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Examining Fake News Observation and Detection on Social Media: Using Machine Learning and Deep Learning Algorithms

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ABSTRACT: Social media, in recent years, has become the mainstream media platform which produces a large amount of content and news for its huge set of audience. Things like politics which have paramount influence on the general public's livelihood are also influenced on social media. Unlike a century ago when only news reporters and officially recognized publications were the only ones who could spread news to the masses, we now live in an era where literally everyone holds the power to create and to spread news. Along with this, the problem that arises is the creation and spreading of fake news which leads us to question the credibility of the news and the content we consume. These fake news can change one's perspective for the bad. In this paper, we will have a look at the various misinformation spread across social media and the methodologies used and being used to tackle them. This survey is mainly focused on how traditional machine learning algorithms and deep learning techniques are being used in categorising the news between "Fake news" and "Not fake news" from a raw text. We discussed how the stacking model works in the field of fake news detection and about its improvements shown in the accuracy score and also discussed how some research is done to show how feature extraction techniques plays a vital role in improving accuracy score by reducing the complexity of the dataset. Along with it, we also discussed fake news detection related to COVID-19 which has been the most crucial topic in recent years.

Keywords: Fake News, Traditional algorithm, Deep learning, Social media.

I. INTRODUCTION

The expeditious change in our lifestyle nowadays has brought many people to use social media as a predominant way to spend their small leisure time they get between their work. Hence many businesses developed having social media as a base and the platforms' users as their customers, and one such business are news publishers.

Technology has brought us to a point where we can no longer believe everything we hear,read or even what we see in real life . Nowadays anybody can create fabricated content in a much easier way. For example, anyone could set up a website in today's world with any sort of domain and there are many sorts of clever photoshopping techniques to manipulate an image and this can spread like a wildfire .

Every change has consequences, one such is fake news; misinformation in social media in recent years has been rising exponentially. There's always been fake news,rumours,propaganda, but now, since the world runs faster than ever and communication is easier than ever, anyone with their digital devices can spread their message to the world. These can be seen in the form of fake news pages or a user who continuously posts misinformation. This is not the

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only problem for the spread of misinformation; the people sharing the messages or posts cause the spread of this misinformation on a large scale.

In this modern era where we are witnessing unprecedented growth of technology both in the private and public sectors, every reader has essentially become their own writer. This enables everyone to share whatever they read online. The surreal growth in the number of internet users worldwide only adds fuel to the fire here as this means that the possibility of fake news spreading wider is increased.

As much of a personal responsibility it is for everyone of us to check the authenticity of the news that we consume on social media before sharing to others, it is of the same level of responsibility for the respective social media platforms to make sure their website/application has no fake news whatsoever.

There has been a substantial amount of misinformation spread during the covid pandemic period. In the first 3 months of 2020 nearly 6000 people were hospitalised across the globe and it has been claimed that at least 800 may have lost their lives due to misinformation during COVID period and also there was a misconception on home remedies to tackle COVID-19 by avoiding ice creams and chicken. [10] discussed about a Secure system to Anonymous Blacklisting. The secure system adds a layer of accountability to any publicly known anonymizing network is proposed. Servers can blacklist misbehaving users while maintaining their privacy and this system shows that how these properties can be attained in a way that is practical, efficient, and sensitive to the needs of both users and services.

In another case, twitter banned Donald Trump's account claiming that the former president of the USA has been continuously spreading misinformation by calling the election a big lie during the election time in 2020. Twitter added that Mr. Trump has to take more responsibility in the messages that he shares through tweets since he has a massive follower base and his claims either legit or not, could ultimately change one's perspective on the election.

In 2019, a fake news source reported against RBI about the closing of nine of its commercial banks and which was shared among the public through social media which created a panic situation among the clients. [8] discussed that Helpful correspondence is developing as a standout amongst the most encouraging procedures in remote systems by reason of giving spatial differing qualities pick up.

In 2013, press put out a tweet saying that there was a explosion in US president's office and Obama is injured and this tweet was retweeted many times in few minutes and it went viral immediately thereafter but this was a false news propagated by Syrian hackers as a result automated trading algorithms seized on the sentiment on this tweet and immediately sent the stock market crashing wiping out billion dollars in less than few hours.

Fake news detection helps us to detect misinformation and news that doesn't have authenticity and stop the further spread of such news to other people on the platform.

In this paper, we have discussed the fake news detection models which have been implemented in the real world using various machine learning and deep learning algorithms and Natural Language Processing. In addition, we have identified the common things in the detection models that we went through and also compared those models in depth by testing out their results and their accuracy score. By then we have also come up with a conclusion at the end showing which is more efficient and accurate.

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II. CATEGORIZATION OF FAKE NEWS

There are many ways in which fake news is being generated, it may be an intentionally created one or news that is generated because of some misunderstanding of the incident , mistake or due to misinterpretations. Fake news can be broadly classified into five divisions, one which is actually fake and other that happens because of human mistakes as discussed above.

Talking about the intentional ones, these are caused either to gain popularity and fame or to offend or spread negative comments about someone. The fake information spreaded for fame can be easily spotted as it is obvious it gains more viewership and attention thus it is easy to be detected by the algorithm trained to detect the fake news. The news that is spreaded to defame or offend someone is a mixed case where this news may or may not get attention from a huge audience. If it does, then it is similar to the previous case. If it doesn't, then it is still dangerous as it may even influence some people in a bad way. In that case, rather than building an algorithm to find the fake news and banning the user , the algorithm also must be made in such a way that the similar type of users and groups linked to him must be verified and banned to stop spreading these types of uploads in the future.

III. NATURAL LANGUAGE PROCESSING IN FAKE NEWS DETECTION:

In today's reality, having machines talk and respond to us in a human-like manner is so common and it keeps getting more realistic with every passing day. For example, the people who ask queries online, smart assistance and calls that are made over the internet- all have one thing in common: none of them are humans. NLP helps them sound and seem so human-like which makes them respond more intelligently.

NLP - refers to the branch of artificial intelligence that gives machines the ability to read and understand and derive meaning from human language. It combines the field of linguistics and computer science to decipher language structure and guidelines to separate details from text and speech. Every day humans interact with each other through public social media platforms transferring a vast quantity of data and with NLP, it makes tasks a lot easier to process large amounts of data. Since fake news detection mostly deals with text data, tools that are provided by NLP make the path easier for text processing in fake news detection.

Machines, as advanced as they may be, are not capable of understanding words and sentences in the same manner as humans do. In order to make corpus more palatable for computers, they must be converted into some numerical structure or representation. For doing that, NLP offers different vectorizers which follow different strategies in converting a text to number and the most commonly used vectorizers are Countvectorizer, Tfidfvectorizer, HashingVectorizer.

Countvectorizer, which follows a bag of words approach where each message inside the document is separated into tokens and number of times tokens get repeated is counted in case of countVectorizer and stored in the form of a matrix.

And for the terms which are not very significant in corpus, in order to remove them or to give lower weight for them, Tf-Idf vectorizer is used which gives a quantified information about the importance of a particular word for the process. This helps in reducing the complexity of the model by reducing dimensions.

IV. MACHINE LEARNING CLASSIFICATION

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Classification is a supervised learning technique by which a set of new groups can be derived based on the given training dataset. It classifies the observations into a number of classes or targets. There are three classification types: binary classification and multi-class classification and multi-labeled classification. Binary classification gives two outcomes such as yes or no,0 or 1, spam or not spam whereas multi-class classification gives more than two outcomes and here each sample is assigned to one label or a target. And in multi-label classification, each sample is assigned to a set of labels or targets.

There are many traditional algorithms which are being used for solving classification problems such as K-nearest neighbour, decision tree, Random forest, and Logistic regression which will be implemented after processing through NLP.

Traditional Machine Learning Approaches

Over the years, fake news on social media has been detected and filtered out using a number of techniques, of which the earlier methods involved the usage of traditional machine learning algorithms. Popular algorithms such as Decision tree, K-Nearest Neighbour, Naive Bayes', Random Forest, Support Vector Machine are some of the traditional machine learning algorithms which have been used for fake news detection on social media.

i) Decision tree

The decision tree works like a flow chart. It is primarily implemented when a problem requires the concept of classification in order to solve. The two main components in any decision tree are external nodes(or leaves) and internal nodes. Every internal node in the decision tree has a condition and based on whether the condition specified is satisfied or not, the decision tree splits giving way to another node. External nodes do not have any conditions and are simply the result or a part of the result.

ii) K-Nearest Neighbour

KNN is one of the many supervised machine learning techniques. Expanded as K-Nearest Neighbour,the algorithm can be used to solve problems that require the concepts of both classification and regression. This method works on the basis of 'K' which denotes the number of nearest neighbours for a given variable. Although KNN is an algorithm that when implemented gives high accuracy in classification and regression type of problems, it only does so for small sized datasets. If the dataset is large, KNN becomes inefficient.

iii) Naive Bayes

Naive Bayes' algorithm is a supervised classification algorithm which incorporates the concept of Bayes' theorem. Bayes' theorem is a concept through which the probability of an event can be calculated given that another event has already happened. In simple words, Bayes' theorem is used to find the conditional probability. Naive Bayes' algorithm is a probabilistic classifier algorithm. The algorithm can be used for large datasets too.

iv) SVM

In machine learning, one of the most fundamental tasks is to classify into two or more categories when a bunch of objects are given. For example, to classify whether the picture is of a dog or a cat. SVMs are support vector machines which are the simplest and arguably the most elegant methods for classification; each point that wants to

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classify is represented in an n-dimensional plane and the coordinates of this point are usually called features. SVMs perform the classification test by drawing a hyperplane that is a line in two dimensions or a plane in three dimensions in such a way that all points of one category are on one plane of the hyperplane and all points of another category are on the other side of the hyperplane. There could be multiple other hyperplanes. SVM tries to find the one that separates the two categories in the best possible manner so that it maximises the distance to points in either category. This distance is called margin and the points that fall exactly on the margin are called supporting vectors. Based on the training set given, the hyperplane is drawn and classified.

V. Survey On Traditional Machine Learning Models:

Many researchers have proposed a combined approach by using some traditional algorithms all together to achieve good results. **Tao Jiang et al. [1]** have implemented five supervised learning models including Support Vector Machines(SVM), Logistic Regression(LR), Decision Tree(DT), K-Nearest Neighbour(KNN) and Random Forest(RF) along with three deep learning models including Convolutional Neural Network(CNN), Long Short-Term Memory(LSTM), Gated Recurrent Unit(GRU) and used Term Frequency-Inverse Document Frequency(tf-idf), TF tokenization techniques to convert raw text into vector form. They have evaluated the obtained results using various performance evaluation metrics like accuracy, precision, recall, F1-score, P-value etc and achieved an accuracy of SVM(92.42%), LR(92.82%), DT(79.87%), K-NN(82.56%), RFI(91.63%), RF2(91.48%), LSTM(88.95), CNN(89.50%), GRU(91.32%). Then, they have proposed their own model with the help of an ensemble method called stacking model which can be used to combine results of various prediction models and form a meta model with all prediction results as individual features and actual prediction as a target variable and then a meta model is fitted with another supervised learning model random forest for a prediction. In their research, they have used above mentioned five supervised learning models and three deep learning models that connect everything through a meta classifier and achieved testing accuracy of 99.94% and 96.05% with respect to ISOT and KDnugget dataset.

Supanya Aphiwongsophon et al. [3] have implemented fake news detection with two popular supervised learning algorithms such as Naive Bayes classifier, support vector machine and also with neural networks. Twitter news which was taken between October 2017 and November 2017 was used, which contained 22 attributes and 948,373 entries. Here, twitter data is classified into two class labels which are believable and unbelievable messages. For the purpose of testing, four test measurements were used: Precision, Recall, F-Measure and Accuracy. Final results conclude that Neural network and SVM performs better when compared to the Naive Bayes classifier. For **Naive Bayes**, the measurements were recall(96.10%), F-measure(97.90%), accuracy(96.08%), Precision(99.80%) and for **SVM and Neural Network** they were recall(99.90%), F-measure(99.80%), accuracy(99.90%).

Suleman khan et al. have done work related to detecting fake news about the spread of COVID-19 in many social media platforms and other electronic media. Here, feature extraction is mainly focused and the results were observed before and after doing feature extraction. Dataset is prepared in fusion with many news sources collected from different social media platforms and is used for classification. There are various steps involved in classifying fake news. Firstly, data is preprocessed by using NLP techniques in removing stop words, URLs, punctuation marks and special characters. After preprocessing is completed, tokenization is performed in transforming larger sentences into separate words. Then, feature extraction is done using named-entity recognition where extraction can be on unstructured data based on many factors. [2] proposed a secure hash message authentication code. A secure hash message authentication code to avoid certificate revocation list checking is proposed for vehicular ad hoc networks (VANETs).

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By using NER, thirty nine features were extracted for the study which was created from a dataset related to COVID-19 fake news. Then, the dataset is trained with eight machine learning algorithms such as decision tree, K-nearest neighbours, AdaBoost classifier, Logistic regression, Linear SVC, bagging classifier, SGD classifier, random forest classifier. Out of which when the performance is measured before doing feature extraction, random forest gave results with accuracy, recall, precision and F1-measure score of 83.33, 84.90, 83.14, 83.61 respectively. After doing feature extraction, the random forest algorithm gave better results with an accuracy and precision score of 88.50 and 87.77 and better recall and F1-measure observed in linear SVC of 89.77 and 88.76%.

Vishesh Mehta et al. [5] have proposed a model to detect fake news related to the spread of COVID-19 on social media. Dataset used is news sources from Twitter. The models that they have applied are Gradient Boosting Classifier(GBC), Logistic Regression(LR), Random Forest Classifier(RFC), Decision Tree Classification(DT). All the classification algorithms are applied to predict whether the posted tweet is a "Fake news" or "Not a fake news". Collected data is preprocessed by using NLP techniques to remove stop words, and all other words that affect accuracy level. Then, the dataset is fitted with all the above-mentioned algorithms and observed F1-score of the algorithms and Logistic regression outperforms with F1-score of 0.93.

Tayyaba Rasool et al. have proposed a method involving a multilevel multiclass concept for fake news detection. The method has a three-step process consisting of feature extraction, relabeling and learning. According to the method proposed, the set of news items to be classified as true and false based on their credibility is first pre-processed in a manual way so that it can be used to train a classifier model. The training data present in the set of news items is converted to numerical values. Feature selection is done to filter out irrelevant features from the dataset. The next step, which is relabeling, basically means that the records present are to be relabeled. Multiple class labels will first be grouped with similar properties until we reach two class labels. After reaching two class labels, binary class solutions can be used to solve the multiclass problem. Post the relabeling process, the classifier is trained. After training the classifier, they performed refinement which is nothing but the iterative process of relabeling and learning. Refinement is done for each binary class so that the labels in every class move one level closer to the original multiclass labels in every iteration. And this process goes on iteratively until the new labels converge to the original labels. In every iteration, one model is trained which adds up as a set of trained models at the end of all iterations. And this set of trained models will be used for classification in the testing part. For experimentation of their proposed method, they have taken a dataset consisting of 12,836 news statements out of which 10,235 legible records remained after performing data cleansing manually. There were 6 labels namely *pants-fire*, *false*, *barely-true*, *half-true*, *mostly-true* and *true*. Out of this, pants-fire and false are in the false category and the remaining four labels are in the true category. After classifying the labels accordingly in the false and true categories, they have trained the classifier. The training dataset is relabeled to new labels one step closer to the original labels. And when the proposed method is tested for accuracy in predicting fake news, the accuracy was found to be 66.29% with the Holdout method using SVM. [4] discussed that the activity related status data will be communicated consistently and shared among drivers through VANETs keeping in mind the end goal to enhance driving security and solace.

VI. The Deep Learning Approach

The deep learning approaches have well structured neural network algorithms which are in most part known as the human brain embedded machine, which basically follows the way our brain works in finding the logic, the way we think and how we learn from past experiences. It is a computational learning system that uses a network function to understand the provided input and conventionally provide the desired output usually in another form.

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In other words these algorithms perform to recognise patterns and information in a similar way the human brain thinks. These are overmined on the way the neurons of the human brain function together and understand the inputs. Here the algorithms like CNN, RNN and LSTM are the ones that help in forming well structured layers on filtration and vectorizing the words and help in deciding if the news is fake or not.

VII. Survey On Deep Learning Models:

Model proposed by **Hager Saleh et al.**, the first dataset they have used is the Fake news detection dataset which was available on kaggle; the dataset consisted of a total of 3988 news articles. The value of the attribute to determine whether the news is fake or real is represented using 0 and 1 respectively. The next dataset they used consisted of about 804 articles similarly the value of fake news was 0 and the real one is 1.

Using NLP the data was preprocessed. The first step was **lower casing**, where all the letters have been lower cased and the correlation within the feature sets have been ensured to solve the sparsity problem. And the next step was about **removing the URLs.** Working with fake news classification of the urls while processing through the machines doesn't make sense, hence the urls have been removed. Up next, **special characters are removed.** In the next step, **stop words are removed**, the words like a, an, to, by, for, etc,. Followed by **Tokenization** where the lengthy text sequences are divided into tokens and at last **stemming** , where the different formats of the same words are made as one word.

For the feature extraction, **N-gram with TF-IDF** is used to extract the features for the ML models and to build the feature matrix. For describing the text context **N-gram** ranged from n=1 to n=4. While **TF-IDF** gives weights to each word representing their importance. **Word embedding** technique is used for converting the words to n-dimensional vectors for comparison with similar words. Here they have used **Glove** to implement word embedding to build a word embedding matrix. They have used glove.6B.zip, which contains vectors in four dimensions: 25d, 50d, 100d, and 200d. The embedding matrix was constructed using 200d.

The OPCNN_FAKE consists of six layers: an embedding layer, dropout layer, convolutional layer,pooling layer,flatten layer, and an output layer.

In the **embedding layer**, each news has been embedded at the word level and represented as a matrix and implemented as a keras library, which has three arguments: input-dim which represents the vocabulary size, output-dim represents the vector size and input-length represents input length sequences. The input-dim was set to 20000, output-dim to 200 and input-length to 32. [6] discussed because of various appealing focal points, agreeable correspondences have been broadly viewed as one of the promising systems to enhance throughput and scope execution in remote interchanges.

In the **Dropout layer,** overfitting is prevented and complexity of the model is reduced, the input of this layer is output of the embedded layer. The dropout value ranges between 0.1 and 0.9.

The **Convolutional Layer** contains convolutional filters and feature maps. These convolutional filters are applied to the input word matrix which gives the features maps representing the valuable input data patterns. They have used ReLU as the activation function here.

Pooling layer reduces the number of features in the feature map by only selecting the most significant valuable features to reduce the computation required.

Flatten layer as the name says is used to transform the converted text into an I-dimensional array.

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In the **Output layer**, one neuron is implemented to determine whether the news is real or fake. The ADAM optimizer is also used and sigmoid is used as the activation function here.

With this OPCNN_FAKE model they were able to obtain an accuracy of 99% and precision of 100% and with a twitter api dataset it has scored an accuracy of 98.87% and precision of 99.34% which is a very good and reliable score for fake news detection.

Similarly **GIUSEPPE SANSONETT et al. [7]** have proposed a model where they had different layers after the Dropout layer which were, Conv1D layer, MaxPooling 1D layer, LTSM layer and dense layer.

In the **Conv 1D layer** the features are extracted from the sequences data, also maps the sequences, it contains 64 filter maps, with size of the kernel as 3 and ReLU as the activation function.The **MaxPooling 1D layer** is implemented to reduce the input size which reduces the number of model parameters.The **LSTM layer** allows the already known information to persist in the model, by taking the input space as a hyperparameter, which represents the word vector size from the embedding layer. **Dense layer**'s input is flattened into a single vector value , which represents the probability that a particular feature is identified and marked as fake news or not.

To run the model they have chosen binary cross-entropy as **loss function**, Adam as the **optimizer** by setting learning rate, $\alpha = 0.001$, the exponential decay rate for the first moment, $\beta 1 = 0.9$ and the decay rate for the second-moment $\beta 2 = 0.999$. At last the accuracy is chosen as the **metric.**

On running this model on the news content dataset this model scored an accuracy of 91.47% on training-test and 92.89% on cross-validation. Which was better than the 89.26% accuracy score of the SVM model and far better than the 81.54% score of KNN . On the second run the model was tested upon the Social context dataset where it scored about 92.98% whilst the SVM model has scored 91% which was improvement from the previous score of 89% on the news content dataset and the KNN 's score has also been improved very significantly from 81.54% on the previous dataset to 84% and on the cross-validation it had a major improved score from 78.61% to 83.13% with the 80/20 method. In brief, even though the deep learning model had scored the highest of all three, SVM models aren't too far behind the model proposed here. On the second dataset the score of SVM is actually really close or even equal to the Deep Learning model. The OPCNN-FAKE model seems to produce the highest accuracy in their experiments by scoring about 99% on accuracy, which does not mean that we should compare those scores on par and come to a conclusion. We should also take those datasets into account on their testing of the results.

VIII. Conclusion:

Thus our proposed survey covers various sources from where the misinformation spread across social media and the methodologies used and being used to tackle them. This survey mainly discusses about how traditional machine learning algorithms and deep learning techniques are being used in categorizing the news as "Fake news" and "Not fake news". The proposed work also discuss how the stacking model works in the field of fake news detection and how feature extraction techniques plays a vital role in improving accuracy by reducing the complexity of the dataset. Along with it, we also discussed fake news detection related to COVID-19 which has been the most crucial topic in the recent years.

IX. References:

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Available online at www.ijarmate.com

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(IJARMATE)

Vol. 8, Issue 7, July 2022

[1] Tao Jiang, Jian Ping Li, Amin Ul Haq, Abdus Saboor, And Amjad Ali, "A novel stacking approach for accurate detection of fake news," in Proc. IEEE Access, Feb 2021.

[2] Christo Ananth, M.Danya Priyadharshini, "A Secure Hash Message Authentication Code to avoid Certificate Revocation list Checking in Vehicular Adhoc networks", International Journal of Applied Engineering Research (IJAER), Volume 10, Special Issue 2, 2015,(1250-1254)

[3] Supanya Aphiwongsophon, Prabhas Chongstitvatana,"Detecting fake news with machine learning method," IEEE Xplore. 15th International Conference on Electrical Engineering/Electronics, Jan 2019.

[4] Christo Ananth, Dr.S. Selvakani, K. Vasumathi, "An Efficient Privacy Preservation in Vehicular Communications Using EC-Based Chameleon Hashing", Journal of Advanced Research in Dynamical and Control Systems, 15-Special Issue, December 2017,pp: 787-792.

[5] Vishesh Mehta, Ram Krishna Mishra,"Machine learning based fake news detection on COVID-19 tweets data," ICCIDE 2021:Proceeding of international conference on computational intelligence and data engineering, Jan 2022, pp 89-96.

[6] Christo Ananth, Dr. G. Arul Dalton, Dr.S.Selvakani, "An Efficient Cooperative Media Access Control Based Relay Node Selection In Wireless Networks", International Journal of Pure and Applied Mathematics, Volume 118, No. 5, 2018,(659-668).

[7] Giuseppe sansonetti, Fabio gasparetti, Giuseppe daniello, Alessandro micarelli," Unreliable users detection in social media: Deep learning techniques for automatic detection," IEEE Access, Nov 2020.

[8] Christo Ananth, Joy Winston.J., "SPLITTING ALGORITHM BASED RELAY NODE SELEC-TION IN WIRELESS NETWORKS", Revista de la Facultad de Agronomía, Volume 34, No. 1, 2018,(162-169).

[9] R. K. Kaliyar, A. Goswami, P. Narang, and S. Sinha, ''FNDNet—A deep convolutional neural network for fake news detection,'' Cognit. Syst. Res., vol. 61, pp. 32–44, Jun. 2020.

[10] Christo Ananth, A.Regina Mary, V.Poornima, M.Mariammal, N.Persis Saro Bell, "Secure system to Anonymous Blacklisting", International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST), Volume 1,Issue 4,July 2015,pp:6-9.

[11] J. C. S. Reis, A. Correia, F. Murai, A. Veloso, F. Benevenuto, and E. Cambria, ''Supervised learning for fake news detection,'' IEEE Intell. Syst., vol. 34, no. 2, pp. 76–81, Mar. 2019.

[12] A. Jain, A. Shakya, H. Khatter, and A. K. Gupta, ''A smart system for fake news detection using machine learning,'' in Proc. Int. Conf. Issues Challenges Intell. Comput. Techn. (ICICT), vol. 1, Sep. 2019, pp. 1–4.

[13] R. K. Kaliyar, A. Goswami, and P. Narang, ''Multiclass fake news detection using ensemble machine learning,'' in Proc. IEEE 9th Int. Conf. Adv. Comput. (IACC), Dec. 2019, pp. 103–107.

[14] J. C. S. Reis, A. Correia, F. Murai, A. Veloso, and F. Benevenuto, ''Explainable machine learning for fake news detection,'' in Proc. 10th ACM Conf. Web Sci. (WebSci), 2019, pp. 17–26.

[15] G. E. R. Agudelo, O. J. S. Parra, and J. B. Velandia, ''Raising a model for fake news detection using machine learning in Python,'' in Proc. Conf. eBus., e-Services e-Soc. Cham, Switzerland: Springer, 2018, pp. 596–60

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Available online at www.ijarmate.com

IJARMATE *International Journal of Advanced Research in Management, Architecture, Technology and Engineering*

(IJARMATE)

Vol. 8, Issue 7, July 2022

[16] H. Ahmed, I. Traore, and S. Saad, ''Detecting opinion spams and fake news using text classification,'' Secur. Privacy, vol. 1, no. 1, p. e9, Jan. 2018.

[17] M. L. Della Vedova, E. Tacchini, S. Moret, G. Ballarin, M. DiPierro, and L. de Alfaro, ''Automatic online fake news detection combining content and social signals,'' in Proc. 22nd Conf. Open Innov. Assoc. (FRUCT), May 2018, pp. 272–279.

[18] S. Shabani and M. Sokhn, ''Hybrid machine-crowd approach for fake news detection,'' in Proc. IEEE 4th Int. Conf. Collaboration Internet Comput. (CIC), Oct. 2018, pp. 299–306.

[19] K. Shu, DR. Magudeswaran, S. Wang, D. Lee, and H. Liu, ''FakeNewsNet: A data repository with news content, social context, and spatiotemporal information for studying fake news on social media,'' Big Data, vol. 8, no. 3, pp. 171–188, Jun. 2020.

[20] A. Abdullah, M. Awan, M. Shehzad, and M. Ashraf, ''Fake news classification bimodal using convolutional neural network and long short-term memory,'' Int. J. Emerg. Technol. Learn, vol. 11, pp. 209–212, Aug. 2020.

[21] J. A. Nasir, O. S. Khan, and I. Varlamis, ''Fake news detection: A hybrid CNN-RNN based deep learning approach,'' Int. J. Inf. Manage. Data Insights, vol. 1, no. 1, Apr. 2021, Art. no. 100007.

[22] R. K. Kaliyar, A. Goswami, P. Narang, and S. Sinha, ''FNDNet—A deep convolutional neural network for fake news detection,'' Cognit. Syst. Res., vol. 61, pp. 32–44, Jun. 2020.

[23] R. K. Kaliyar, A. Goswami, and P. Narang, ''EchoFakeD: Improving fake news detection in social media with an efficient deep neural network,'' Neural Comput. Appl., pp. 1–17, Jan. 2021, doi: 10.1007/s00521-020- 05611-1.

[24] R. K. Kaliyar, A. Goswami, and P. Narang, ''DeepFakE: Improving fake news detection using tensor decomposition-based deep neural network,'' J. Supercomput., vol. 77, no. 2, pp. 1015–1037, Feb. 2021.

[25] Q. Li, Q. Hu, Y. Lu, Y. Yang, and J. Cheng, ''Multi-level word features based on CNN for fake news detection in cultural communication,'' Pers. Ubiquitous Comput., vol. 24, no. 2, pp. 259–272, 2019.

[26] Iwendi C, Bashir AK, Peshkar A, Sujatha R, Chatterjee JM, Pasupuleti S, et al. COVID-19 patient health prediction using boosted random forest algorithm. Front Public Health. (2020) 8:357. doi: 10.3389/fpubh.2020.00357

[27] Srivastava G. The Impact of the COVID-19 Pandemic on Mental Health of Children and Adolescents. (2020). Available online at: http://urn.kb.se/resolve? urn=urn:nbn:se:uu:diva-414191

[28] Pennycook G, McPhetres J, Zhang Y, Lu JG, Rand DG. Fighting COVID-19 misinformation on social media: experimental evidence for a scalable accuracy-nudge intervention. Psychological science. (2020) 31:770–80. doi: 10.1177/0956797620939054

[29] Jain, S., Sharma, V. and Kaushal, R. Towards automated real-time detection of misinformation on Twitter. IEEE, 2016.

[30] Nicollas R. de Oliveira, Dianne S. V. Medeiros, Diago M. F. Mattos, " A sensitive stylistic approach to identify fake news on social networking," IEEE signal processing letters, Vol.27,2020

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[31] X. Zhou and R. Zafarani, "Fake news: A survey of research, detection methods, and opportunities," 2018, arXiv:1812.00315.

[32] W. Y. Wang, "Liar, liar pants on fire": A new benchmark dataset for fake news detection," 2017, arXiv:1705.00648.

[33] N. R. de Oliveira, L. H. Reis, N. C. Fernandes, C. A. M. Bastos, D. S. V. de Medeiros, and D. M. F. Mattos, "Natural language processing characterization of recurring calls in public security services," in Proc. Int. Conf. Comput., Netw. Commun., 2020, pp. 1009–1013.

[34] S. Gaonkar, S. Itagi, R. Chalippatt, A. Gaonkar, S. Aswale, and P. Shetgaonkar, "Detection of online fake news : A survey," in Proc. Int. Conf. Vision Towards Emerg. Trends Commun. Netw., 2019, pp. 1–6.

[35] R. Oshikawa, J. Qian, and W. Y. Wang, "A survey on natural language processing for fake news detection," in Proc. 12th Int. Conf. Lang. Resour. Eval., 2020, pp. 6086–6093.