

Fake News Accuracy using Naive Bayes Classifier

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Abstract---This paper helps us to detect the accuracy of the fake news using Naive Bayes classification. Here the data is divided into test dataset and train dataset and the train dataset is divided into groups of similar information. Test data is later matched with these groups and accuracy is found using Naive Bayes classifier. It helps in knowing whether a given news is fake or real. It provides maximum accuracy and helps to determine the fake news

Keywords—Machine Learning, Fake News Classification, Probability.

I. INTRODUCTION

The news information can be easily accessed through Internet and social media. It is convenient for user to follow their interest events available in online mode.

Mass-media playing a huge role in influencing the society and as it is common, some people try to take advantage of it. Sometimes mass media modulate the information in their own way to reach their goal. There are many websites which provide false information. They consciously try to bring out propaganda, hoaxes and misinformation under the guise of being authentic news.

Their primary purpose is to manipulate the information that can make public believe in it. There are lots of example of such websites all over the world .Therefore, fake news affects the minds of the people. According to study Scientist believe that many artificial intelligence algorithms can help in exposing the false news.

This is because the artificial intelligence is now a days be coming very popular and many devices are available to check it partially.

In this the deep learning and machine learning concepts are used to detect the fake new using naïve Bayes classifier. The data set is loaded for which the news is to be classified and then the data is to be split as test and train data and pipelining is to be done to detect the accuracy.

As the fake news is increasing day by day the people are not believing even if the news is real and this drifts the thoughts of the common people from the real issue.

II. EXISTING SYSTEM

There are projects which are being done in this domain which use algorithms such as Hybrid Cloud approach to detect the fake news. But such algorithms have very less accuracy and take more storage.

This algorithm uses human as input sometimes, so the risk that the data given by a single human is very high which hinders the accuracy of the fake news detection so an algorithm with a efficiency greater than the current algorithm is needed.

Hybrid approach based models need lager data sets to train the data and this method also does not sometimes classify the data so there is a higher risk of matching with the unrelated data which in turn will affect the accuracy of the news.

III. PROPOSED SYSTEM

The proposed system uses naïve Bayes algorithm for detecting the fake news, it has a higher accuracy level. The data is divided here into two parts (test and train). The train data is trained and is classified into groups with similar datasets. After the data is trained the test data is assigned to the group which has similar characteristics with the group. Now, the naïve Bayes algorithm is used to detect the accuracy of the fake news with which spams can be stopped.

Also here weights are given to each and every individual word, the least important word is given less weight and most important word is given most weight. Also the tfidf vector is used to count the number of word and also the number of unique words is counted and at the same time the weights are allotted to each and every word.

In this way the unimportant words are not taken into consideration and the accuracy of only important words are matched and detected from the dataset, this saves the time to detect the accuracy of the news.

IV. NAIVE BAYES CLASSIFIER AND ITS USES

In machine learning, naïve Bayes classifiers are the part of simple machine learning. Naive Bayes is popular algorithm which is used to find the accuracy of the news whether its real or fake using multinomial NB and pipelining concepts . There are number of algorithms that focus on common principle, so it is not the only algorithm for training such classifiers.

To check if the news is fake or real naïve Bayes can be used.

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It is a kind of algorithm is used in text classification. The use of token is correlated with the news that may be fake or not fake in naïve Bayes classifier and then the accuracy of the news is calculated by using Bayes theorem.

V. NAÏVE BAYES FORMULA DETAILS

The following is the formula for naïve Bayes classification uses the probability of the previous event and compares it with the existing event .Each and every probability of the event is calculated and at last the overall probability of the news as compared to the dataset is calculated.

Therefore on calculating the overall probability, we can get the approximate value and can detect whether the news is real or fake .

$$P(A|B) = P(B|A) \cdot P(A) / P(B), (1)$$

Finding the probability of event, A when event B is TRUE

P(A) = PRIOR PROBABILITY

P(A|B) = POSTERIOR PROBABILITY

FINDING PROBABILITY:

$$P(A|B1) = P(A1|B1) \cdot P(A2|B1) \cdot P(A3|B1) (2)$$

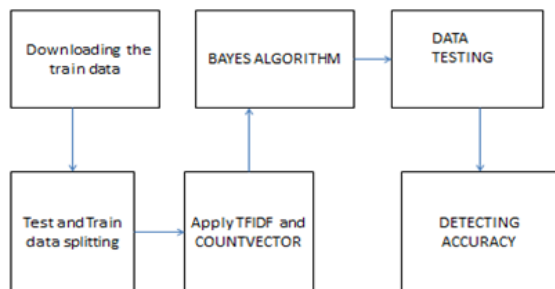
$$P(A|B2) = P(A1|B2) \cdot P(A2|B2) \cdot P(A3|B2) (3)$$

If the probability is 0

$$P(\text{Word}) = \frac{\text{Word count} + 1}{(\text{total number of words} + \text{No. of unique words})}$$

Therefore, by using this formula one can find the accuracy of the news.

VI. SYSTEM ARCHITECTURE



The first step in the detection of fake news is extracting the training data either by downloading it from a file or from online.

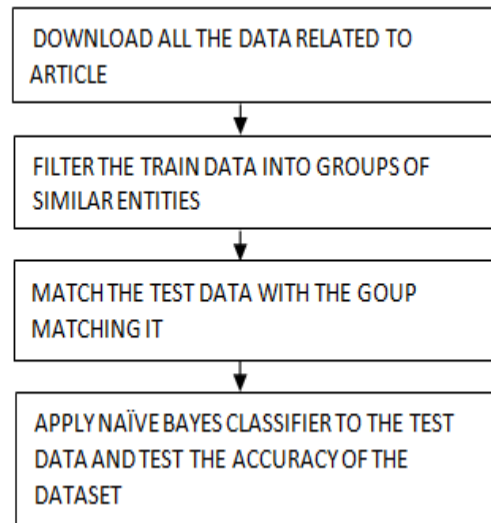
There are two methods to count the words. The Fit method and the Transform method. The fit method is used to give a specific serial number to each and every word and the transform method is used to count the number of times a particular word is occurring in the data set. Instead of using both the methods separately we can use it as a whole single method called fit transform method which helps us in saving both the space and time.

Term frequency is required to count number of times a word is occurring, and inverse document frequency is used to give weight to the words. It gives maximum weight to the most important words and minimum weight to the least important words. So, we club both the methods into a single method to save the time and space in the detection called as tfidf which calculates the height of a particular word.

Now the dataset is split into two parts that is test and train dataset. Now multinomial Naïve Bayes algorithm is used to classify the train data in groups of similar entities. The

test data is no matched with the group of the train data it's matching with. After the data is matched naïve Bayes algorithm is applied to the test dataset and the probability of each and every word is checked and approximate percentage value is calculated and in this way the accuracy of the fake news is determined. Therefore, in this way it is determined whether a given news is fake or real.

VII. MODULE FLOW



First extract all the data which is to be checked or download it if available and then divide the data into test and train, train the data and then apply Bayes theorem in this way Naïve Bayes theorem is applied.

A. Data Pre-processing

This contains all the data which must be checked thoroughly and preprocessed. First, we go through the train, test and validation data files then performed some pre-processing like tokenizing, stemming etc. Here the data is checked thoroughly if it has missing values.

B. Feature Extraction

In this dataset we have done feature extraction and selection methods from scikit and python. To perform feature selection, we use a method called as tf-idf. We have also used word to vector to extract the features, also pipelining has been used to ease the code.

C. Classification

Here the classification of the data is done in to parts that is test data and train data and the train dataset is classified into groups with similar entities. Later the test data is matched, and the group is assigned to whichever it belongs to and then further the Naïve Bayes classifier is applied and the probability of each and every word is calculated individually.

If the word whose probability is to be calculated is not available in the dataset of the train data then the Laplace smoothing is applied here. Finally, the data is determined if it's fake or real.



D. Prediction

Our finally selected and best performing classifier was algorithm which was then saved on disk with name file_modal.sav. Once you close this repository, this model will be copied to user's machine and will be used by predict.py file to classify the fake news with accuracy. It takes a news article as input from user then model is used for final classification output that is shown to user along with probability of truth.

VIII. CONCLUSION

Therefore by using naïve Bayes theorem we can conclude that any news from a large or small dataset can be classified as fake or real news by matching it with the previous dataset values in less time which in turn helps the users to believe in a particular news.

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