ALERT.LY

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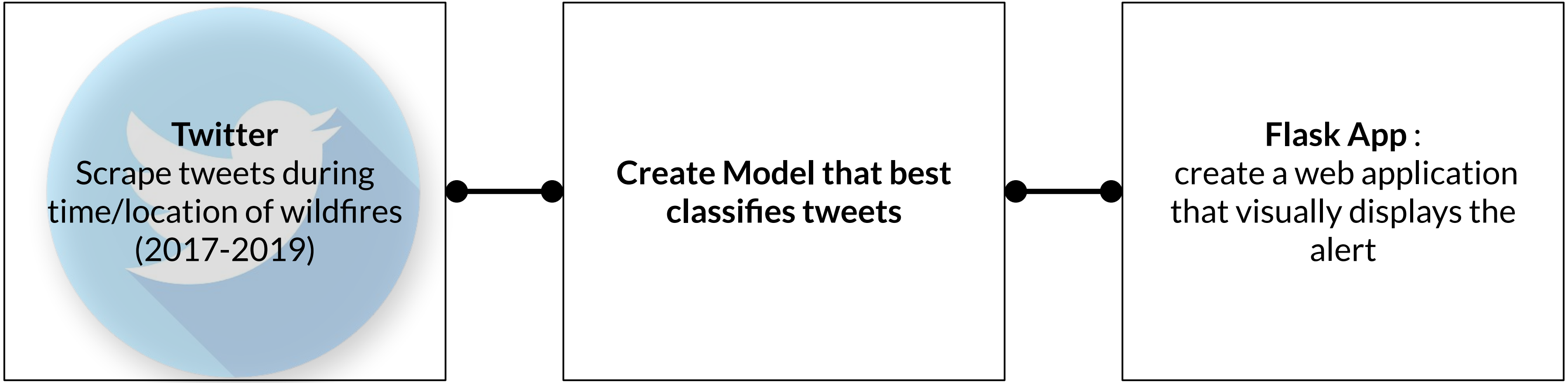
Problem/Task:

- Create an alert system that utilizes social media activity to identify when an emergency first occurs

Focus: California wildfires



Twitter
Scrape tweets during time/location of wildfires (2017-2019)

Create Model that best classifies tweets

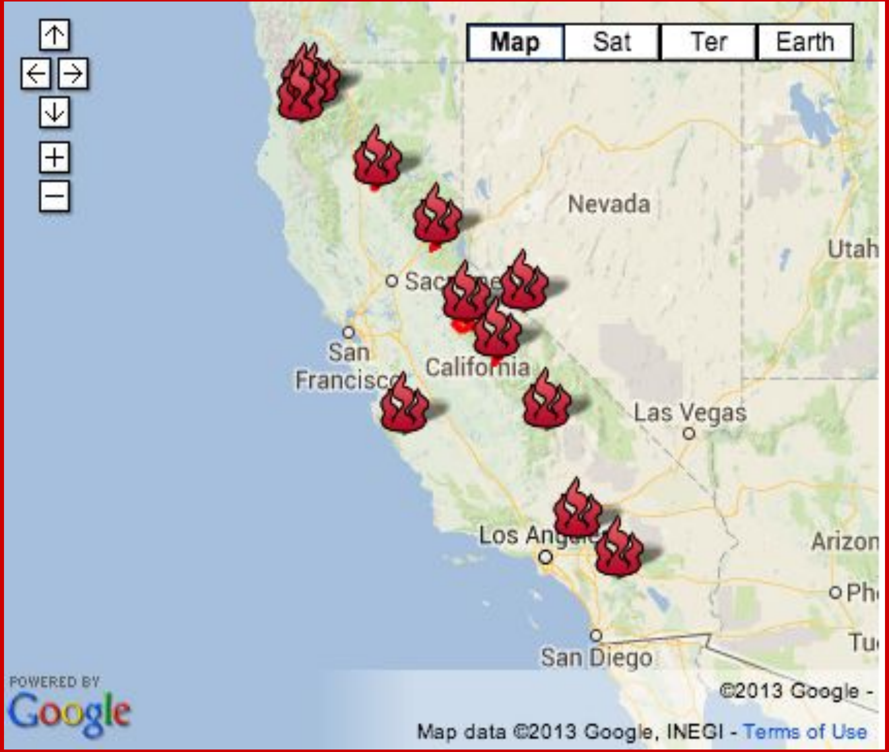
Flask App :
create a web application that visually displays the alert

Data:

- Data were collected based on date and geotag
  - Tweepy (API)
  - GetOldTweets3 (web scraper)
- Pre-fire tweets (2019 September)
- Post-fire tweets (2019 October)
  - Specific Fire : Saddleridge, Tick, Kincade, Getty, Maria

Total Data: 24,410 Tweets

Related Tweets: 5,691 (23.3%)
Unrelated Tweets: 18,719 (76.6%)

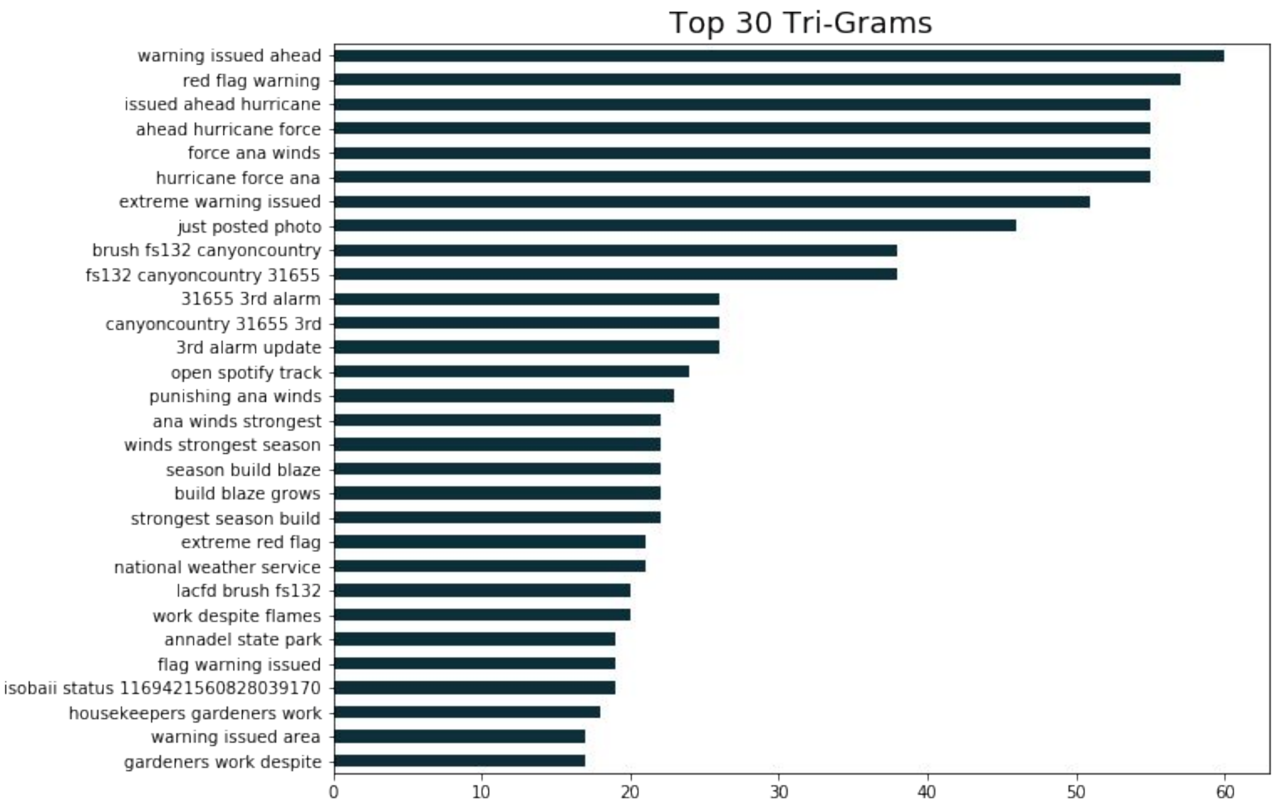


Common Tri-grams

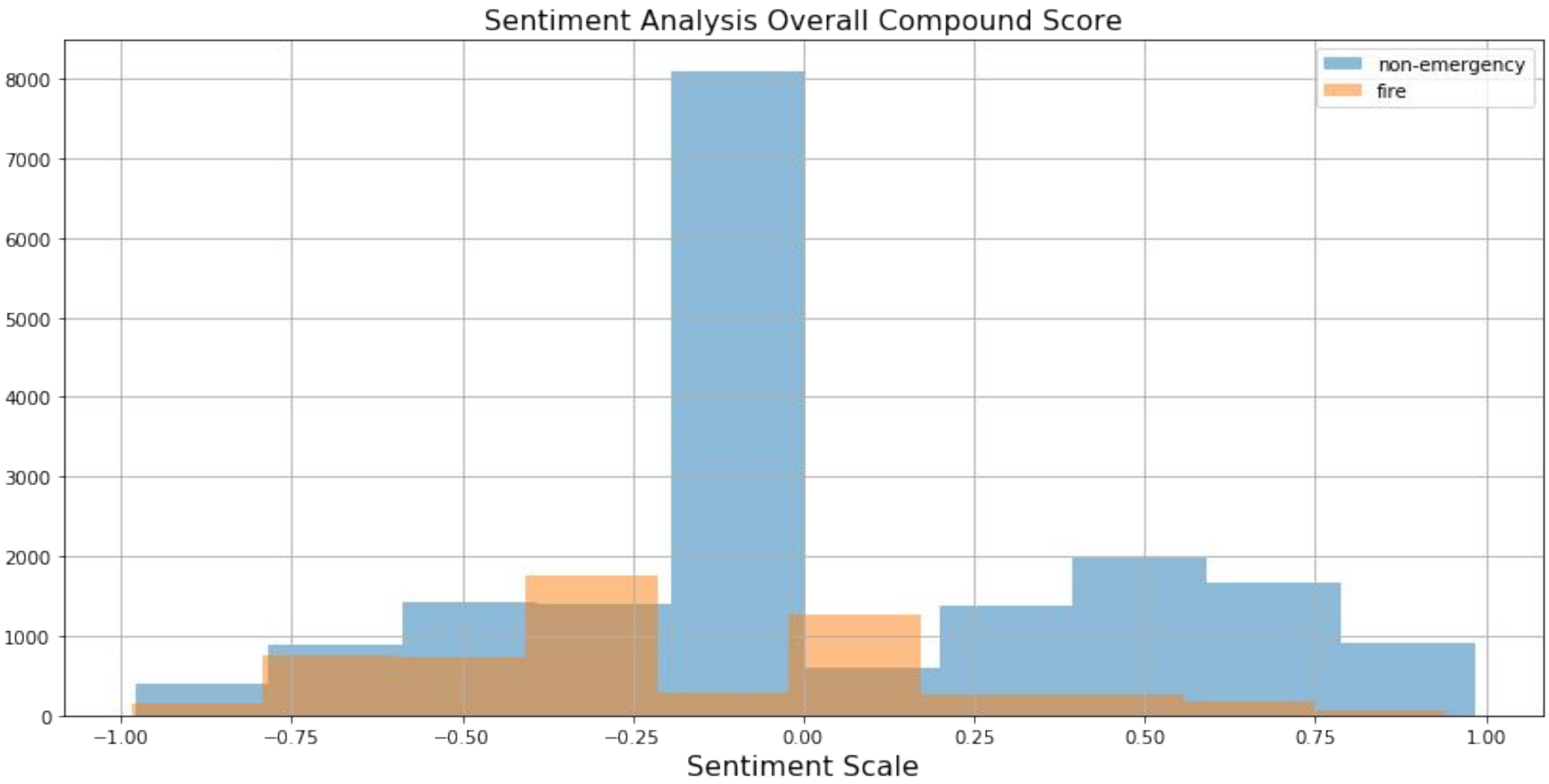
Weather related

“Warnings”

Los Angeles - Santa Ana winds/ Hurricane winds



Overall Sentiment Score of Tweets



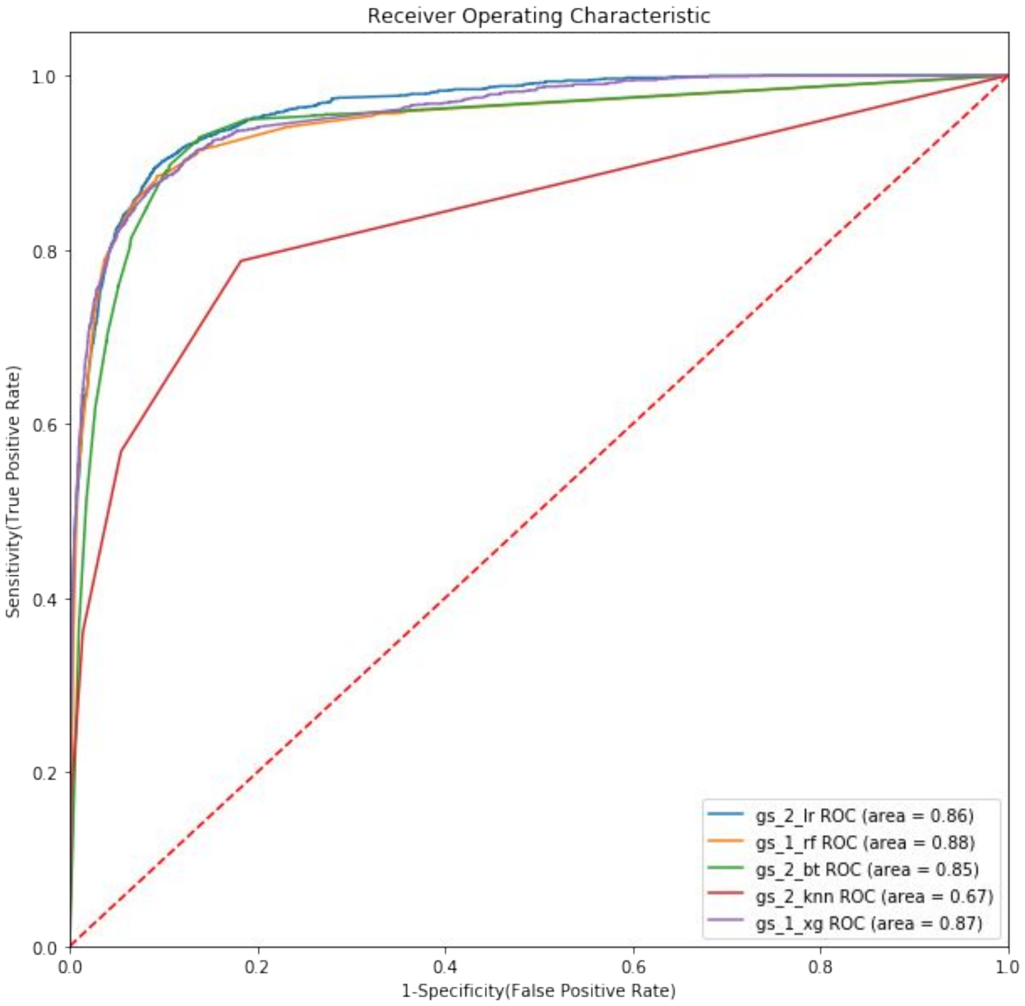
Model Estimators:

Logistic Regression
Random Forest
Bagging
K-nearest neighbors
XGBoost

Best Model:

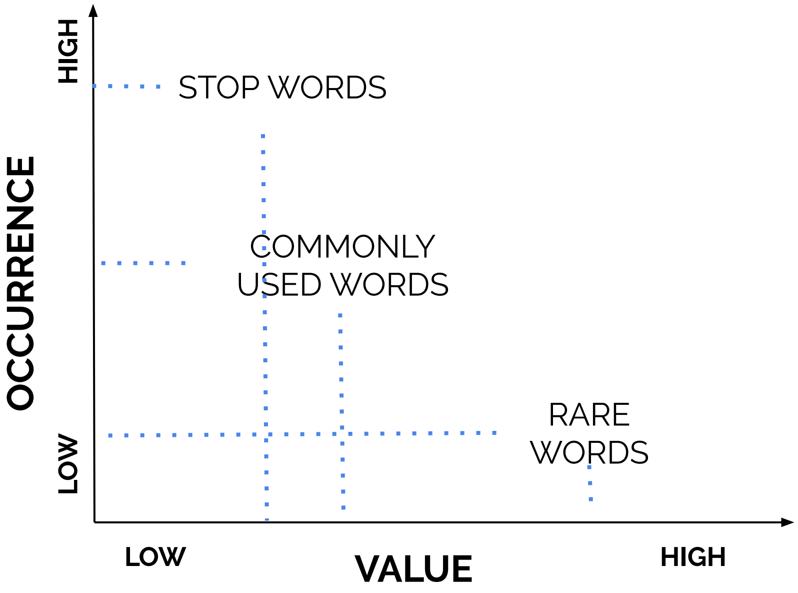
TF-idf + Random Forest

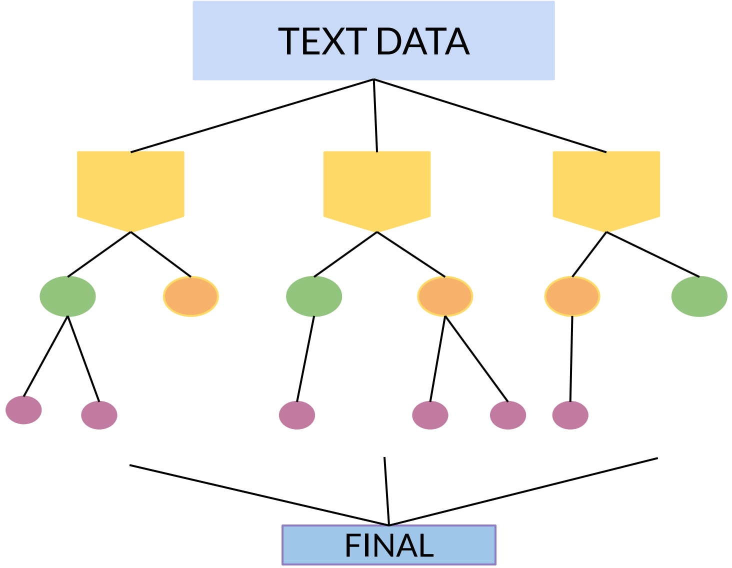
X = text data



Model Transformer: Tf-IDF

Model Estimator: Random Forest

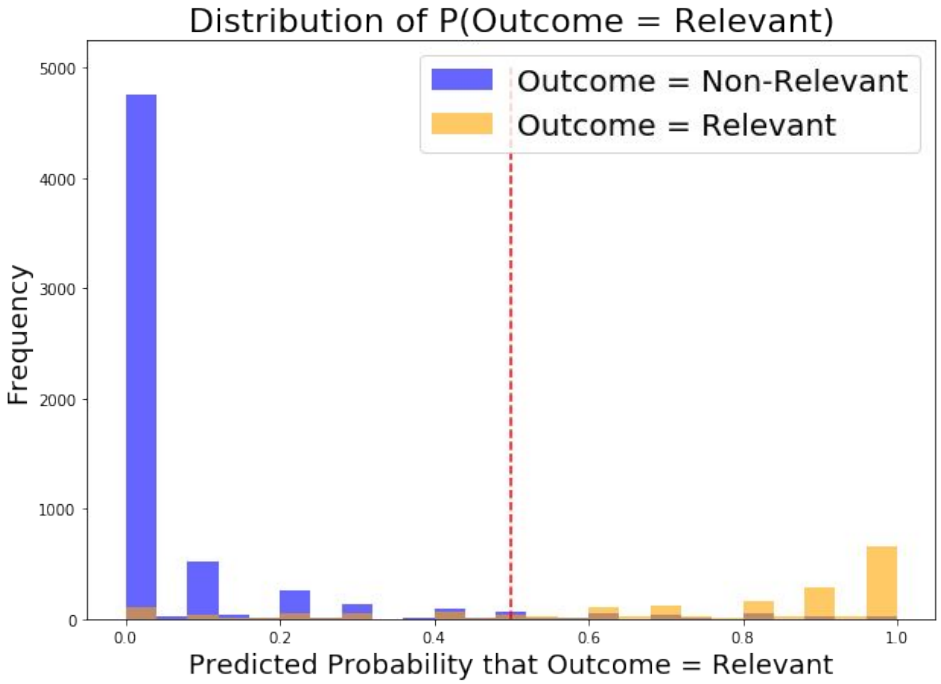


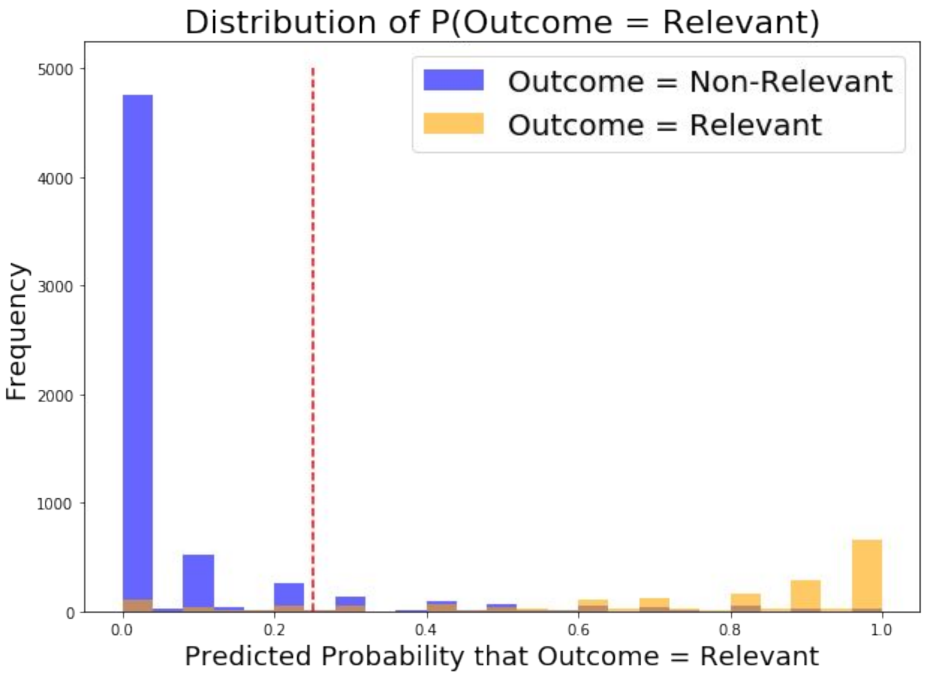


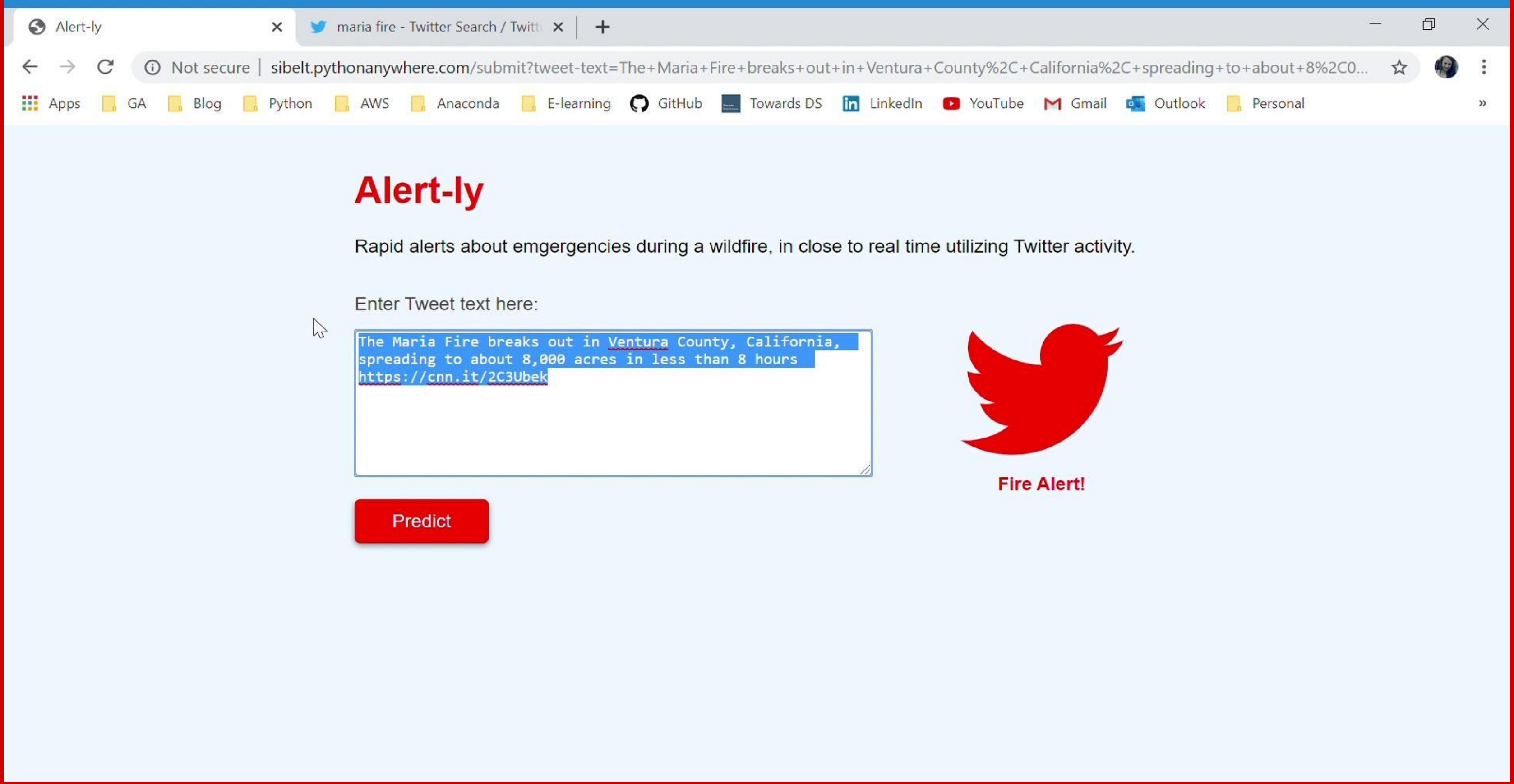
Model Accuracy: .92217

Threshold : 0.5 —> 0.25

Sensitivity : 0.8728 —> 0.907






Alert-ly
maria fire - Twitter Search / Twitt
Not secure
sibelt.pythonanywhere.com/submit?tweet-text=The+Maria+Fire+breaks+out+in+Ventura+County%2C+California%2C+spreading+to+about+8%2C0...
Apps
GA
Blog
Python
AWS
Anaconda
E-learning
GitHub
Towards DS
LinkedIn
YouTube
Gmail
Outlook
Personal

Alert-ly

Rapid alerts about emgergencies during a wildfire, in close to real time utilizing Twitter activity.

Enter Tweet text here:

```
The Maria Fire breaks out in Ventura County, California,
spreading to about 8,000 acres in less than 8 hours
https://cnn.it/2C3Ubek
```

Predict

Fire Alert!

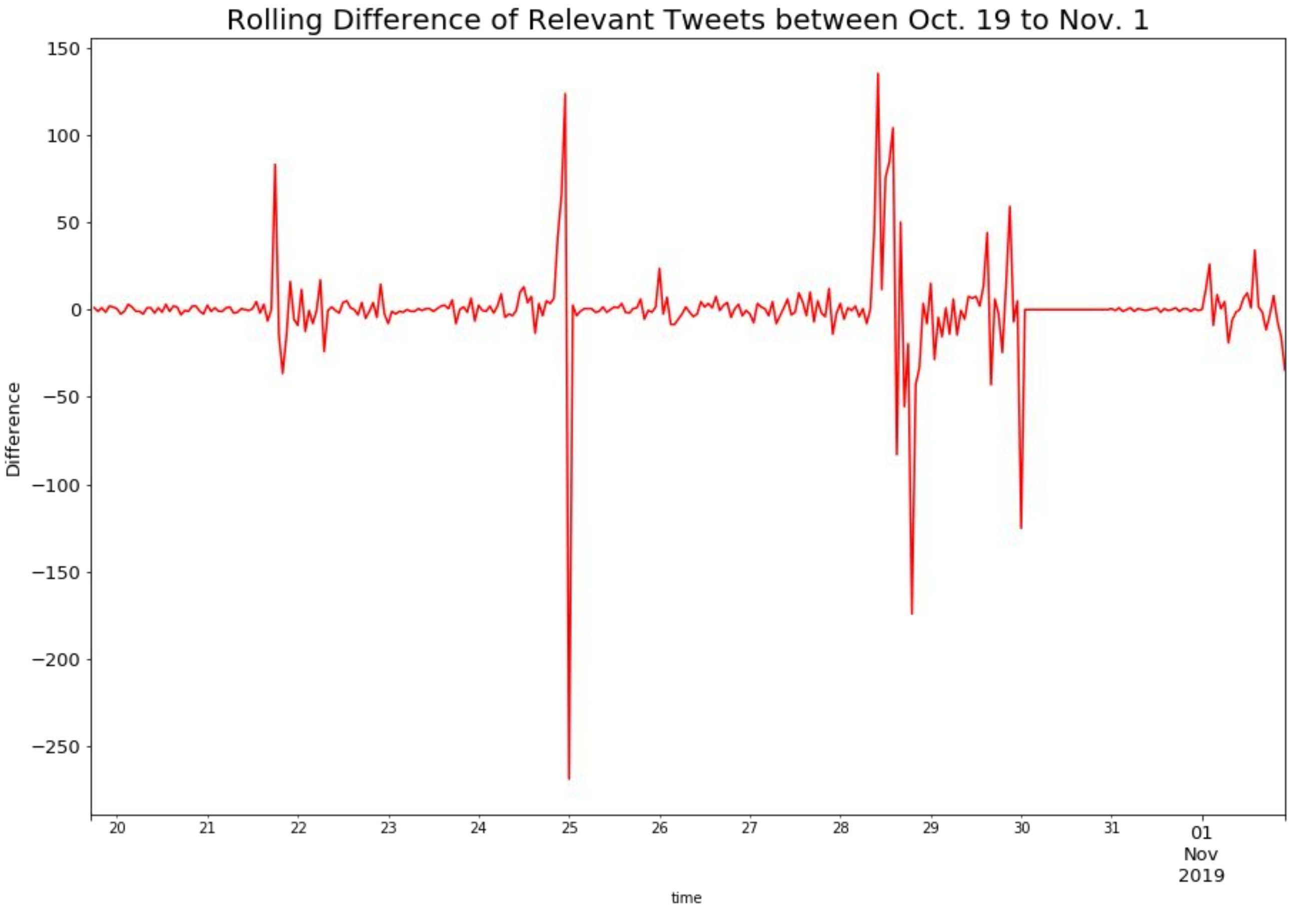
ALERT.LY 1.0 Demo

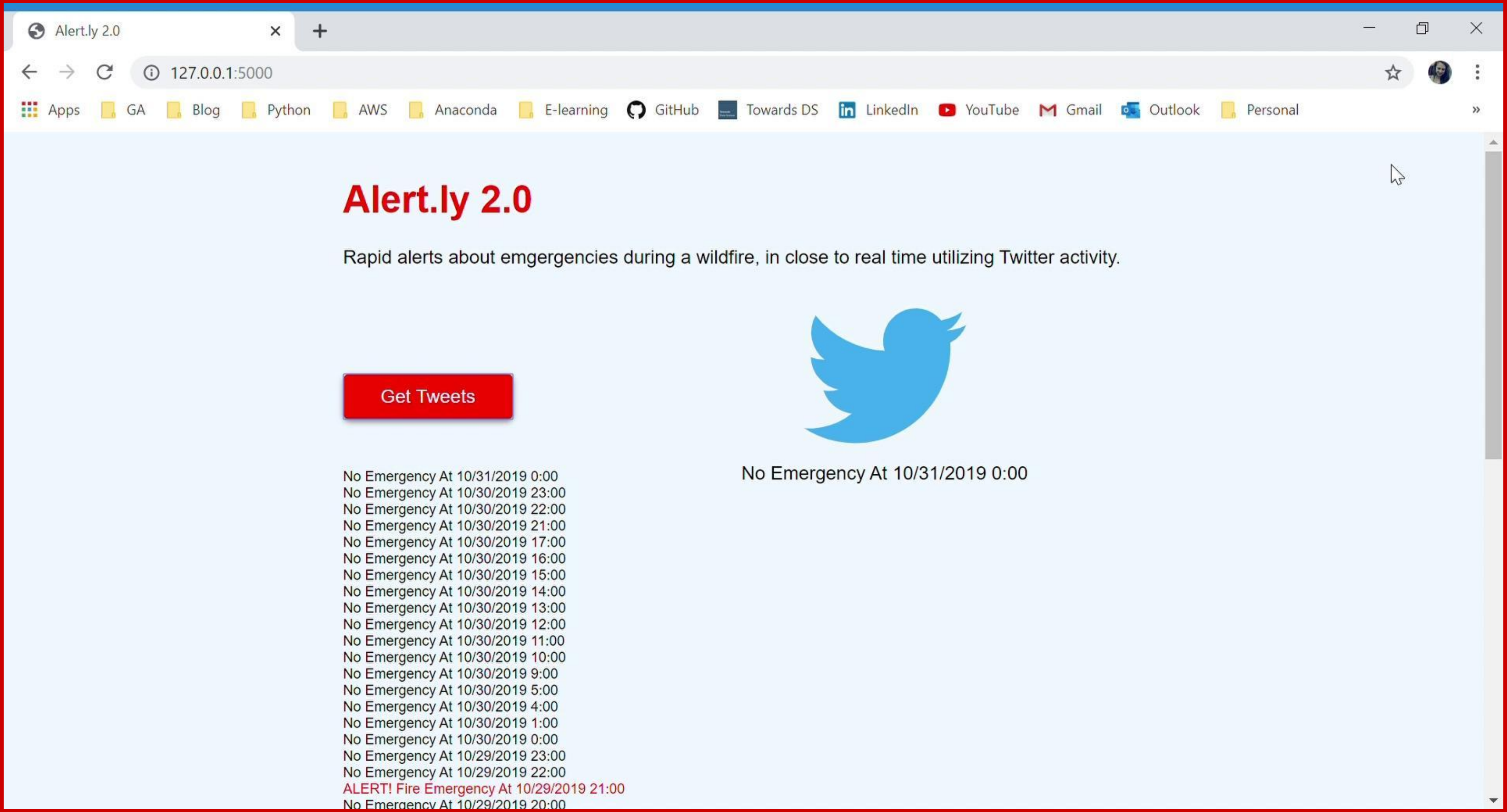
Model: Pickle | App: Flask | HTML, CSS | Hosting: PythonAnywhere.com

Time Series Analysis

- Difference between **“Relevant Tweets”** vs **“Rolling Avg. of last 2 hours”**

- Spikes show significant increase in language related to emergency





Alert.ly 2.0

Rapid alerts about emgergencies during a wildfire, in close to real time utilizing Twitter activity.

No Emergency At 10/31/2019 0:00

No Emergency At 10/31/2019 0:00
No Emergency At 10/30/2019 23:00
No Emergency At 10/30/2019 22:00
No Emergency At 10/30/2019 21:00
No Emergency At 10/30/2019 17:00
No Emergency At 10/30/2019 16:00
No Emergency At 10/30/2019 15:00
No Emergency At 10/30/2019 14:00
No Emergency At 10/30/2019 13:00
No Emergency At 10/30/2019 12:00
No Emergency At 10/30/2019 11:00
No Emergency At 10/30/2019 10:00
No Emergency At 10/30/2019 9:00
No Emergency At 10/30/2019 5:00
No Emergency At 10/30/2019 4:00
No Emergency At 10/30/2019 1:00
No Emergency At 10/30/2019 0:00
No Emergency At 10/29/2019 23:00
No Emergency At 10/29/2019 22:00
ALERT! Fire Emergency At 10/29/2019 21:00
No Emergency At 10/29/2019 20:00

ALERT.LY 2.0 Demo

Data: Time Series Analysis | App: Flask | HTML, CSS, JQuery | Hosting: PythonAnywhere.com

Goal:

- Create an alert system that utilizes social media activity to identify when an alert first occurs

Next Steps:

- Gather more data
- Implement other disasters into our model
- Further improve/optimize our Type II Errors
- Create a model to detect anomalies of emergency related tweets
- Implement a continuous live scrapper to monitor tweets
- Mobile Application for ALERT.LY

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Questions?

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Sources:

- https://pypi.org/project/GetOldTweets3/
- http://docs.tweepy.org/en/latest/getting_started.html#api
- https://patch.com/california/fremont/california-fire-map_460d9ceb
- https://twitter.com/cnnbrk/status/1190272548887498753