



Fake News detection on Reddit



IIT - OSNA 2018 - Martin Berger, Manu Sreekumar, Antoine Gargot

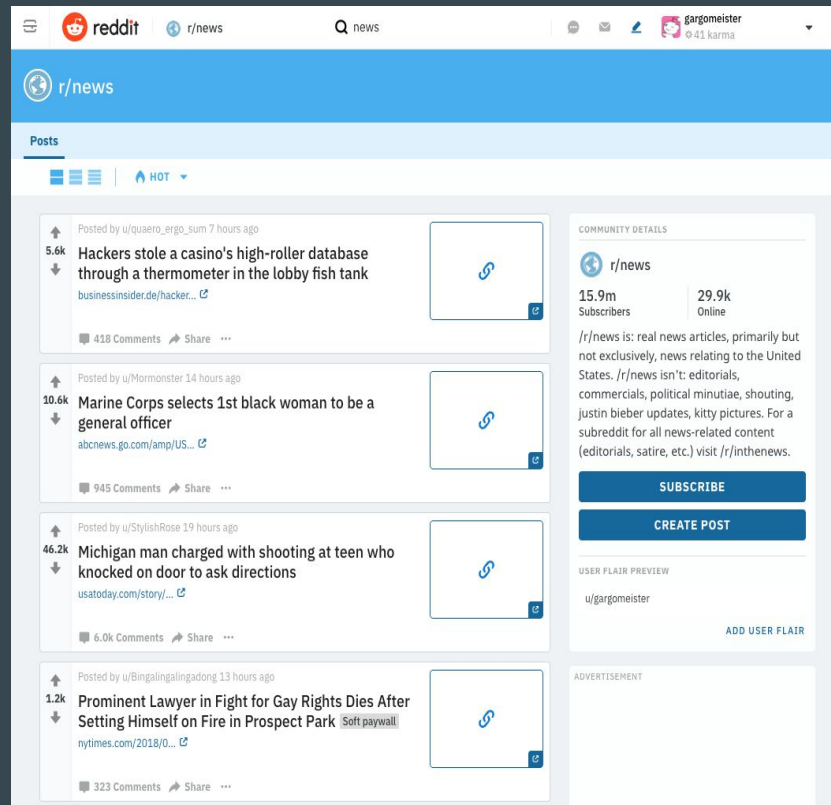
How did you find our data ?

Reddit API.

Cross-validated fake and reliable news sources.

Search for posts in all reddit.

Feature extraction relative to each post.



Is there some relevant information in our data ?

Data Overview: 9855 observations = 5512 fake + 4343 reliable

Features Extracted: `Post_id`, `website`, `post_author`, `post_title`, `post_num_comments`, `post_subreddit_subscribers`, `post_subreddit_name_prefixed`, `Post_selftext`, `comments`, `post_upvotes`, `user_is_gold`, `user_is_mod`, `user_link_karma`, `user_comment_karma`, `subreddit_active_user_count`, `subreddit_advertiser_category`, `subreddit_audience_target`

Top 5 users collected: `removalbot` = 1240, `conspirobot` = 570, `autotldr` = 368, `iamtotalcrap` = 257, `alternate-source-bot` = 199,

Top subreddits: `r/removalbot` = 1240, `r/The_Donald` = 688, `r/conspiro` = 571, `r/conspiracy` = 472, `r/autotldr` = 368, `r/atheismbot` = 257, `r/alt_source_bot_log` = 199, `r/politics` = 163

SubReddit Active Users, Karma & Upvotes: Fake News Variances

Is the network can help us to detect fake news ?

Select features from our data :

- User based features.
- Post based features.
- SubReddit features.

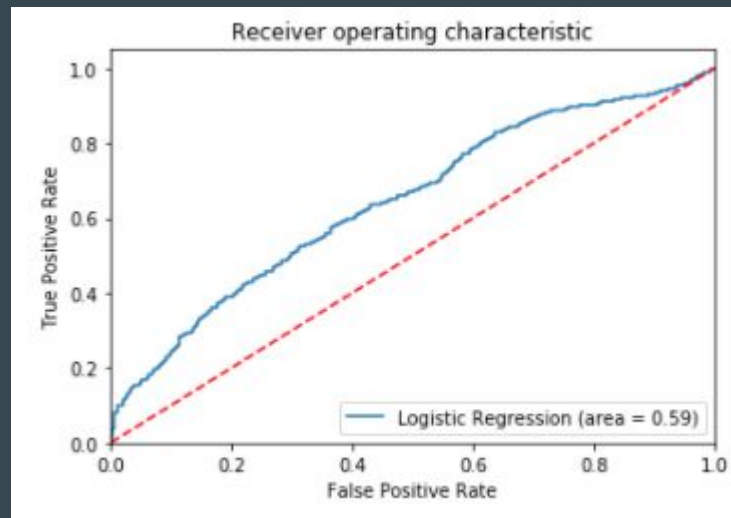
Data cleaning.

Features selection best for model.

Fit a logistic Regression for our data.

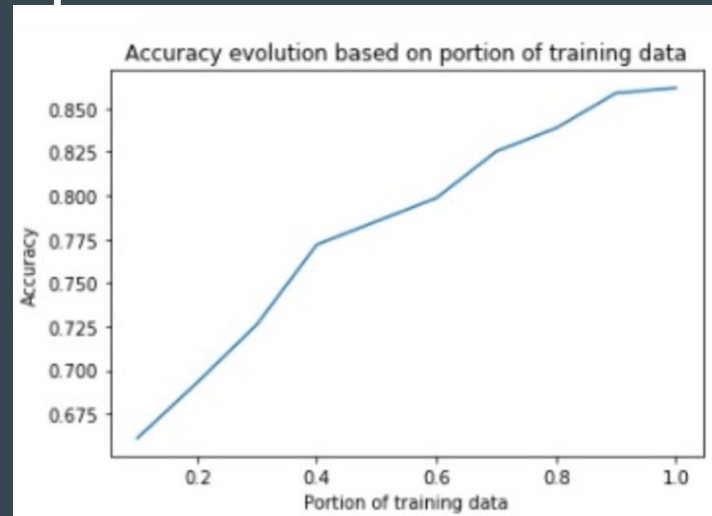
Why we have bad results ??!!!

	precision	recall	f1-score	support
0	0.53	0.54	0.53	857
1	0.66	0.65	0.65	1168
avg / total	0.60	0.60	0.60	2025



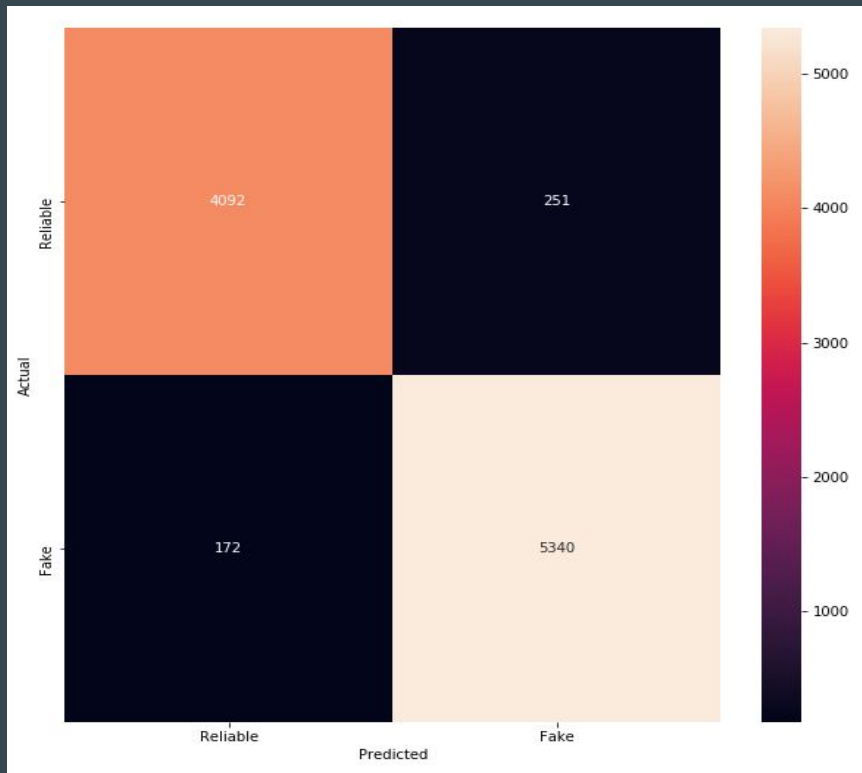
Do the text data involved with Reddit Posts help us to detect fake news ?

- Merge 5 features :
 - Post Text
 - Post Title
 - Author name
 - Subreddit
 - Top 10 comments
- Cleaned the text data and remove sparse words.
- Used all combinations of tuning parameters for Count Vectorizer, Tf-IDF vectorizer and ML Models.
- Received highest cross validation accuracy of 87.92 %.



	precision	recall	f1-score	support
Reliable	0.65	0.98	0.78	4343
Fake	0.98	0.58	0.73	5512
avg / total	0.83	0.76	0.75	9855

Confusion Matrix and Model Mean Accuracy

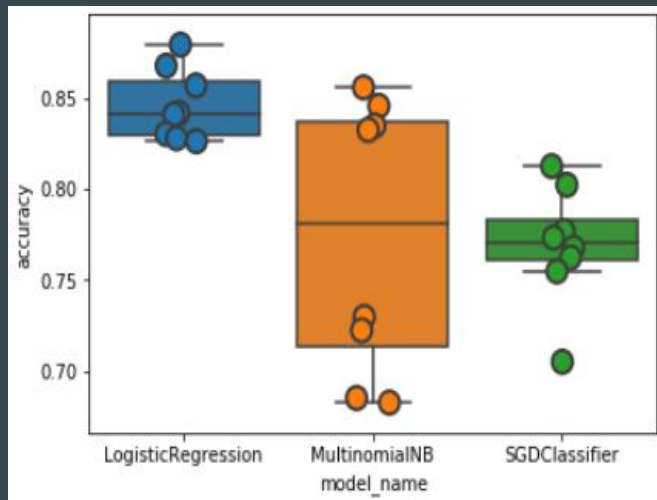


Model Name vs Mean Accuracy

LogisticRegression 0.846385

MultinomialNB 0.773643

SGDClassifier 0.769419



Conclusion and Future Work

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Strong signals present in text data of the Reddit posts, namely - subreddit, post title and top 10 comments.

Good indication of the possible distinction between user communities sharing Fake News.

Currently restricted Classification labels to Fake and True, based on the general trend of articles and reputation of web domains.

Future Work -> Extraction of larger number of data points from Reddit Sites, NLP of news texts and better labelling features in Reddit.

Thank You

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