

Survey on Various Tool for Analyzing and Detecting Fake Review by using AI

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Abstract: *The prevalence of fake product reviews in online shopping platforms has raised concerns regarding the authenticity and reliability of customer feedback. This study proposes a method for detecting fake reviews using a logistic regression model and review-centric features. By analyzing linguistic patterns, sentiment analysis, and reviewer behavior, the proposed model aims to accurately differentiate between genuine and fake reviews. Experimental evaluations on real-world datasets demonstrate an overall accuracy of 82%, showcasing the effectiveness of the approach. The integration of natural language processing techniques allows for the extraction of important features from review texts, which are then utilized as inputs to the logistic regression model. Additionally, considering reviewer behavior, such as the number of reviews, consistency of ratings, and timing, enhances the accuracy of the detection system. The proposed method offers a scalable solution that can be easily implemented in existing e-commerce platforms, bolstering their credibility and protecting consumers from misleading information. By filtering out fake reviews, this approach empowers users to make informed purchasing decisions, ultimately improving customer satisfaction in the online marketplace*

Keywords: logistic regression classifier, detection, web scrapping. Fake reviews, feature extraction, review sentiment

I. INTRODUCTION

In today's digital era, consumer decision-making heavily relies on reviews as a Reviews are the main information source that consumers rely on to make decisions about products or services. for services or products. Positive In the digital age, reviews are a crucial information source for consumers, influencing their decisions and product sales. Consequently, reviews have gained immense credibility as authentic expressions of genuine opinions about the quality of services or products. However, the manipulation of reviews through misleading or inauthentic content is considered deceptive and falls under the category of fake information. When a fake review is associated with a genuinely good product, it raises doubts about the product's credibility. The ongoing pandemic has further accelerated the growth of e-commerce, with society increasingly relying on convenient services such as e-banking and online shopping. In this context, if product reviews are fabricated, it can lead to incorrect conclusions about the product's quality. Reviews can be classified into two categories: genuine and fake, with fake reviews encompassing both positive and negative feedback. Consequently, the identification of fraudulent reviews has emerged as a crucial and imperative area of research.

II. PURPOSE OF PLANNED SYSTEM

The development of a user-friendly system for detecting spam reviews is currently underway. The primary objective is to empower users with the ability to make accurate judgments about products. The focus is on creating a scheme that is easy to navigate and understand, ensuring a seamless user experience. By implementing this scheme, users will have the

necessary tools to identify and filter out spam reviews effectively. The ultimate goal is to provide users with reliable and trustworthy information, enabling them to make informed decisions about products. This scheme aims to enhance the user's capacity to discern between genuine and fraudulent reviews, ultimately improving their overall shopping experience.

III. LITERATURE SURVEY

In the paper titled "A technique for identifying fraudulent reviews by analyzing the temporal characteristics of both reviews and comments." It examines online shopping site review records and proposes a new method for detecting deceptive product reviews. This process utilizes the analysis of temporal trends in reviews and comments to determine the authenticity of the reviews. This perspective provides an advantage over existing methods.

In the paper "A framework addressing the challenges and issues involved in detecting fake reviews," the authors introduce a new strategy for detecting fake comments related to commodities, this approach centres on analyzing unusual scoring patterns. By closely examining deviations in scoring behaviours, our innovative method aims to differentiate between genuine and deceptive comments. This approach offers an effective solution to identify fake comments associated with commodities by focusing on the distinct characteristics of scoring irregularities. By combining static and dynamic features, this method successfully detects fake comments for online commodities, as demonstrated by experimental results.

The paper on "Fake product review monitoring system" focuses on studying datasets from legal sites. The author employs various techniques such as feature selection, data mining, data cleaning, and web scraping to develop a system capable of distinguishing between fake and genuine product reviews.

This technique hinges on a comprehension of human psychology and the capacity to identify deceptive actions. By carefully examining fake reviews, heuristic rules can be developed that are interpretable and effective. For instance, previous studies have identified rules based on factors such as review length, sentiment, and helpfulness rate to differentiate between incentivized and non-incentivized reviews. Distinguishing between incentivized and non-incentivized reviews involves recognizing general trends in online reviews, such as observing a restricted quantity of reviews associated with both the user and the product. Minimal feedback, have also been identified as indicators of potential fake reviews.

Industry demands rapid application prototyping and simulations of the protocols to save time, money and energy. Use of intelligent systems with high speed communication, the sector is moving towards the standardizations.

IV. PROPOSED SYSTEM

We have designed a system that detects fake or spam reviews of products. To implement this system, we employ a range of machine learning techniques. Machine learning techniques are employed by utilizing an appropriate dataset of reviews to construct the model, and the model that exhibits the highest level of accuracy is employed for categorizing reviews as authentic or fraudulent.

The model undergoes training using various algorithms, including Logistic Regression and Naïve Bayes [4]. The dataset is pre-processed to extract relevant features, and optimal models are selected following the fitting of all classifiers. Ultimately, the chosen model is applied to accurately and reliably identify spam reviews. The proposed system is depicted in Figure 1. By using these methods, we are able to effectively detect and categorize fake or spam reviews, providing users with trustworthy and reliable information about products.

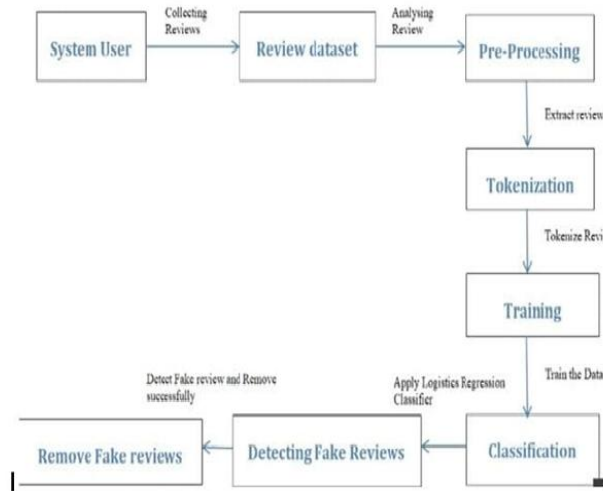


Fig.1 System Architecture

V. METHODOLOGY

System User:

An application user or system user refers to a user account established on the operating system of the server. These users are responsible for maintaining and interacting with the product. System roles encompass all the entities that will be affected by the introduction of the new product.

Dataset:

To train the model, the user needs to collect a dataset of reviews from various platforms such as Flipchart, Amazon, Twitter, WhatsApp, and Instagram. This dataset consists of thousands of rows and includes approximately 14 attributes. These attributes include :

URL: Extracted link from web scraping Review. Title: Headline review

Look over Text: Content of the review presented generate in paragraph confirmation

timing: Timestamp of when it was posted

ID for the profile: Unique identifier for the user's profile

Most_rev: Maximum number of reviews submitted by the profile in a single day

Blink: Hyperlink leading to the user's profile

Help...

Pre-processing:

Data pre-processing entails converting raw data into a format suitable for utilization by a machine learning model.

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After collecting the dataset, the data is pre-processed to enhance the accuracy of the model. This process involves various steps such as cleaning the data, normalizing or scaling and Dividing the data into training and testing sets is a crucial step in the data pre-processing stage. This is done to guarantee that the data is in a uniform and suitable format for effective utilization by the machine learning algorithm. By performing these pre-processing steps, the accuracy of the model can be improved as it is trained on clean and well-structured data.

Feature Extraction:

It facilitates the selection of pertinent data by eliminating irrelevant noise from the process.. It focuses on identifying and considering only the important and effective features. In this specific case, we are only considering two attributes: reviews and review sentiment. Feature extraction can be categorized into two main types: linear and non-linear. An example of linear feature extraction is Principal Component Analysis (PCA), where principal components are

normalized linear combinations of the original features in a dataset. The review attribute contains reviews as a floating-point value. All other columns or attributes are excluded or removed from consideration in this process. By performing feature extraction, we aim to streamline the data and retain only the most significant features for analysis or model training.

Data cleaning:

Correcting or eliminating erroneous, corrupted, incorrectly formatted, duplicate, or incomplete data from a dataset is known as data cleaning. To achieve this, various NLTK libraries such as stop words, punkt, and word net are utilized. During the cleaning process, Common words such as "a," "an," and "the" are removed from the reviews to enhance precision. Additionally, various punctuation marks are excluded to promote cleaner data. Moreover, lemmatization is applied to the reviews, which involves considering words with the same meaning only once. This step aids in organizing the data more effectively. Ultimately, the data cleaning process aims to refine the dataset, making it more accurate, consistent, and suitable for analysis or model training.

Tokenization

In Python, tokenization involves breaking down an extensive text into smaller segments, such as lines, words, or even generating units for non-English languages. The NLTK library includes a module named "tokenize()" that offers two sub-categories for tokenization:

1. Word tokenize: it make seprete the sentences into unique words.
2. Sentence tokenize: it is one way which is used to divide paragraph or sentence.which get easy to used..Top of Form

In this specific context, feature tokenization is performed, which means that the reviews are split into smaller, meaningful parts. This process breaks down the reviews into distinct units, allowing for further analysis or processing at a more granular level. By performing tokenization, the text data is segmented into manageable components, facilitating subsequent tasks such as sentiment analysis or text classification.

Training:

Once the well-structured and cleansed data is ready. Instruction encompasses to development of a model or a "brain" using the existing information in the dataset. Multiple algorithms, including logistic regression and Naïve Bayes, can be applied for this task. Throughout the training phase, the model acquires knowledge of patterns and relationships within the data, empowering it to create parts of the data .By utilizing different algorithms, the model can be trained to understand and generalize from the provided dataset, enhancing its ability to make accurate predictions or classifications in real-world scenarios.

Classification:

After being trained using various algorithms, the model gains the ability to make decisions. Similar to the human brain, the trained model takes into account previous knowledge and experience to make informed decisions. The model is now capable of distinguishing reviews into two categories: fake and genuine, while also providing a measure of the probability of their truthfulness. In essence, the trained model acts as a cognitive entity that leverages its learned information to make accurate determinations about the authenticity of reviews, quantifying the likelihood of their veracity.

Web Scrapping:

Web scraping is a method used to extract a large volume Extracting data from websites involves dealing with typically unstructured information presented in HTML format. This information is subsequently transformed into a structured format, such as a spreadsheet or another organized form.

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This enables the data to be utilized in various applications. Web scraping has become an essential tool for both businesses and individuals, as it allows for the rapid and efficient collection of information from the internet. There are multiple approaches to web scraping, and in this case, the process is carried out using BeautifulSoup, a Python library known for its web scraping capabilities.

Detecting Fake Reviews:

The system retrieves the reviews from websites and applies cleaning techniques to remove punctuation, HTML tags, and other unnecessary elements. This prepares the reviews for further analysis. The system then utilizes various

functions to determine whether the provided reviews are genuine or fake. By leveraging these functions, predictions can be made regarding the authenticity of the reviews.

Removing the fake reviews:

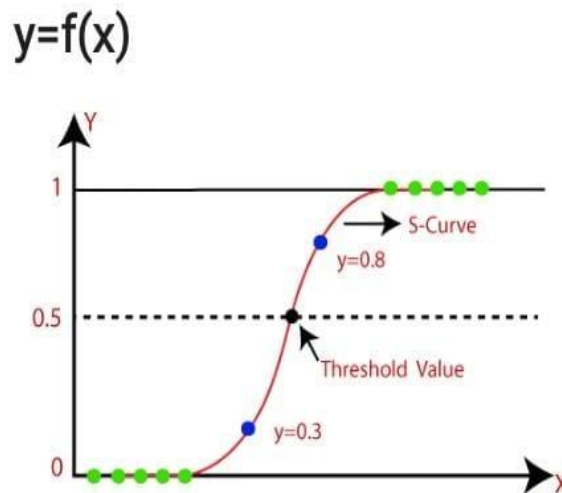
In this scenario, the system effectively detects and subsequently eliminates fake reviews. The genuine reviews are consolidated into a single list, while the identified fake reviews are segregated and placed in a separate category. This method ensures that only authentic reviews remain in the original list, successfully removing the fake reviews from consideration..

Algorithms:

1) Logistic Regression:

Logistic Regression is a method employed in supervised learning for classification purposes. It serves as a binary classification model, predicting outcomes as either true or false, typically represented by 1 or 0. This technique is widely utilized for predicting categorical dependent variables by considering a specified set of independent variables. Logistic regression is especially useful in scenarios involving systems with two distinct categories. most of it employed in light addressing separating issues. There are two important variable in logistic regression independent variable (x) the dependent variable (y). The input variable (x) is used as an input to the algorithm, while the output variable (y) represents the predicted outcome. Mathematically, this can be expressed as

$$y=f(x)$$



VI. CONCLUSION

In this research, our primary focus centered on the identification of spam reviews. Following a thorough analysis of the data , and we gone to proposed the Artificial intelligence to developed such software which is used to detect the fake review which is came from user. Our approach involved reconfiguring the representation of reviews by taking into account usersproducts, the review text, and the specific details. To put our strategy into practice, we used a multilevel interactive attention neural network model with aspect planning. To enhance the model, we introduced a regularization term designed to capture the tacit relationships among users, reviews, and products. Our project is carried out on three major technique to assess the efficacy of developed method , named MIANA. The results illustrated significant enhancements in classification performance compared to cutting-edge techniques for spotting fraudulent reviews . However, it's important to note that our current method specifically discusses specific aspect terms for hotels and restaurants, and the limitation of cross-domain issues remains a focal point for future research. Subsequent work will involve validating the our our approach on on cross-domain datasets and creating a single, integrated model that can automatically extract detailed information and spot fraudulent reviews.

REFERENCES

- [1] Systematic Review of Deepfake Detection Literature MD BEDDHU MURALI^{1,2}, SHOHEL RANA^{1,2}, (Member, IEEE), MOHAMMAD NUR NOBI³, (Member, IEEE), , AND ANDREW H. SUNG², (Member, IEEE) date of publication February 24, 2022, Received January 25, 2022, accepted February 16, 2022, date of current version March 10, 2022
- [2] Generating and identifying fraudulent reviews for online products. Chandrashekhar Kandpal, Joni Salminen^{a,b,* c}, Ahmed Mohamed Kamel^d, , Bernard J. Jansen^a, Soon-gyo Jung^a a Qatar Computing Research Institute, Hamad Bin Khalifa University, Doha, Qatar Turki School of Economics at the University of Turku, Turku, Finland Jaypee Institute of Information Technology, Noida, India Cairo University, Cairo, Egypt Source Journal: Journal of Retailing and Consumer Services
- [3] Date of publication April 26, 2021 Received April 1, 2021, accepted April 21, 2021, date of current version May 6, 2021. Digital Object Identifier 10.1109/ACCESS.2021.3075573 Fake Reviews Detection: A Survey ROBERT OLLINGTON¹, RAMI MOHAWESH¹, SHUXIANG XU¹, MATTHEW SPRINGER¹, YASER JARARWEH², AND SUMBAL MAQSOOD¹, SON N. TRAN¹
- [4] Date of current version March 10, 2022. Received January 17, 2022, accepted February 10, 2022, date of publication February 18, 2022, Digital Object Identifier 10.1109/ACCESS.2022.3152806 The Effect of Identifying Inauthentic Reviews in E-commerce Amidst and Post Covid-19: Detection Using SKL-Based Approaches for Fake Reviews M. USMAN ASHRAF¹, KHALID ALSUBHI¹, HINA TUFAIL¹, AND HANI MOAITEQ ALJAHDALI⁴
- [5] Hina Tufail, M. Usman Ashraf, Khalid Alsubhi, Hani Moaiteq Aljahdali. "The Effect of Fake Reviews on e-Commerce During and After Covid-19 Pandemic: SKL-Based Fake Reviews Detection", IEEE Access, 2022 International Journal & Research Paper Publisher | IJRASET
- [6] Meiling Liu, Yue Shang, Qi Yue, Jiyun Zhou. "Detecting Fake Reviews Using Multidimensional Representations With FineGrained Aspects Plan", IEEE Access, 2021
- [7] awar, U.B., Bhirud, S.G., Kolhe, S.R. (2020). Light Scattering Study on Protocols and Simulators Used in Automotive Application(s). In: Iyer, B., Deshpande, P., Sharma, S., Shiurkar, U. (eds) Computing in Engineering and Technology. Advances in Intelligent Systems and Computing, vol 1025. Springer, Singapore. https://doi.org/10.1007/978-981-32-9515-5_16