



Classifying Climate Change Tweets

Joe Marx

Climate Tweets?



 **Katie Mack** @AstroKatie 15h
Honestly climate change scares the heck out of me and it makes me so sad to see what we're losing because of it.

  29  122 

 **Gary P Jackson (RAT)** @gary4205 7h
[@AstroKatie](#) Maybe you should learn some actual SCIENCE then, and stop listening to the criminals pushing the [#GlobalWarming](#) SCAM!

  7  

 **George Wallace**  @MrGeorgeWallace 
Global warming's for real y'all. Someday there won't be any rappers with ice in their names. Only water. Water-T. Water Cube. Vanilla Water.
12:37 PM · Apr 26, 2012 

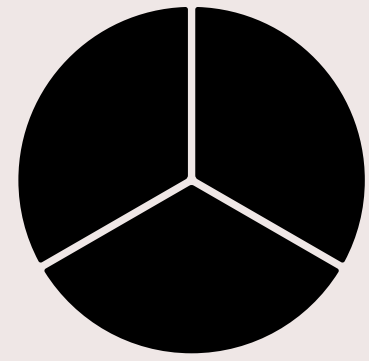
 174  251  Share this Tweet



Business Case

- Better understand the online conversation surrounding climate change
- See if fossil fuel emissions follow trend of sentiment
- Look at will of the people to design legislation to tackle climate change
- Target climate deniers with information that may persuade them to





Process



Data Collection

EDA

Modeling

Validation

Application



kaggle

Twint

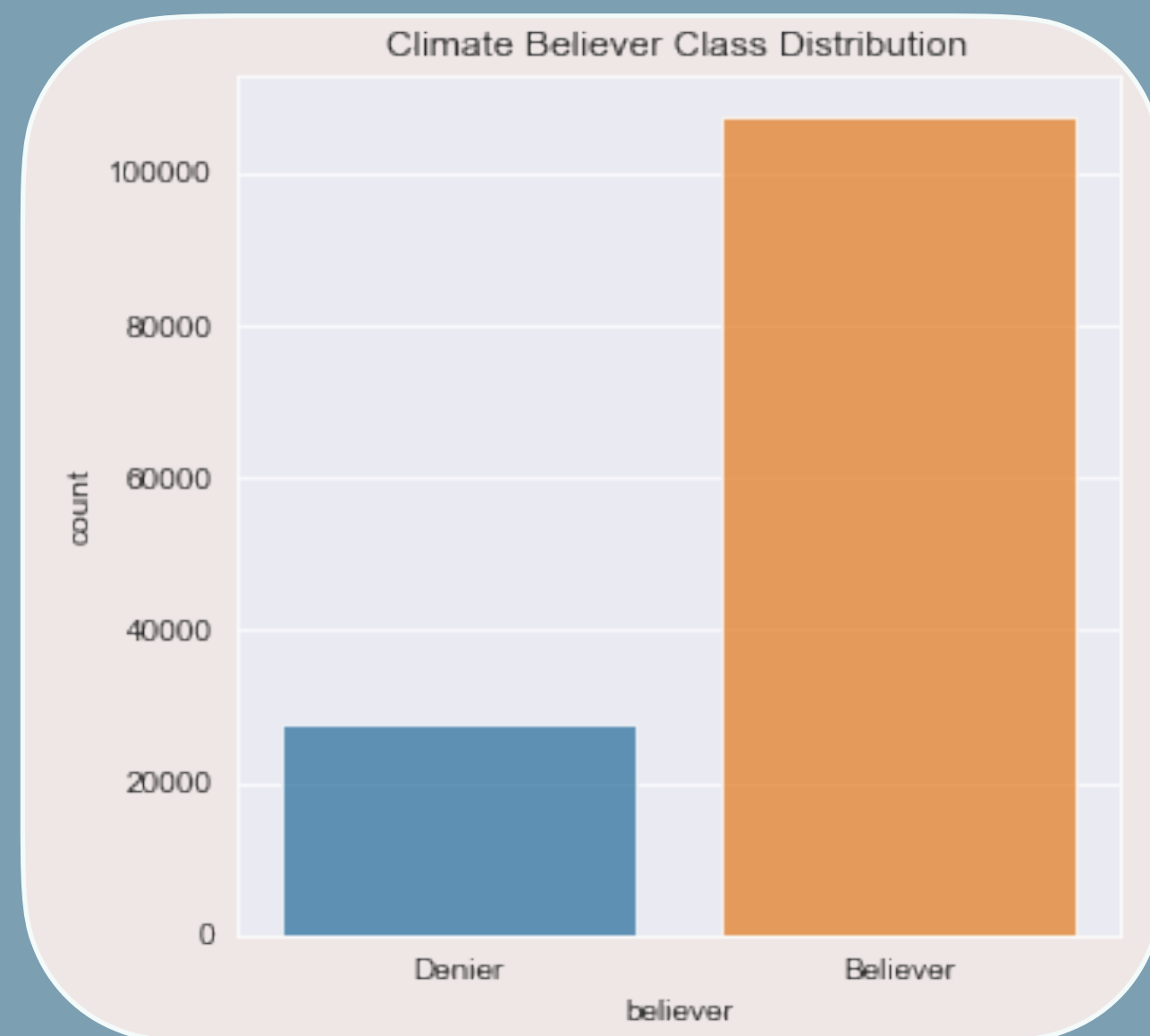
Data Collection

Twarc

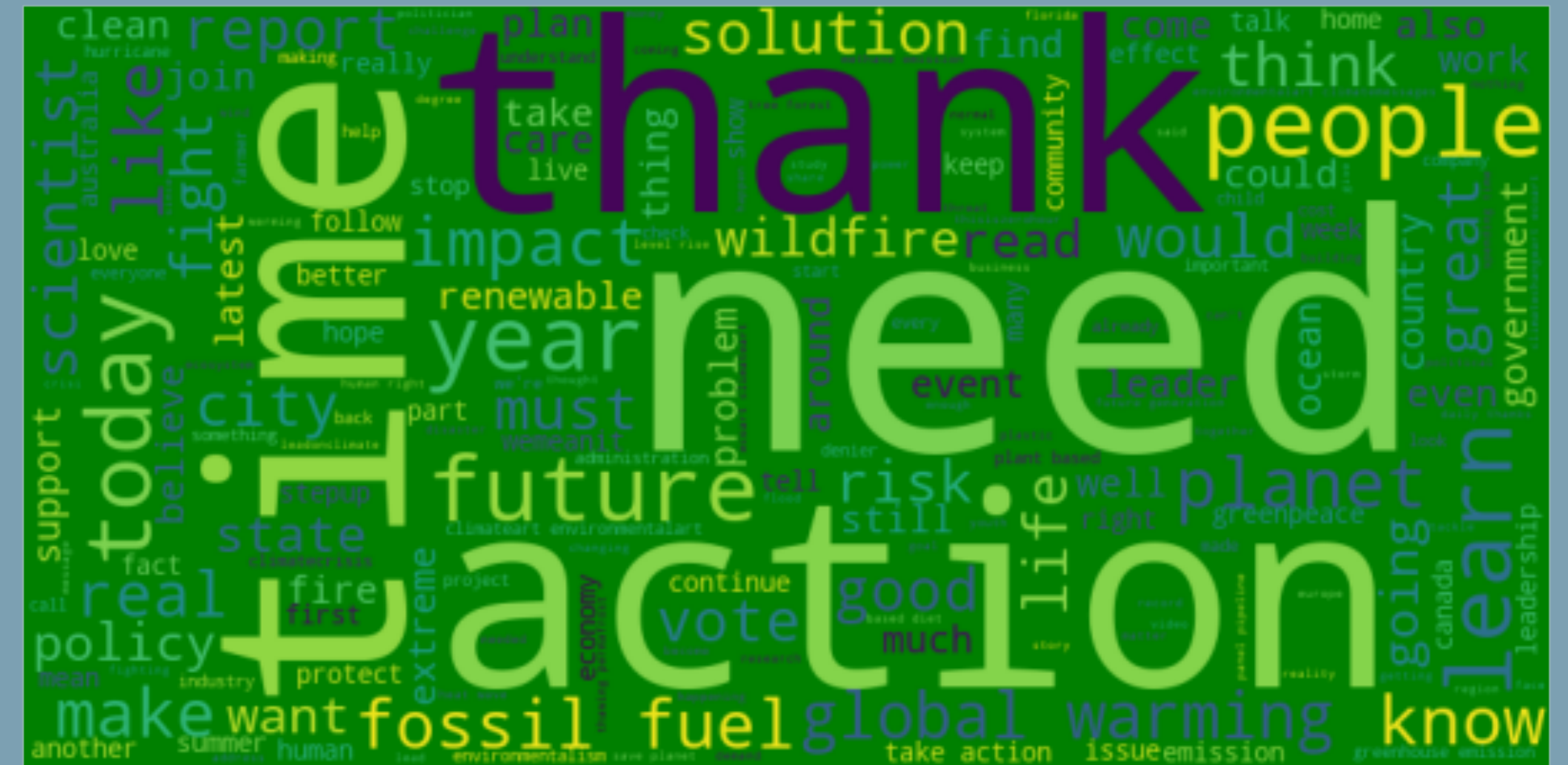


EDA

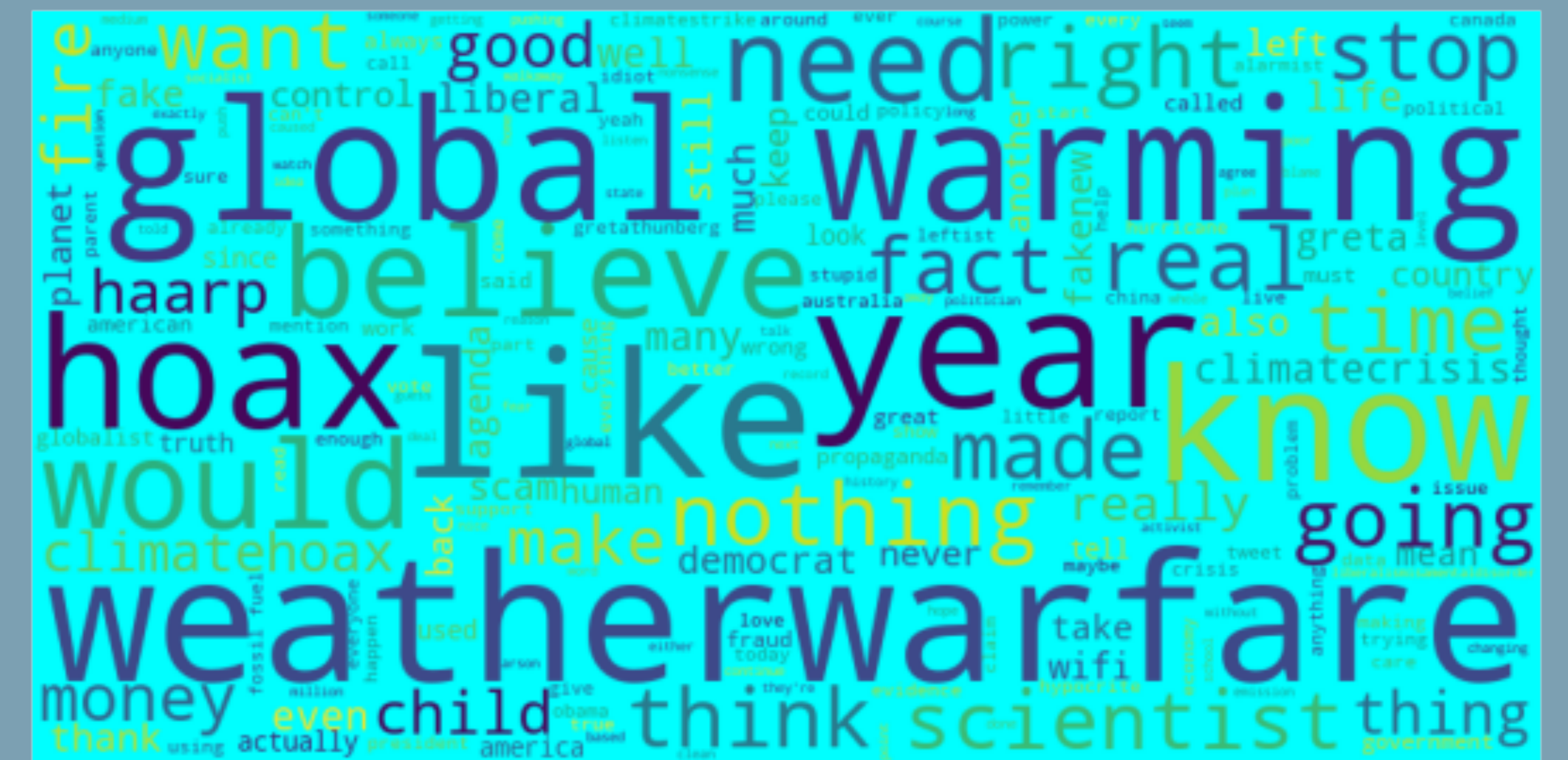
- Looked for classifying hashtags
- Class Distribution
- Class patterns



Climate Believer Tweets



Climate Denier Tweets





Modeling

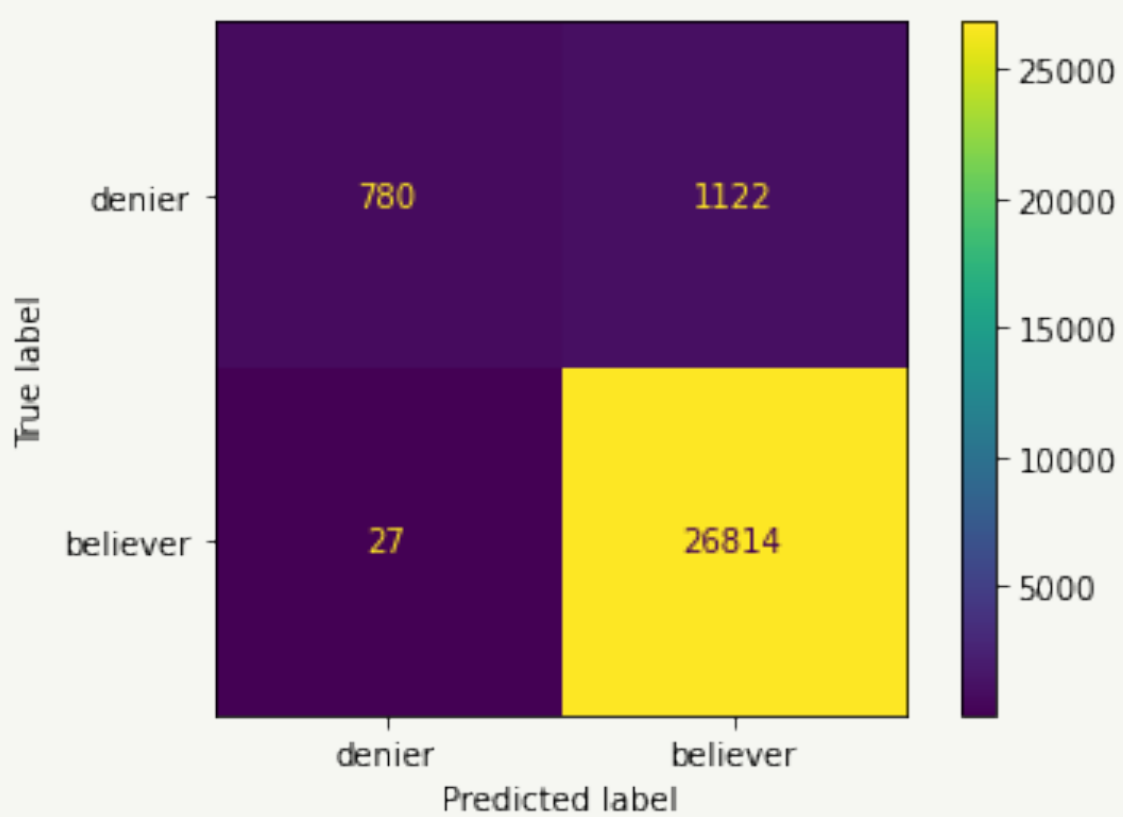
- Data prepared with regex, nltkTarget variable engineered using hashtags
- Vectorized with NLTK TF-IDF then passed into sci-kit learn classifiers using GridSearchCV
- Validated on separate pre-labeled dataset from Kaggle

```
# most common tags associated with sample of tweets presenting climate denial
denier_tags = ['climatechangeisfalse', 'climatechangenotreal', 'climatechangehoax',
               'globalwarminghoax', 'tcot', 'ccot', 'tlot', 'pjnet', 'rednationrising', 'votered',
               'libtard', 'libtards', 'maga']

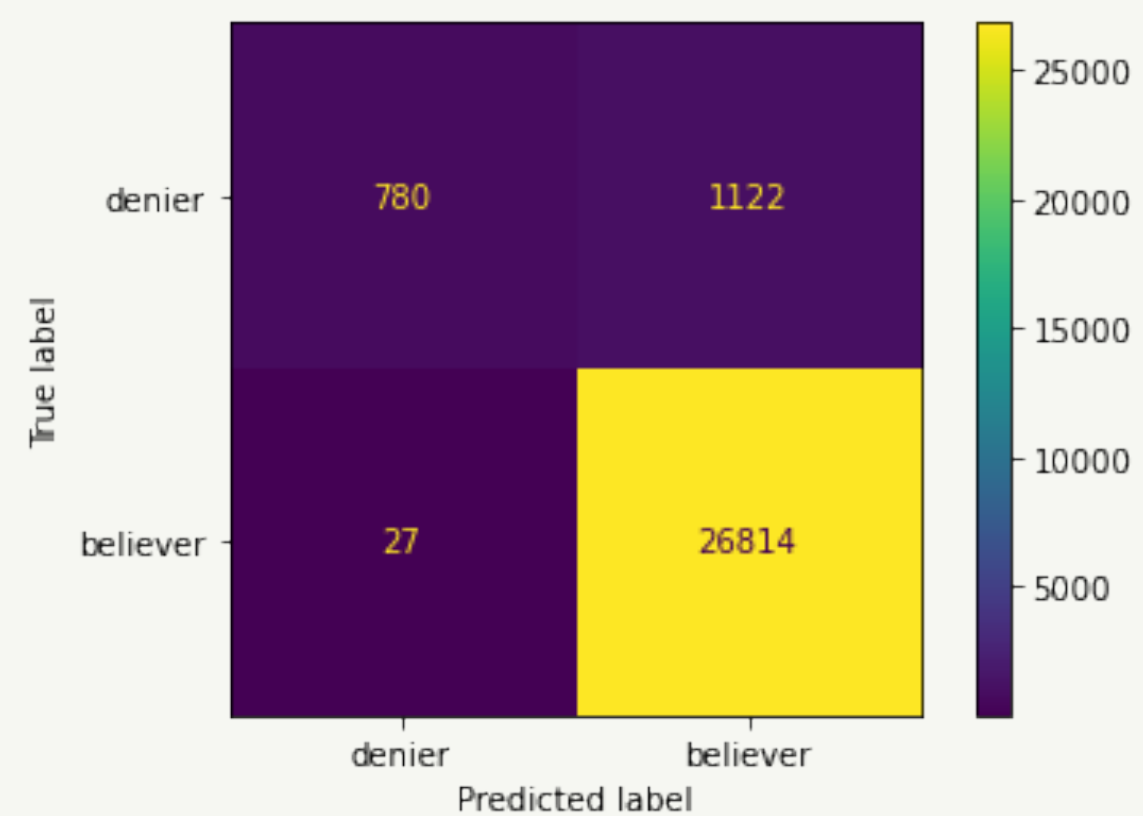
# most common tags associated with sample of tweets indicating belief in climate science
believer_tags = ['climatechangeisreal', 'actonclimate', 'extinctionrebellion', 'climateemergency',
                 'climateactionnow', 'capitalism', 'public_health', 'climateaction', 'humanityextinction',
                 'activism', 'noplanetb', 'savetheplanet']
```


Results

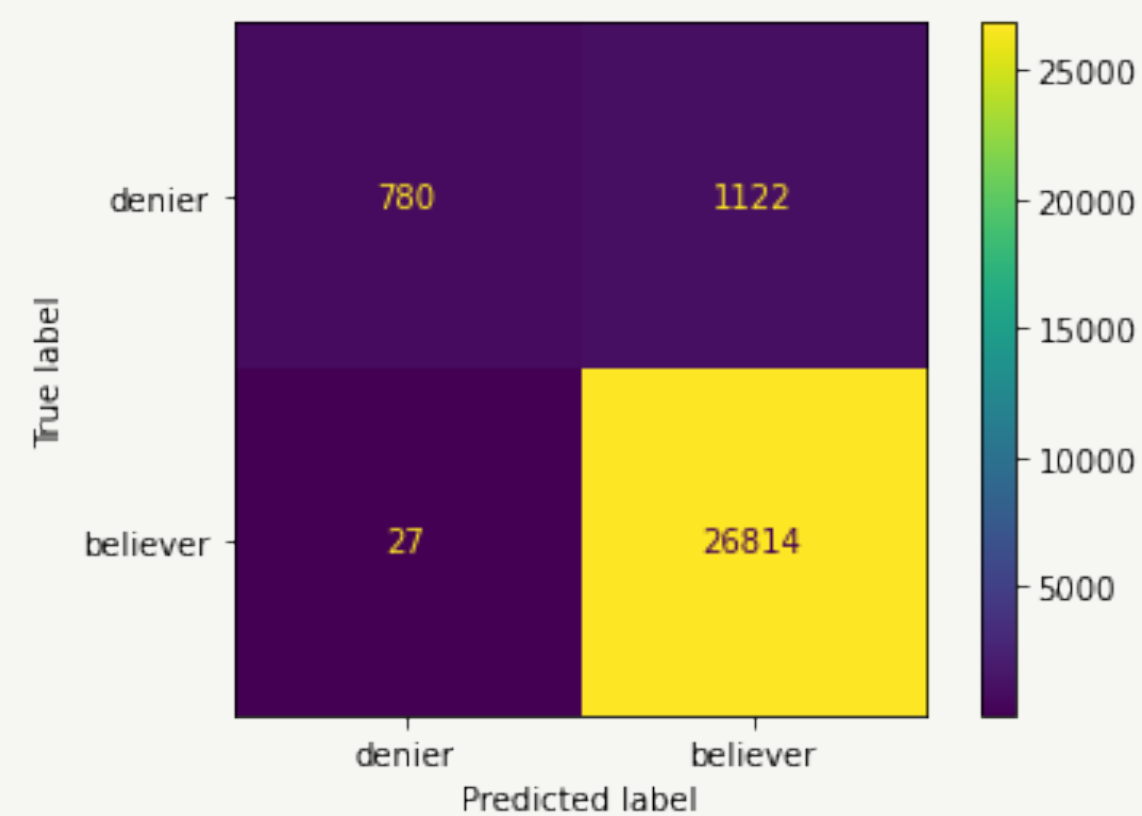
Test Set Confusion Matrix



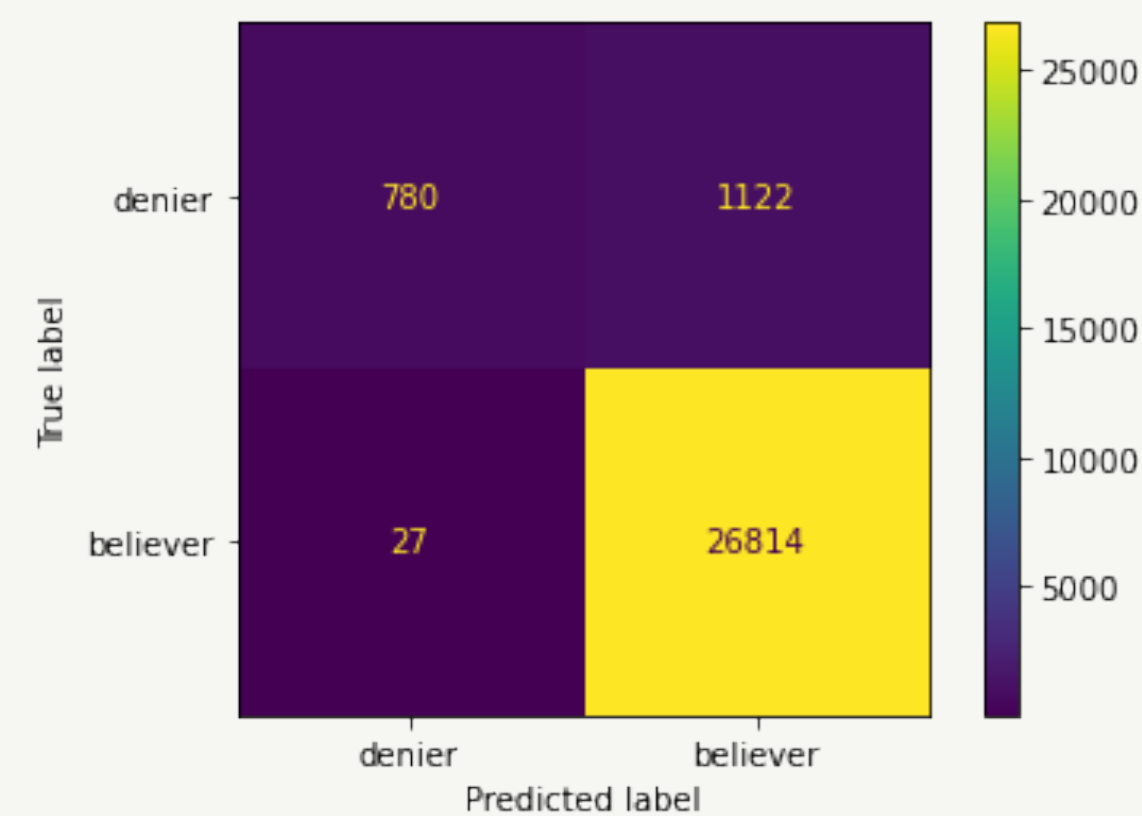
Test Set Confusion Matrix



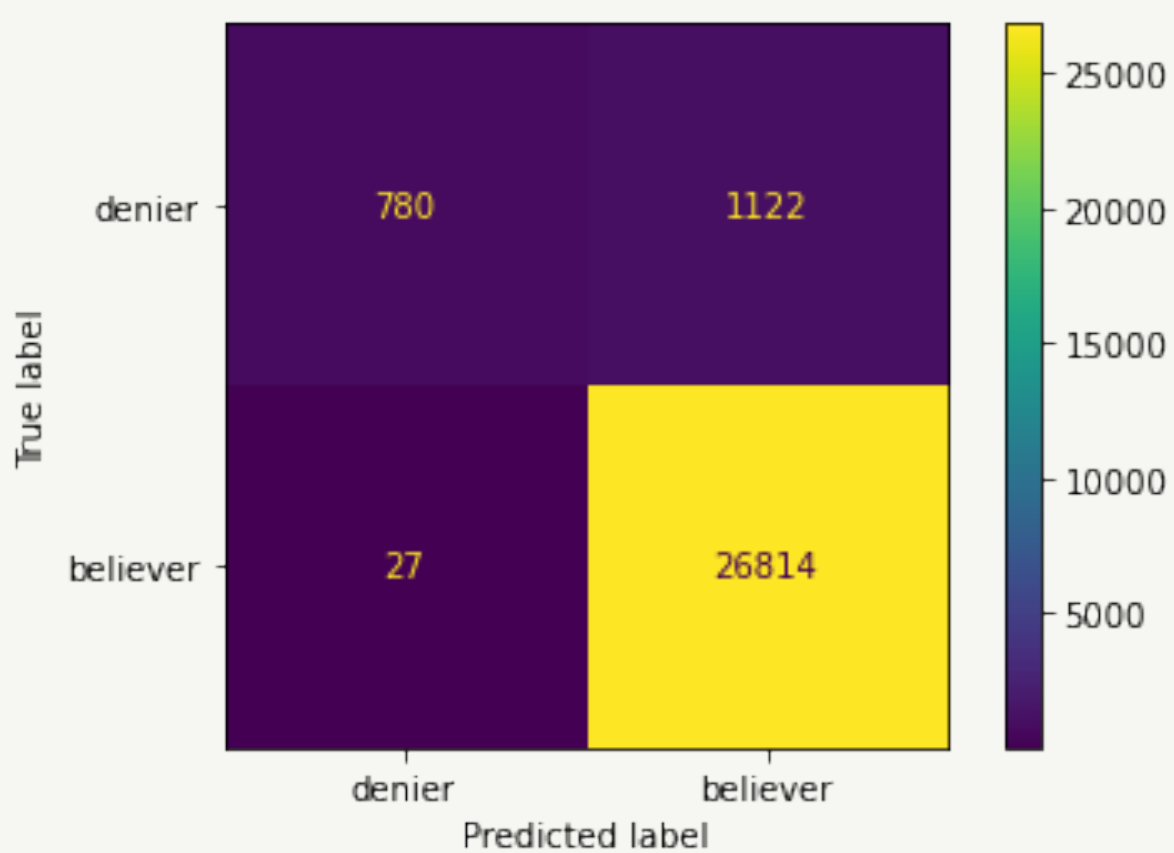
Test Set Confusion Matrix



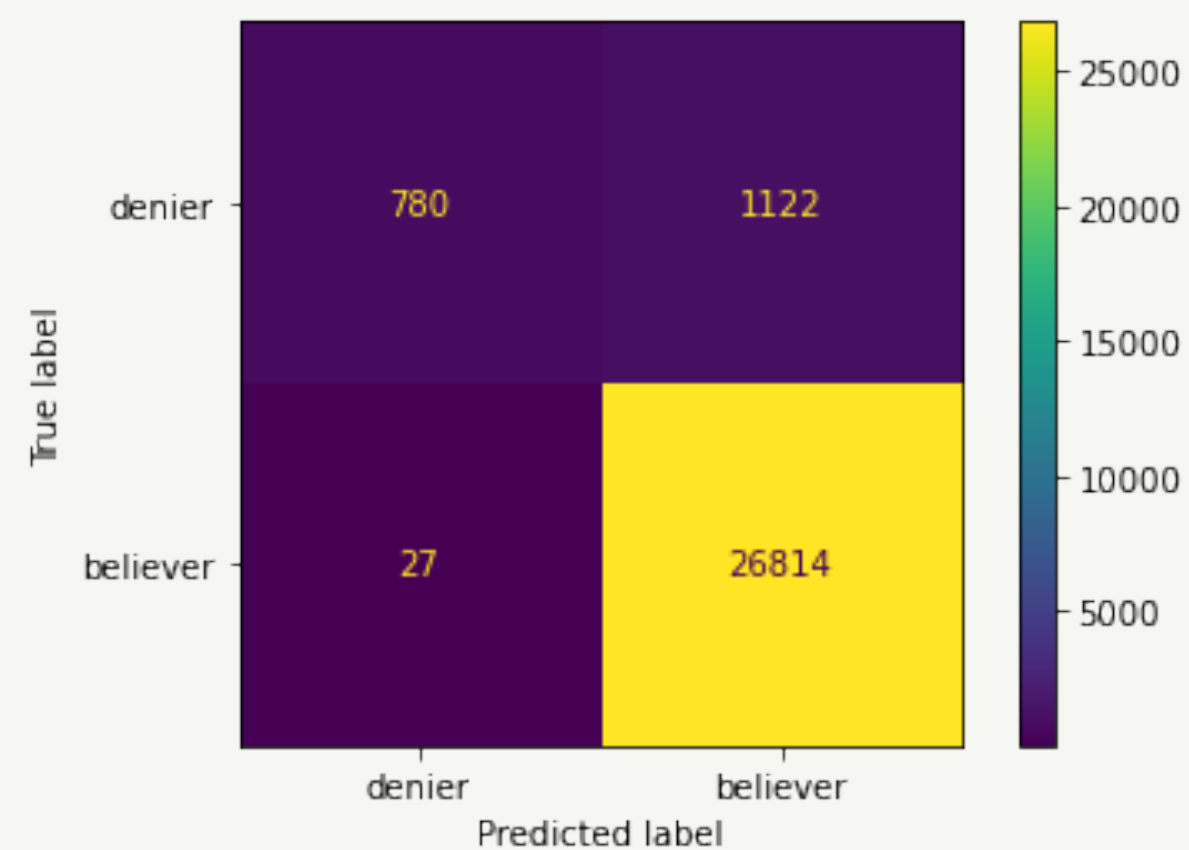
Test Set Confusion Matrix



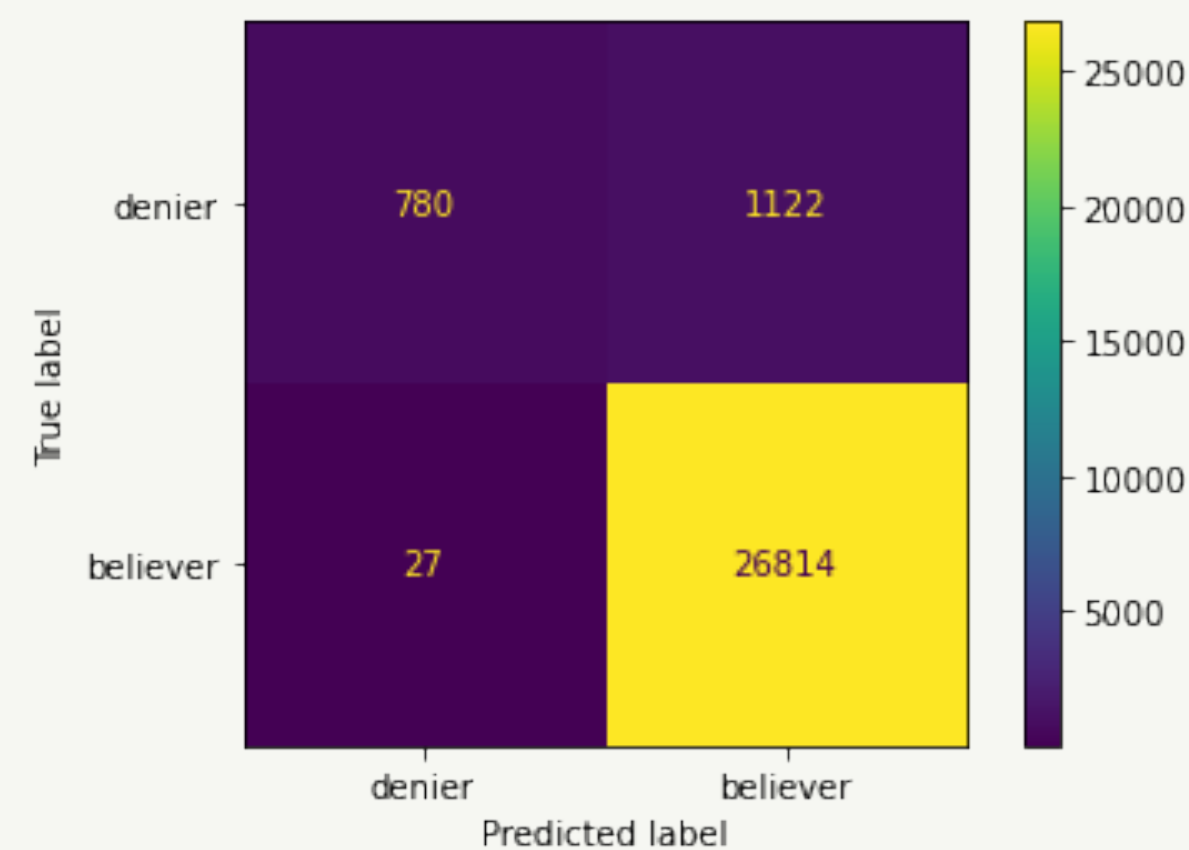
Test Set Confusion Matrix



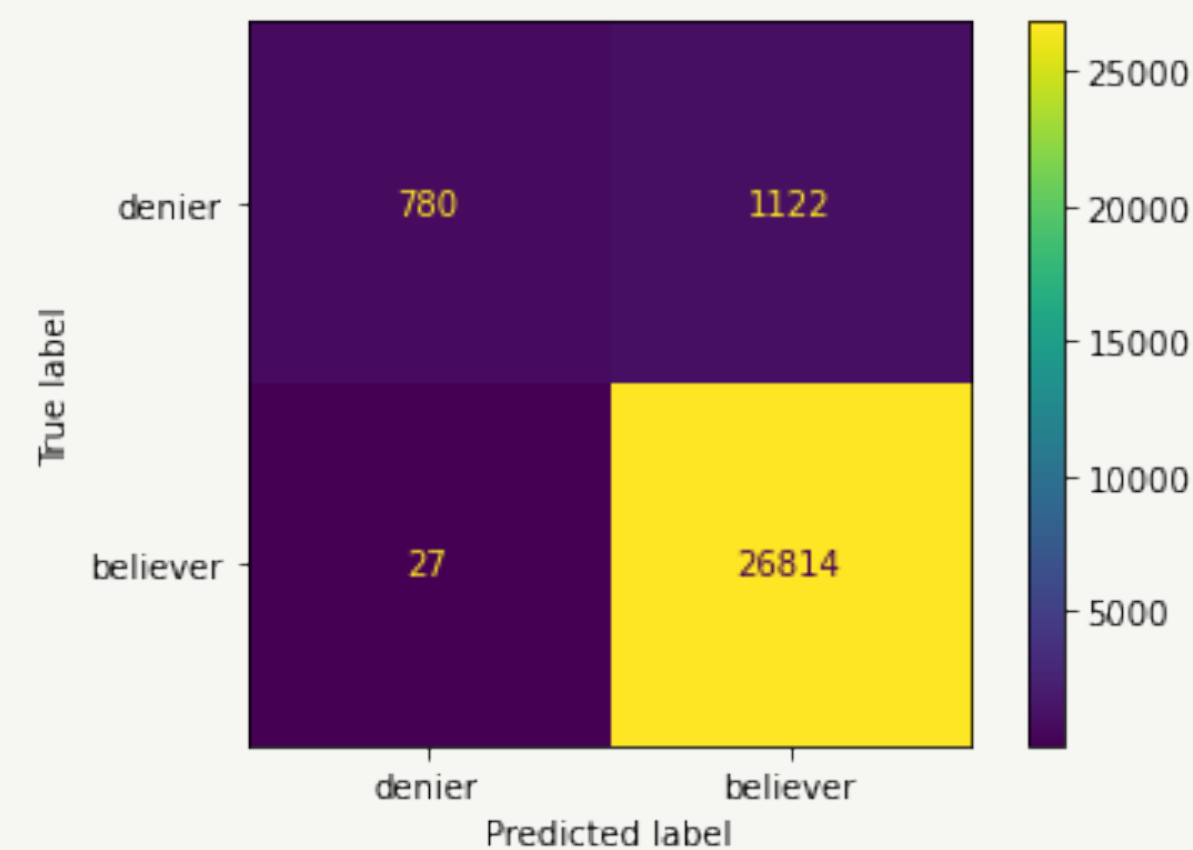
Test Set Confusion Matrix



Test Set Confusion Matrix



Test Set Confusion Matrix



Believer



bitchsquads_ebooks
@bitchsquadb0t



Denying climate change is dangerous. Join the progress made possible by the progress we're making to realize their potential:

Denier



Solar Secrets @SolarSecrets · Jul 17, 2018



MAKE IT STOP! Solar energy is trying to force conformity
ow.ly/qelk30kZRZz #tcot #tlot #climatechange #solar

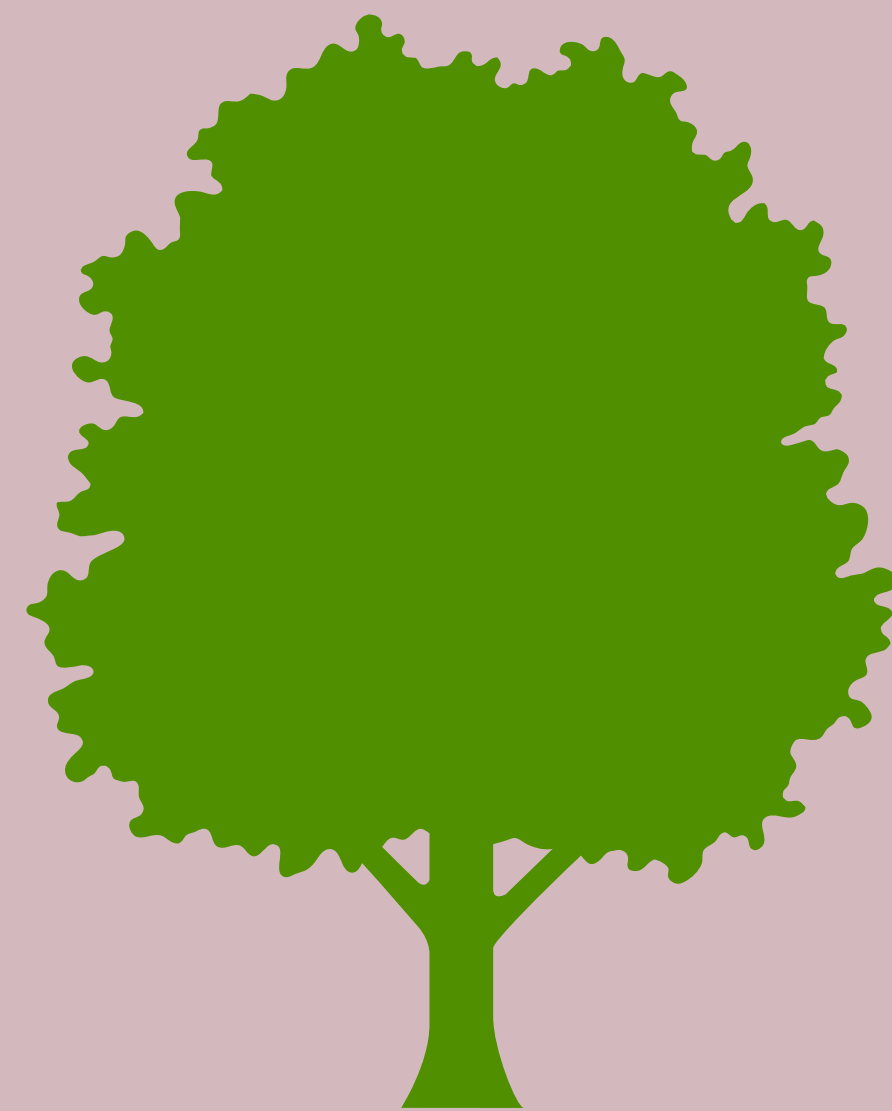


Next Steps

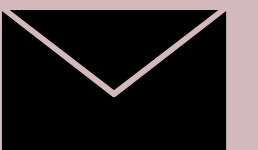
AND Shortcomings

- Robust Feature Engineering
- Analyze and work to reduce false positives
 - Utilize more of the GW dataset
- Implement neural network model with transfer learning
- Use CO2 emissions API to look at emissions over time in relation to text sentiment
- Twitter no longer captures all right wing sentiment
- Hashtags are imperfect categorizers
- Twitter \neq Overall public sentiment

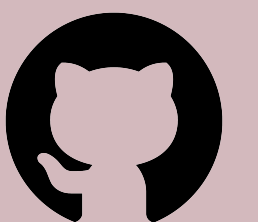
Thank You!



jmarx@hash.fyi



https://github.com/JoeBrowz/climate_prop



<http://linkedin.com/in/joe-marx-260a64102>

