



The Polarization of Information on the Web

Charles Dickens

Crystal Harper Cook

Ram Hari Dahal

Prajjwal Dangal

Pamela Biló Thomas

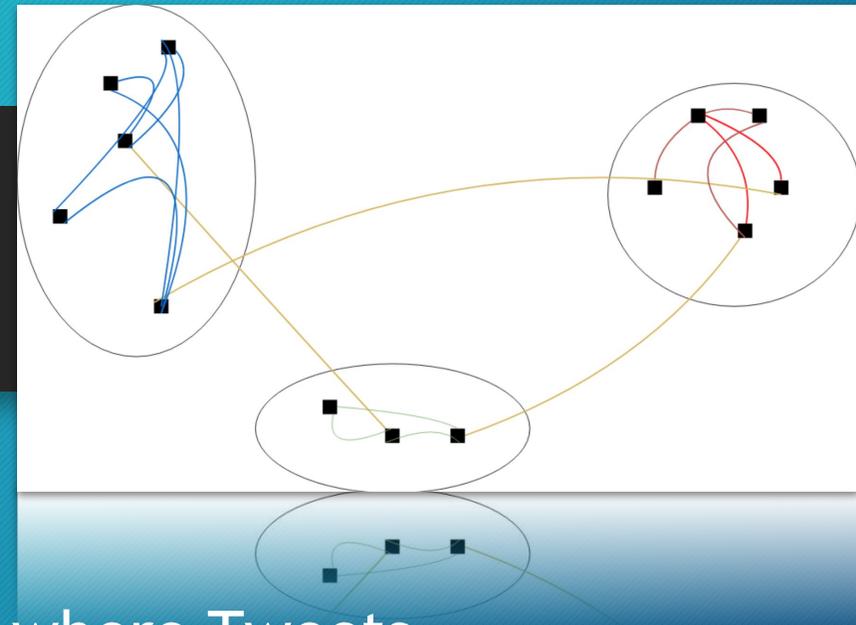
Objective & Impact

- The primary goal of this study is to compare the polarization of opinions, information, and users on the web
- Given the current polarized political climate in the United States, a better understanding of how people view certain issues and how those viewpoints may be connected to other topics could help bridge the gap and facilitate discourse between groups.

Approach

Our focus for the week was primarily on Twitter.

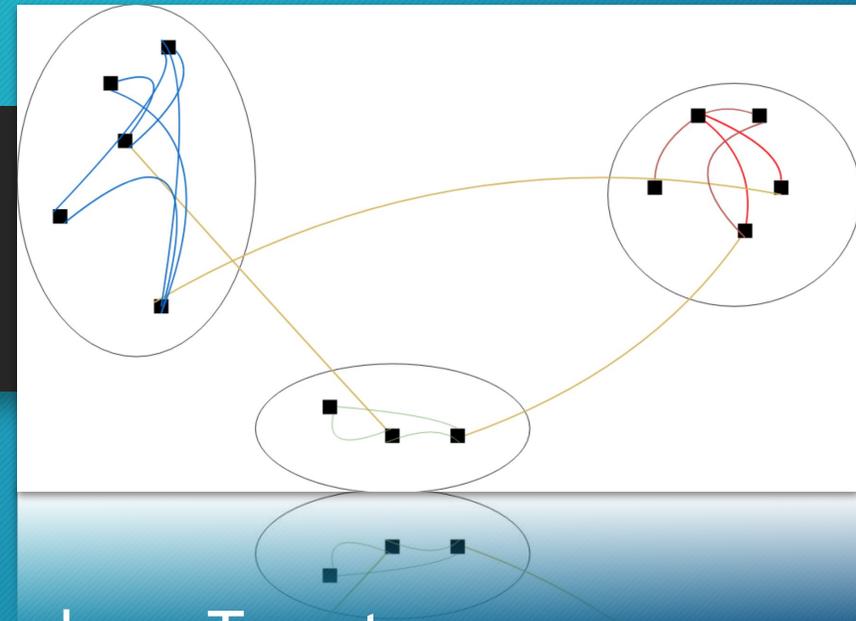
1) We will develop a fully connected directed graph where Tweets are represented as nodes of a graph and edge weights correspond to the transition probabilities between the nodes.



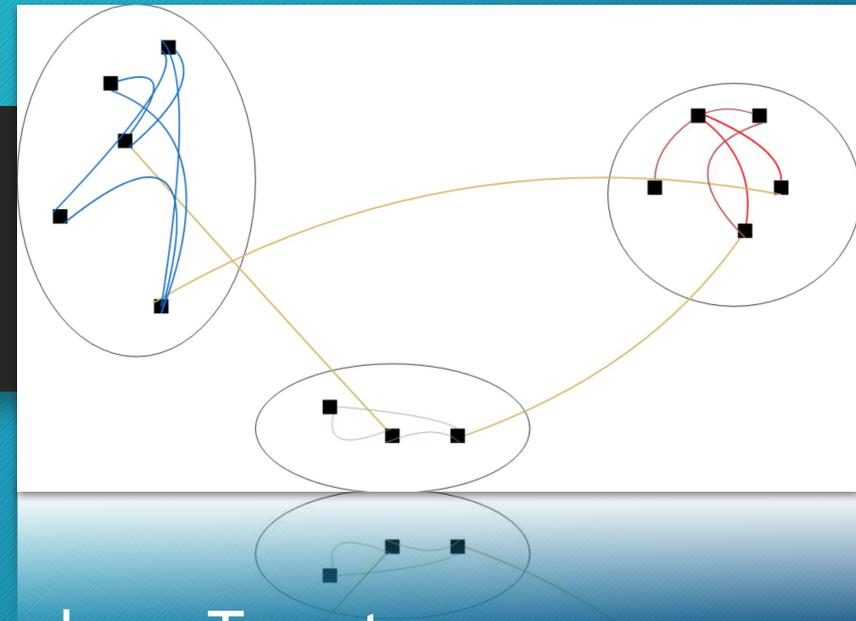
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- 2) The graph will then be input to our clustering algorithm to identify communities of thought.



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- 1) We will develop a fully connected directed graph where Tweets are represented as nodes of a graph and edge weights correspond to the transition probabilities between the nodes.
- 2) The graph will then be input to our clustering algorithm to identify communities of thought.
- 3) The polarization of our sampled Tweets can then be compared based on the average conductance of the retrieved clusters.

Data Collection

	A	B	C	D	E
1	tweet	target	q1_from_re	q1_from_rea	AdjustedScore
2	@BobSaloCT nice passive-aggre	Atheism	AGAINST: V	0.3727	-0.3727
3	@IslamRevisited8 If only God is	Atheism	AGAINST: V	0.4856	-0.4856
4	If Jesus Didn't Know Time of 2nc	Atheism	AGAINST: V	0.4881	-0.4881
5	Is @Ed_Miliband already workin	Atheism	AGAINST: V	0.4933	-0.4933
6	We are #witness to the superb &	Atheism	AGAINST: V	0.4958	-0.4958
7	We are #witness to the superb &	Atheism	AGAINST: V	0.4928	-0.4928
8	Is @Ed_Miliband already workin	Atheism	AGAINST: V	0.4933	-0.4933

Source:

<https://data.world/crowdfunder/progressive-issues-sentiment>

Four topics: Abortion, Atheism, Hillary Clinton, Feminism

Three outcomes: For, Against, Neutral

Source:

<https://data.world/bkey/politician-tweets>

Collect hashtags tweeted by politicians and compare how many hashtags are used by both

Weight Calculation - Sentiment

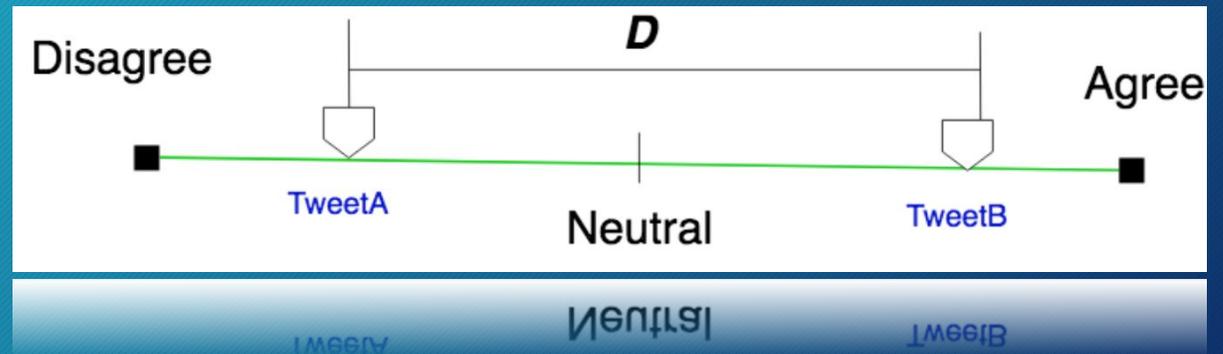
For each tweet we are given the sentiment classification:

- For or Against

Along with a confidence value with the range 0 and 1

Against tweets had their confidence values multiplied by -1

Edge weights are calculated based on their distance



Weight Calculation - Political Hashtags

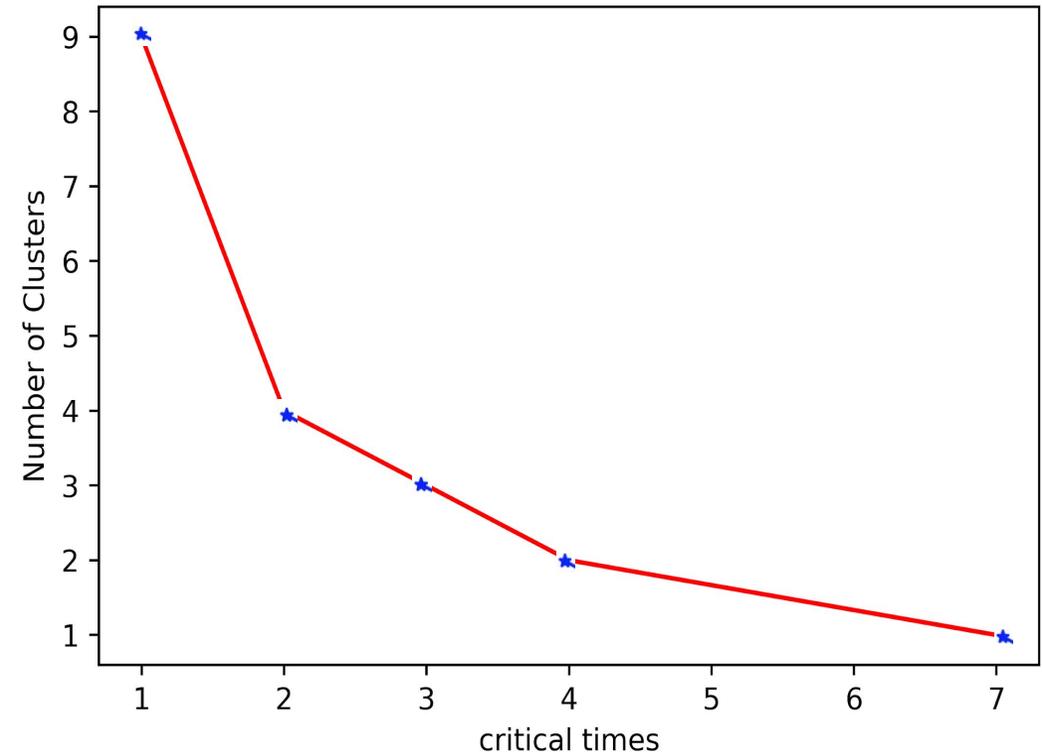
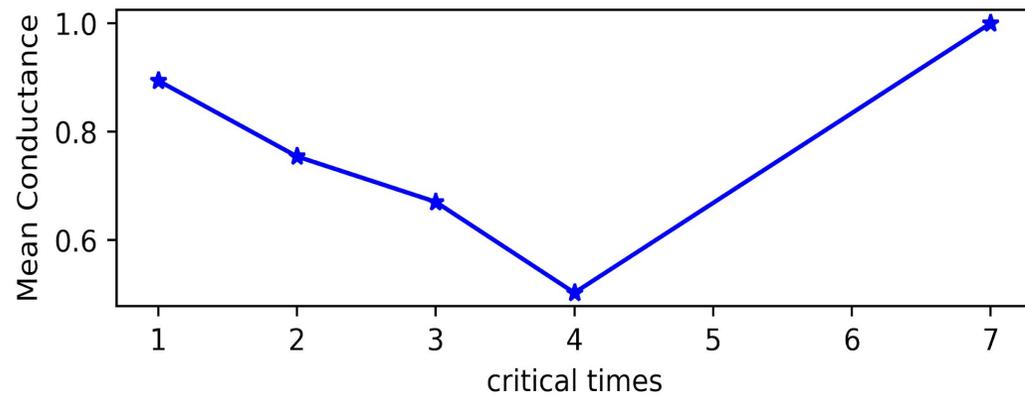
For each pair of politicians:

 Calculate how many hashtags the two politicians have in common

 Normalize on a scale of 0-1 based upon the most hashtags shared between two politicians

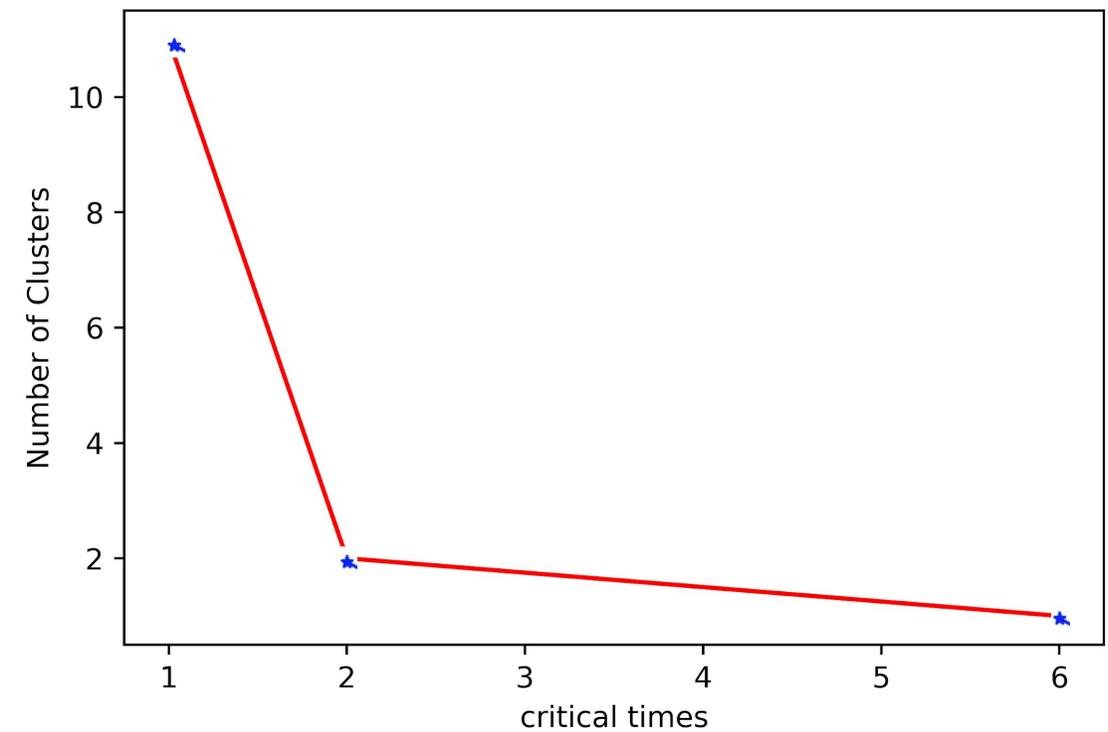
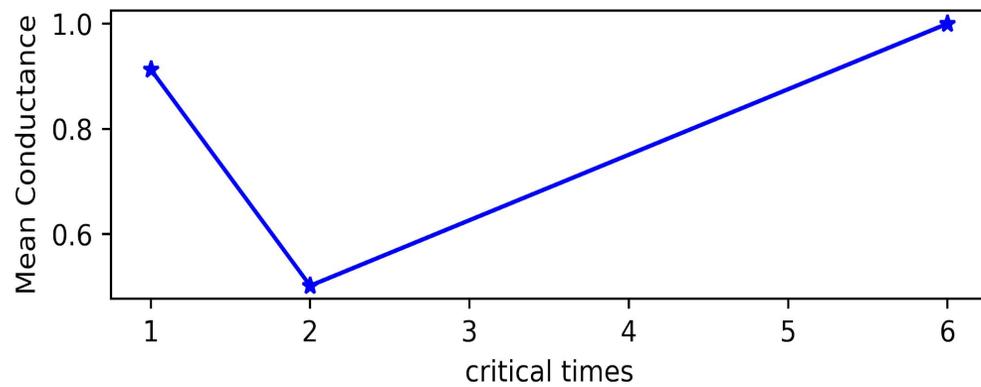
Results Topic: Atheism

Our Model's Conductance Calculations



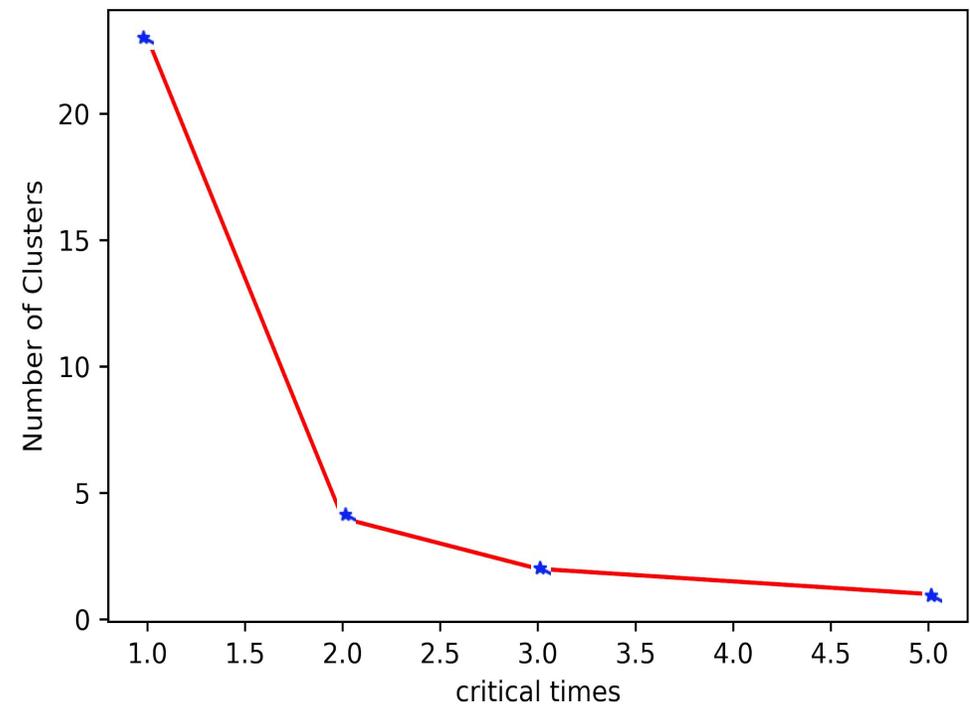
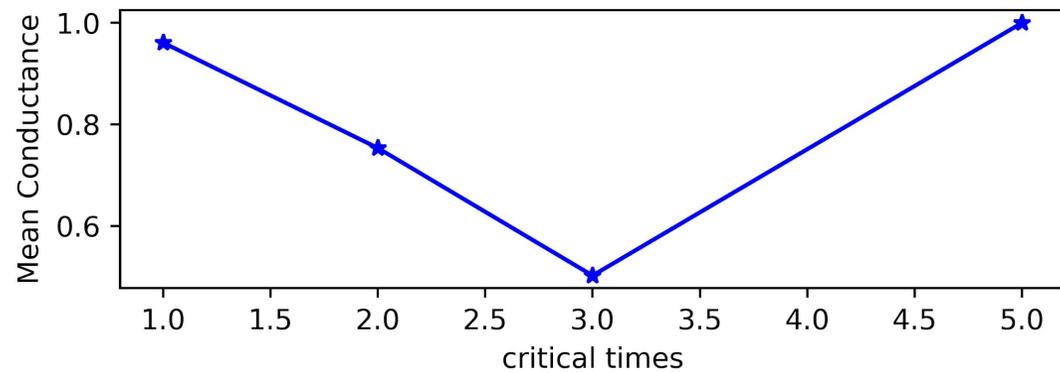
Sentiment Only Conductance Score: 0.5029761904761905

Results Topic: Feminist Movement



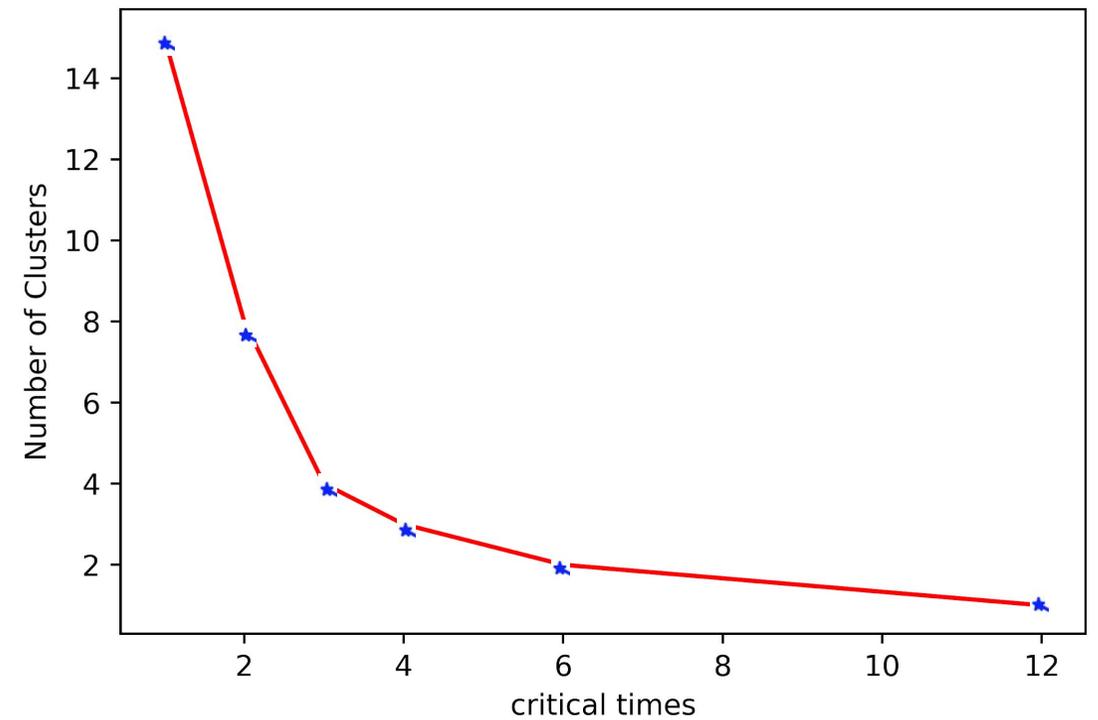
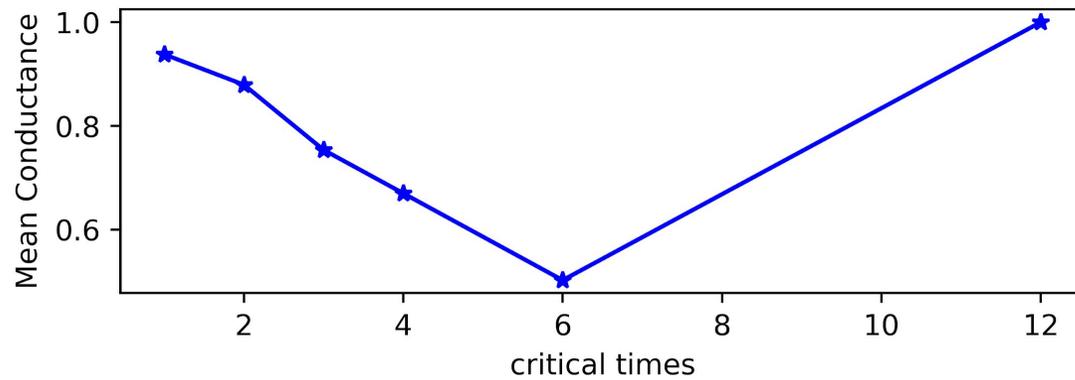
Sentiment Only Conductance Score: 0.5021097046413502

Results Topic: Hillary Clinton



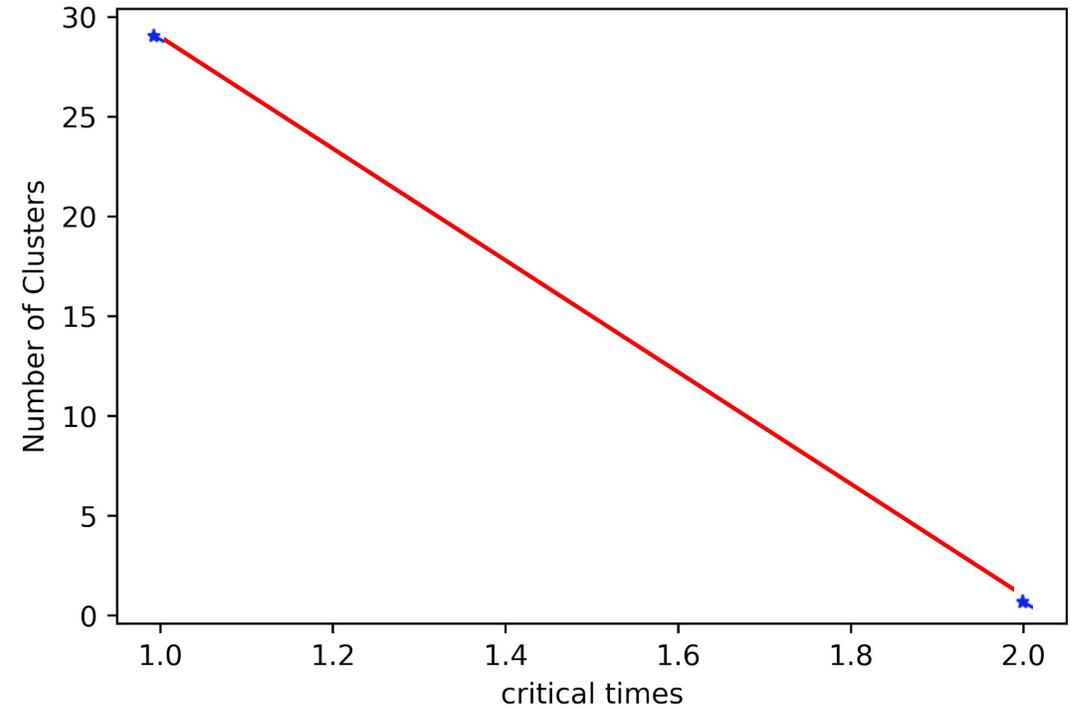
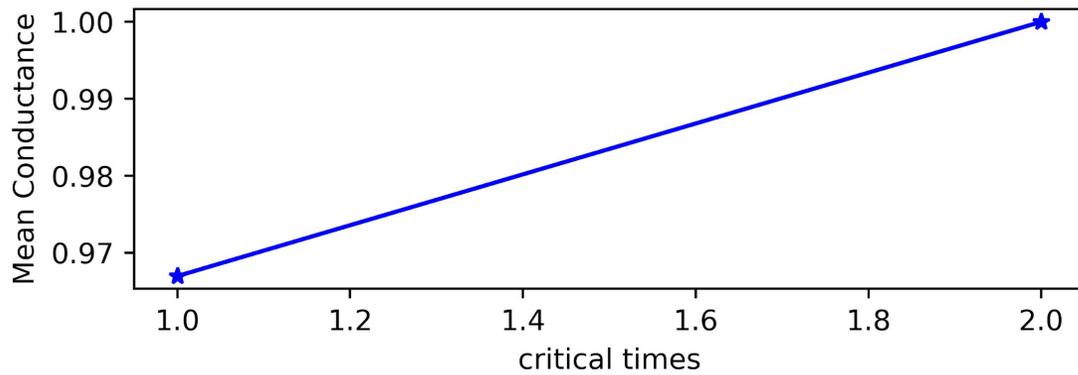
Sentiment Only Conductance Score: 0.502283105022831

Results Topic: Legalization of Abortion

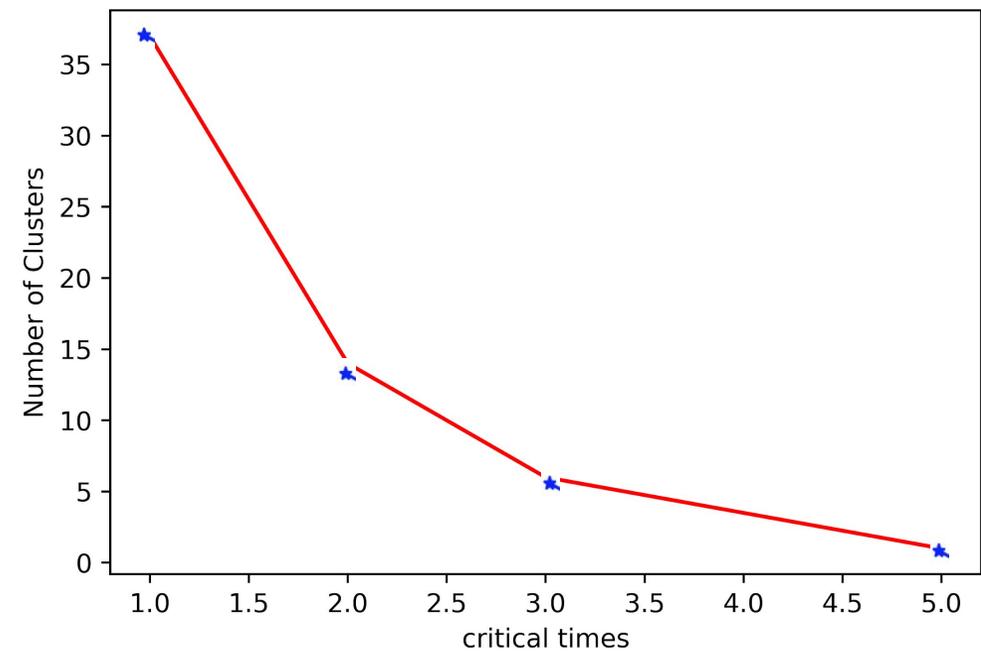
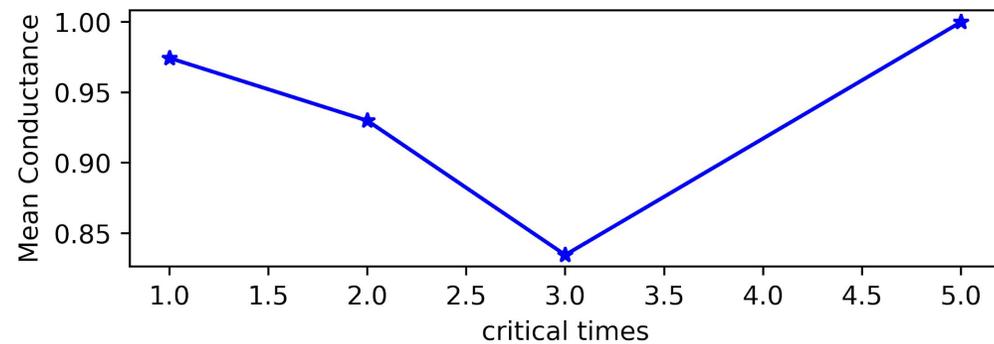


Sentiment Only Conductance Score: 0.5024630541871922

Results Topic: Politician All Hashtags

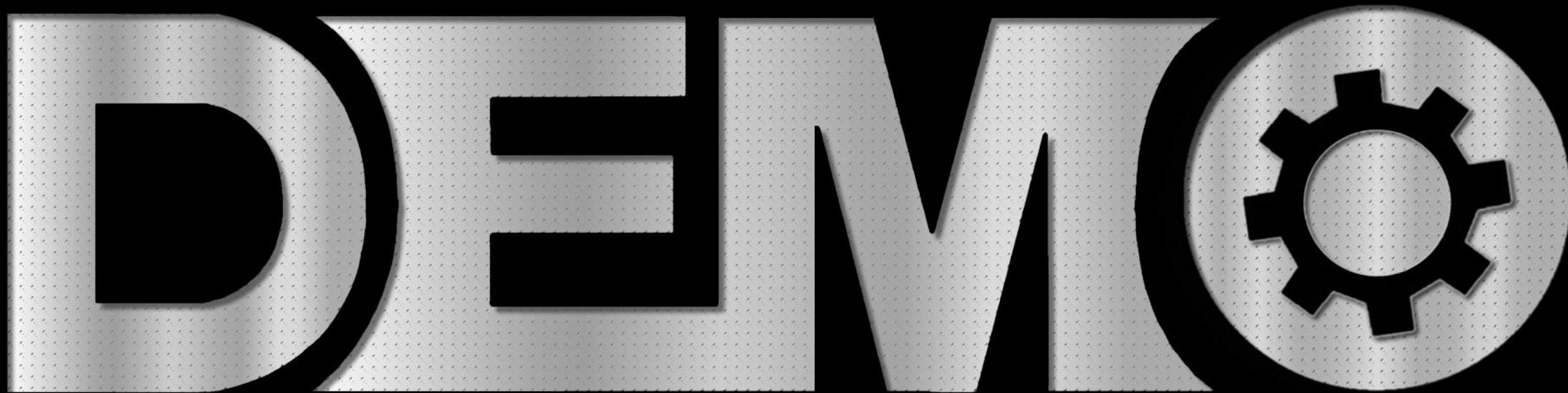


Results Topic: Politician Filtered Hashtags



Visualization

DEMO

The word "DEMO" is rendered in a large, bold, 3D font. The letters are white with a fine grid pattern and a black outline. The letter 'O' is circular and contains a black gear icon. The text is set against a black background.

Further work

A publicly available web app:

- Allows users to choose from a range of current issues



- Include substantial amount of data for each topic
- Include other data sources (Facebook posts, comments on news articles)

Further work cont.

- Polarization trend over time for the same topic
- Incorporate features such as a tweet's popularity, a user's popularity, and user interactions into edge weight calculation
- Inter-issue similarity
- Add more types of visualization

References

Data: Progressive Issue Sentiment Analysis

<https://www.figure-eight.com/data-for-everyone/>

Data: Politician Tweets

<https://data.world/bkey/politician-tweets>

Thank You

Kelly Andronicos

Brent Ladd

Mark Ward

Tsai-Wei Wu

Carolyn Johnson

Tyler Netherly

Elizabeth Bell

Yucong Zhang