



e-ISSN:2582-7219



INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH IN SCIENCE, ENGINEERING AND TECHNOLOGY

Volume 6, Issue 4, April 2023



INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.54



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Overview: Fake News Detection using Machine Learning Algorithms

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ABSTRACT: It is becoming simple for people to look for news and information due to convenient get rich entry of speedy boom and proliferation of the data reachable through standard information available through traditional news on social media. Nowadays, a lot of information is shared on social media, and we are unable to tell which information is legitimate and which is fake. The cost and accessibility for posting a news item on social media are both low. The spread of fake news has the potential to have a profoundly negative effect on both people and society. This project aims to develop a powerful machine learning algorithm for detecting fake news.

KEYWORDS: CNN,SVM,KNN,Decision Tree,TFIDF

I.INTRODUCTION

These days rather than going to traditional media outlets, people are tuning to online social media services for news and information. Conventional media outlets, such as newspapers and radio. When first contrasted with the traditional media, the causes of these changes are easily defined. In addition to being less time-money-consuming, social media has made sharing and expressing one's opinion simple and only require a single click. In fact, social networks serve many informational and commercial purposes in addition to serving as a tool for interaction. For other media outlets like newspapers, radio, and television, they are the main rivals.

The way news is produced, shared and consumed has been significantly altered by social media systems, which has led to both unexpected opportunities and difficult challenges. Social media's emergence as a venue for disinformation campaigns that compromise the trustworthiness of the entire news ecosystem is a major issue today. One distinctive aspect of news on social media is that anyone can sign up as a news publisher for no charge. Businesses are moving more and more to social media. Naturally, with this change comes growing concerns about fake news publishers who post "fake" news stories and frequently employ "fake" followers. Because the widespread dissemination of false information can have a detrimental effect on both people and society.

II.LITERATURE REVIEW

There are numerous algorithms available for identifying news. To do that, we analyze data using various classifiers in various research papers. Random Forest, CNN, SVM, KNN, Logistic Regression, Naive Bayes, Long Short Term Memory, and SGD are the classifiers. The accuracy achieved with Random Forest is 83%, the accuracy achieved with CNN is 97%, the accuracy achieved with SVM is 94%, the accuracy achieved with KNN is 79%, the accuracy achieved with Logistic Regression is 97%, the accuracy achieved with Naive Bayes is 90%, the accuracy achieved with Long Short Term Memory is 97%, the accuracy achieved with the combination of SVM &NB is 78%, and the accuracy achieved with SGD is 77.2. In contrast to all High accuracy is obtained by CNN,LR and LSTM.



I. Random Forest

It is a decision tree combination. Each tree will construct a random subset of the training dataset in this case. At each node of the decision tree model, the data set is divided into a random subset of variables.

Sentiment was used as a key feature in their new approach to fake news detection in order to increase accuracy. When compared to not using Cosine similarity, their method produces accuracy that is higher when using TF-IDF with it.[1]

II.CNN

A Deep Neural Network techniques for fake news detection was created by Rohit kumar kaliyar[2]He classified the Fake or Real News Dataset using Convolution Neural Networks, Long Short Term Memory, Naive Bayes, Decision Tree, Random Forest, and K-Nearest Neighbor techniques to identify fake news. When using the CNN method, the accuracy is increased by increasing the network depth. Accuracy, precision, recall, and f1-score values are all decreased in this by using the k-nearest neighbor algorithm. Using the CNN algorithm, he achieved a maximum accuracy of 91.3% in this.

III.Support vector machine

For the purpose of detecting fake news across multiple labels, Tayyaba rasool, Wasi Haide,Arslan shakuat and M.Usman Akram created a multilayered supervised learning Methods.[5]For identifying the fake news, they used the LIAR Dataset. They employed SVM evaluation techniques for Cross Validation, Holdout testing, and testing on test sets. They achieve an accuracy of 39.5% by combining several machine learning algorithms with hold-out, testing, and cross validation for evaluation.

A Comparison of Various Machine Learning Models for Accurate Detection of Fake News was created by Amali D. and Umadevi K. S [7] They employed Naive Bayes' Classifier, Logistic Regression, Decision Trees, Support Vector Machines, and Artificial Neural Networks to detect fake news using the fake news dataset from kaggle.com. They employed the feature extraction techniques Count Vectorizer and TF-IDF Vectorizer. SVM performs better than TF-IDF with an accuracy of 92.8%.

IV.K-Nearest Neighbour

A K-nearest Neighbor classifier techniques was created by Ankit Kesrwani,Sudhakar singh Chauhan and ramchandran nair for detection of fake news on social media[9]. They utilize Buzz Feed news for this. It includes details regarding Facebook news. When K is set between 15 and 20, the model's accuracy is at its highest level. They achieve the highest accuracy of 79% when tested against the Facebook news dataset by doing this.

V.Logistic Regression

The classification algorithm used by machine learning to estimate the likelihood of categorical dependant variable is called as a probability prediction algorithm.The dependent variable in logistic regression is a binary variable with data coded as 1 (yes, success) or 0 (no, failure). Using machine learning algorithms, Uma Sharma, Sidarth Saran, and Shankar M. Patil created a fake news detection system [6]

Using data from social media and fake news they work on logistic regression, SVM and KNN models. The LIWC method is used to extract features. According to their experiment, Logistic Regression has a high accuracy rate of 91%, which is higher than SVM's 67% and KNN's 68%. Some machine learning algorithms for fake news detection were developed by Vanya Tiwari, Ruth G. Lennon, and Thomas Dowling [9]



VI. Navie bayes

By utilizing the FND-jru Pontes Rout and news file dataset, N krishna are developed a machine learning model for fake news detection [8]. After testing various datasets, they discovered that each model exhibits a range of accuracies. Among these, Nave Bayes, Passive Aggressive, and DNN provided better accuracies of 90%, 83%, and 80%. For feature extraction, they used TF-IDF, Bag-of-Words, and Count Vectorizer.

VII. Hybrid models

For fake news, Ms. Smita vinit implemented a hybrid model for detection. SVM and Naive Bayes techniques are combined [9]. They used a manual dataset to train the model, and they extracted features using Word Count and Glout techniques. The hybrid model's accuracy was good at 78%. Evaluating Machine Learning Algorithms for Fake News Detection was put into place by Shlok Gilda [10]. Datasets were gathered from signal media. Gradient Boosting, Random Forest, Stochastic Gradient Descent, and SVM were all used in this model. For feature extraction, they used TF-IDF and PCFG in this paper. The models that perform the best across all techniques are stochastic gradient descent models, which have an accuracy of 77.2% and are trained exclusively on the TF-IDF feature set.

III. CONCLUSION

The spread of fake news has the potential to have a profoundly negative effect on both people and society. Hence fake news detection is important. This system aims to develop a powerful machine learning algorithm for detecting fake news. In this paper, an overview of the various machine learning algorithms is provided.

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- [8] Rahul M, Monica R, Mamathan N, Krishana R developed a machine learning model for fake news detection by using FND-jru, Pontes Rout, News Files datasets.
- [9] Ms. Smita vinit implemented a hybrid model for fake news detection. It is a combination of SVM and Naive Bayes techniques.
- [10] Shlok Gilda implemented a Evaluating Machine Learning Algorithms for Fake News Detection.



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