Classifying cyberbullying on the Twitter dataset

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I. Dataset

The dataset I used originates from the article SOSNet: A Graph Convolutional Network Approach to Fine-Grained Cyberbullying Detection [referencia], which can be found on Kaggle [referencia]. It contains over 47000 tweets, which were manually classified into the following cyberbullying categories: age, ethnicity, gender, not cyberbullying, other forms of cyberbullying and religion.

II. Classification pipeline

A. Pre-processing

Before creating the classification pipeline, a few pre-processing steps were taken:

a) Removing mentions: Since mentions don't bring any value to the classifier, I decided to remove any word that starts with the character '@'. In order to do so, I used Python's regular expressions library [referencia] to modify the tweets and remove any mentions.

b) Lemmatization: I used Lemmatization [referencia] to .

B. Creating the pipeline

I used Logistic Regression [referencia] to

III. Evaluation

The classifier was run 10 times, with the data shuffled each run. The accurary score of each pipeline was stored along with its corresponding pipeline. Then, I took the pipeline whose accuracy was closest to the average accuracy of all pipelines as to avoid overperforming or underperforming pipelines and obtain a more reliable representation of the model's performance.

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age
-> schools, bullied, bullies, bully, school

ethnicity
-> coon, dumb, colored, nigga, nigger

gender
-> female, sexist, notsexist, rape, feminazi

not_cyberbullying
-> daesh, mosul, andre, beatdown, mkr

other_cyberbullying
-> harassment, code, bullied, idiot, blameonenotall

religion
-> muslims, mohammed, islam, muslim, christian
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Fig. 1. Top five words for each class of cyberbullying

I will now give a brief analysis the results of each class of cyberbullying as shown in Figure 1.

a) Age: All top words are strongly linked to bullying in schools, which indicates that age-based cyberbullying usually occurs in educational environments.

b) Ethnicity: Most words are slurs aimed at African-American people, reflecting ethnicity-based cyberbullying.

c) Gender: Words like female and sexist indicate possible gender discrimination, while more extreme words like feminazi and rape indicate misogynistic behavior.

d) Not cyberbullying: Results don't point to anything.

e) Other cyberbullying: Harassment and idiot could point to types of cyberbullying that were not included in the dataset.

f) Religion: All top words are related to religion, but are not related to cyberbullying specifically. This could indicate a bias in the dataset, since harmful are the majority.

IV. Dataset size

Dataset

V. Topic analysis

Topic

References

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