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Fake news detection by using natural language processing techniques

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ABSTARACT

This project proposes the use of NLP (Natural Language Processing) techniques for detecting 'fake news,' that is, news items originating from untrustworthy sources. Only employing a count vectorizer (using word tallies) or a (Term Frequency Inverse Document Frequency) tfidf matrix to develop a model will get you this far. Is it possible to develop a model that distinguishes between "real" and "fake" news? So, a proposed project would assemble a dataset of both fake and real news and use a Naive Bayes classifier to create a model to categorise a piece of writing as fake or real based on the words and phrases it contains.

KEY WORDS: fake news, real news , natural language processing , countvectorizer TFIDF , naïve Bayes

INTRODUCTION:

News is an important aspect of our lives. Current news is useful in everyday life to reinforce awareness of what is going on across the world. Some people like to watch television news, while others prefer to read newspapers. Any news that is either factually incorrect or misrepresents the facts and spreads virally is considered fake news (or maybe to a targeted audience). It is frequently disseminated through traditional news outlets as well as social media platforms such as Facebook, Twitter, and WhatsApp.

The incontrovertible fact that Fake News closely copies the "style" and "patterns" that real news normally follows is what actually distinguishes it from simple hoaxes like "Moon landing was fake," etc. That is what makes it so difficult for the untrained human eye to tell the difference.

In this research, we use a machine learning approach to suggest a solution to the challenge of detecting fake news. Our research looks into many textual qualities that can be used to tell the difference between fake and real content. Using those properties, we use several ensemble approaches to train a mixture of machine learning algorithms. Because learning models have a tendency to reduce mistake rates by employing strategies like bag of words, stemming, and stop words, they have a lower error rate. These methods make it easier to train various machine learning algorithms.

2. PROPOSED SYSTEM BLOCK DIAGRAM:

The proposed system is depicted in diagram (Fig.). The system architecture is three-tiered, with (1) data, (2) a processing unit for pre-processing, noise reduction, and parameter extraction, and (3) a classifier and model evaluation.

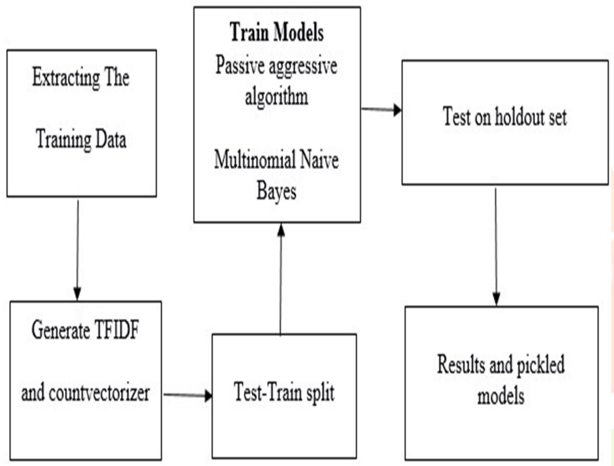


Fig. system architecture

The count vectorizer or a tfidf matrix is used to develop a model in this paper. Because this is a text classification problem, the optimum solution is to use a Naive Bayes classifier, which is commonly used for text-based processing.The real purpose is to create a model for text transformation (count vectorizer versus tfidf vectorizer) and to choose which type of text to utilise (headlines vs full text).

The next step is to extract the most important features for countvectorizer or tfidf-vectorizer. This is usually done by using an n-number of the most commonly used words, and/or phrases, lower cased or not, mainly removing the stop words, which are common words like "the," "when," and "there," and only using those words that appear a minimum of a given number of times during a given text data set.

I.DATASET COLLECTION:

It was challenging to compile a dataset that was both accurate and reliable. We ultimately grabbed a dataset from the kaggle.com website after exploring other datasets. There are roughly 6335 rows and 4 columns in this dataset. The 70:30 rule is used in machine learning, where 70% of the dataset is used to train the module and 30% is used to test it. As a result, we separated our dataset into 5068 training samples and 1901 testing samples. For testing and validation, the 1267 samples are further separated into two classes of 638 and 629 samples.

3. EVALUTION MATRIX:

This model's performance has been improved by the use of several evaluation matrices. The performance of this model was assessed using a number of evaluation indicators. When identifying the news piece as phoney, we thought the outcome was favourable.

- True Positive (TP): When fake news is anticipated to be fake news.
- True Negative (TN): When true news is predicted to be true news.
- False Negative (FN): When bogus news is misinterpreted as actual news.
- False Positive (FP): When true news is misinterpreted as phoney.

$$\text{Precision} = \frac{|TP|}{|TP| + |FP|}$$

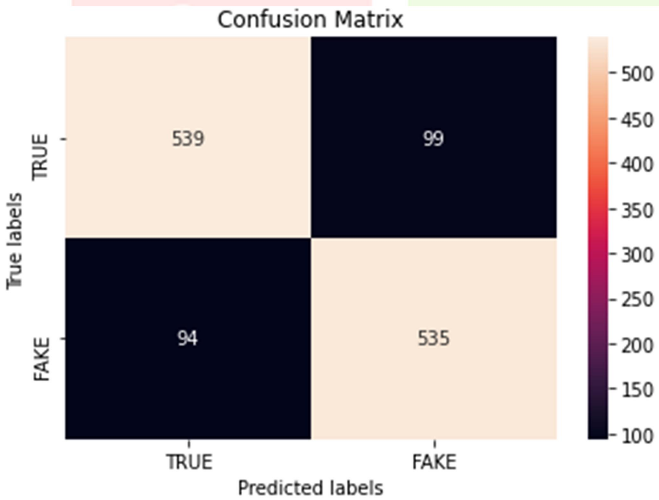
$$\text{Recall} = \frac{|TP|}{|TP|+|FN|}$$

$$F1 = 2.\frac{Precision * Recall}{Precision + Recall}$$

$$\text{Accuracy} = \frac{|TP| + |TN|}{|TP| + |TN| + |FP| + |FN|}$$

4. RECEIVED RESULT:

Figure 4 depicts the results. We discovered maximum accuracy after using the Nave Bayes classifier to evaluate our model. On the test set, this model had an about 85 percent classification accuracy. This model's weight average precision is.85, and its recall is 85. The confusion matrix's row shows the test data's actual class (labels), while the column represents what the classification predicts. The fourth row of the Confusion Matrix shows that 535 news articles are classified as "true negative," while 99 news articles are misclassified as "mixing of true and false," resulting in "false positive." There are 94 news stories that have been misclassified as having "no factual information" and are therefore "false negative."



5. CONCLUSION:

The study found that even a basic AI algorithm (such as a naive Bayes classifier) can accurately classify fake news. As a result, the findings of this study imply that AI techniques could be used to successfully address this critical issue.

6. ACKNOWLEDGEMENT:

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