

Hyperpartisian News detection

Florian Biebel Daan Middendorp

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Introduction

- ▶ Hyperpartisan News
 - ▶ "Extremely biased in favor of a political party"
- ▶ SemEval 2019 competition

Datasets

1. byarticle (600 articles directly labeled; *quality data*)
2. bypublisher (600k articles indirectly labeled by publisher; *quantity data*)
3. byart-bypub-mix (byarticle + 1100 articles from bypublisher)

due to time and ressource constraints, only byarticle and mix were used, as well as a seed

Attempts

- ▶ Classifiers
 - ▶ Logistic Regression
 - ▶ SGD Classifier
 - ▶ Random Forest Classifier
 - ▶ Naive Base Classifier
 - ▶ CNN Keras
- ▶ Feature Unions
 - ▶ Length of article
 - ▶ Number of capitalized words
 - ▶ Number of exclamation marks

Pipeline

- ▶ Transformer
 - ▶ CountVectorizer
 - ▶ TfidfTransformer
- ▶ Bag of Words
- ▶ Classifier

Article measures

- ▶ Hyperpartisan
 - ▶ Average of 596 words per article
 - ▶ Average of 7 capitalized words per article
 - ▶ Average of 0.98 exclamation marks per article
- ▶ Non-Hyperpartisan
 - ▶ Average of 415 words per article
 - ▶ Average of 5 capitalized words per article
 - ▶ Average of 0.36 exclamation marks per article
- ▶ How to tokenize?

Measure tokenization

- ▶ Add as word
 - ▶ LONGARTICLE
 - ▶ CAPITALUSAGE
 - ▶ EXCLAMATIONMARK
- ▶ Feature Union
 - ▶ Concatenates results of multiple transformer objects.

Scores (20 runs)

Method	Acc.	Prec.	Rec.	F1
Logistic regression	0,70-0,82	0,65-0,81	0,38-0,60	0,51-0,70
SGD Classifier	0,62-0,76	0,51-0,79	0,52-0,78	0,59-0,70
Random Forest	0,63-0,78	0,60-0,88	0,27-0,47	0,41-0,59
Naive Bayes	0,65-0,78	0,50-0,75	0,57-0,80	0,59-0,71
Log. reg. FU	0,71-0,82	0,67-0,92	0,39-0,64	0,49-0,70
SGD FU	0,34-0,70	0,00-0,40	0,00-1,00	0,0-0,58

Baselines

- ▶ Logistic Regression
- ▶ SGDClassifier (SVM)

Logistic Regression

	Quality	Mix
Accuracy	80	68
Precision	76	67
Recall	60	50
F1	67	57

consistent results due to the seed

SVM

	Quality	Mix
Accuracy	71-76	63-69
Precision	55-64	56-60
Recall	65-80	59-70
F1	60-66	59-65

inconsistent results despite seed

due to Stochastic Gradient Descent

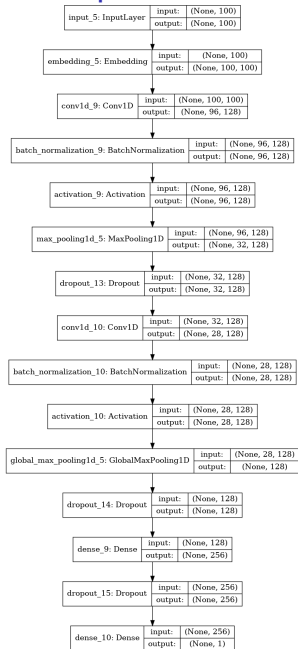
CNN

	Quality	Mix
Accuracy	69-74	59-66
Precision	53-63	51-61
Recall	47-67	57-72
F1	52-60	57-61

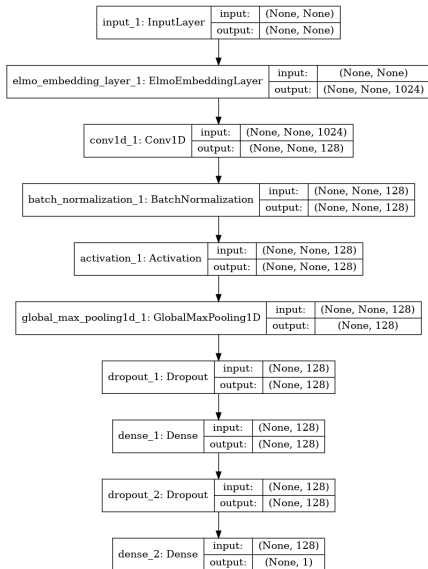
Techniques

- ▶ BatchNormalization
- ▶ Dropout
- ▶ (Global)MaxPooling
- ▶ Learning Embeddings and Pre-Learned Embeddings (ELMo/Word2Vec/GloVe)

CNN Graph



ELMo Model



Conclusion