If Twitter Could Vote

Joseph Brown, Mikaela Jordan, and Adam Swayze

Tarleton State University

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Predicting Primary Results

If Twitter Could Vote

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Polling and Predictions

Results

Democrats

Republicans

Future Work

References

- In Primaries, polls change fast and are inaccurate

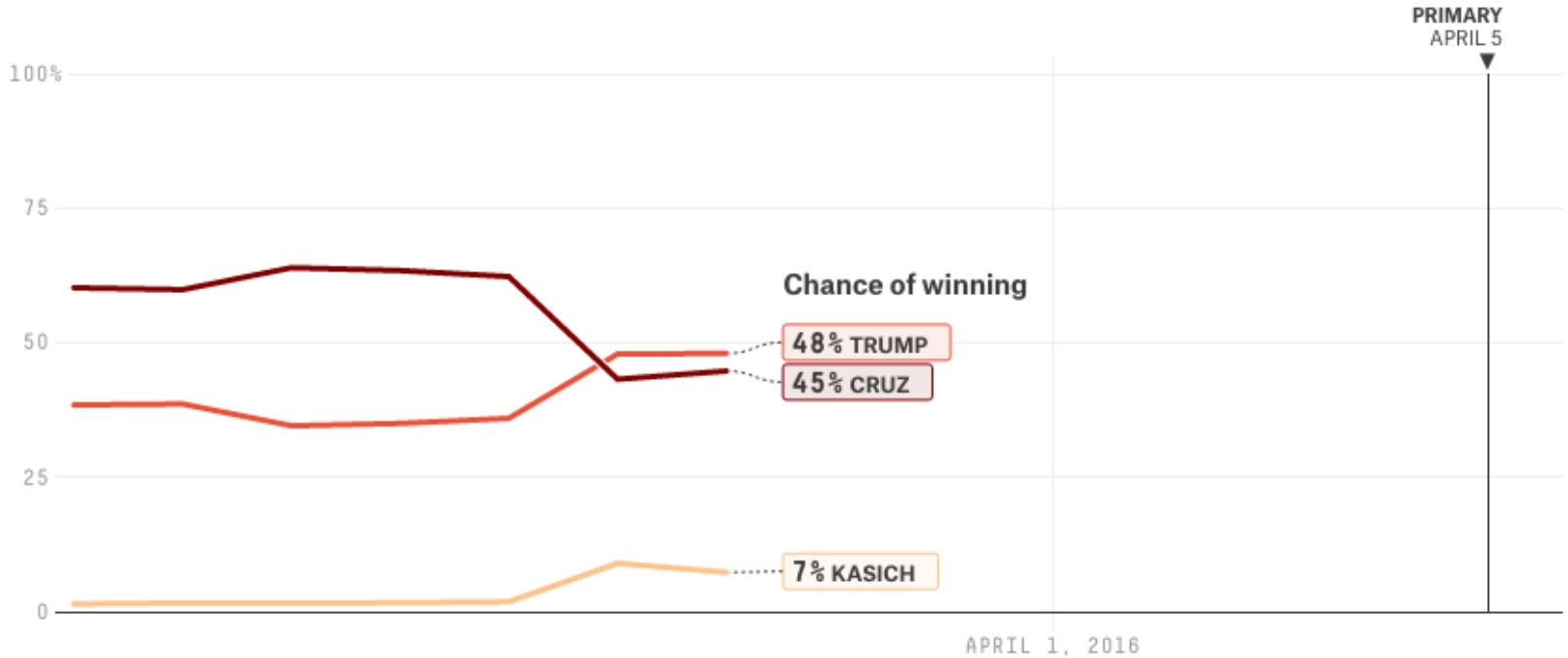
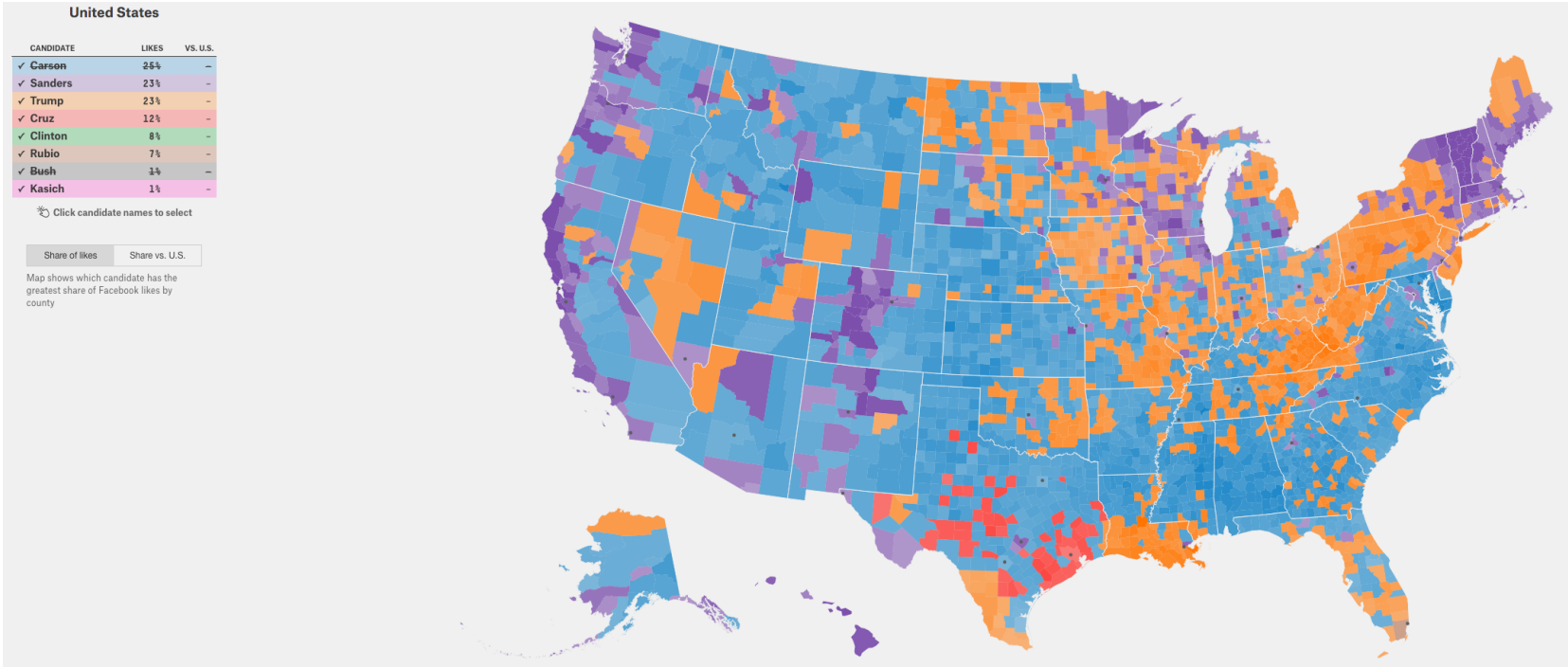


Figure: Late March/Early April Polls for the Wisconsin Republican Primary from 538

Alternative Primary Predictions

- Counties colored by Candidate with most Facebook likes



Candidates and Social Media

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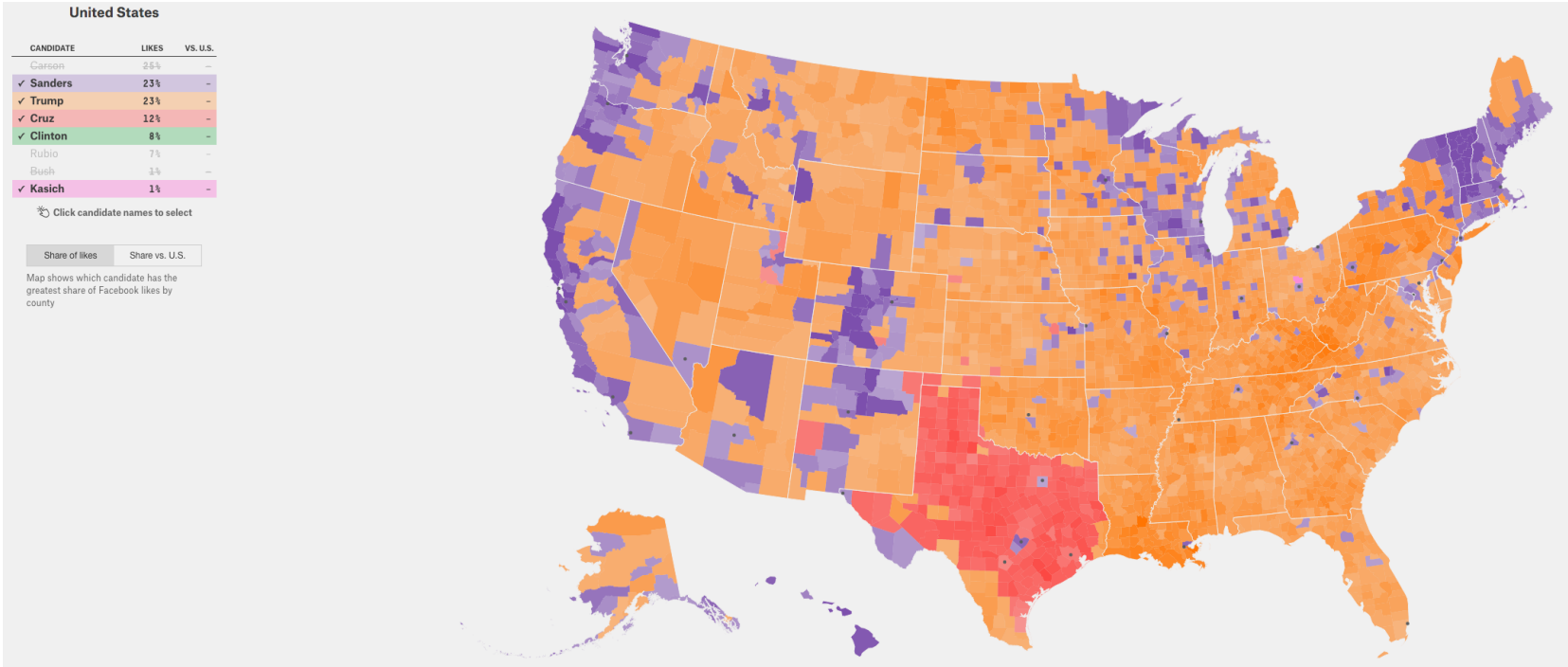
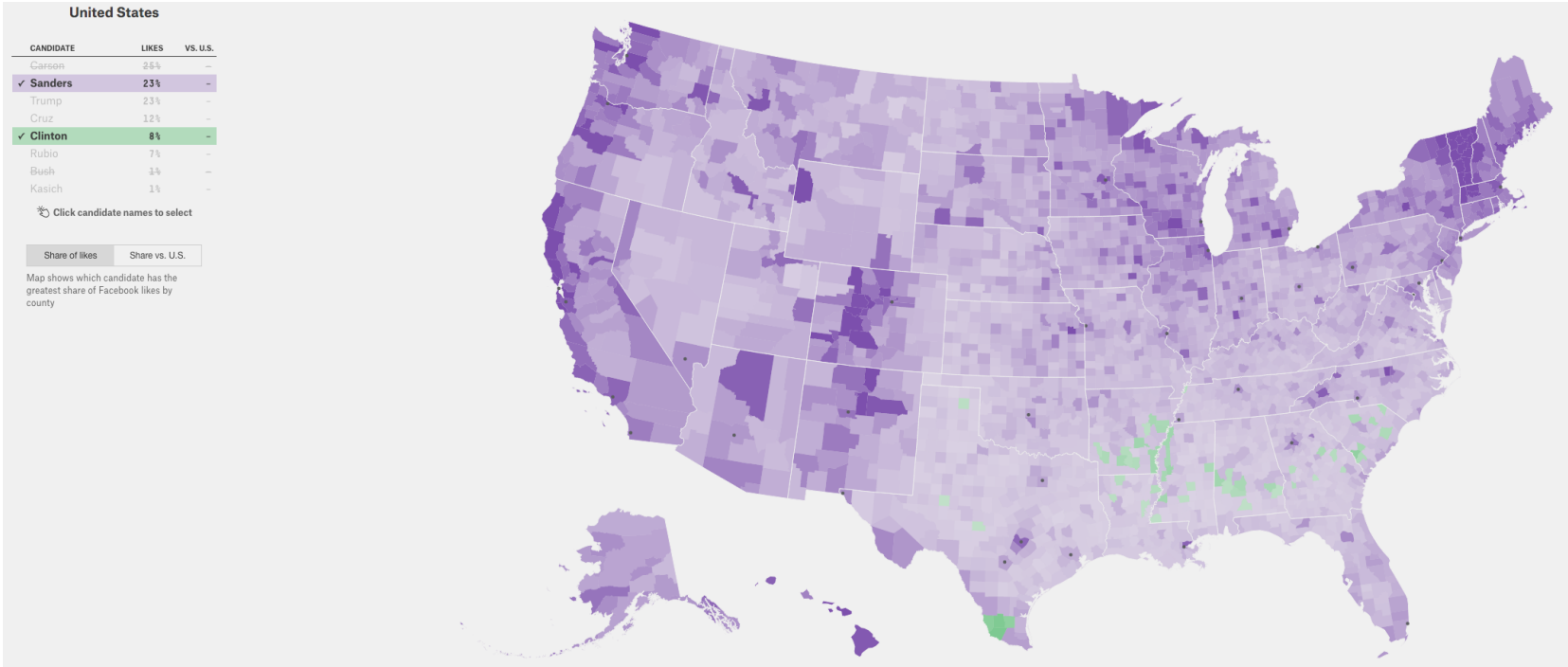
- The Final Five



Candidates and Social Media

- Democratic Candidates



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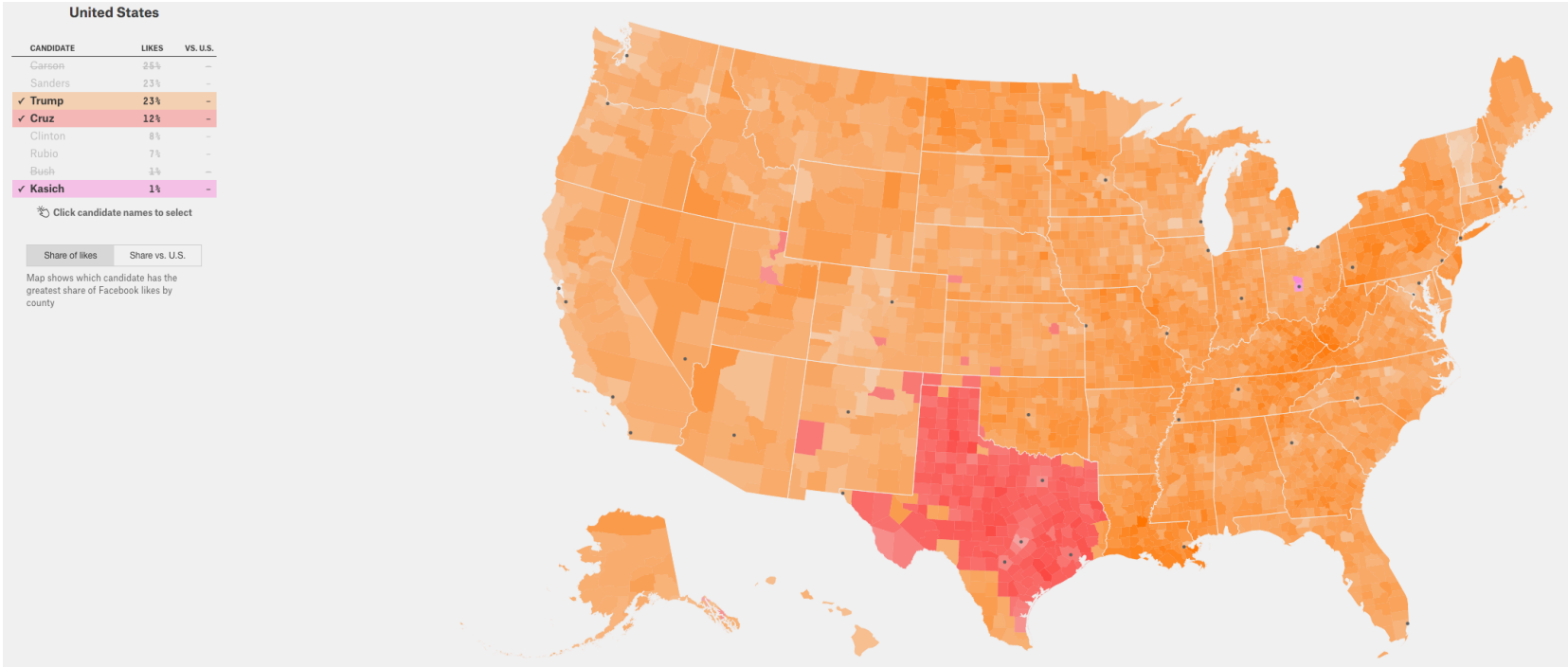
- Republican Candidates



Natural Language Processing

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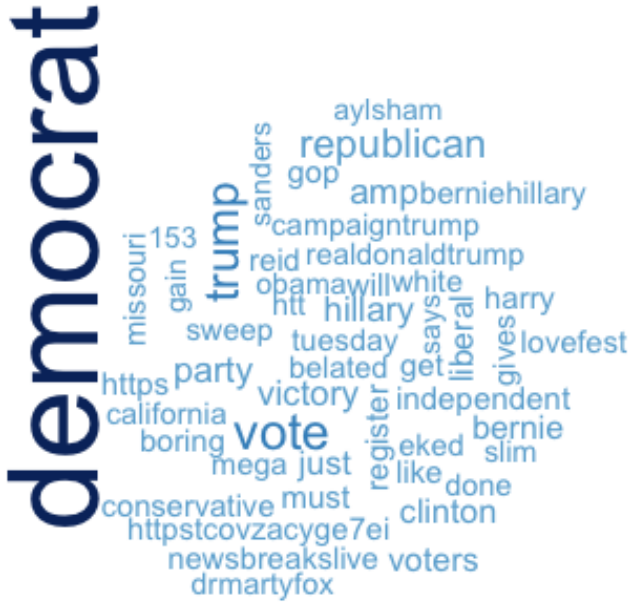
References

- Basic Idea
  - Computers understanding language

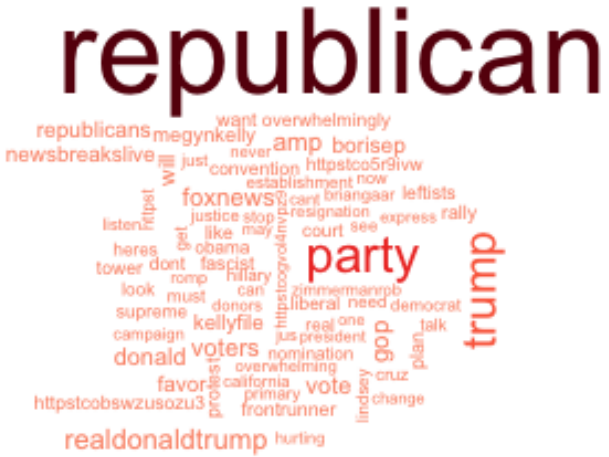
Natural Language Processing

- Basic Idea
  - Computers understanding language
- Several Tasks in Natural Language Processing
  - Question Answering
  - Automatic Summarization
  - Sentiment Analysis

Popular Word Usage



(a)



(b)

Figure: Word Clouds for Twitter Searches with Keywords "Democrat" and "Republican"

Design of the Primary Prediction

In a Perfect World

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References

- Created a dataset with the names of all counties in US, their respective FIPS codes, and the recorded majority winners for each county
  - Unique identification number for each county in US

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  - Unique identification number for each county in US
- Found a dataset with area and centroid of each county in US

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  - Unique identification number for each county in US
- Found a dataset with area and centroid of each county in US
- Search for tweets with specified keywords in every county of US

Candidates	Bernie Sanders	Hillary Clinton	Donald Trump	John Kasich	Ted Cruz
Keywords	"Bernie" "Sanders" "Feel The Bern" "Bernie2016"	"I'm with Her" "HillaryClinton" "Hillary2016" "Clinton"	"Trump" "Donald" "Make America Great Again" "Trump2016" "DonaldTrump"	"Kasich" "JohnKasich" "Kasich2016"	"Cruz" "TedCruz "Trust Ted" "TrustTed" "Cruz2016"

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- Merge results data frame with tweets data frame by FIPS code

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An Example

An original tweet from our collection:

"TrusTED #cruz2016 ❤❤❤❤❤❤❤❤❤❤❤❤❤❤ @ Palmbay FL
https://t.co/SNElizEZY0L"

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- Cleaning Tweets
  - Remove punctuation

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  - Remove Stopwords

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- Cleaning Tweets
  - Remove punctuation
  - Remove emojis
  - Remove Stopwords
  - Make everything lower case

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"trusted cruz2016 palmbay fl httpstcosneliezy0l"

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- Create a Document-Term Matrix

Doc Name	Term 1	Term 2	...	Term n
Doc 1	Freq(T1 in D1)	Freq(T2 in D1)	...	Freq(Tn in D1)
$\vdots$				
Doc m	Freq(T1 in Dm)	Freq(T2 in Dm)	...	Freq(Tn in Dm)

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Doc m	Freq(T1 in Dm)	Freq(T2 in Dm)	...	Freq(Tn in Dm)
My Tweet	5	0	...	0

- Attach labels to each tweet based on location of tweet

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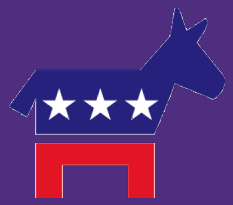
Doc m	Freq(T1 in Dm)	Freq(T2 in Dm)	...	Freq(Tn in Dm)
My Tweet	5	0	...	0

- Attach labels to each tweet based on location of tweet
- Use machine learning algorithms to predict majority winners of each tweet's county

Results



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		Predicted	
		Bernie	Hillary
Actual	Bernie	431	3332
	Hillary	148	10212

Table: Support Vector Machine Confusion Matrix

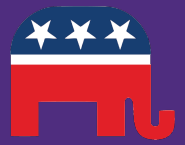
		Predicted	
		Bernie	Hillary
Actual	Bernie	434	3329
	Hillary	132	10228

Table: Neural Network Size 6 Confusion Matrix

	Accuracy Rate
Support Vector Machine	75.35934%
Neural Network	75.49388%

Table: Accuracy Rates of Both Models

Results



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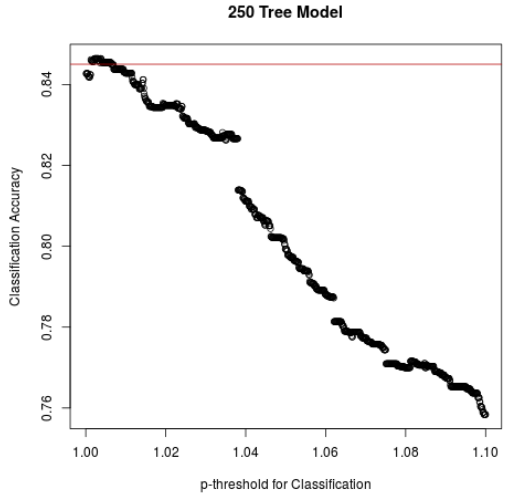

Figure: A plot of classification accuracy versus probability threshold for Random Forest Model

		Predicted	
		Trump	Not Trump
Actual	Trump	9517	42
	Not Trump	1695	58

Table: Random Forest with 250 Trees Confusion Matrix. Has an accuracy of 84.644625%

Limitations with Social Media

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- Majority of Sanders supporters are younger and more likely to use Twitter (estimated at 88% by Pew Research Center)

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- Majority of Sanders supporters are younger and more likely to use Twitter (estimated at 88% by Pew Research Center)
- According to the Pew Research Center, only 23% of Americans use Twitter

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Future Work

References

- Continue to try to improve our models
- Compare to traditional polling results
- Does Twitter have an advantage over traditional polling?

References

We'd like to thank the Office of Student Research and Creative Activity at Tarleton State University

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