sentiment analysis of polish texts

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Dataset

A dataset of media releases (Twitter, News and Comments, Youtube, Facebook) from Poland related to COVID-19 for open research

15/01/2020-31/07/2020

```
"","text","time"
"1","Tez uwazam ze falszywa pandemia #koronawirus jest jak stan wojenny. Ja juz mam nerwice, czuje stres jak widze zamaskowanych. https://t.co/TtlrJ
"2","Podawajcie dalej! #koronawirus #KoronawirusWPolsce #zajob #wybory2020 #DUDA2020 #Trzaskowski2020 # https://t.co/9PDDfYrpFp",2020-07-09 19:48:39
"3","Precz z pandemia!!! #koronawirus #koronawiruswpolsce #koronawiruspolska #zajob https://t.co/N8bTjei2zt",2020-07-10 17:58:43
"4","Ludzie zra sie na ulicach przez te kanalie #szumowski #koronawirus #koronawiruswpolsce dlatego nie ide na wybory https://t.co/NRfe9MQ0xH",2020-
"5","Lekarze to najwiekszy zawyd tej pseudoepidemii #koronawirus https://t.co/32BkrWrHTa",2020-07-13 20:08:11
"6","Rekordowa frekwencja? Przeciez mamy WIELKA EPIDEMIE! Ludzie otworzcie oczy! Bo sami sobie przeczycie! #koronawirus #koronawiruswpolsce #zajob #
"7","Polacy przeciwko #zajob #falszywapandemia #koronawirus #koronawiruspolska #COVID19 #KoronawirusWPolsce #wybory2020 #Trza #Trzaskowski2020 #DUDA
"8","Niewykluczone, ze jednak sprybuje pokonac wstret i oddam glos - oczywiscie na #PAD . Przekonal mnie apel @GadowskiWitold . Mam nadzieje, ze jes
"9","65 uzytych respiratoryw w calym kraju! Polsko otworz oczy! #koronawirus https://t.co/luXYCuZ5am",2020-07-12 19:55:42
"10","Polacy przeciwko #zajob #falszywapandemia #koronawirus #koronawiruspolska #COVID19 #KoronawirusWPolsce #wybory2020 #Trza #Trzaskowski2020 #DUD
```

Dataset

coronavirus | 2020 Poland coronavirus data | Dataset library

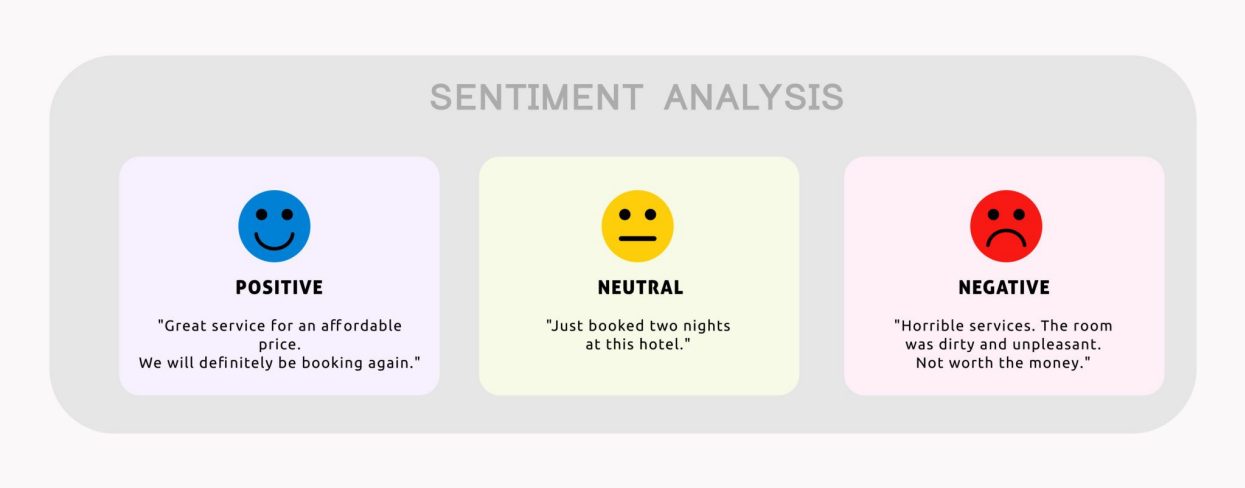
by dtandev • Python • Version: Current • License: MIT

2020 Poland coronavirus data (COVID-19 / 2019-nCoV)

```
Timestamp,Confirmed,Deaths,Recovered,In_the_hospital,In_quarantine,Under_medical_supervision,Number_of_tests_carried_out
03-03-2020,0,0,0,68,316,4459,559
04-03-2020,1,0,0,65,349,4540,584
05-03-2020,1,0,0,92,490,5647,676
06-03-2020,5,0,0,128,1299,6184,855
07-03-2020,6,0,0,146,1548,6409,856
08-03-2020,12,0,0,168,932,7122,1154
09-03-2020,17,0,0,467,1014,7110,1384
10-03-2020,22,0,0,220,1055,9366,1630
11-03-2020,31,0,0,317,1193,11524,2024
```

Sentiment analysis

Sentiment analysis is the automated process of tagging data according to their sentiment, such as positive, negative and neutral. Sentiment analysis allows companies to analyze data at scale, detect insights and automate processes.



Idea

- to analyze data from social media(e.g. Twitter) in Polish that would be related to the coronavirus
- Compare results with statistics data for the: Deaths,Recovered,In_the_hospital,In_quarantine,Under_medical_supervision

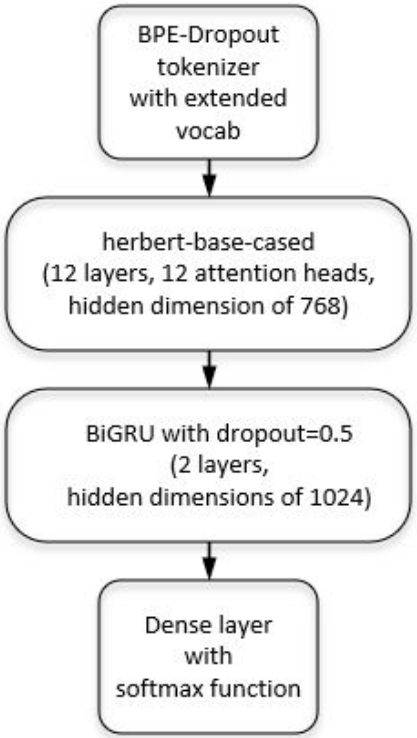
herbert-base-cased-sentiment

Model

Model is based on HerBERT (Polish version of BERT) since it receives state-of-the-art results in the area of text classification. It is followed with 2 layers of a bidirectional gated recurrent unit and a fully connected layer.

The BPE-Dropout tokenizer from HerBERT (which changes a text into tokens before passing input to HerBERT) was extended with additional COVID-19 tokens so that it would recognize (not separate) the basic coronavirus words.

Dataset: publicly available Twitter dataset from CLARIN.SI repository with 100 personally labeled COVID-19 tweets in order to train a model on a sample of domain-specific texts.



Model

twitter-xlm-roberta-base-sentiment-finetunned

This is multilingual XLM-Roberta model sequence classifier fine tunned and based on Cardiff NLP Group sentiment classification model.

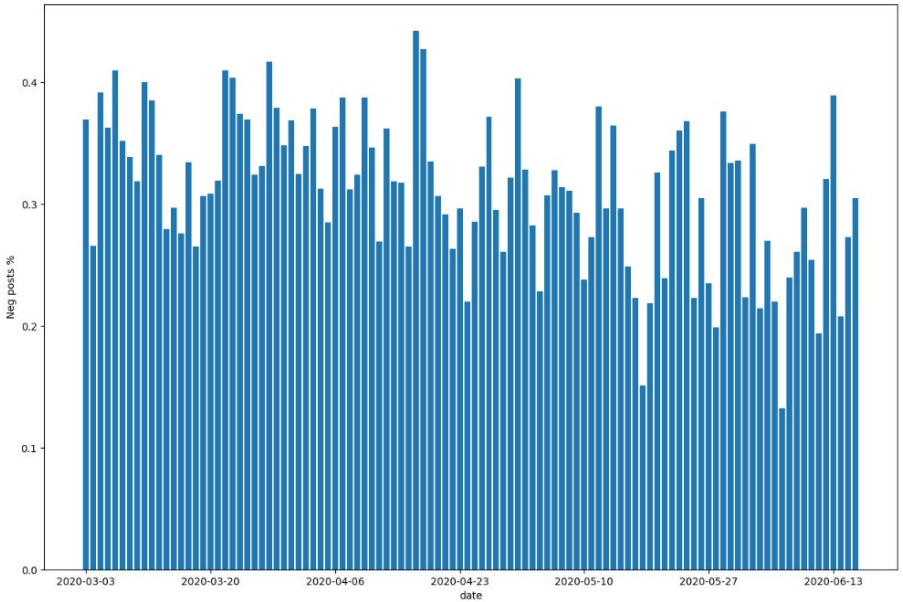
supports Polish

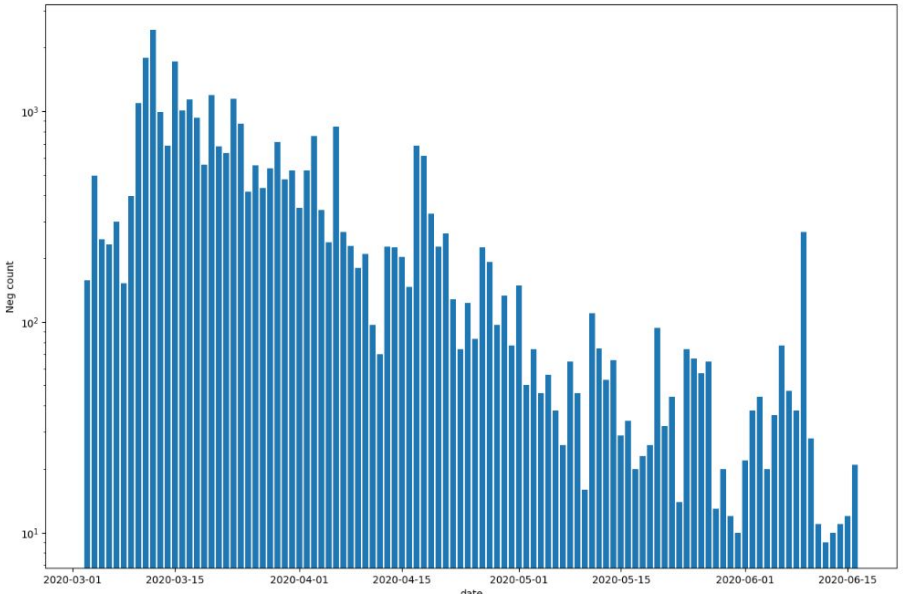
Model `twitter-sentiment-pl-base`

Twitter Sentiment PL (base) is a model based on herbert-base for analyzing sentiment of Polish twitter posts. It was trained on the translated version of TweetEval by Barbieri et al., 2020 for 10 epochs on single RTX3090 gpu

Results

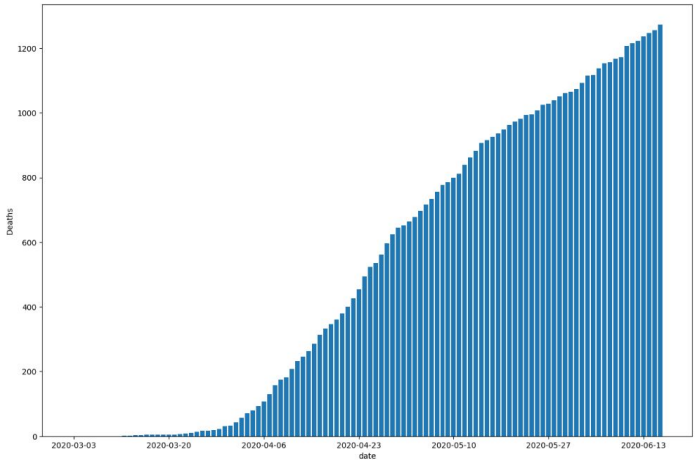
Neg posts percentage / count



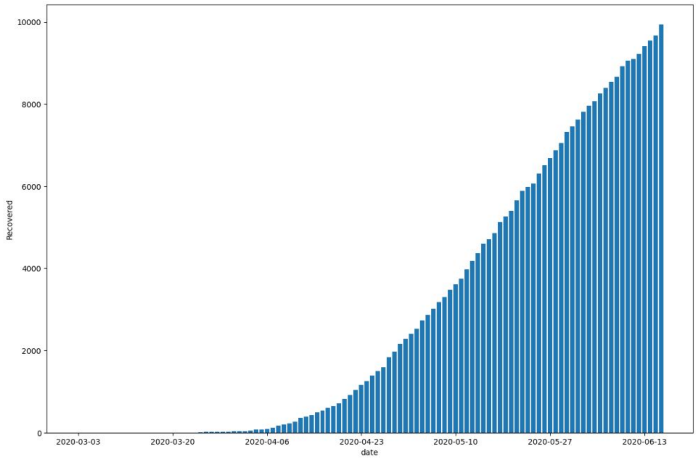


Results

Death curve

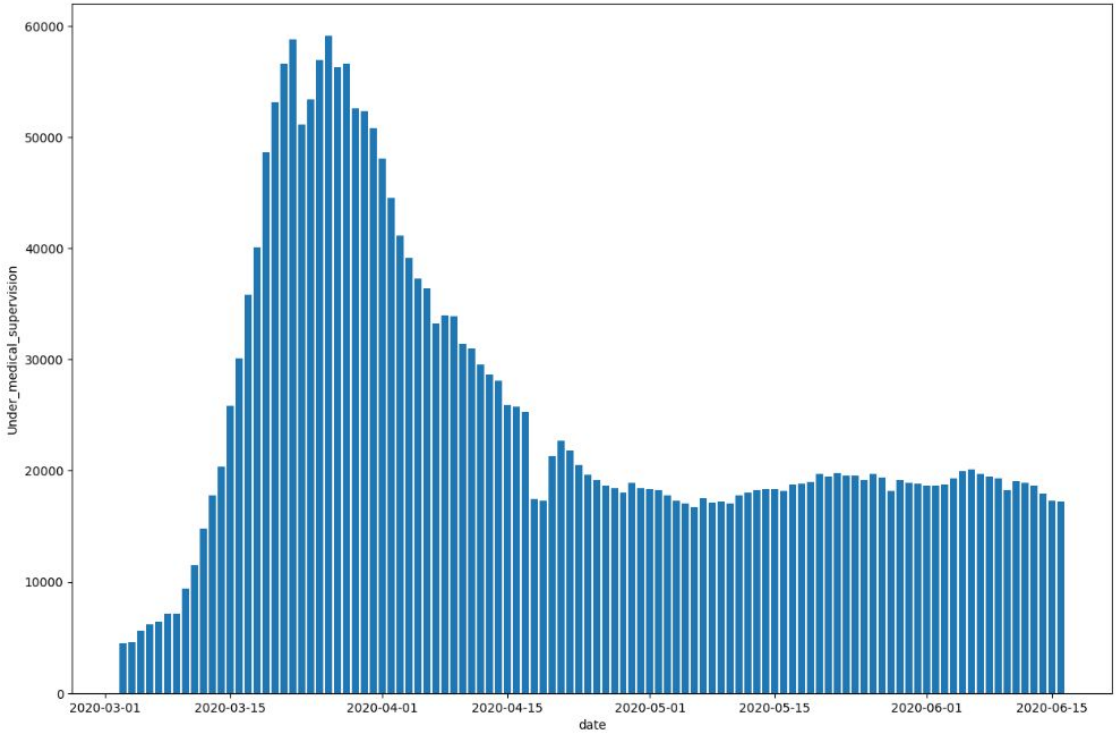


Recovered



Results

Under medical supervision



Results

Let’s have a look at Pearson correlations of negative posts and dataset variable

twitter_sentiment_pl_base

	Recovered	Deaths	Under medical supervision	Confirmed	In quarantine	In the hospital
neg %	-0.48	-0.50	0.25	-0.49	0.002	-0.21
neg count	-0.62	-0.74	0.46	-0.73	-0.36	-0.58

twitter-xlm-roberta-base-sentiment-finetunned

	Recovered	Deaths	Under medical supervision	Confirmed	In quarantine	In the hospital
neg %	-0.169	-0.191	0.071	-0.193	-0.117	-0.12
neg count	-0.45	-0.549	0.221	-0.55	-0.426	-0.525

Results

Let’s have a look at Pearson correlations of negative posts and dataset variables

sliding window smooth

twitter_sentiment_pl_base

	Recovered	Deaths	Under medical supervision	Confirmed	In quarantine	In the hospital
neg %	-0.948	-0.966	0.276	-0.961	-0.37	-0.641
neg count	-0.76	-0.85	0.46	-0.85	-0.45	-0.67

twitter-xlm-roberta-base-sentiment-finetunned

	Recovered	Deaths	Under medical supervision	Confirmed	In quarantine	In the hospital
neg %	-0.527	-0.652	0.432	-0.640	-0.380	-0.574
neg count	-0.672	-0.779	0.349	-0.783	-0.538	-0.696

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Conclusion

From the conclusions, it is strange that negative posts have no correlation with the number of deaths. this is most likely due to population fatigue over time.

Thank you for your attention! Python notebook and a github blog are also provided