A Review of NLP And Ml Algorithms For The Detection of Fake News on Social Media

Charu Kanwar[1], Yogesh Mohan[2]
[1]Dept of Computer Science
[2]Assistant Professor, Dept of Computer Science
[1, 2] Himachal Pradesh University, Shimla

Abstract- *In this modern age, we commonly employ numerous types of machines for our daily work. People currently favor using electronic media over traditional media. Therefore, online media has become very complicated, especially in our nation where most of the population is not computer-savvy. Through this e-media, it is very simple to disseminate numerous rumors or chitchat. These rumors could cause several social disruptions. Nowadays, readers face a serious problem with fake news. With traditional media, we can completely trust the news, but in today's period, it is more challenging to believe and trust the information we get from the internet. This study focuses on the problem of fake news in this modern age of the internet.*

This paper reviews the Natural Language Processing (NLP) and Machine Learning (ML) techniques for detecting bogus information on social media. This paper also highlights the difficulty in trusting news received from social media, and how false news might disrupt the news ecosystem's authenticity balance. This study aims to provide insight into the use of NLP and ML algorithms for detecting bogus news on the internet. Furthermore, this article justifies additional research into the topic of fake news.

Keywords- NLP (Natural language processing), ML(Machine Learning), Fake News, Facebook, Twitter.

I. INTRODUCTION

In this modern age, we frequently use various types of machines for our day-to-day work. Nowadays, people prefer to use an e-newspaper rather than an ordinary newspaper. However, there have been so many complications developed in online media, especially in our country where most people are not electronic-friendly. It is very easy to spread various rumors orgossip through this e-media. These rumors may create various disturbances in our society. Today's readers face significant challenges because of fake news. In old age, we couldfully trust whatour all-India radio tells us through their news bulletins. However, with the proliferation of social media channels available today, determining the accuracy and reliability of information received has become increasingly difficult. Online networking giants such as Facebook, Twitter, Instagram, and WhatsApp play a significant role in the spread of incorrect information. In this age of information overload, Fake news has emerged as a negative factor influencing digital media.

Dissemination of false information has been ongoing for decades. The idea of fake news predates the internet's creation. Before the creation of the internet, fake information would typically spread orally from one individual to another[1].The widespread dissemination of fake news can do significant harm to both people and society as a whole. In the beginning, fake news can upset the news ecosystem's authenticity balance which we can see during the 2016 presidential election[2]. fake news exerts a notable impact on public opinion, giving rise to heated headlines and generating controversy.

FAKE NEWS

Fake news is a category of information that is deliberately and erroneously presented before us[2]. The information fabricated is intentionally misleading and fictitious. Fabricated information is purposefully designed to deceive both viewers and readers. Although propaganda, conspiracy theories, and hoaxes are not new, the recent proliferation and volume of misinformation are conveyed through Facebook, Twitter, and other social media platforms[3].It is comprised of stories intended to increment readership, web sharing, and web click income.For thousands of years, people spread gossip, rumor, and disinformation to influence and control other people, communities, and societies for their profit[4]. Large tech companies like Google, Facebook, WhatsApp, and Twitter are taking major steps to fight against misinformation across their platforms. However, their attempts have had little impact on the minimization of fake news[5].

DIFFERENT TYPES OF FAKE NEWS

Detecting false information has become increasingly prominent in today's world, where misinformation and

disinformation can spread rapidly through social media and other online platforms. Fabricated news is a variety of misinformation and disinformation that is intentionally distributed to deceive or influence readers. To effectively identify false news, it is important to describe the various types of false news. The world of fake news is very extensive and its direction is somewhat unclear, although there are instances where various forms of misinformation are spread[6]. Here are some different types of fake news-

Clickbaits: Clickbait refers to a kind of content with the primary goal of capturing attention and encouraging visitors to click on the link to reach a webpage. It has been linked to the quick spread of rumors and misinformation on the internet[7].

Propaganda: Propaganda refers to stories that are created by a political entity to shape the perceptions of the common people[8].

Satire and parody: Satire and parody utilize sarcasm, fake narratives, and humor to convey news or information entertainingly. These things are designed as news or information to shame an individual, organization, community, or religion [4].

Hoaxes: The term "hoax" refers to false information or an attempt to mislead or influence readers into believing something that is not true. Hoax is a type of deceit that seeks to make people laugh or be hazardous[9].

Sloppy news content: Sloppy news material refers to stories produced by reporters and media organizations containing inaccurate details without any fact-checking, which might mislead the audience[4].

SOCIAL NETWORKING AND FAKE NEWS

Social networking has evolved into a strong tool for sharing information and communicating with people in today's society. It has transformed how we communicate, bringing people together across huge distances. However, in addition to the numerous advantages of social media, there is rising concern about the proliferation of false news. With the advent of the internet, the ability to access and distribute information has been greatly influenced[10]. A news-rating organization discovered dozens of news websites generated by AI chatbots that were growing online[11].Social media Orkut was created in 2004 and became everyone's savior back then. However, its presence dropped quickly with the arrival of now-popular social networking sites such as Facebook and Twitter [12].It has been reported that WhatsApp is a major platform for the spread of fake news in India. Tragically, in May 2017, two

separate incidents in the state of Jharkhand resulted in the deaths of seven men due to mob violence[13]. This disturbing misinformation circulated on WhatsApp has caused the loss of innocent lives. According to some online sources, Whatsapp currently has approximately 2 billion active users globally[14].Whatsapp Messenger has become the most popular app, with 63% of Indians using it daily, which is increasing daily[15].WhatsApp is primarily a messaging application that is designed for confidential and personal interactions among individuals or small groups. WhatsApp allows individual users to share information such as images, videos, etc. Platforms like Facebook and Twitter offer social networking capabilities, including the ability to create a profile, connect with friends and followers, join groups, and like, comment on, or share other people's postings. After the 2008 U.S. presidential campaign, Facebook and Twitter became key social media places for political parties, interest groups, and people interested in politics to connect and interact[16]. As of the first quarter of 2023 Facebook, with 2.98 billion monthly active users, is a significant source of online news delivery[17].Twitter has 353.9 million active users worldwide[18]. Instagram has become a battleground for an ongoing 'Meme War,' in which players from two principal online parties engage in trolling and clashes to establish authority within the network[19].In today's time, Instagram has 1.35 billion active users[20]. Unfortunately, the usage of social networking is on the rise which weakens trust and poses major problems in the field of information authenticity.

- ## FACEBOOK WORKS TO COMBAT FAKE NEWS

Facebook has been working hard to prevent the dissemination of false information on its platform, and measures have been taken. Facebook collaborates with independent fact-checkers in certain countries. Fact-checkers primarily focus on the accuracy of the information and provide ratings accordingly[21].

- ## WHATSAPP WORKS TO TACKLE FAKE NEWS

WhatsApp has taken important steps to combat the issue of false information and fake news that may appear on its platform. It utilizes ML technology to rapidly identify and flag fake news. WhatsApp successfully combats the spread of fake news by combining complicated human intelligence and AI machine learning algorithms[22].

- ## TWITTER WORKS TO COMBAT FAKE NEWS

Twitter is currently testing a new feature called "Notes on Media" to fight against the spread of false information. This feature aims to assist users in identifying

misleading photos and videos. Twitter is utilizing crowd-sourced fact-checks through Community Notes to offer valuable insights on particular media content[23].

- **INSTAGRAM WORK TO TACKLE FAKE NEWS**

Instagram utilizes technology that matches images to identify similar content and then labels it accordingly, which helps to reduce the spread of misinformation. At an earlier point this year, an option for "False Information" feedback was included. This, combined with other indicators, aids in improved detection and response to potentially false information[24].Instagram employs a combination of technology and user feedback to detect posts that may contain inaccurate information. Instagram collaborates with third-party fact-checkers worldwide who assess content in over 60 languages[25].

II. LITERATURE REVIEW ON FAKE NEWS DETECTION

Researchers enhance the field by investigating and analyzing the fake information that is present on our social networking. The paper discusses the latest developments in combating harmful content on social media and highlights social bots' role in spreading fake news. Several researchers are dedicated to addressing the problem and are investigating several techniques to combat it.

One effective approach is to use NLP and ML techniques to identify fake news. The training is done using data collected from different datasets such as Kaggle, LIAR, Newspapers, social media, etc. Further researchers focus on the review of such studies that use NLP and ML in their approach to combat misinformation.

VL Rubin et al. [26]discussthe challenges of detecting fake news propose a method of spotting false information and suggest a solution to aid individualsin recognizing and removing possibly misleading news. In their analysis, the authors consider three categories of false information: deliberate falsehoods, widespread hoaxes, and amusing fabrications. They evaluate the benefits and drawbacks of using these types of content in text analysis and predictive modeling. The paper highlights the importance of filtering, vetting, and verifying online information. Based on the authors' research findings, it is recommended to create an automated system for detecting fake news as part of a comprehensive news verification suite.

Prakhar Biyani et al. [27] study focuses on identifying Clickbaits in news feeds by analyzing articles.Articles that use

misleading headlines to attract users to click on the link and generate revenue from the landing page are Clickbaits. The authors employed machine learning to detect clickbait. Authors use a variety of indicators that indicate the level of informality on a page, which strongly suggests whether it is clickbait or not. They perform experiments to assess their method and examine the characteristics of clickbait and non-clickbait articles.This model provides a high level of achievement, achieving a 74.9% F-1 score in accuracy.

Nasira Perveen et al. [28]study introduces a method for identifying spam on Twitter by analyzing sentimental features. The researchers gathered a set of 29,000 tweets, each corresponding to one of 29 popular topics on Twitter in 2012. They then tested the effectiveness of their method using five different classifiers.By incorporating content and user-oriented features, the proposed enhancements lead to improved classification accuracy. The machine learning techniques used in this paper are Bayes Net, Naive Bayes, Random Forest, SVM & J48. The J48 got the highest accuracy of 92.34%.

Mykhailo Granik et al. [29]study proposes a straightforward method to identify fake news through the use of a naive Bayes classifier. The authors developed the approach as a software system and tested it on a dataset of Facebook news articles. The test results showed an accuracy of around 74%, which is a decent outcome given the model's relative simplicity. The authors also suggest several ways to improve the results. The paper concludes that artificial intelligence methods can address the problem of fake news detection.

Santosh Kumar Bharti et al. [30] study suggest a framework to identify sarcasm in Hindi tweets by utilizing online news as a contextual reference. The authors highlight the challenge of sarcasm detection in Indian languages due to the richness of morphology and the lack of annotated resources. By analyzing the keywords and their arrangement in a tweet and the corresponding news, the suggested structure attains an accuracy level of 79.4%.The authors also discuss the limitation of the proposed framework, which is the absence of a news time-stamp, and suggest future improvements.

Stefan Helmstetter et al. [31]discuss the problem of fake information on social media platforms like Twitter. One of the biggest challenges in this task is gathering a sufficient amount of training data. To overcome this challenge, the authors propose anML technique, which automatically collects a large-scale which is very noisy training dataset comprising hundreds of thousands of tweets. As tweets are collected, they are automatically categorized as either trustworthy or untrustworthy based on their source. This dataset is then used to train a classifier. The classifier is later utilized to classify

fake and non-fake tweets under a different classification category. The authors demonstrate that despite the labels not aligning with the new classification target, fake news can still be detected with an impressive score of up to 0.9.

Maarten S. Looijenga [32]investigated the use of fake messages on Twitter during the Dutch election in 2012. The paper uses a dataset of 613,033 tweets and evaluates the performance of eight ML classifiers. Based on the results, the Decision Tree algorithm had the highest F-Score of 88%.In addition, the paper carries out qualitative content of false tweets that were posted during the election. It also identifies six distinct types of false content.The goal of this research is to identify fraudulent messages through the use of machine learning.

Marco L. Della Vedova et al. [33]propose amachine learning (ML) method for detecting fake news on social networks by combining news content and social context features. The authors define fake news as "news articles that are intentionally and verifiably false". The proposed method outperforms existing methods in the literature by increasing their accuracyup to 4.8%. The approach of the author isimplemented within a Facebook Messenger chatbot and yields an accuracy of 81.7% in detecting bogus news. The research focuses entirely on Machine learning methods for detecting bogus news.

Monther Aldwairi et al. [5]discuss the issue of false news and hoaxes on social media networks. The authors describe fake news as false stories that are purposefully manufactured to deceive readers. The purpose of authors is to benefit from false information, which uses flashy headlines or graphics to persuade people to click links and enhance advertisement revenue. To detect fake postings, writers use certain, refined aspects of the title and content. When using the logistic classifier for this purpose, empirical results show a 99.4% precision rate. The study also covers the dataset issue, as well as the application of Natural Language Processing (NLP) techniques for news to help detect bogus news on certain issues. The authors offer a lightweight Clickbait detection system based on high-level feature title attributes.This paper also concludes by emphasizing the importance of effectively countering fake news and Clickbaits.

Sneha Kudugunta et al. [34]propose a Deep Neural Network architecture which is based on Long Short-Term Memory (LSTM) for detecting bots on Twitter. The authors suggest a technique for generating a large labeled dataset appropriate for Deep net training from a small quantity of labeled data. The techniques are Logistic Regression, Random Forest, and AdaBoost. The highest accuracy using AdaBoost is 99.81%.

Anjali Jain et al. [35]propose A framework for identifying false information through Machine Learning and Natural Language Processing. The goal is to validate news stories shared on social media sites such as WhatsApp, Facebook, and Twitter. The proposed model utilizesa Support Vector Machine to determine whether the news is true or false. The proposed model's findings demonstrate an accuracy of up to 93.6%. This study tries to prevent the spread of bogus news, which can have negative implications such as mob lynching.

Vasu Agarwal et al. [36]discussthe methods of NLP and ML to detect fake news. The authors used the LIAR dataset, which contains labeled news statements, and trained the data on five different classifiers to see which one worked best for this particular dataset. To preprocess the data, the authors used NLP techniques such asbag-of-words, n-grams, and TF-IDF. Authors use Precision, recall, and f1 scores were used to determine which model performs best.

Z Khanam et al. [37]Propose a methodology to detect fake news using supervised machine learning algorithms. The researchers study studies on fake information detection and investigate various Machine Learning models to discover the best option.They recommend using the Python Sci-Kit-Learn module for text data Tokenization and Feature Extraction because it includes useful tools like Count Vectorizer and Tiff Vectorizer. Then, based on the results of the confusion matrix, they use feature selection methods to experiment and select the best-fit features to get the highest precision.The highest level of accuracy is 92%.

Supanya Aphiwongsophon et al. [38]Propose a simple method to identify Fake news using Machine learning. In this study, the researcher chose the dataset sourced from Twitter.The ML techniques used by authors in this paper are Naïve Bayes, Neural Networks, and SVM. The neural network got 99.90%, and SVM got 99.90%.

Marius Cristian Buzea et al. [39]propose a Machine Learning method for detecting bogus news in Roman language web sources.The approach proposed is based on a Romanian news corpus containing 25,841 true and 13,064 fake news items.The paper compares the performance of neural network architectures such as Long Short-Term Memory (LSTM), Convolutional Neural Networks (CNN), Gated Recurrent Units (GRU), Bidirectional Encoder Representations from Transformers (BERT), and standard classifiers such as Support Vector Machine (SVM) and Naïve Bayes (NB) for detecting fake news in Romanian.CNN outperforms both the traditional classification methods and the BERT models.

Sarra Senhadji et al. [40]concentrate on detecting bogus news with ML approaches, notably the Naive Bayes and Long Short-Term Memory (LSTM) classifiers. The authors evaluatethese classifiers' effectiveness in accurately identifying fake news. The LSTM classifier outperformed the Naive Bayes classifier in the investigation, obtaining an accuracy of 92%. The paper emphasizes the significance of spotting fake news, which can have major implications, such as misinforming readers. The authors propose that their approach be used to stop the spread of bogus news on the internet.

Mahfujur Rahman et al. [41]Concentrate on detecting bogus news in online news platforms. As people rely more on online news sources, the propagation of false information and rumorshas become a big issue that has a negative influence on society. This paper recommends using classic ML techniques and DL models to detect bogus news. The testing dataset was collected from the Kaggle website. The results reveal that the logistic regression technique outperforms the older methods with 96% accuracy, while the Bi-LSTM model outperforms them all with 99% accuracy. Overall, the research offers a viable technique for detecting bogus news and dealing with the harmful repercussions of its dissemination.

Roy Setiawan et al. [42]suggest a solution to the problem of incorrect information quickly spreading on online platforms such as Facebook and Twitter. For automatic news article classification, the authors recommend adopting a machine-learning optimization technique. They created a dataset of fake and non-fake news from sites such as Facebook and Twitter. The suggested technique tries to determine the veracity of news and avoid disseminating fake information via popular channels. NLP and SVM are used in the study to obtain 91.23% accuracy in classifying news items. The article emphasizes the necessity of recognizing fake news and the risks connected with disinformation distributed on social media platforms.

Afreen Kansal [43]proposes a style-based approach to identify bogus news before it is released. Rather than publishing news and then assessing whether it's phony or not, the goal is to avert damage. To detect bogus news, the paper employs an ensemble ML classification model. With the advancement of social media and technology, the problem of fake information has become increasingly widespread in this digital era. The report emphasizes the need to comprehend and analyze the underlying writing style to detect fake news. The recorded accuracy score was 93.5%.

Deepjyoti Choudhury et al. [44]Using machine learning classifiers, authors offer a unique way to detect bogus news.

The authors compared the performance of four different classifiers on various datasets: SVM, Naive Bayes, Random Forest, and Logistic Regression. The SVM classifier scored maximum accuracy in the datasets Liar, Fake Job Posting, and Fake News. The proposed GA-based method has also demonstrated good results in detecting bogus news. The report emphasizes the importance of spotting fake news and the necessity for more effective countermeasures**.**

These researcher's work highlights the need to apply powerful machine learning and natural language processing tools to battle the spread of fake news, clickbait, and other concerns on numerous internet platforms. Their findings can help individuals and organizations make more informed decisions in the age of digital information by providing vital insights into the creation of more accurate and robust fake news detection systems.

Table 1shows the details ofthe researcher's work, including their reference, publication year, aim of the paper, techniques applied, and research outcomes or accuracy.

Table 1: Comparison of various NLP and ML approaches for detecting false news

Ref. No.	Year	Dataset	Aim of the paper	Techniques Applied	Results/Accuracy
[26]	2015	Online News	Three different sorts of bogus news to detect it.	NLP	Got an accuracy of 76%
[27]	2016	Yahoo News, Google news	Detect Clickbait news using Machine learning approaches	ML Models (Gradient BoostedDecision Trees)	Got an accuracy of 74.9%
[28]	2016	29000 Tweets	Propose a sentimental approach to detect fake news on Twitter	ML techniques Naive Bayes, Random Forest, SVM & J48.	Got an accuracy of 92.34% using J48
[29]	2017	Facebook Posts	Detection offakenews using the NB method	ML technique Naïve Bayes classifier	Naïve Bayes got 74%
[30]	2017	Hindi tweets	To detect fake news out of sarcastic tweets which were written in Hindi	ML and NLP	Support Vector Machine (79.4%)
[31]	2018	Twitter	weakly supervised method to detect fake news on Twitter	Naive Bayes, Decision Trees, Support Vector Machines (SVM), Neural Networks, Random Forest and XGBoost	Using a large-scale dataset with inaccurate labels instead of a small, accurate hand-labeled dataset produces very good results.
[32]	2018	Twitter	Find true and false Tweets in 613.033 tweets on Twitter	8 ML Classifiers Linear Support Vector Machines (LSVM), Gaussian Naïve Bayes (G-NB), Bernoulli Naïve Bayes(B-NB) and Multinomial NaïveBayes(M-NB), DecisionTrees (DT), Extra Trees (ET), Stochastic Gradient Descent (SGD) and Random Forests (RF)	328.897 tweets classified as true, and 284.136 tweets classified as false
[33]	2018	Facebook Posts	Detection offakenews using ML techniques	ML Techniques	81% accuracy was obtained.
[5]	2018	Facebook, Forex, and Reddit.	Detect Clickbait type of fake news using ML techniques	Bayes Net, Logistic, Random Forest & Naïve bayes	Logistic Classifier got 99.4%
[34]	2018	3000 Twitter Bots	Proposed anarchitecturethat distinguishes between bots and people with good classification accuracy at the tweet and account levels.	Logistic Regression, Random Forest, AdaBoost	The highest accuracy using AdaBoost is 99.81%.

[35]	2019	Online News	Demonstrate a model using ML and NLP techniques	Naïve Bayes, SVM & NLP	Got an accuracy of 93.50%
[36]	2019	LIAR Dataset	NLP and ML techniques can predict the chances of a news report by utilizing past news reportdata.	Bag-of-words, n-grams,Count Vectorizer, and TF-IDF	Best-performing model is the SVM
[37]	2021	Liar Dataset	A methodology that can detect if an article is authentic or not	XG boost, Random Forest(RF), Naïve Bayes(NB), K-Nearest Neighbors (KNN), Decision Tree, SVM, and NLP Techniques	Highest accuracy is 92%
[38]	2022	948,373 messages by Twitter API	Using ML provides a simple method for detecting bogus news.	Naïve Bayes, Neural network, SVM	The neural network got 99.90%, SVM got 99.90%
[39]	2022	25,841 true and 13,064 fake	Propose supervised ML algorithms for detecting bogus news in Romanian-language web sources.	Recurrent neural network, Convolutional neural network,Bidirectional Encoder Representations, Naïve Bayes, and Support Vector Machine	The best result achieved by the CNN of 98.20%
[40]	2022	20,800 news articles related to the US presidential elections in 2016	To identify the accuracy of classifiers in distinguishing between authentic and fake news	NBandLSTM	LSTM achieves an accuracy of 92%
[41]	2022	Kaggle dataset	Detect fake news using both traditional ML models and DL techniques	logistic regression, decision tree, k-nearest neighbors, naive Bayes, long short-term memory, & bidirectional long-short-term memory	The Bi-LSTM model generated 99%
[42]	2022	Facebook and Twitter	To develop a model capable of detecting bogus news onFacebook and Twitter	ML and NLP Techniques	The proposed model achieved 91.23% accuracy
[43]	2023	21417 real news and 23481 fake news	Using an ensemble machine learning, a style-based technique for detecting bogus news before it is published	POS tagging and Machine Learning Models	The accuracy score was reported to be 93.5%
[44]	2023	Liar dataset	Propose an approach to detect fake newsML classifiers	ML models	The SVM achieved the highest accuracy

III. CONCLUSION

This study concludes that the internet and social media's widespread use has resulted in the easy dissemination of fake news whichcauses negative consequencesfor individuals and organizations.It is important to authenticate news articles that are circulated on internet platforms to prevent the propagation of fake news, which can cause harmful consequences. In this paper, we define fake news, Fake news on social media, and different types of fake news and then compare and discuss the benchmark datasets and experimental results of various methods of NLP and ML Techniques. This paper aims tostudy various methods for detecting fake news in social media using NLP and ML algorithms. The methods have been evaluated by researcherson different datasets have shown promising results in terms of accuracy. This study also emphasizes the importance of detecting fraudulent information on social media networks. and its associated challenges.We also propose new suggestions for our future fake news detection models based on our observations.

IV. FUTURE WORK

There are so many future improvements in this project and they are-

- Investigating how diverse types of information, such as content, user-related characteristics, and social

context cues, might be combined to improve the accuracy of detecting fake news.
- Evaluating the methods on larger, more diverse datasets to ensure their generalizability and robustness.
- Creating more user-friendly and accessible solutions, such as browser extensions or mobile applications, for spotting bogus news in social media.
- Improving the accuracy using bigger andbetter datasets.
- Collaborating with experts in related fields to develop more comprehensive solutions.

V. ACKNOWLEDGMENT

REFERENCES

[1] J. M. Burkhardt, *Library Technology Reports vol. 53, no. 8, "Combating Fake News in the Digital Age,"* vol. 53, no. 8. 2017.

[2] K. Shu, A. Sliva, S. Wang, J. Tang, and H. Liu, "Fake News Detection on Social Media: A Data Mining Perspective," no. i, 2017, [Online]. Available: http://arxiv.org/abs/1708.01967

[3] C. Geeng, S. Yee, and F. Roesner, "Fake News on Facebook and Twitter: Investigating How People (Don't) Investigate," *Conf. Hum. Factors Comput. Syst. - Proc.*, pp. 1–14, 2020, doi: 10.1145/3313831.3376784.

[4] S. A. Khan, M. H. Alkawaz, and H. M. Zangana, "The Use and Abuse of Social Media for Spreading Fake News," *2019 IEEE Int. Conf. Autom. Control Intell. Syst. I2CACIS 2019 - Proc.*, no. June, pp. 145–148, 2019, doi: 10.1109/I2CACIS.2019.8825029.

[5] M. Aldwairi and A. Alwahedi, "Detecting fake news in social media networks," *Procedia Comput. Sci.*, vol. 141, pp. 215–222, 2018, doi: 10.1016/j.procs.2018.10.171.

[6] S. Sharma and D. K. Sharma, "Fake News Detection: A long way to go," *2019 4th Int. Conf. Inf. Syst. Comput. Networks, ISCON 2019*, no. November, pp. 816–821, 2019, doi: 10.1109/ISCON47742.2019.9036221.

[7] Y. Chen, N. J. Conroy, and V. L. Rubin, "Misleading online content: Recognizing clickbait as 'false news,'" *WMDD 2015 - Proc. ACM Work. Multimodal Decept. Detect. co-located with ICMI 2015*, no. November, pp. 15–19, 2015, doi: 10.1145/2823465.2823467.

[8] B. Collins, D. T. Hoang, N. T. Nguyen, and D. Hwang, "Trends in combating fake news on social media–a survey," *J. Inf. Telecommun.*, vol. 5, no. 2, pp. 247–266, 2021, doi: 10.1080/24751839.2020.1847379.

[9] R. Mustapha *et al.*, "The Impact on Hoax News among Societies: What Islamic Expert Say?," *Int. J. Acad. Res. Progress. Educ. Dev.*, vol. 11, no. 1, 2022, doi: 10.6007/ijarped/v11-i1/12090.

[10] V. L. Crittenden, L. M. Hopkins, and J. M. Simmons, "Crittenden et al - Satirists as opinion leaders.pdf," vol. 11, no. 3, pp. 174–180, 2011, doi: 10.1002/pa.

[11] "99904937 @ economictimes.indiatimes.com." [Online]. Available: https://economictimes.indiatimes.com/tech/technology/ai-chatbots-have-been-used-to-create-dozens-of-news-content-farms/articleshow/99904937.cms

[12] "news-orkut-farewell-mail-goes-viral-people-remembers-on-twitter-see-how-they-reacted-631992 @ www.indiatvnews.com." [Online]. Available: https://www.indiatvnews.com/technology/news-orkut-farewell-mail-goes-viral-people-remembers-on-twitter-see-how-they-reacted-631992

[13] G. Farooq, "Politics of fake news: How WhatsApp became a potent propaganda tool in India," *Media Watch*, vol. 9, no. 1, pp. 106–117, 2018, doi: 10.15655/mw/2018/v9i1/49279.

[14] D. Brian, "Whatsapp-Users @ Backlinko.Com," *02.03.2021*. [Online]. Available: https://backlinko.com/whatsapp-users

[15] P. Khurana, D. Kumar, and S. Kumar, "Research of fake news spreading through whatsapp," *Int. J. Innov. Technol. Explor. Eng.*, vol. 8, no. 6 Special Issue 4, pp. 948–951, 2019, doi: 10.35940/ijitee.F1193.0486S419.

[16] J. Brummette, M. DiStaso, M. Vafeiadis, and M. Messner, "Read All About It: The Politicization of 'Fake News' on Twitter," *Journal. Mass Commun. Q.*, vol. 95, no. 2, pp. 497–517, 2018, doi: 10.1177/1077699018769906.

[17] "essential-facebook-stats @ datareportal.com." [Online]. Available: https://datareportal.com/essential-facebook-stats#:~:text=Essential Facebook statistics and trends,'active' social media platforms.

[18] "ec4777e7591cd04cb674fde6f20aac4f04235ee6 @ www.statista.com." [Online]. Available: https://www.statista.com/statistics/303681/twitter-users-worldwide/

[19] A. Al-Rawi, "Political memes and fake news discourses on instagram," *Media Commun.*, vol. 9, no. 1, pp. 276–290, 2021, doi: 10.17645/MAC.V9I1.3533.

[20] "165b42a1d58ef419f691f0e9038f06de58cdd41e @ www.statista.com." [Online]. Available: https://www.statista.com/statistics/183585/instagram-number-of-global-users/

[21] "1952307158131536 @ www.facebook.com." [Online]. Available: https://www.facebook.com/help/1952307158131536

[22] "2384f8b6acc4d3566e652155272d130d5b802d48 @ www.analyticsinsight.net." [Online]. Available: https://www.analyticsinsight.net/how-whatsapp-utilises-machine-learning-to-combat-fake-news/

[23] "twitter-testing-new-feature-to-fight-against-fake-news-know-more-2023-05-31-873514 @ www.indiatvnews.com." [Online]. Available: https://www.indiatvnews.com/technology/news/twitter-testing-new-feature-to-fight-against-fake-news-know-more-2023-05-31-873514

[24] "combatting-misinformation-on-instagram @ about.instagram.com." [Online]. Available: https://about.instagram.com/blog/announcements/combatting-misinformation-on-instagram

[25] "1735798276553028 @ help.instagram.com." [Online]. Available: https://help.instagram.com/1735798276553028

[26] V. L. Rubin, Y. Chen, and N. J. Conroy, "Deception detection for news: Three types of fakes," *Proc. Assoc. Inf. Sci. Technol.*, vol. 52, no. 1, pp. 1–4, 2015, doi: 10.1002/pra2.2015.145052010083.

[27] P. Biyani, K. Tsioutsiouliklis, and J. Blackmer, "' 8 Amazing Secrets for Getting More Clicks ': Detecting Clickbaits in News Streams Using Article Informality Clickbait classification," pp. 94–100.

[28] N. Perveen, M. M., Q. Rasool, and N. Akhtar, "Sentiment Based Twitter Spam Detection," *Int. J. Adv. Comput. Sci. Appl.*, vol. 7, no. 7, pp. 568–573, 2016, doi: 10.14569/ijacsa.2016.070777.

[29] M. Granik and V. Mesyura, "Fake news detection using naive Bayes classifier," *2017 IEEE 1st Ukr. Conf. Electr. Comput. Eng. UKRCON 2017 - Proc.*, pp. 900–903, 2017, doi: 10.1109/UKRCON.2017.8100379.

[30] S. K. Bharti, K. Sathya Babu, and S. K. Jena, "Harnessing Online News for Sarcasm Detection in Hindi Tweets," *Lect. Notes Comput. Sci. (including Subser. Lect. Notes Artif. Intell. Lect. Notes Bioinformatics)*, vol. 10597

LNCS, no. December, pp. 679–686, 2017, doi: 0.1007/978-3-319-69900-4_86.

[31] S. Helmstetter and H. Paulheim, "Weakly supervised learning for fake news detection on Twitter," *Proc. 2018 IEEE/ACM Int. Conf. Adv. Soc. Networks Anal. Mining, ASONAM 2018*, pp. 274–277, 2018, doi: 10.1109/ASONAM.2018.8508520.

[32] M. Looijenga, "The Detection of Fake Messages using Machine Learning," *Retrieved Sept.*, vol. 1, p. 2021, 2018, [Online]. Available: http://essay.utwente.nl/77385/

[33] M. L. Della Vedova, E. Tacchini, S. Moret, G. Ballarin, and M. Dipierro, "Content and Social Signals," *2018 22nd Conf. Open Innov. Assoc.*, pp. 272–279, 2018.

[34] S. Kudugunta and E. Ferrara, "Deep neural networks for bot detection," *Inf. Sci. (Ny).*, vol. 467, pp. 312–322, 2018, doi: 10.1016/j.ins.2018.08.019.

[35] A. Jain, A. Shakya, H. Khatter, and A. K. Gupta, "A smart System for Fake News Detection Using Machine Learning," *IEEE Int. Conf. Issues Challenges Intell. Comput. Tech. ICICT 2019*, no. September, 2019, doi: 10.1109/ICICT46931.2019.8977659.

[36] V. Agarwal, H. P. Sultana, S. Malhotra, and A. Sarkar, "Analysis of Classifiers for Fake News Detection," *Procedia Comput. Sci.*, vol. 165, no. 2019, pp. 377–383, 2019, doi: 10.1016/j.procs.2020.01.035.

[37] Z. Khanam, B. N. Alwasel, H. Sirafi, and M. Rashid, "Fake News Detection Using Machine Learning Approaches," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 1099, no. 1, p. 012040, 2021, doi: 10.1088/1757-899x/1099/1/012040.

[38] R. H. Patel, R. Patel, S. Patel, and N. Patel, "Detecting Fake News Using Machine Learning," *Lect. Notes Data Eng. Commun. Technol.*, vol. 101, pp. 613–625, 2022, doi: 10.1007/978-981-16-7610-9_45.

[39] M. C. Buzea, S. Trausan-Matu, and T. Rebedea, "Automatic Fake News Detection for Romanian Online News," *Inf.*, vol. 13, no. 3, pp. 1–13, 2022, doi: 10.3390/info13030151.

[40] S. Senhadji and R. A. S. Ahmed, "Fake news detection using naïve Bayes and long short term memory algorithms," *IAES Int. J. Artif. Intell.*, vol. 11, no. 2, pp. 746–752, 2022, doi: 10.11591/ijai.v11.i2.pp746-752.

[41] M. Rahman, M. Hasan, M. M. Billah, and R. J. Sajuti, "Political Fake News Detection from Different News Source on Social Media using Machine Learning Techniques," *AIUB J. Sci. Eng.*, vol. 21, no. 2, pp. 110–117, 2022, doi: 10.53799/ajse.v21i1.383.

[42] R. Setiawan *et al.*, "Certain Investigation of Fake News Detection from Facebook and Twitter Using Artificial Intelligence Approach," *Wirel. Pers. Commun.*, vol. 127, no. 2, pp. 1737–1762, 2022, doi: 10.1007/s11277-021-08720-9.

[43] A. Kansal, "Fake News Detection Using Pos Tagging and Machine Learning Fake News Detection Using Pos Tagging and," *J. Appl. Secur. Res.*, vol. 18, no. 2, pp. 164–179, 2023, doi: 10.1080/19361610.2021.1963605.

[44] D. Choudhury and T. Acharjee, "A novel approach to fake news detection in social networks using genetic algorithm applying machine learning classifiers," *Multimed. Tools Appl.*, vol. 82, no. 6, pp. 9029–9045, 2023, doi: 10.1007/s11042-022-12788-1.