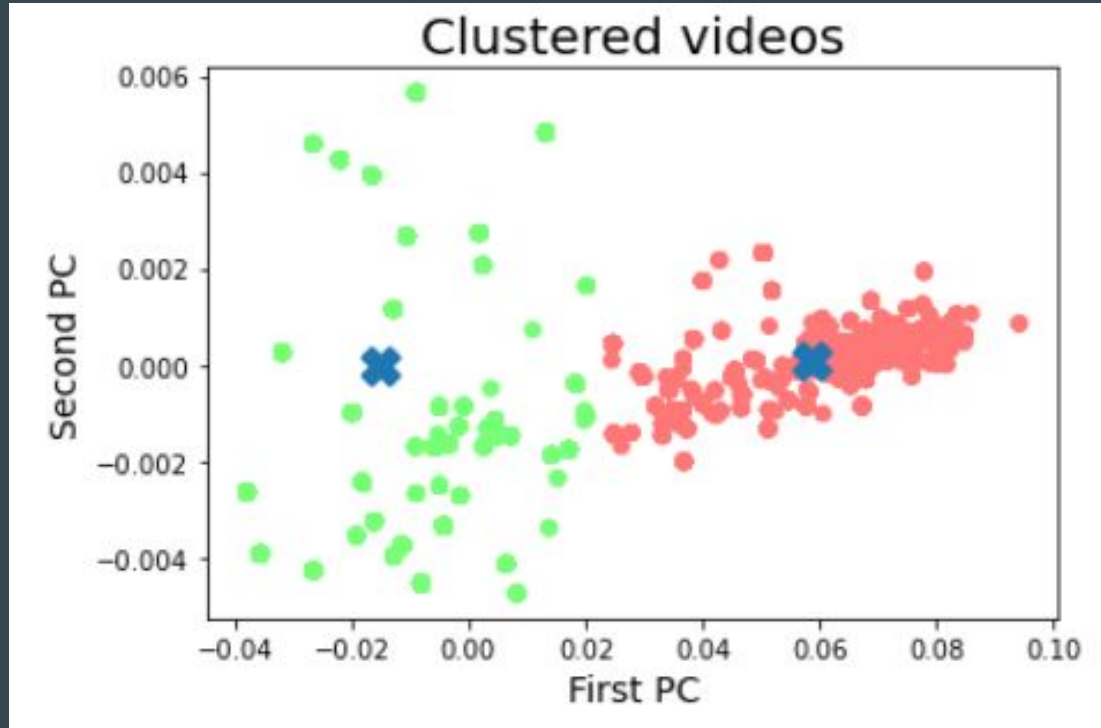
Hashtag Cooccurrences

Clustering of Videos based on Hashtags

- Word2Vec
- Hashtag mapped to a vector
- Video mapped to the mean of its vectors
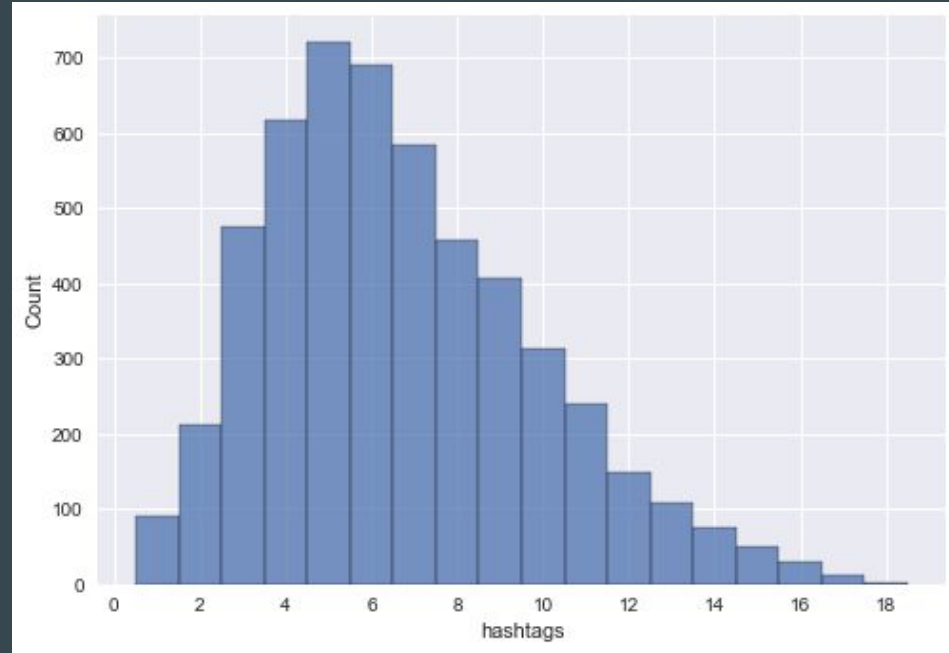- K-means clustering on the videos

Elbow method

Clustering of Videos based on Hashtags

Hashtag Analysis

- Number of Hashtags per video
- On average users use 5,6,7 hashtags per video and only few videos use more than 10 hashtags.
- What do these hashtags represent?

Hashtag Analysis

- Hashtag Graph
- Nodes: Hashtags, Edges: Coccurance, Edge weights: Coccurance count
- Hashtag should have appeared at least 50 times.
- Removed the fyp, xyzbca hashtag as it is used in almost all videos.
- Detect communities using Clauset-Newman-Moore greedy modularity maximization method.
- The algorithm begins with each node in its own community and joins the pair of communities that most increases modularity until no such pair exists and then assign each hashtag a community.

Hashtag Network

Color: Community

Size: number of other hashtags connected

2 communities
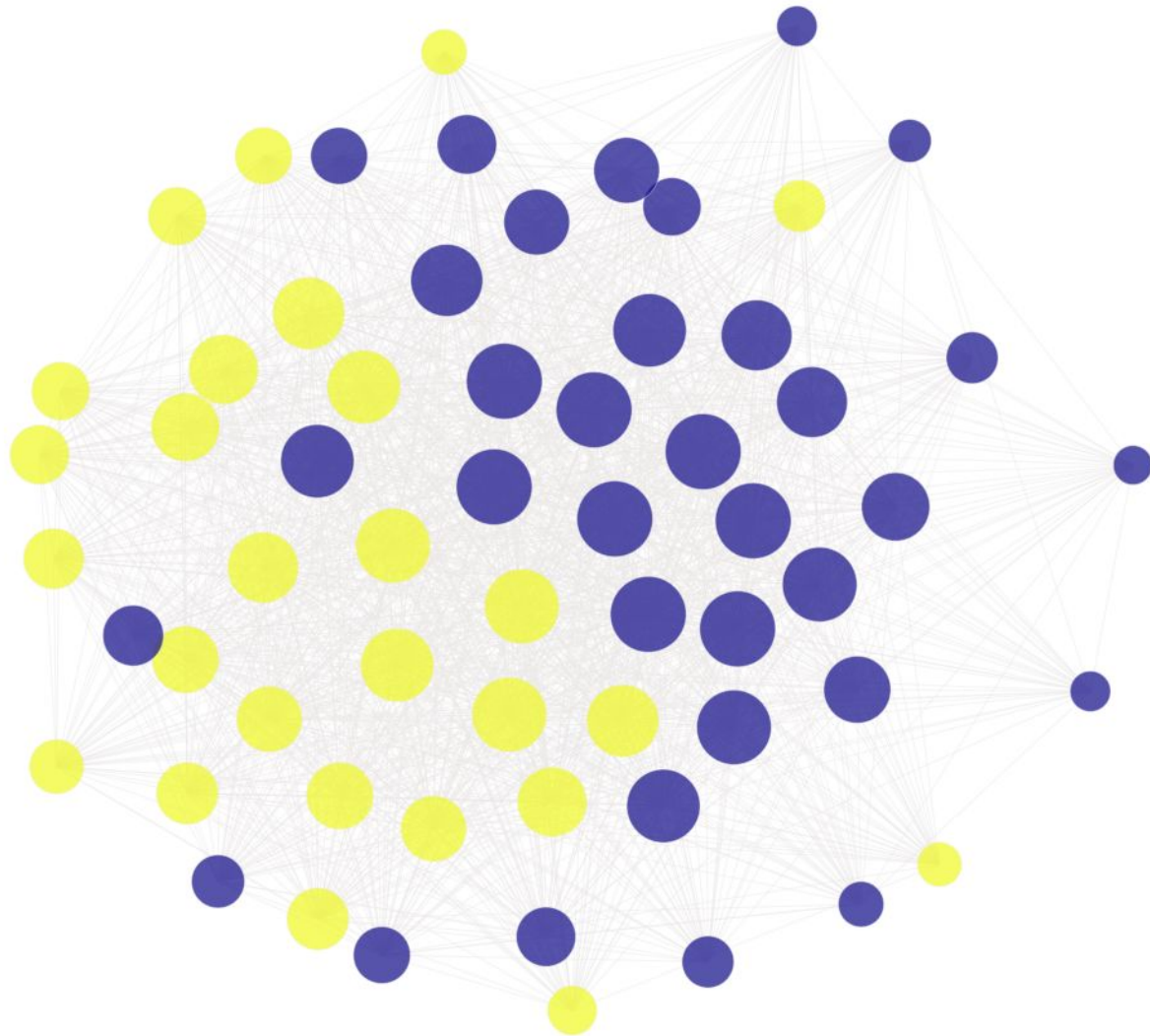
Hashtag Communities

Blue: Seasonal, election related

Red: Associated with a theme
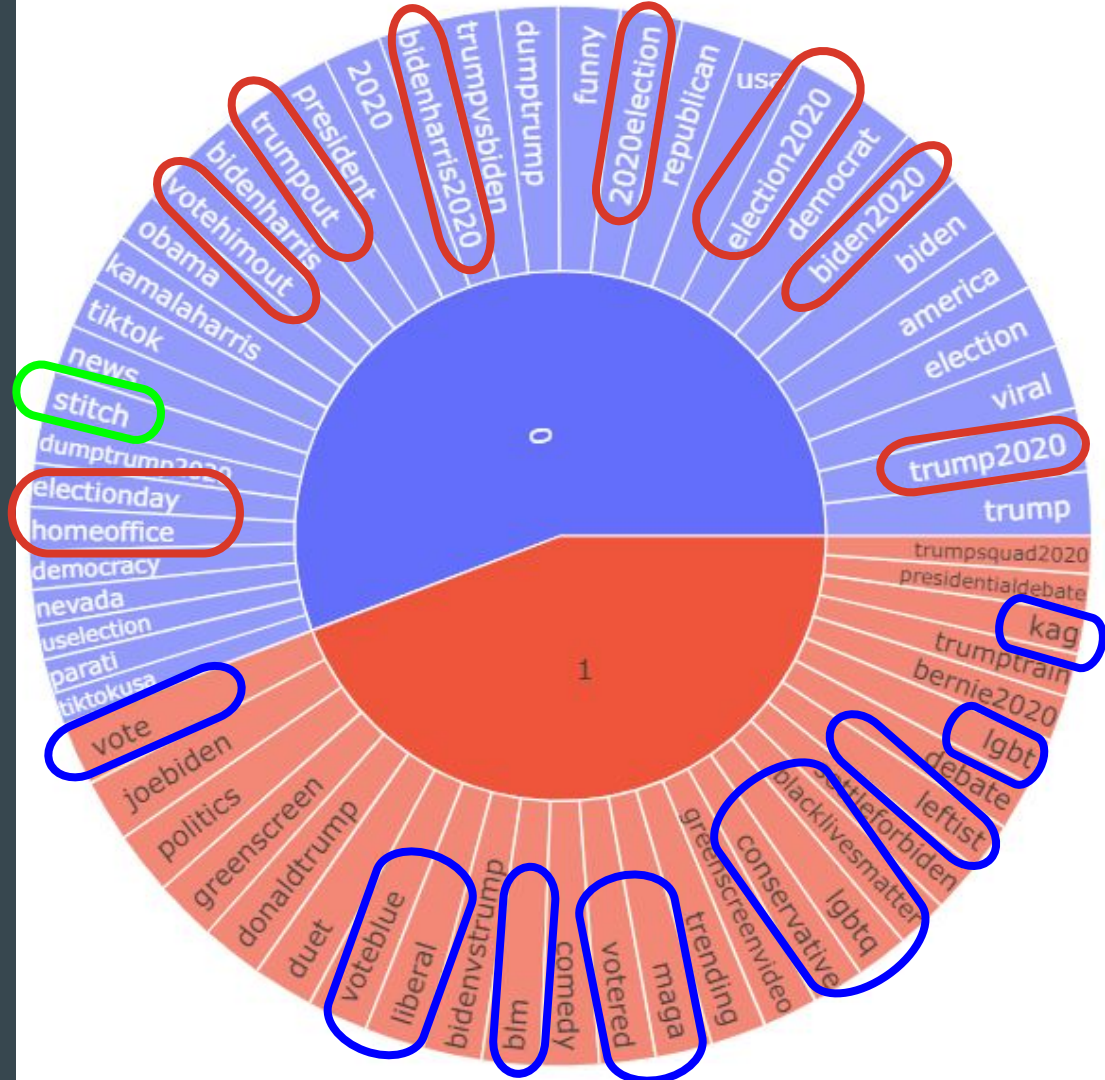
RQ 3

What are the topics of discussion in the election discourse through TikTok?

Topics discussed on TikTok and the election

- Method : vectorize with TF-IDF
- Calculate pairwise distance between all the tiktoks (cosine similarity)
- Weighted Graph where nodes are tiktoks and edges are distances
- Graph partitioning with *community* library
- Look at the top words to each cluster

Results

- 15 topics
- Modularity : 0.6

trumpvsbiden,election2020,greenscreen,biden2020,viral,trump,dumptrump2020,vote,biden,election
biden2020,trump2020,trumpvsbiden,trump,election2020,politics,biden,greenscreen,voteblue,vote
blm,blacklivesmatter,biden2020,trump2020,democrat,trump,maga,voteblue,lgbt,liberal
donaldtrump,trump,usa,funny,viral,america,comedy,trump2020,melaniatrump,president
democrat,republican,liberal,biden2020,trump2020,politics,conservative,trump,biden,maga
blackconservative,maketheswitch,openyoureyes,republican,conservative,trump2020,democrat,maga,blacklivesmatter,blackrepublican
trump,politics,comedy,election,liberal,republican,progressive,biden,biden2020,satire
trump2020,votered,trump,republican,conservative,maga,biden2020,stitch,kag,politics
2020election,zodiacsigns,astrology,boo,biden2020,dayinmylife,welldone,wip,bbmas,voteblue2020
bidenvstrump,biden2020,biden,election,trump,trump2020,2020election,election2020,vote,greenscreen
trump2020,maga,votered,trumptrain,trump,trumpsquad2020,kag,biden2020,biden,republican
viral,trump2020,trump,xyzbca,trending,republican,biden,funny,biden2020,conservative
joebiden,donaldtrump,trump,biden2020,biden,trump2020,election,kamalaharris,debate,trumpvsbiden
trump,biden,trumpvsbiden,viral,greenscreen,biden2020,voteblue,2020election,xyzbca,election2020
trumpout,trump,biden2020,duet,biden,billyblanksjr,viral,election2020,voteblue,trumpout2020
voteblue,biden2020,vote,dumptrump,bidenharris2020,votehimout,trump,trump2020,biden,politics
holidaytiktok,rnbvibes,election,election2020,biden2020,bidenvstrump,trump2020,trumpvsbiden,vote,2020election
trumpout,biden2020,usa,trump2020,biden,trump,tiktokusa,america,uselection,democracy
2020election,biden2020,trump,trump2020,greenscreenvideo,vote,election,bidenharris2020,homeoffice,joebiden
election2020,election,biden2020,trump,biden,trump2020,vote,2020election,trumpvsbiden,joebiden
democracia

Results

- Polarity on TikTok
- Talk about the other side a lot

trumpvsbiden,election2020,greenscreen,biden2020,viral,trump,dumptrump2020,vote,biden,election

biden2020,trump2020,trumpvsbiden,trump,election2020,politics,biden,greenscreen,voteblue,vote

bidenvstrump,biden2020,biden,election,trump,trump2020,2020election,election2020,vote,greenscreen

joebiden,donaldtrump,trump,biden2020,biden,trump2020,election,kamalaharris,debate,trumpvsbiden

2020election,biden2020,trump,trump2020,greenscreenvideo,vote,election,bidenharris2020,homeoffice,joebiden

election2020,election,biden2020,trump,biden,trump2020,vote,2020election,trumpvsbiden,joebiden

democracia

Results

blm,blacklivesmatter,biden2020,trump2020,democrat,trump,maga,voteblue,lgbt,liberal

- Specific topics debated, the example of BLM

- "A fifth of the voters said the protests were the single most important factor in their decision in the ballot bow"[1]

- [1] https://www.nytimes.com/2020/11/07/us/black-lives-matter-protests.html

Results

- TikTok audience, young audience

donaldtrump,trump,usa,funny,viral,america,comedy,trump2020,melaniatrump,president

trump,politics,comedy,election,liberal,republican,progressive,biden,biden2020,satire

2020election,zodiacsigns,astrology,boo,biden2020,dayinmylife,welldone,wip,bbmas,voteblue2020

viral,trump2020,trump,xyzbca,trending,republican,biden,funny,biden2020,conservative

holidaytiktok,rnbvibes,election,election2020,biden2020,bidenvstrump,trump2020,trumpvsbiden,vote,2020election

Conclusion

- ○ How did the momentum to the election culminate on TikTok over time?
    - ■ Around the election
    - ■ Around specific events
- ○ What are the topics of discussion in the election discourse through TikTok?
    - ■ Mentioning the opponents a lot
    - ■ Specific events
    - ■ Discussed from a young perspective
- ○ What kind of hashtags are used and will the hashtags provide a way to clusters the videos into categories?
    - ■ Seasonal or general themes

Discussion

- Many users do not have the legal age to vote but make political videos
- Gen Z might not be interested in the politics that is about parties, candidates
- But they do want to talk about issues

Limitations :

- Analysis done on hashtags - not videos
- Did not take into account the popularity of each video

Thanks !