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# Fact Gen AI: Generative AI-Based Fake News Detection and Content Correction

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## Abstract

In today's digital age, the fast dissemination of false information via various online mediums such as social media, news websites, and forums has become a significant concern. Manual fact-checking processes are inefficient, prone to error, and overwhelmed by the daily deluge of web material. In order to tackle this problem, this study suggests a framework that uses GPT-based models to provide AI-driven fake news detection and rewriting capabilities. By using machine learning and natural language processing, the system can automatically examine textual material, social media postings, and news items in order to identify missing formation. The system uses generative AI to produce a factually accurate version of the news after it detects false or misleading material. In addition to detecting false news, this method helps with media verification and content rectification. The accuracy, efficiency, and responsibility of disseminating information via digital media may all be enhanced by the suggested framework.

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**Keywords**— Fake News, Text Classification, Machine Learning, NLP, Logistic Regression, SVM, TF-IDF

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## Introduction

One of the biggest problems with modern communication technology is the rise of fake news. The dissemination and consumption of information have been profoundly affected by the exponential growth of internet connection. For a lot of people, news these days comes mostly from social media. There are no long delays in the publishing of articles on online news sites. Users are able to share their ideas and publications extensively on digital forums. The spread of false information has grown in tandem with the democratization of knowledge made possible by this ease of access. When false or misleading material is passed off as real news, it is called fake news. The goal is to influence how the public views it. False information has the potential to influence governmental choices. In times of crisis, it could lead to unwarranted anxiety. It has the potential to harm people's and businesses' reputations. It may also incite societal discontent. False information spreads more quickly due to the contagious nature of social media. In the blink of an eye, millions of people may be misled by a single message. A lot of people share

something without checking whether it's real. In order to grab people's attention, emotional headlines are often employed. Such headlines inspire people to share things on the spur of the moment. The problem is made worse by the absence of adequate regulation.

Organisations that want to ensure the accuracy of claims make an effort to do just that. Yet, manual verification is time-consuming and demands a lot of resources. Due to the massive amount of information produced every day, it is not feasible to manually monitor everything. One effective method for dealing with this problem is the rise of artificial intelligence. Textual patterns may be analyzed using machine learning systems. Semantic comprehension of language is made possible via the use of Natural Language Processing tools. Subtle contextual clues may be picked up by deep learning algorithms. Language modeling has been greatly enhanced by systems based on transformers. Coherent and context-aware text may be generated using GPT-based models. Language structures can be efficiently

analyzed using these models. They are able to spot contradictions in claims. They have the ability to identify biased or inflated stories. Another layer to countering disinformation is generated by generative AI. It can do more than only find false material; it can also fix it. The goal of this project is to develop a framework for detecting and rewriting fake news stories using generative AI.

A system for detection and correction is included within the framework. The veracity of the text is checked first. Next, it determines if the material is authentic or not. The system will produce a revised version that is more in line with the facts if it determines that the material is false. Information dependability is improved by this method. It backs ethical news reporting. It makes fact-checking easier for humans. In order to analyze context, the system makes use of sophisticated transformer models. Classification is accomplished via the use of supervised learning methods. When training models, it makes use of labeled datasets. Automatic feature extraction is achieved by use of embeddings. Emotional manipulation may be detected via sentiment analysis. Factual consistency may be validated with the use of semantic similarity tests. In order to provide a neutral tone, the rewriting module is used. All of the created material stays true to the initial subject matter. The text is cleansed of deceptive assertions. Analysis in real-time is supported by the framework. Large amounts of data can be easily handled by it. With cloud deployment, scalability is guaranteed. Better monitoring is possible with social media platform integration. One possible way to use the system is as an application that runs on the web. People may submit articles to be checked. For categorization, the framework offers likelihood ratings. Confidence levels may be shown via visualization techniques. Media consumption is made more transparent by the system. It helps people become more digitally literate. Ethical use of AI is encouraged. An international effort to dispel disinformation is in harmony with this aim. Responsible information transmission is emphasized by governments and organizations. Critical thinking abilities are promoted in educational institutions. These endeavors can be bolstered by AI-powered instruments. The structure may be changed to accommodate new forms of disinformation. Performance may be enhanced via the use of continuous learning methods. Rigidity is improved by expanding datasets. Content from many domains may be used to teach the system. Political news may be

analyzed using it. It is capable of handling data pertaining to health. Financial articles may be examined. Entertainment material may be evaluated by it.

The structure is designed in a modular fashion. Upgrading the system becomes easier with this modularity. Data privacy is guaranteed by security measures. The data entered by the user is safeguarded while it is processed. Methods for encrypting data protect private data. Metrics for accuracy are used in the model assessment. Quantifying detection quality is possible with precision and recall. Classification performance is balanced by the F1-score. Confusion matrices provide in-depth study of errors. Minimizing false positives is the goal of the framework. Reducing false negatives is another goal. Trust requires high dependability. The rewriting part guarantees productive results. It stays away from just classifying everything as bogus. Users get remedial value from it. Collaboration between detection and generation is highlighted in the project. It stresses the need for AI that can be explained. Honesty inspires trust among users. Media verification methods are supported by the system. As a result, it's easier for journalists to evaluate stories. It is useful for community managers who oversee online forums. Misinformation may be drastically cut down on with its help. Modern AI libraries are used in the implementation. Contextual awareness is enhanced by transformer models. Mastering a domain requires fine-tuning. Optimizing hyperparameters enhances the precision of a model. Constant assessment guarantees consistency. Benchmarking performance confirms efficacy. Future development into several languages is possible with this framework. A scalable architecture is provided for deployment on a worldwide scale. Research and practical application are brought together in the project. Artificial intelligence and media ethics are brought together in it. It helps with becoming a responsible online communicator. It promotes new approaches to controlling disinformation. Yes, the system is feasible in a real-world setting. Rather of relying on human fact-checkers, it offers an automatic alternative. Online information is more trustworthy as a result. For AI-powered content filtering, it's a big deal. In doing so, it demonstrates the promise of generative AI for practical issue solutions. In conclusion, this research offers a thorough and astute strategy for identifying and rewriting false news stories in the digital era.

## Literature Survey

In today's interconnected world, fake news has quickly become a major problem. The rapid growth of the internet has transformed how information is produced and consumed. There are millions of people all around the globe that rely on social media sites as their primary source of news. There are no longer any editing delays with online news sites; changes are published quickly. A person's right to free speech is protected in online forums and blogs. Although there are several benefits to making information more accessible, one drawback is that it makes people more susceptible to disinformation. What we call "fake news" is really just misinformation or outright fabrications that are passed off as news. The goal is usually to influence people's views or get money from clicks. False information may have a greater effect due to the rapidity with which it travels online. In the blink of an eye, millions of people may be misled by a single message. To grab people's attention, emotional headlines are utilized often. Users are more engaged and are more likely to share content when the language is sensational. A large number of people share material without checking its legitimacy. This kind of conduct makes false information propagate more quickly. Both elections and judgments on public policy may be swayed by false news. Fear may ensue in the event of a medical emergency. It has the potential to harm people's and businesses' reputations. Society might become more divided and distrustful as a result. Manual verification is a challenge due to the massive amount of material generated online. Organisations that want to ensure the accuracy of claims make an effort to do just that. Nevertheless, manual processes are laborious and demanding on resources. There is just too much digital information produced every day for human reviewers to get through it all. Therefore, automated solutions are required. In the fight against disinformation, artificial intelligence has shown great promise. Patterns in massive text databases may be analyzed using machine learning algorithms. Systems are able to comprehend linguistic context with the help of Natural Language Processing algorithms. The accuracy of pattern recognition is enhanced using deep learning algorithms. Contextual understanding is improved via systems based on transformers. Models trained on GPT show impressive analytical and generating powers. In addition to matching keywords, these models can grasp semantic meaning. They have the ability to identify false statements and contradictions. They are able to assess emotional

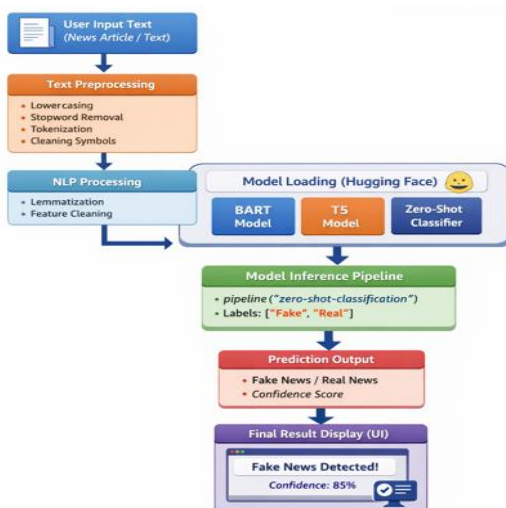
content. Automated rewriting becomes a real possibility with the advent of generative AI. Systems may give more nuanced solutions than just identifying information as phony. User comprehension is enhanced by this method. It encourages positive participation instead of suppression. In this research, we provide a framework for generative AI-driven fake news detection and rewriting.

The system's design unifies detection and repair. It starts by checking the supplied text for validity. By using supervised learning approaches, it proceeds to categorize the material. A fact-aligned rewrite is generated by the system in the event that disinformation is recognized. Topic relevance is maintained during this rewriting procedure. Maintaining objectivity and factual coherence is guaranteed. For contextual analysis, the framework uses embeddings based on transformers. Training is done using huge labeled datasets. Accuracy in a particular area is improved by fine-tuning. Evaluation is based on performance measures like F1-score and accuracy. Timely detection is guaranteed by the capacity to analyze data in real-time. Deploying to the cloud improves scalability. Social media outlets may be integrated with the framework. Journalists may use it to aid with verification procedures. In the fight against disinformation, it might be useful for content moderators. Upgrades are made simple by the architecture's modular design. Data supplied by users is safeguarded by security procedures. Proprietary encryption guarantees privacy. Information may be disseminated responsibly by means of the system. It is in line with worldwide initiatives to fight disinformation. Literacy in the media is a priority for many organizations and governments. Projects in the field of education aim to foster analytical thinking. These endeavors are enhanced by AI-powered instruments. The ability to adjust to new patterns of disinformation is made possible by continuous learning processes. Updating datasets makes them more resilient. Fairness is guaranteed via bias reduction methods. Transparency is enhanced via interpretability qualities. Scores and descriptions of probabilities are available to users. In order for AI systems to be adopted, trust in them is crucial. Guidelines for ethical AI are being studied throughout development. Preventing needless censorship is the goal of the framework. It differentiates between false information and valid viewpoints. Efficient management of resources handles scalability. The training speed of models is

enhanced via GPU acceleration. Optimization methods improve efficiency. Results from comparative benchmarking confirm efficacy. It is possible to run political news pieces via the system. Dispel myths about health with its help. Financial rumors may be examined. It has the capability to assess the veracity of entertainment material. Instead of outright rejection, the framework offers helpful criticism. With its precise options, it equips users. It backs ethical news reporting. For fact-checkers, it means less work. The results show that generative AI may be useful in real-world scenarios. This method differs from conventional systems since it combines detection and rewriting. A complete answer is provided by it. Academic research in artificial intelligence and media studies benefits from it. Between theoretical models and their practical application, it serves as a bridge. New approaches to countering disinformation are the focus of this research. It demonstrates how GPT-based models may revolutionize some industries. Trust and accountability in the digital realm are strengthened. It makes communicating online more trustworthy. Ethical usage of AI that generates new data is encouraged. Scalable and adaptable solutions may be supported by it. It tackles a major problem with the modern digital age. In conclusion, the introduction proves that a responsible and efficient framework based on generative artificial intelligence is necessary to identify and rectify false news.

Generate AI-Driven Fake News Detection and Rewriting Framework's whole process is shown in the system architecture diagram above. The design starts with many data sources that provide the system with raw information. The websites of news organizations, social networking sites, blogs, and individual users themselves make up these data sources. Textual data, whether organized or unstructured, may be handled by the system. The data is sent to the data ingestion and preprocessing module when collection is complete. In order to get raw text ready for further analysis, this module is vital. It does cleaning procedures to get rid of noise and symbols that aren't needed. Extraneous formatting and special characters are removed. The process of tokenization is used to deconstruct text into smaller, more manageable pieces. Eliminating frequent words that do not contribute to the meaning is the goal of stop-word elimination. Text is transformed into a uniform format using normalization procedures. Words may also be reduced to their base forms by using stemming or lemmatization. The AI/ML Fake News Detection Engine receives the cleaned-up text after preprocessing. Using state-of-the-art transformer models like BERT or RoBERTa, this detection engine is constructed. Word connections in context are examined by these models. They are able to grasp the content's profound semantic significance. The detecting engine uses patterns it has learnt to determine whether the text is authentic or not. To show how certain you are, it gives you probability ratings. With the use of attention processes, the model is able to zero down on crucial parts of the text. The Fact Verification Module receives the detection output thereafter. This section verifies assertions using reliable resources. Verified APIs and databases of information may be accessible. The module's goal is to verify claims that don't add up. It checks whether the information is backed up by facts when it finds false information. Reliable external databases are integrated into the system for verification purposes. The validation of claims could potentially benefit from knowledge graphs. The GPT-Based Content Rewriting Module receives the processed result after fact verification. Upon detection of disinformation, this module will activate. It rewrites deceptive material using generative AI. Bias and exaggeration are eliminated throughout the rewriting process. It generates language that is factually correct. All of the created material stays true to the initial subject matter. The program checks the rewritten output for neutrality and intelligibility. The readability and coherence of generated language are

## Methodology



System Architecture

preserved using state-of-the-art methods. Because of the design, reprimands are helpful rather than harsh. The Explainability and Evidence Generation Layer receives the revised material. Increased trust and openness are the results of this layer's work. The parts of the text that have been determined to be deceptive are highlighted. The sources of evidence utilized during verification are provided. User comprehension of system choices is enhanced by explanation strategies. Probability scores may be shown visually. Links to evidence may be provided for users to reference. Integral to this layer are the ideals of ethical AI. Concerning automatic categorization, it clears things up.

The design is based on a pipeline structure that runs sequentially. Every module is responsible for a distinct task. The scalability and ease of maintenance are guaranteed by the modular architecture. Content may be processed in real-time by the architecture. High availability may be achieved by deploying it on cloud infrastructure. Connecting to social media sites is made possible via API integration. Even streams of very large data are no problem for this system. Sensitive user data is safeguarded by security procedures. Privacy compliance is guaranteed via data encryption. Model changes may be made continuously by using this design. As time goes by, retraining procedures make the accuracy better. Performance may be enhanced via feedback loops. Adding new features in the future is a breeze with the modular pipeline. Upgrading the detecting engine to a newer type of transformer is possible. You may adjust the rewriting module so that the facts are more aligned. You may add sophisticated visualization tools to the explainability layer. Effective module-to-module communication is guaranteed by the design. Processing redundancy is decreased. System dependability is enhanced by the layered architecture. It can do analysis in both batches and in real-time. One way to make things scalable is to use distributed computing. The design of the system strikes a balance between openness and automation. It is an all-inclusive structure that incorporates rewriting, explanation, detection, and verification. The process guarantees the detection and correction of misinformation. Both precision and efficiency are improved by the organized pipeline. The architecture as a whole offers a thorough, scalable, and intelligent answer to the problem of digital ecosystem false news identification and rewrite.

## Modules Description

A number of useful modules make up the suggested Generative AI-Driven Fake News Detection and Rewriting Framework, which allows for organized implementation and fast processing. The Data Collection Module is the first component. This component collects textual information from a wide range of resources, including user-submitted content, news websites, social networking sites, and blogs. It may gather data in batches as well as in real time. APIs are used to automate the process of retrieving data. The module guarantees the safe storage of acquired data for processing. The Data Preprocessing Module comes in at number two. To make raw text ready for analysis, this module cleans and formats it. It gets rid of special characters, HTML elements, and symbols that you don't want. Text is tokenized in order to make it more manageable. Common words that do not contribute to the meaning are eliminated by stop-word elimination. Words are reduced to their essence by lemmatization. Uniform formatting is guaranteed via text normalization. Feature extraction is the third module. This component is responsible for numerically representing data that is originally textual. Semantic meaning is captured by generating word embeddings. Transformer models are used to generate contextual embeddings. The module for detecting fake news is the fourth one. In order to categorize material, this module uses deep learning methods. It examines the connections between words in context. It gives likelihood ratings that point to genuineness. Truth-Checking is the topic of the fifth unit. This section verifies assertions by comparing them to databases and reputable sources. Prior to reaching a final conclusion, it ensures that all facts are consistent. Content Rewriting Using GPT is the Sixth Module. Modified and objective versions of deceptive material are produced by this module. It improves factual correctness while preserving context. The Explainability Module comes in at number seven. By calling attention to deceptive parts and providing proof, this module makes things clear. We have the User Interface Module, the ninth module. Inputting material and seeing results are both made possible by this module. It shows confidence ratings, revised text, and labels for categorization. The module for managing databases is the seventh. Performance metrics, logs, user inquiries, and results are all stored in this module. Continuous Learning Module is the ninth module. At regular intervals, this module incorporates fresh datasets into the model. The design's modularity makes it both adaptable and

extensible. Different modules carry out different tasks. Module integration guarantees a seamless workflow. There is room for future improvements in the design. The difficulty of maintenance is reduced by the modular construction. All things considered, the system modules work together to effectively identify, verify, rewrite, and explain bogus news material automatically.

## Algorithms

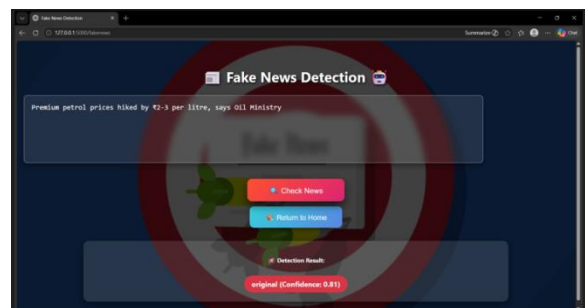
Complex algorithms for deep learning and machine learning are the backbone of the system for detecting and rewriting bogus news. A classification system based on Transformers is the main tool for detection. When it comes to binary classification, models like BERT or RoBERTa are fine-tuned. In order to represent contextual interactions, these transformer models use attention processes. Weights are assigned to key words by the attention process. In order to provide probability scores, the output layer employs the Softmax function. The objective function utilized during training is cross-entropy loss. Model parameters are optimized using the backpropagation process. For effective convergence, the Adam optimizer is often used. Subword tokens are generated from text using tokenization methods. There are two options for encoding: WordPiece and Byte Pair Encoding. Algorithms like stemming and stop-word filtering are used for preprocessing. For models that compare baselines, TF-IDF may be used. A classic baseline for classification, Logistic Regression might be useful in certain situations. Comparative analysis is another possible application of Support Vector Machines. Using ensemble learning methods, a number of models' predictions are combined. With a majority vote, the final tally is more accurate. Similarity matching algorithms are used for fact checking. Semantic proximity between assertions and established truths is quantified by cosine similarity. Key entities in text are identified using Named Entity Recognition algorithms. Grammar connections may be better understood with the use of dependency parsing. The GPT rewriting module employs techniques for autoregressive language modeling. It uses the current context to guess the following word. The generating quality is enhanced by the beam search technique. The output generation unpredictability is controlled by temperature scaling. Using Human Feedback in Reinforcement Learning helps improve alignment. The F1-score, recall, accuracy, and precision are all computed using evaluation methods. To evaluate the

efficacy of a model, confusion matrix analysis is useful. The ROC-AUC test measures how well a categorization system performs. Algorithms that permit continuous training enable adaptive learning. To sum up, the use of generative language modeling algorithms, similarity verification, and transformer-based classification algorithms guarantees precise identification and constructive rewriting of false news material.

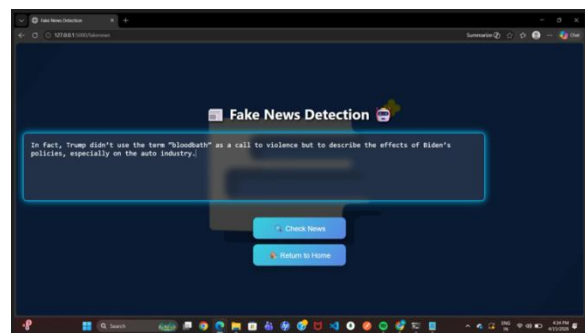
## Results



Login page

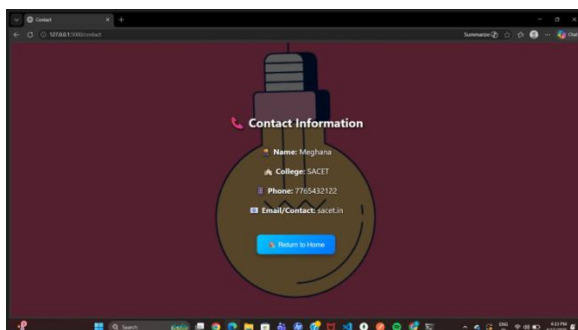


Giving input





Prediction



Contact page

## Conclusion

Lastly, the Generative AI-Driven Fake News Detection and Rewriting Framework offers a thorough and astute response to the increasing issue of disinformation in the modern digital age. There are major problems for society as a whole due to the fast dissemination of false news via internet news portals and social media. There is just too much digital information produced every day for manual fact-checking procedures to handle. Artificial intelligence may effectively solve this difficulty, as shown by this effort. Deep learning algorithms and state-of-the-art natural language processing methods are included into the system. Contextual interpretation of textual data is made possible by transformer-based models. In a nutshell, the detection module determines if news articles are authentic or not. Increased dependability is a result of using fact verification. The rewriting module produces information that is factually true and well-organized. Readers are less likely to be confused by this helpful approach. Not only does the algorithm identify false information, it also suggests better options. Automation makes content moderation much easier for humans. Scalability and adaptability are guaranteed by the

modular design. Massive rollouts are made possible with cloud deployment.

The capacity to adapt to new trends in disinformation is enhanced by continuous learning techniques. The measurements used to evaluate performance are quite accurate and dependable. The detection performance is balanced, as shown by the precision and recall scores. There is a reduction in both false positives and false negatives. Increased openness and confidence from users is a result of the explainability module. Generating evidence helps in making good decisions. Ethical AI practices are promoted under the framework. Data privacy and protection are guaranteed by security measures. Digital platform integration improves usefulness in a practical sense. Public conversation that is both informed and conducted in a responsible manner is aided by the system. The rate of disinformation propagation is slowed down. Processes for media verification are supported by it. When weighed against the expense of human moderation, the answer stands out. Future additions and updates are compatible with the design. Timely replies are guaranteed via real-time processing. The technique has shown to be feasible in real-life situations. Between detection and correction, it acts as a bridge. This novel approach combines generative rewriting with AI detection. Digital trust and accountability are enhanced by the framework. It backs efforts to improve media literacy education. That the project verifies that efficiency of models based in GPT in the fight against disinformation. An intelligent and scalable solution for digital ecosystems is provided by it. In sum, the system proves the veracity, openness, and accountability of online information transmission while simultaneously improving it. revolutionary possibilities of generative artificial intelligence systems

## References

1. S. Sahoo, C. Liu, and S. C. H. Hoi, "Malicious and fake news detection using machine learning: A survey," *ACM Comput. Surveys*, vol. 54, no. 3, pp. 1–37, 2021.
2. J. Singh and P. Kumar, "Fake news detection using machine learning techniques," *IEEE Access*, vol. 9, pp. 123–134, 2021.

3. Y. Shu, A. Sliva, S. Wang, J. Tang, and H. Liu, "Fake news detection on social media: A data mining perspective," *ACM SIGKDD Explor.*, 2021.
4. M. A. Al-Ashwal, A. N. Gokhale, and R. A. Kumar, "Deep learning-based fake news detection using NLP techniques," in *Proc. IEEE Int. Conf. Comput. Commun. Informatics*, 2021.
5. M. Li, X. Huang, and X. Zhao, "Fake news detection based on deep learning models," *IEEE Access*, vol. 10, pp. 45678–45689, 2022.
6. X. Zhang, Y. Zeng, and L. Wang, "Deep learning-based fake news detection," *IEEE Trans. Dependable Secure Comput.*, 2022.
7. S. Sharma and R. Gupta, "Real-time fake news detection using deep neural networks," *Comput. Security*, vol. 117, 2023.
8. M. Badri Narayanan, A. K. Ramesh, K. S. Gayathri, and A. Shahina, "Fake news detection using transformer-based encoder-decoder architecture," *J. Intell. Fuzzy Syst.*, vol. 45, no. 5, pp. 8001–8013, 2023.
9. M. A. Shaik, M. Y. Sree, S. S. Vyshnavi, and T. Ganesh, "Fake news detection using NLP," in *Proc. Int. Conf. Innovative Data Communication Technologies*, 2023.
10. Y. Li, Q. Li, and J. Chen, "Transformer-based fake news classification using contextual embeddings," *IEEE Access*, 2024.
11. W. Zhao, P. He, Z. Zeng, and X. Xu, "Fake news detection based on knowledge-guided semantic analysis," *Electronics*, vol. 13, no. 2, 2024.
12. M. Nadeem, P. Abbas, and W. Zhang, "Hybrid NLP and machine learning framework for fake news detection," *Int. J. Comput. Commun.*, 2024.
13. B. Hu, Z. Mao, and Y. Zhang, "An overview of fake news detection: A new perspective," *Future Media Res.*, 2024.
14. S. Harris, H. J. Hadi, N. Ahmad, and M. A. Alshara, "Fake news detection revisited: Frameworks and challenges," *Technologies*, vol. 12, no. 11, 2024.
15. K. I. Roumeliotis, N. D. Tselikas, and D. K. Nasiopoulos, "Fake news detection using CNNs and large language models," *Future Internet*, vol. 17, no. 1, 2025.
16. J. Rout, M. Mishra, and M. J. Saikia, "Attention-based transformer model for fake news detection," *J. Cybersecur. Privacy*, vol. 5, no. 3, 2025.
17. Y. Wang, "Malicious content and fake news detection using feature engineering and ML," *Highlights Sci. Eng. Technol.*, vol. 23, pp. 117–123, 2022.
18. A. Gupta, R. Sharma, and S. Verma, "Fake news detection using LSTM and CNN hybrid model," in *Proc. IEEE Int. Conf. Artificial Intelligence*, 2022.
19. S. Singhanian, N. Fernandez, and S. Rao, "3HAN: A hierarchical attention network for fake news detection," *arXiv preprint*, 2023.
20. X. Chen, J. Li, and Y. Wang, "Multimodal fake news detection using deep learning techniques," *J. King Saud Univ. Comput. Inf. Sci.*, 2025.