



Fake News Detection System Using Neural Network

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ABSTRACT

Nowadays, social media is a very important thing in our daily lives. People can't even think about a second without social media. Because of their busy life, people depend more on social media for information, thus increasing its popularity. Social media can be considered as a two-sided coin having its own advantage and disadvantage. These media help people to connect with their family or friends around the world. But the other side of the social media has many disadvantages. It can be considered as the cause of many problems in our society. One such major issue is the fake news. People were unable to distinguish the true and fake news and also about the credibility of the news and the news provider. They blindly believe the news without knowing the truth and they share the news with others. As a result, the fake news spread faster than the true news. By this, many people and organizations get affected. So, in a world of increasing fake news, a fake news detection system is an essential thing.

This project deals with fake news. The system is a Webapp named ALIKAH- a fake news detection system. It is just like social media network where the news providers can provide the news. This system distinguishes the fake and true news among the news provided in the Alikah system. There are three modules in this system-the admin, news providers and the users. Admin manages and monitors the system and its functionalities. News providers can provide the news to this system after getting permission from the admin and the user can view, like, comment, report and subscribe to the news and the news provider. Neural network is used as the classifier. This system detects the fake news by checking the credibility of the news provider, monitoring the comments and also by

checking the relation of the heading and content of the news provided. It also helps to detect the fake news spreading on other social media like Facebook, by using its heading and content. This system definitely will be a beneficiary to the people and organizations which get affected by the news and also help to find the providers of these news.

Key words: Neural Networks, Fake, Deep, Sentimental

1. INTRODUCTION

Newspaper, radio and television were the mediums through which we consumed news. In Traditional news process, a professional creates the content this is then edited for content and language by editors in the media. Very few people control editing, publication and amplification stages. So traditional news medium preserved the credibility of the news. But when we entered into the internet age, the traditional process where a single point controlled and assured the quality of the news changed. Anybody in the internet world can create, share a news without looking the credibility of the news. It is less expensive to consume news from social media rather than traditional news medium. It is easier to circulate the news in social media through share button. People use social media to upload and share their achievements. Social media can also be considered as a medium to acquire popularity. As the use of social media increases, people started using social media for getting information online. Besides these advantages provided by the social media the quality of the news is a question. As it is easy to create and spread news through social media, spreading of fake news increased. Fake news is the news that contain false information whose intention is to mislead the people. Sometimes it is for some financial and political gain. Some of the examples of fake news that that occurred in the Kerala flood time were the announcement of

the financial assistance by UAE government to the flood affected people, the supply of food packages to the people in Kerala by LULU group. But it was a fake news which affected the rescue operation at the time of flood. It wasted the money and time for rescue operation. These examples show that the spreading of fake news have a serious impact on individuals and society. Fake news detection system is an emerging research area in natural language processing. This paper introduces ALIKAH –A FAKE NEWS DETECTION SYSTEM to detect the fake news by checking the credibility of the news provider, monitor the comments and check for the relation between the title and contents.

2. OUR SYSTEM

This paper introduces ALIKAH- A Fake News Detection System, to detect the fake news that is spreading in social media. Alikah is a web app just like a social media network which will detect the fake news provided in the Alikah system. The three modules in the system are News providers, Users and Admin. News providers provide the news in the ALIKAH system after they login. Users can check a news in other sites and conclude whether it is a fake news or not. Admin can control the entire action. This system works by checking the credibility of the news provider, monitoring the comments, and checking the relation between news title and its content.

3. METHODOLOGY

The methodology is creating a neural network model that will classify a news into fake or not and natural language toolkit for preprocessing the news. The methodology of this work includes testing and training phase. Clickbait detection(There is no relation in heading and content) is kind of fake news. Train the neural network for the clickbait detection using the dataset from clickbait challenge site. In the training phase, the system would be trained about the relationship[1,2] between title and content, comments posted by the users and then classify the comments into positive and negative comments and also the rating of the news provider will also be taken. And all it would be saved using feed forward neural network and by the time of testing we can check whether the saved datasets work efficiently or not. The figure 1 below shows the methodology of the project.

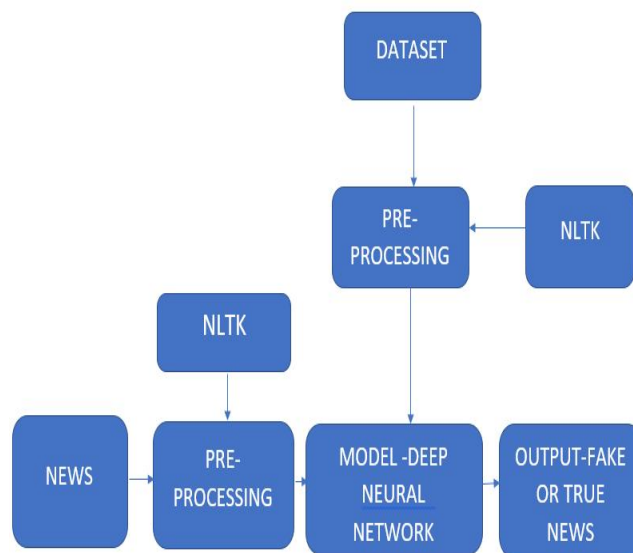


Figure 1: Methodology

3.1 Feature extraction and preprocessing

Preprocessing of the data is performed before processing the data. This includes removing stop words, stemming, lemmatizing and converting all text to lowercase. Stop words are the most common word in English like THE, THAT etc. Stemming and lemmatizing deals with converting a word into base form. This produces a comma separated list of words. And for avoiding the processing bottleneck that is repeating the same over and over in the python memory like in this project the training of a classifier. So, after saving the trained classifier as pickle and then load the pickle file.

3.2 Model- Deep neural network[2]

Artificial neural network process information in the same way as our brain. As the brain contains many neurons artificial neural network or ANN also contain many neurons to solve specific problems. As humans, ANN also learn by example. ANN has the ability to understand how to do a specific task based on the data given during training phase. And also it can creates its own representation of the information it receives during the training phase. The neural network itself finds a way to solve a particular problem. It does not need a specific algorithm for problem solving. This project is using feed forward neural network in which signals travel from input to output and there is no loop. Every neural network has a input layer, hidden layer and output layer. In our model we have 3 dense layer each of which has 256 neurons. A weight is associated with each layer. The knowledge[3,4] which neural network posses is defined by these connections weights. Information's are stored in the weight matrix W of the neural network. Training phase/ learning is the determination of the weights. And we are using Rectified linear unit as the activation function. RELU speed up the training. RELU

function is $f(X) = \max(0, X)$. Its value is zero or one depending on the sign of X . Any negative element is set to zero and others as one. As the figure 2 shows when a news is given to the system, it is first preprocessed by the NLTK techniques. Later it is we create a bag of word fs for the article and it is given into the neural network model and at the output layer the output score will give you the classification of the news into fake or not.

3.3 Sentimental Analysis

Sentiment analysis is the process of determining whether a writing is positive or negative. This project also classifies the comments into positive and negative comments for determine whether a news is fake or not. Naive Bayes [5] classifier is used as the classifier in the sentimental analysis procedure. This classifier works by pointing out the probability of different attributes with a certain class. This is based on the bayes theorem.

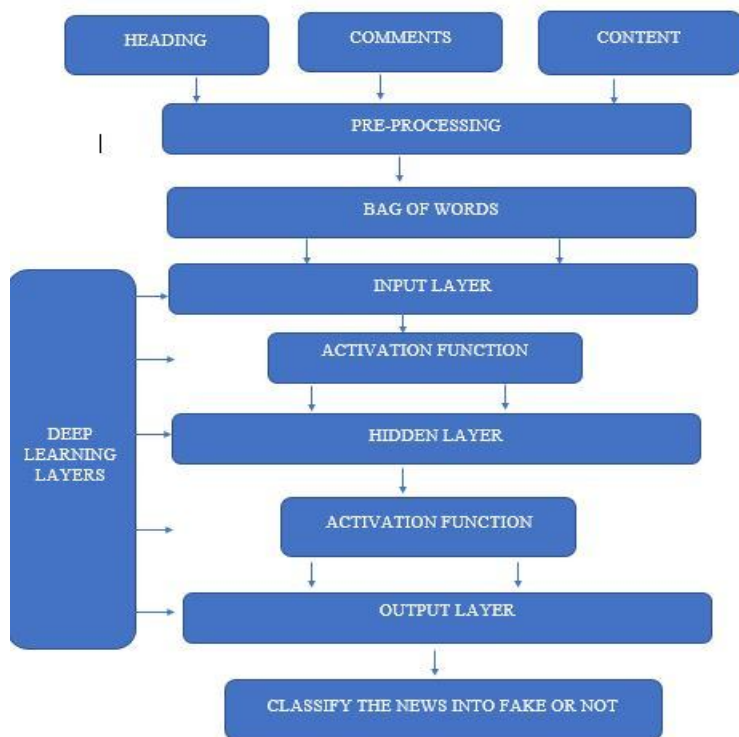


Figure 2: Methods included in classification of a news

4. CONCLUSION

As part of the project work we decided to work on an area which is socially relevant and so we decided to work on fake news detection as it is a needed thing in today's world. Today people are consuming daily news they need, from social media rather than from traditional media. With increasing

popularity of the social media among today's world, more fake news is circulating in the social media which have a great negative impact on society as well as in individuals. We reviewed the current scenario and we came to a conclusion that this fake news detection system is an inevitable thing in today's world for ensuring the credibility of the news we go through daily. By using the deep learning methods in our work, we check whether the circulated news is fake or not. We want to extend this work by performing analysis on datasets such as Twitter and Facebook. [3]

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