

Fake News Detection on Social Media using Machine Learning Techniques



Shivani Suresh Nikam, Rupali Dalvi

Abstract: Web based life administrations, as Facebook and Twitter, Renren, Instagram, and linkedin have recently become an enormous and persistent supply of day by day news. These stages give a huge number of clients and give numerous administrations, for example, content arrangement and distributing. Not all distributed information via internet based medium is dependable and exact. Numerous individuals attempt to distribute fake and mistaken news so as to control general conclusion. Counterfeit news might be intentionally made to advance money related, political and public premiums, and can lead to unsafe effects on people convictions and choices.. In this paper we examine different systems for recognizing counterfeit information via internet based networking medium. Our point is to locate a dependable and right model that arranges a given article as fake or genuine. For identification of fake articles we use machine learning algorithms.

Keywords : Fake News, Misinformation, Disinformation, Social Media, Machine Learning.

I. INTRODUCTION

Social medium has become an indispensable methods for huge scope data sharing and correspondence in all occupations, including promoting, detailing, open affiliations, and the sky is the limit from there. This change in spending practices is because of some novel highlights, for example, versatility, free, and intuitiveness. In any case, the low consumption, simple access, and quick communicating of data of social medium draw a gigantic crowd and empower the broad spread of false information, i.e., information with purposely bogus data. For instance, in 2016, millions of individuals read and “liked” fake news stories proclaiming that Pope Francis has endorsed Donald Trump for U.S. president. When the Pakistani defense minister mistakenly believed a fake news story, he threatened a nuclear war with Israel. These examples clearly show that fake news stories are tricky not only for the trustworthiness of online journalism, but also due to their damaging genuine-world consequences, resulting in violence or influencing election results. Therefore, it becomes more and more important for policy makers to control and discourage the creation of fake news, for online business to identify and stop fake news, and for people to secure themselves from fake news.

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Counterfeit talk via web-based networking media presents extraordinary difficulties. In the first place, fake tattle is purposefully made to mislead editors, which makes it nontrivial to perceive only subject to content. Second, web based life records is enormous scope, multi-modular, for the most part client created, once in a while puzzling and boisterous. Third, the supporters of web-based social networking originate from various foundations, have various inclinations or necessities, and utilize online networking for shifted purposes. At long last, the negligible exertion of making online life accounts makes it simple to make noxious records, for instance, social bots, cyborg customers, and trolls, all of which can become predominant wellsprings of engendering of fake news.

Although the significance of the problem, our understanding of fake news is still incomplete. For example, we want to identify why people create fake rumor , who creates and publishes it, how fake news disseminate, what characteristics differentiate fake news from genuine news, or why some people are more vulnerable to fake news than others. Therefore, we suggest to understand fake news with disciplines such as journalism, psychology, and social knowledge, and distinguish the unique characteristics for its detection. Establishing a superior perceptive of fake news will allow us to come up with algorithmic solutions for detecting fake rumor and control it before fake rumor is broadly distributed.

Since counterfeit talk endeavours to increment bogus cases in news content, the most basic methods for remembering it is to authenticate the reliability of critical cases in a report to pick the information veracity. Counterfeit news acknowledgment on regular news media generally depends on investigating news content data. News substance can have a few modalities, for example, content, picture, video. Study has investigated various ways to deal with discover highlights from single or joined modalities and develop AI models to group counterfeit gossip.

II. LITERATURE SURVEY

H. Ahmed et al.[1], proposed a false rumor recognition model using n-gram analysis. In this system author uses Term Frequency (TF) and Term Frequency-Inverted Document Frequency (TF-IDF) for feature extraction. Author uses six machine learning algorithm for the classification of news. The accuracy of the system is 92%. Ghaith Jardaneh et al.[2], uses content and user correlated attributes, and utilize sentiment analysis to generate new attributes for the finding of fake Arabic news.

Author uses four algorithms, namely Random Forest (RF), Decision Tree (DT), Logistic Regression (LR), AdaBoost. The accuracy of the system is 76%.

Mykhailo Granik et al[3], uses naive Bayes classifier for identifying fake news. This approach was implemented as a software system and tested against various data set of Facebook etc. which provided an accuracy of 74%. This paper did not consider punctuation errors, leading to a low accuracy.

Shlok Gilda et al[4], apply TF-IDF of probabilistic context free grammar and bi-grams detection to a corpus of about 11,000 articles. Author uses diverse classification algorithms namely, Stochastic Gradient Descent, Gradient Boosting (SGDGB), Support Vector Machines (SVM), Bounded Decision Trees (BDT), and Random Forests (RF). Author finds that Term Frequency-Inverted Document Frequency (TF-IDF) of bigrams fed into a Stochastic Gradient Descent (SGDGB) model gives with an accuracy of 77.2%.

Akshay Jain et al[5], uses Naive Bayes classification model to analyze whether a post on Facebook will be categorized as genuine or fake. This paper did not consider punctuation errors, leading to a low accuracy.

Rohit Kumar Kaliyar et al[6], author used TF-IDF feature extraction technique. For the classification of news author use machine learning and deep learning algorithms.

Amitabha Dey et al[7], initially perform “text normalization” on tweets, investigate procedures for features extraction to classify news into classification, perform a comprehensive linguistic analysis on tweets, extract bag-of-words to discover clear pattern, and at last apply k-nearest neighbour algorithm for classifying polarized rumor from credible.

Terry Traylor et al[8], used Textblob, Natural Language, and SciPy Toolkits to build up a novel fake rumor detector that use quoted attribution in a Bayesian machine learning classification as a input features to estimate the likelihood that a news article is fake. This model gives with an accuracy of 63.333% .

William Yang Wang et al[9], proposed automatic false information finding based on surface-level linguistic patterns. Author intended a novel, hybrid convolutional neural network to integrate metadata with text.

Julio C. S. Reis et al[10], surveyed types of features for fake news detection. Author evaluates the discriminative intensity of the previous features using several classic and state of-the art classifiers, including Naive Bayes (NB), k-Nearest Neighbors (KNN), Random Forests (RF), Support Vector Machine with RBF kernel (SVM), and XGBoost (XGB). The best results were obtained by Random forest and XGBoost classifiers, statistically attached with 0.85 (0.007) and 0.86 (0.006) for AUC, respectively.

Mahid et al[11], present the different types of features namely content based features , visual based features and hybrid model. Content based features extracted from news content, visual based features extracted from images and videos, and hybrid model consist of content based and social content based features.

Mitali Desai et al[12], talked about different methods to carryout sentiment analysis on Twitter information including information based system and AI strategies. Creator presents the parametric examination of the talked about strategies dependent on recognized parameters.

Gisel Bastidas Guacho et al[13], propose a semi-supervised content based strategy for detecting miss-informative news

articles. This method leverages tensor-based article embeddings so as to build a k-nearest neighbor graph of news articles which captures similarity between them in a latent, embedding space. Author then use a guilt-by-association propagation algorithm to diffuse known article labels over the graph. Experiments on three genuine-world datasets demonstrate that this model is able to distinguish fake from genuine news only using a small number of labelled articles, compared to state-of-the-art content-based approaches which achieve similar quality while assuming fully supervised models. This proposed method achieves 67.43%. of accuracy using Support vector machine.

III. PROPOSED METHODOLOGY

The framework comprises of two significant segments: an online UI and a backend which coordinates our fake news discovery model. The electronic interface furnishes clients with reasonable certainty examination of rumor . A client can enter either the tweet or the heading of the rumor . On run of the mill genuinity checking sites, a client just observes the check creditable score of information. The backend comprises of numerous segments: (1) a database to store the pre-trained results as well as a crawler to extract hidden information and its comments; (2) the detection part, which gives the identification of news either true or false.

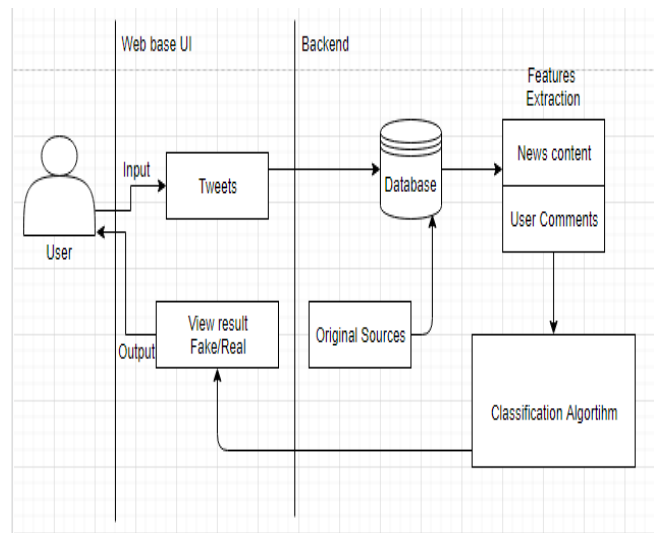


Figure no 1. System Architecture

A. Data Pre-processing

It is a method that is used to convert the raw data into a clean data set. Each and every time the data is collected from different sources it is collected in fresh format which is not achievable for the study. For achieving better results from the realistic model in Machine Learning developments the format of the data has to be in a proper manner. So in data pre-processing is required because of the presence of unformatted genuine world data.

B. Features reduction

Feature reduction is the process in which high dimensional data is converted into low dimensional space. Feature reduction technique solve the problem of overfitting. PCA and wrapper feature reduction are the feature reduction techniques. PCA selects top n features and remove unnecessary features by assigning lower weight to them.

In wrapper feature reduction technique top feature subsets are selected which gives better accuracy.

C. Classification Algorithm

Naive bayes is a supervised learning algorithm which is used for classification. It is based on bayes theorem assuming that features are independent of each other. It calculates the probability of every class, the class with maximum probability is chosen as the output. Support Vector Machines (SVM) are an arrangement of related supervised learning techniques operated for grouping and classification.

IV. .RESULT AND DISCUSSIONS

We develop a model for fake news detection on twitter using machine learning algorithm. We collect dataset from real world sources i.e. from kaggle. In pre-processing step we remove missing values, convert categorical data into numerical data. In the pre-processing step we perform tokenization, stop words removal, stemming activity. In Stop words removal process we remove common words from the documents (e.g., so, and, or, the...). We remove stops words by using NLTK Toolkit. In tokenization process we divide the text body into separate features. A stemming algorithm is a process of linguistic normalization, in which the variant forms of a word are reduced to a common form for e.g. - 1. Played-play 2. Clustering– cluster. After pre-processing step we perform feature selection using PCA. PCA selects top N features and remove unnecessary features by assigning lower weight. After feature reduction we splits our data into training and testing phase. The features extracted is passed to the trained classifier. The classifier gets trained regularly as new training data is feed into the classifier. The classifier determines whether the news is fake or real. Our system will give best accuracy for classification of news. In our proposed system we will find the users who spread fake news after classification of news.

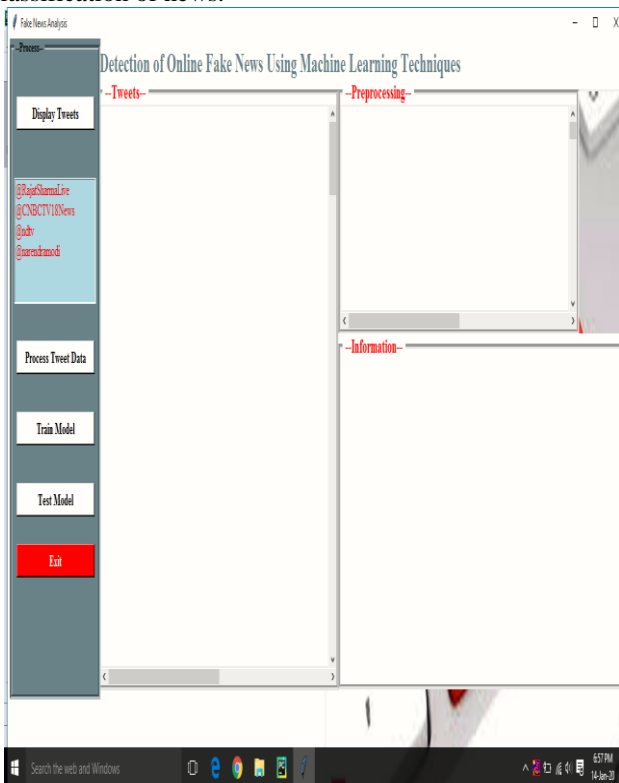


Figure no. 2 Enter tweets

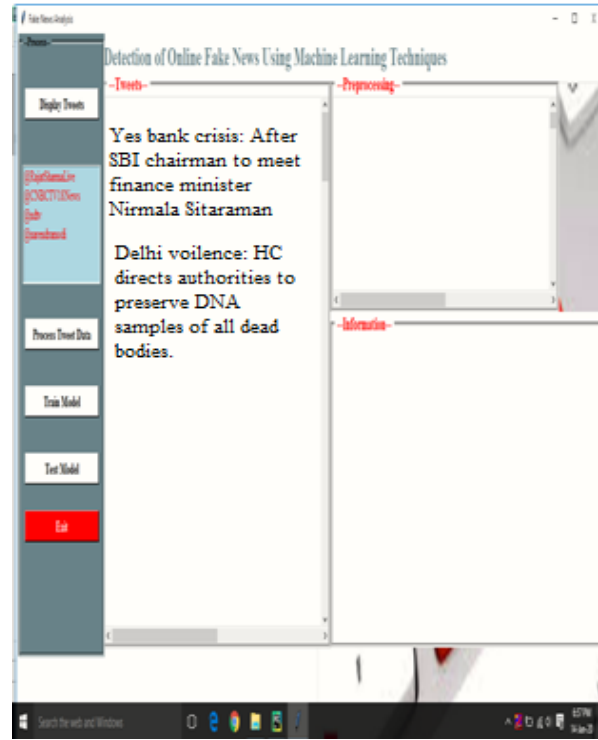


Figure no 3. Display tweets

V. CONCLUSION

With the growing omnipresence of online life, a regularly expanding number of people exhaust information from web based life instead of ordinary news media. Regardless, online life has furthermore been used to spread phony news, which has strong negative impacts on solitary customers and increasingly broad society. In this paper, we will develop a system which identify fake news on twitter. In our proposed system we will use SVM algorithm for classification of tweets.

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REFERENCES

1. Hadeer Ahmed, Issa Traore, and Sherif Saad, "Detection of Online Fake News Using N-Gram Analysis and Machine Learning Techniques", In: Traore I., Woungang I., Awad A. (eds) Intelligent, Secure, and Dependable Systems in Distributed and Cloud Environments. ISDDC 2017. Lecture Notes in Computer Science, vol 10618. Springer, Cham
2. Ghaith Jardaneh, Momen Buzz, Hamed Abdelhaq, Douglas Johnson, 2019 IEEE Jordan International Joint Conference on Electrical Engineering and Information Technology (JEEIT)
3. Mykhailo Granik, Volodymyr Mesyura, "Fake News Detection Using Naive Bayes Classifier", 2017 IEEE First Ukraine Conference on Electrical and Computer Engineering (UKRCON)
4. Shlok Gilda, "Evaluating Machine Learning Algorithms for Fake News Detection", 2017 IEEE 15th Student Conference on Research and Development (SCORED)
5. Akshay Jain, Amey Kasbe, "Fake News Detection", 2018 IEEE International Students' Conference on Electrical, Electronics and Computer Sciences
6. Rohit Kumar Kaliyar, "Fake News Detection Using A Deep Neural Network", 2018 4th International Conference on Computing Communication and Automation (ICCCA)

7. Amitabha Dey, Rafsan Zani Rafi, Shahriar Hasan Parash, Sauvik Kundu Arko and Amitabha Chakrabarty, "Fake News Pattern Recognition using Linguistic Analysis", 2018 Joint 7th International Conference on Informatics, Electronics Vision (ICIEV) and 2018 2nd International Conference on Imaging, Vision Pattern Recognition (icIVPR)
8. Terry Traylor, Jeremy Straub, Gurmeet, Nicholas Snell, "Classifying Fake News Articles Using Natural Language Processing to Identify InArticle Attribution as a Supervised Learning Estimator", 2019 IEEE 13th International Conference on Semantic Computing (ICSC)
9. William Yang Wang, "Liar, Liar Pants on Fire": A New Benchmark Dataset for Fake News Detection, Proceedings of the 55th Annual Meeting of the Association for Computational Linguistics (Short Papers), pages 422–426 Vancouver, Canada, July 30 - August 4, 2017.
10. Julio C. S. Reis, Andre Correia, Fabricio Murai, Adriano Veloso, and Fabricio Benevenuto, "Supervised Learning for Fake News Detection", 2019 IEEE Intelligent Systems
11. Zaitul Iradah Mahid, Selvakumar Manickam, Shankar Karuppayah, " Fake News on Social Media: Brief Review on Detection Techniques ", 2018 IEEE
12. Mitali Desai, Mayuri A Mehta, " Techniques for sentiment analysis of Twitter data: A comprehensive survey", International Conference on Computing, Communication and Automation (ICCCA2016)
13. Gisel Bastidas Guacho, Sara Abdali, Neil Shah, Evangelos E. Papalexakis, " Semi-supervised Content-based Detection of Misinformation via Tensor Embeddings".

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