Analysis of Various Techniques for Fake News Detection

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Abstract - The major objective of textual information retrieval is to process, search and analyze the factual data from various applications. There are various textual contents however, which express some subjective characteristics. Such content mainly includes the opinions, sentiments, attitudes, and emotions which contribute majorly within the fake news detection mechanisms. The fake news detection procedure has four major steps involved in it. In the initial step, the pre-processing of data is done from which the features will be extracted in the second step. The extracted features are given as input in the third step in order to classify the data for attaining fake news. With the help of existing patterns, some more patterns are generated with the help of pattern based technique which is applied during the feature extraction process. This results in enhancing the accuracy of data classification. Python is used for implementing the proposed algorithm with the help of NLTK tool box. As per the achieved simulation results it is seen that there is a reduction in the execution time and an enhancement in accuracy.

Keywords *- Information extraction, NLTK, Classification, Tokenization, Patterns based approach*

I. INTRODUCTION

This process involves the matching of a search keyword by a user with the documents that are related to it and contain that topic related information which is meant for a user. However information exchange is different as its goal is to take out information from any unstructured document which is readable to machine. This process relies on natural language processing which ultimately leads to human language processing. Systems which are compatible with information retrieval are expected to cater regular necessities like affordability, adjustment with new domains and enhance development for proper functioning [1]. Number of web-based search engine type's productive systems has been produced by study on information retrieval. The text understanding system is not very attractive and the information extraction system difficulty lies in between these two categories. There has been a growing interest in developing systems for information extraction, of which this volume is just one indication. A terrorist report, a template of extracted information confluence of need and ability observing what is possible with current natural language processing technology, and how the possible may indeed be useful. An enormous amount of information exists only in natural language form. If this information is to be automatically manipulated and analyzed, it must first be distilled into a more structured form in which the individual "facts" are accessible [2]. Fake news has existed for a very long time, nearly the same amount of time as news began to circulate widely after the printing press was invented in 1997. However, there is no agreed definition of the term "fake news". A narrow definition of fake news is news articles that are intentionally and verifiably false and could mislead readers [3]. There are various types of classifiers utilized within these systems.

k-Nearest Neighbor: In this type of classifier, a patter x is classified by assigning class label to it that is most frequently represented among its k nearest patterns. The class with minimum average distance is used to assign a test pattern that shows that this method is sensitive to distance function [4]. The Euclidean distance metric is employed for getting minimum average distance. The k-nearest neighbor classifier is a conventional nonparametric classifier that is said to yield good performance for optimal values of k.

Bayesian Classifier: In supervised parametric classifiers theory, most general approach used is quadratic discrimination. When dealing with d-dimensions the obtained decision boundaries by these classifiers can become very complicated. Most of the discriminant function generation computation has been done off-line. This approach can be more affected by curse of dimensionality as in this quadratic discriminant a large number of parameters need to be considered [5]. In case of small training samples its performance is affected drastically.

Multi-layer Perceptron (MLP): The multi-layer perceptron classifier is a basic feedforward artificial neural network. They have used a single hidden layer initially for simplicity

(simplifies choosing the number of neurons) and then went for two hidden layers for better classification performance. The hidden units were chosen differently for each data set. The number of hidden neurons was found out experimentally over a number of trials.

SVM Classification: SVM is a classification algorithm based on optimization theory and initially developed. Here, an object is viewed as an n-dimensional vector and it separates such objects with an n-1 dimensional hyperplane. This is called a linear classifier. There are many hyperplanes that are used to classify data [6].

II. NEED OF FAKE NEWS DETECTION

Today there are numerous online social media platforms which work as a source to provide important information to the users. Numerous users access this information and share it amongst each other as well. However, this information is not always true. There are numerous fake social platforms as well which provide false information to the users which can result in misleading them. Thus, in order to prevent the spreading of false information amongst the users, the identification of such fake social platforms is very important. However, it is not an easy task to differentiate the genuine and fake social platforms due to the presence of such huge amount of information on the internet. Thus, in order to solve all such issues, a fake news detection technique is to be presented which can reliably help the users to identify which news is genuine. There are numerous research techniques proposed till today which have been reviewed in this research as well.

III. PROBLEM FORMULATION

Today, the social media is being utilized on daily basis by numerous users all over the globe. News related to various fields is gathered by the users and information is also shared amongst each other. The users are misled however, if the news available on the social networking websites is not true. But, the differentiating of real and fake news is itself a very difficult task. Within most of the social networking sites, the reliable and unreliable information is being mixed. The increase in number of online users of social media is the major cause of increment in the news. There is no awareness of the actual news to the youngsters due to which they rely completely on the information given to them through social media platforms. A "right-click authentication" was proposed earlier which helped in authenticating the online information. A review related to the issues that arise due to the presence of false information on online platforms is presented in this paper. In future, improvement is to be done in the classification phase through this work. For data classification, the nearest neighbor technique is applied which can help in classifying the most similar features. Through this method, the accuracy of classification increases along with the reduction in execution time.

IV. LITERATURE REVIEW

Pardis Pourghomi, et.al (2017) presented in this paper [7] a review is presented related to the problems that are faced when wrong information is shared online. Further, the key metrics that are required within the Information Quality fields is improved here. In order to add structure to the complexity of this scenario, the dimensions of Information Quality are proposed to be used. The quality of information that is received by the users is further validated by the measures provided in this paper.

Nikolaos Panagiotou, et.al (2016) studied in this paper [8] that due to the increase in presence of the data within the social media, the event detection mechanism has gained popularity. The large number of event detection algorithms, designs and the evolution methodologies are reviewed in this paper. The potential applications present within the datasets are also studied in this paper along with the various problems that are arising within them. A proper study of the various developments made within this research area is presented in this paper. This provides a basic understanding of the number of challenges that have been removed and the various issues which have to be handled yet. This review helped the researchers in analyzing the existing methods and proposing further studies on the basis of the challenges that still exist.

Manuel Egele, (2015) presented in this paper[9] that the cybercriminals these days have made it very common to compromise the social networking accounts for their own profits. The malicious messages generated by these hijackers are spread across the networking sites by taking control over the accounts present on social sites. Various techniques are to be applied on high-profile accounts to ensure that their identity remains safe and is not compromised. Detection is made reliable with the help of one property that the high-profile accounts have which is that they do not change their behavior with the passage of time. The proposed method was experimented within various scenarios and it was concluded that the deployment of this method within the popular agencies would have prevented them from three real-world attacks.

Arushi Gupta, et.al (2015) proposed in this paper [10] a mechanism in order to detect spammers on the Twitter social network. On the basis of the number of characteristics of the tweet-level and the user-level, this work is proposed. There are three learning algorithms present in this paper which are applied in the proposed method which are Naive Bayes, Clustering and Decision trees. A novel technique which is designed by gathering the merits of three above mentioned learning algorithms is proposed in this paper for identifying

the spammers. On the basis of various parameters such as Total Accuracy, Spammers Detection Accuracy and Non-Spammers Detection Accuracy, the enhancement of the proposed method is computed. As per the results achieved it can be seen that the proposed algorithm has outperformed all the traditional methods. The accuracy is achieved to the highest here and the non-spammers are also identified with this method.

Zhiwei Jin, et.al (2016) studied in this paper [11] the content on images has been highly studied for detecting the fake and genuine content within the microblogs. There are different image distribution patterns present within the fake news and the original news. Thus, in order to detect the fake news the visual and statistical features are studied in this paper which help in characterizing the features present in images. Various experiments were conducted by applying the proposed method on real-time applications. As per the results achieved it was seen that the in comparison to the existing approaches, the proposed method performed efficiently and provided better results.

Nehal Mamgain, et.al, (2016) proposed in this paper [12], a thorough effort to dive into the novel domain of performing sentiment analysis of individuals' opinions with respect to top colleges in India. Other than taking additional preprocessing measures like the expansion of net lingo and removal of duplicate tweets, a probabilistic model based on Bayes' theorem was utilized for spelling revision, which is disregarded in other research contemplates. Moreover, a contrast has been displayed between four distinct kernels of SVM: RBF, linear, polynomial and sigmoid. Multilayer Perceptron Neural Network surpasses the results yielded by the machine learning algorithms owing to its exceptionally accurate approximation of the cost function, ideal number of hidden layers and learning the relationship among input and output variables at every progression.

Aldo Hernández, et.al, (2016) presented in this paper [13], a sentiment analysis method on Twitter content to predict future attacks on the web. The method is based on the daily gathering of tweets from two sets of users; the individuals who utilize the platform as a method for expression for views on relevant issues, and the individuals who utilize it to present contents identified with security attacks in the web. The goal is to predict the response of specific groups involved in hacking activism when the sentiment is sufficiently negative among various Twitter users. For two contextual analyses, it is demonstrated that having coefficients of determination greater than 44.34% and 99.2% can figure out whether a significant increase in the percentage of negative opinions is identified with attacks.

Anurag P. Jain, et.al, (2015) proposed in this paper [14], an approach for examining the sentiments of users utilizing data mining classifiers. It additionally compares the performance of single classifiers for sentiments analysis over ensemble of classifier. Experimental results acquired demonstrate that k-nearest neighbor classifier gives high predictive accuracy. Results likewise demonstrate that single classifiers outperforms ensemble of classifier approach. It can be seen from the test results that data mining classifiers is a decent decision for sentiments prediction utilizing tweeter data.

V. CONCLUSION

For the fake news detection technique, data classification and feature extraction techniques are utilized in the proposed work. In order to provide feature extraction, the N-gram algorithm is utilized and the correlation factor is utilized for classification process. The features that are approximately equal are not classified here by the current correlation factor due to which the accuracy of classification reduces and the execution time increases. In the proposed technique, the similarity will be calculated using Euclidian distance and the features will be classified approximately equally with the help of nearest neighbor classifier. Here, as per the experiments conducted and results achieved the accuracy of the system increases with the reduction in execution time and fault detection rate. The n-gram technique is applied in order to implement the sentiment analysis through which the features of input data will be analyzed along with fake news with the help of classification. The input dataset will be divided into segments with the help of N-gram approach and for the fake news detection; each segment will be analyzed individually.

VI. REFERENCES

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