JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Fake News Detection using Machine Learning

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Abstract : In today's world, the use of internet is increasing day by day. Most people use the Internet every day for commercial and non-commercial purposes. Today, most of the people uses social media platforms including Facebook, Twitter and Instagram . Through these platforms, people are connected with each other online. These platforms are beneficial for the people, but problem is also coming due to its use which includes spreading fake news which results in negative impact on the people and society. The objective of this paper is to make people aware about the spread of fake news and reduce it by using machine learning approach.

IndexTerms **- Machine learning, Social media,Fake news.**

I. INTRODUCTION

Today, the whole world uses the internet. The use of internet gives you all kinds of information and any work you do instantly. Social media platform is also a part of internet service. Using social media, you can interact with your friends and relatives online. We can also talk to people across the seven seas with the help of these social networking sites. The use of internet has made the whole world digital today. Today, almost everything is done online. With the help of online internet services, we can do any work from home today. The digital world has many advantages but also some disadvantages. One of the disadvantages is the fake news

Social networking platforms are widely used for commercial and political purposes. Merchants also post many business related advertisements on social media. Some political organizations also resort to social networking sites for propaganda. But sometimes social networking sites spread false news about these political organizations or businesses which bring them into disrepute in the society and cause them great harm in their business. The purpose of this research paper is to reduce the spread of such false news in the society and to detect it using machine learning. How Fake News arrives and spreads in our society i.e Life Cycle of Fake News is given below in below figure 1 :-

Figure-1 : Life Cycle of Fake News

II. METHODOLOGY

Now a days, the use of World Wide Web and social media platforms like Facebook, Twitter and Instagram are very increasing. These platforms provide us all kinds of information and by using it, we also get to know about current affairs. But sometimes these platforms are also responsible for spreading false news in our society. This type of news misleads people and spreads much faster than other genuine news resulting in offline violence and chaos. With the help of machine learning, we can detect fake news and stop it from spreading. In the section below, we will discuss machine learning supervised classifiers to detect fake news, reasons for using machine learning for detection of fake news, and training given to machine learning Classifier to detect Fake News.

1. Machine Learning Supervised Classifiers to Detect Fake News:- Machine learning algorithms used to detect fake news are given below :

(a) Support Vector Machine :- This is a most superintended algorithm which is learned from labelled dataset and is mostly used in binary classification which is available in several kernel functions. This model estimates a hyperplane .it is also used to solve regression. Applications of SVM :- 1)Text & Hypertext 2)Image classification 3) Satellite classification 4) Transcribed Characters

(b) Logistic Regression :- It is mainly used for binary classification to check that an email is spam or non- spam diabetic or presuming this Diabetic or non-diabetic zero or one (true/false). this classification underlying principle of simple linear regression.

(c)Random Forest :- Random Forest is also known as bootstrap aggregation. It is a superintend machine learning technique which is use to assemble numerous decision trees. The ultimate decision is based on the repercussion Of the majority of the decision trees. Decision tree abide from low bios and high variance. Random forest flexibility and transforms high variances / low variances.
Step 1: compose bootstrapped dataset.
Step 2: compose decision tree with the help of the bootstrapped dataset.
Step 3: repeat step 1 and step 2 to get innumerable or necessary number of decision tree.

(d)Naive Bayes :- This technique is also used for the classification and it checks that the news is real or fake. Many researchers use this machine learning classifier for the detection of false news. The use of token is associated with the news that might be real or fake in Naive Bayes classifier . the precision of the news is estimated by using Bayes theorem.

(e) Recurrent Neural Network :- Recurrent neural network is also useful for detecting false news. Many researchers use recurrent neural network to verify whether the news is true or false.

(f)Neural network:- There are several machine learning algorithms that are used in classification . One of them is neural network. Today many researchers use this classifier to detect the fake news.

(g) K-Nearest Neighbor :- This is the superintendent algorithm of machine learning use to solve classification problems. This classifier collects data of all cases on the basis of similarities to verify new cases. Now researchers use these classifier to identify false news on social media.

(h) Decision Tree :- This super algorithm of machine learning helps in detecting false news. This algorithm divides the dataset into several smaller subgroups. Today, researchers are using different machine learning classifiers, and one of them is the decision tree. They use these machine learning classifiers to detect fake news.

2. Reasons for using machine learning to detect fake news :- Increasing use of internet and social media platforms are responsible for spreading fake news in our society. From the use of share option of these platforms, the false news quickly propagates. Fake news harms reputation of not only an individual but also any organization or business in our society. So it is essential to control spread of fake news .it is difficult for most of the people to differentiate between real and false news. The question comes to light that what should we do to control fake news and stop it from spreading. Machine learning helps to detect and control fake news quickly. When an individual or an organization posts the fake news, machine learning examine the details of that particular post and detect it as false news.

3. Training given to machine learning classifiers to detect fake news :- The training of machine learning classifiers is one of the most important tasks which plays an important role in the precision of the outcome of these classifiers. Classifiers should be trained in accurate way with particular data sets. Different researchers train these machine learning classifiers to detect fake news. Training dataset in an imbalanced form is the main problem arises while training these classifiers. To train these classifiers, researchers use three different models i.e. TF-IDF Model, N-Gram Model and Bag of Words Model. Researchers use training dataset for the training purpose. These researchers remove unnecessary words and these words are converted to its single form. So the training dataset which is given to classifiers should only have the precious data. After training, classifiers then use for experiments. The steps use while training the classifier for Fake News Detection are given in the following figure 2. :-

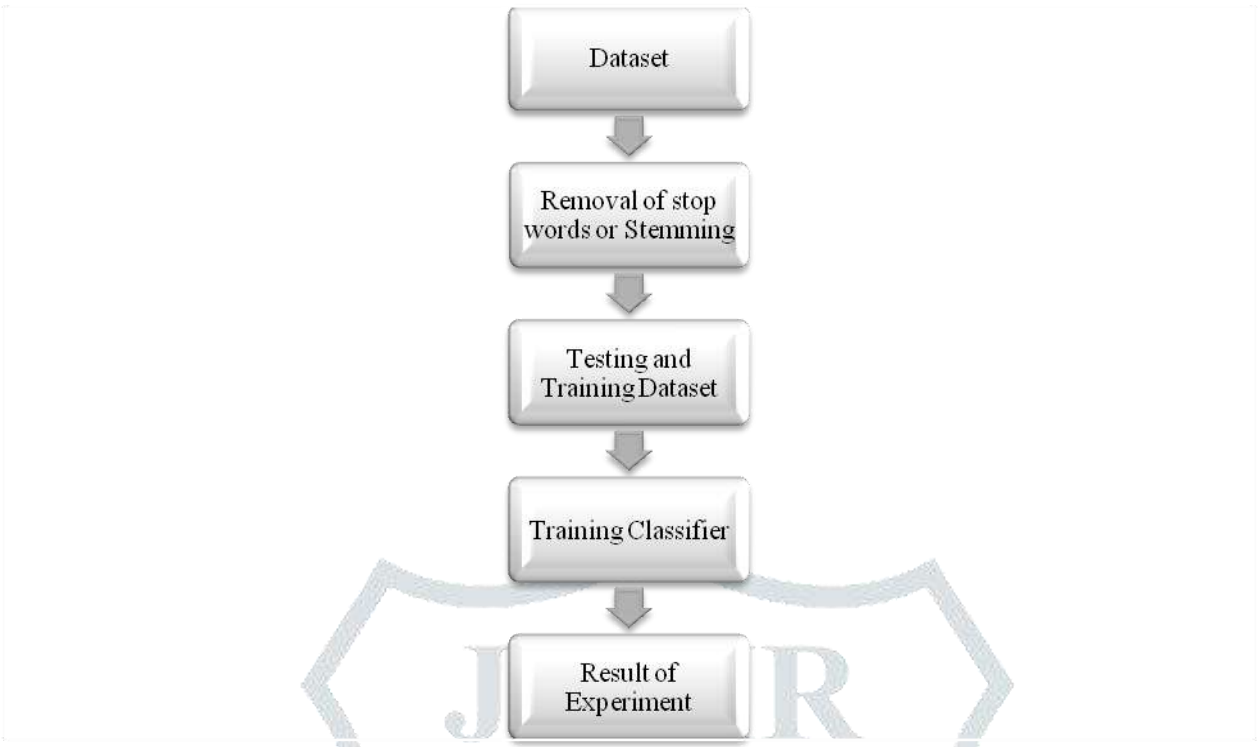

Figure-2 : Steps use while Training a Classifier for detection of Fake News

III. LITERATURE REVIEW

1)Fake News Detection Using Naive Bayes Classifier- R.J. Poovaraghan, M.V. Keerti Priya, P.V. Sai Surya Vamsi, Mansi Mewara and Sowmya Loganathan .Published in the year in 2019 in PDIT, Hospet, Karnataka :- This paper shows a simple approach for detection of fake news using Naive Bayes classifier. In this paper, the dataset is divided into test dataset and train dataset. The train dataset is further divided into groups containing similar information. Then test data is matched with these groups and accuracy is calculated using this classifier. It helps to verify whether the news is true or fake with maximum accuracy.

2) Fake news detection in social media-Kelly Stahl. Published in the year 2018 in California State University Stanislaus, 1 University Circle, Turlock :- In this paper , Linguistic Cue, Network Analysis,Naïve Bayes Classifier, Support Vector Machines and Semantic Analysis are used to detect false news on social media . This paper proposes a three - part method Using Naive Bayes, Support Vector Machines, and Semantic Analysis which is an accurate for detection of fake news on social media.

3)Fake news detection using random forest and decision tree - Reham Jehad and Suhad A. Yousif. published in the year 2020 in Al-Nahrain Journal of science (ANJS). This paper a simple approach for fake news classification using random forest and decision tree .In this paper, the accuracy achieved using random forest is 84.97% and decision tree is 89.11%. This paper concludes that decision tree is better than random forest for the classification of fake news because decision tree achieves more accuracy than random forest.

4)Fake News Detection: A Survey of Techniques - Pallavi B. Petkar & S.S.Sonawane Published in the year 2020 in International Journal of Innovative Technology and Exploring Engineering (IJITEE) . This paper performs survey machine learning techniques for detection of fake news.the goal of this paper is to give brief summary on datasets and machine learning techniques which performs an important role in fake news detection.In this research work, Neutral network gives highest accuracy of 90% in most of the research work.

IV. CONCLUSION

Today, with the increasing use of the Internet, false news is becoming more and more common. A Large number of people use the internet and social media platforms on a daily basis. There is an extreme need to Stop the spread. The machine learning classifier is used for many purposes and is also used to detect and reduce The dispersion of bogus information. The classifiers are trained with dataset which is called training dataset. After Training dataset , classifiers can easily detect fake news. In this paper, we discussed about the machine learning Classifiers , training given to machine learning classifiers and reasons for using machine learning classifiers in the detection of fake news. The objective of this paper is to explain the role of machine learning in fake news Detection.

V. ACKNOWLEDGEMENT

We would hereby like to express our gratitude to our Mentor, Prof. Prajakta Singham for her exceptional support without whom this paper and the research behind it would have not been possible. We have been truly benifited by her valuable thoughts, suggestions and ideas .We thank her for her constant words of encouragement and patience throughout the work.

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