Natural Language Processing

Maciej Nalepa
maciej.nalepa@alu.uclm.es

Piotr Maliszewski
piotr.maliszewski@alu.uclm.es

Gökay Iseri
gokay.iseri@alu.uclm.es

Başar Milli
basar.milli@alu.uclm.es

ABSTRACT

In the time of hate speech it is important to be able to detect such a things in the internet. However it is a hard task, because one cannot classify something that is not a hate speech as it, because it would cause unfortunate consequences to a user.

CCS CONCEPTS

• **Computing methodologies → Machine learning**.

KEYWORDS

machine learning

ACM Reference Format:
Maciej Nalepa, Piotr Maliszewski, Gökay Iseri, and Başar Milli. 2021. Natural Language Processing. In *Proceedings of ACM Conference (Conference'17).* ACM, New York, NY, USA, 2 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

1 PROBLEM DESCRIPTION

We have been working with tweeter speech type data set. The aim of that task was to classify tweets as hate speech, offensive or neither. We had information about the class that a tweet should be classified. The classification should be based on the processing of tweet content - used words and phrases. As usually in natural language processing, tweets have been full of grammatical mistakes, slang, and many other features that were interfering. They had to be removed.

The code and source files are available at https://github.com/GummyBearStudioTeam/ESI_MLTechniques.

2 METHODS AND MATERIALS

2.1 Classification

Two regressors have been used - Random Forest and LinearSVC, although results of the confusion matrix do not differ.

2.2 Dataset for testing

We used 70% of the dataset for training and 30% for testing.

Conference'17, July 2017, Washington, DC, USA

ACM ISBN 978-x-xxxx-xxxx-x/YY/MM…$15.00
https://doi.org/10.1145/nnnnnnn.nnnnnnn

3 EXPERIMENTS

We have been checking the data to analyse what may be needed. To purify some data we removed repeating more than two times letters, which is not permissible according to English grammar. For example "likeeee" became "like". We also replaced emoticons with some emotion names. For example a happy emoticon would become a string "smile" or "happy". Most of emoticons were also removed, because they do not contain any important for the topic meaning. Contractions have been replaced with their equivalents. Also some abbreviations have been change to their standard form. As "idk" to "I do not know". Some slang words have been also changed to their standard form. For example "ya" to "you" or "dem" to "them". Last two features of our implementation haven't been caught by the word corrector

4 RESULTS

The results of confusion matrix are shown below.

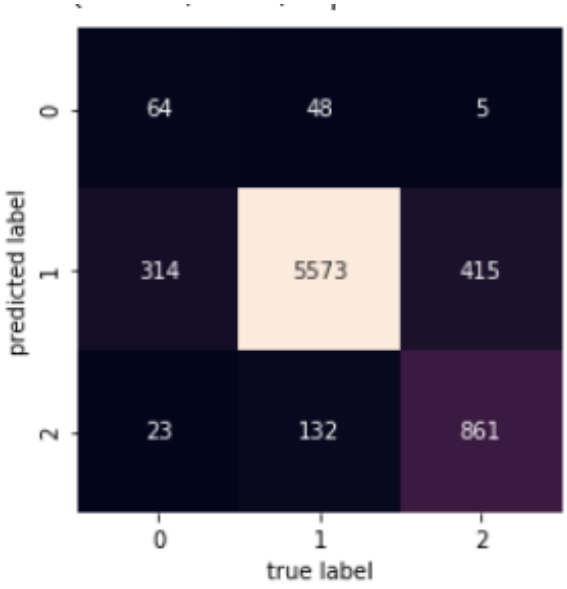

Figure 1: Confusion matrix

	precision	recall	f1-score	support
0	0.16	0.55	0.25	117
1	0.97	0.88	0.92	6302
2	0.67	0.85	0.75	1016
accuracy			0.87	7435
macro avg	0.60	0.76	0.64	7435
weighted avg	0.92	0.87	0.89	7435

Figure 2: Classification report of Random Forest

	precision	recall	f1-score	support
0	0.55	0.16	0.25	401
1	0.88	0.97	0.92	5753
2	0.85	0.67	0.75	1281
accuracy			0.87	7435
macro avg	0.76	0.60	0.64	7435
weighted avg	0.86	0.87	0.86	7435

Figure 3: Classification report of Linear SVC

Algorithm made a lot of mistakes with the first class. Which is because a task of classifying hate speech is not an easy thing to do for computers. And often require knowing the context. The second category was classified quite properly, however a lot of values have been misclassified due to the amount of data classified that way. The last category has not an error so big as the first one.

ACKNOWLEDGMENTS

This work is part of UCLM project of the Machine Learning Techniques subject. Group PMG.