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Paper Authors

Nagababu Pachhala, Motupally Anil Kumar, Pallapu Rakhesh , Kolaneedi Anil kumar

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IDENTIFYING DECEPTIVE REVIEWS USING MACHINE LEARNING

[1]Nagababu Pachhala, **Assistant Professor**, Department of IT, Vasireddy Venkatadri Institute of Technology, Nambur, Guntur Dt., Andhra Pradesh.

Motupally Anil Kumar[2], **Pallapu Rakhesh [3]**, **Kolaneedi Anil kumar[4]**
[2,3,4,] UG Students, Department of IT,
Vasireddy Venkatadri Institute of Technology, Nambur, Guntur Dt., Andhra Pradesh.
[2]anilmotupally123@gmail.com , [3] pallapurakheshvenkatasai@gmail.com
[4] kolaneedianilkumar666@gmail.com

Abstract

Internet reviews are mostly regarded as a critical element in establishing and sustaining a positive reputation for the businesses. Also, they will make it simpler for end users to make decisions. A favorable review for a specific product typically draws more customers and results in a significant increase in sales. Today, reviews are made on purpose to create a false reputation and draw in more clients. So, our aim is to find false reviews. The ability to spot false reviews depends on both the key characteristics of the reviews as well as the reviewers' actions. This project proposes using machine learning to detect fake reviews. In addition to the review feature extraction process, this project employs several feature engineering techniques to extract various reviewer behaviors. The project compares the results of several experiments conducted on a real Reviews dataset of amazon reviews with and without features derived from user behavior compare the performance of several classifiers in both cases, including Naive Bayes (NB), SVM, and Logistic Regression. During the evaluations, various language models' confusion matrix, f1 score, and precession are also taken into account.

Keywords: machine learning, logistic regression, Support Vector Machine, Streamlit, numpy,imutils, pandas, matplotlib, seaborn, textblob and nltk.

Introduction

Everyone has the right to openly express his or her ideas and opinions anonymously and without fear of repercussions. Social media and internet publishing have made it even simpler to express yourself honestly and boldly. These views have both positives and negatives in that they provide the proper input to the right person, which may help remedy the problem, but they can also be manipulated. These viewpoints are valued. This enables anyone with bad intents to easily manipulate the system to create the appearance of sincerity and publish opinions to promote their own product or to criticise competitors' products and services, without exposing their name or

the company for which they work. In today's day, encouraging consumers to submit a review about a product has become a solid approach for promoting their product through the genuine audience's voice. Such valuable information has been spammed and twisted. One intriguing study was conducted as a result of several studies to identify false opinion spam. In order to increase their reputation and sales, they create phoney reviews and ratings for their items on their website. This is unfair and deceptive. This is a prevalent practise these days, which raises the necessity for a bogus review detector.

Fake reviews can be created by businesses, competitors, or individuals who have no experience with the product or service under consideration. These reviews can be positive or negative, and they can be shared on a variety of platforms, including social media, e-commerce websites, and review websites. Several approaches have been developed by researchers to detect fake reviews. Analyzing the text content of reviews, identifying patterns of behaviour, and using machine learning algorithms are some of the most common methods. Examining the language, grammar, and vocabulary used in the review is part of text analysis. Analyzing patterns of behaviour entails looking at the reviewer's previous reviews, the time and date of the review, and the products or services reviewed. Machine learning algorithms are built to learn from large datasets of reviews and identify patterns that indicate fake reviews. Fake reviews must be detected because they can have a significant impact on businesses. Customers may be misled into making purchases they would not have made otherwise, or they **Literature Survey:**

1. M. Ott, Y. Choi, C. Cardie, and J. Hancock (2011). By any stretch of the imagination, locating deceptive opinion spam. 309-319 in Proceedings of the Association for Computational Linguistics' 49th Annual Meeting. This paper proposes a supervised learning approach for detecting misleading opinion spam, such as fake reviews. The authors train a classifier to detect deceptive reviews using features such as sentiment analysis, ngrams, and part-of-speech tags. On several datasets, the method achieves high accuracy.

2. S. Feng, S. Banerjee, and Y. Choi (2012). Syntactic stylometry is used to detect deception. 188–197 in the Proceedings of the 2012 Joint Conference on Empirical Methods in Natural Language Processing and Computational Natural Language Learning. Based on syntactic stylometry, this paper presents a linguistic-based method for detecting fake reviews. The authors train a classifier to detect deceptive reviews using syntactic features such as sentence length and tree depth. On a dataset of hotel reviews, the

method outperforms several baseline methods.

3. N. Jindal and B. Liu (2008). Analysis and opinion spam. 219-230 in Proceedings of the International Conference on Web Search and Web Data Mining. This paper proposes a linguistic method for detecting opinion spam, such as fake reviews. The authors train a classifier to detect spam reviews using features such as sentiment analysis, part-of-speech tags, and readability. On a dataset of hotel reviews, the method achieves high accuracy. **Problem Identification**

Fake review detection is a difficult topic that has grown in importance as online reviews have become more prevalent in ecommerce. Fake reviews can mislead customers and undermine a company's reputation. Fake reviews are difficult to spot since they are frequently written to be indistinguishable from genuine evaluations. Absence of labelled data: Labelled data for training fake review detection models is scarce. Manually classifying reviews as authentic or fraudulent is costly and time-consuming. As a result, the amount of data accessible for training and assessing models is limited. Adversarial attacks: Review spammers' techniques are continually evolving in order to evade discovery. They may employ advanced ways to disguise their language or change detecting algorithms' attributes. Untrustworthy

sources: Reviews can be obtained from a variety of venues, including social media, online markets, and review websites. Unfortunately, not all sources are trustworthy or dependable, and the quality and authenticity of the reviews can vary.

Methodology

Step 1: Collecting data and dataset creation

This entails retrieving reviews from Kaggle, analysing them, and then extracting characteristics.

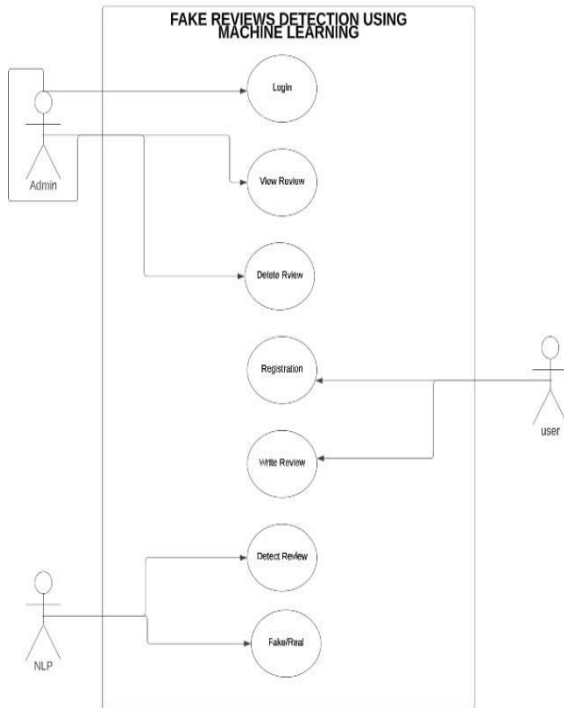**Step 2:** Building a Support Vector Machine for various types of evaluations.

In this stage, a Support Vector Machine model is constructed for the goal of detecting false reviews from various sources.

Step 3: Datasets are used for training and testing.

Datasets are employed in the training and testing processes.

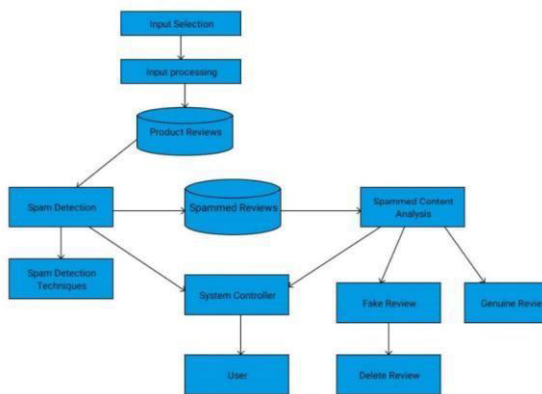**Step 4:** Use case diagram for deployment and analysis.

Architecture

In input selection we are taking input from the user we will store the product reviews.In spammed content analysis we are having two types of reviews Fake review and Genuine review. In fake review Machine Learning-Based Review Fraud Detection. The Genuine reviews are real reviews. If fake review was found in reviews it deletes the reviews

Implementation

To proceed, we require the following:

1. Python 3.10 or above installed on your device
2. A Dataset available in the form of csv format

Support Vector Machine (SVM) is frequently used to categorise fraudulent reviews. They use a number of binary classifications to discover trends in fake reviews. When the supervised learning model has downscaled the bogus reviews and the SVM model has applied filters to extract features from the user input reviews, the fully SVM layer predicts.

Python implementation using SVM In Python, we can implement a SVM model using Numpy,Pandas and NLTK and then we Load the preprocessed data and later we define SVM model using Numpy Define the functions for SVM, supervised learning model. The modules imported from Python is NLTK. Natural Language Toolkit (NLTK) is a free and open-source software package for natural language processing. It offers a variety of tools and resources to aid developers and academics in their work with human language data. You can use NLTK to do tasks like tokenization, stemming, and part-of-speech tagging. One of the primary benefits of NLTK is that it is very customisable, allowing you to create your own natural language processing algorithms. It also comes with a number of pre-built models for typical

tasks like sentiment analysis and text classification. In academia and industry, NLTK is widely used for a number of applications such as language learning, machine translation, and chatbot development.
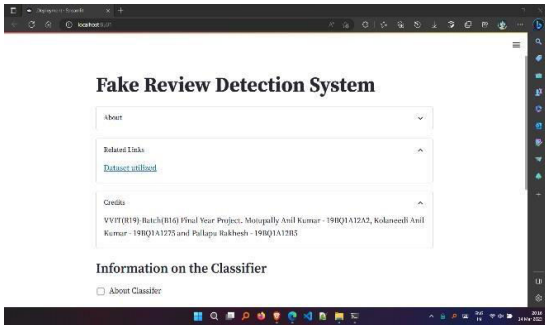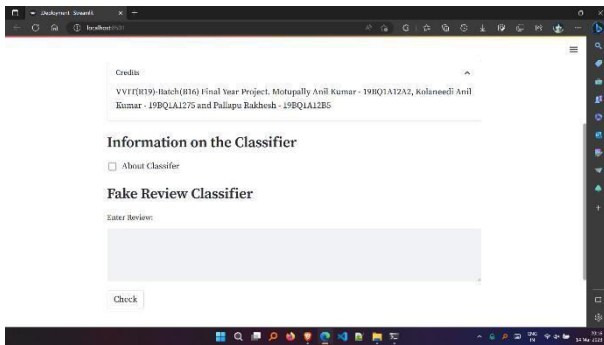
Results & Conclusion

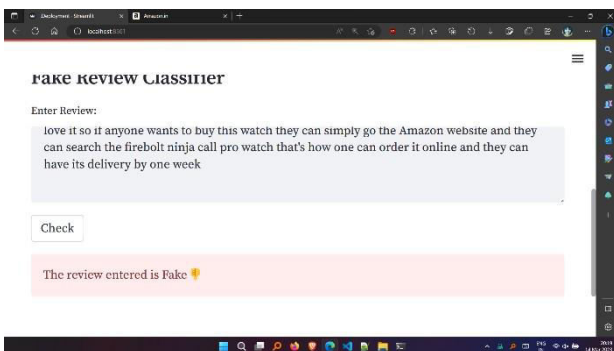
Figure 1 Home page

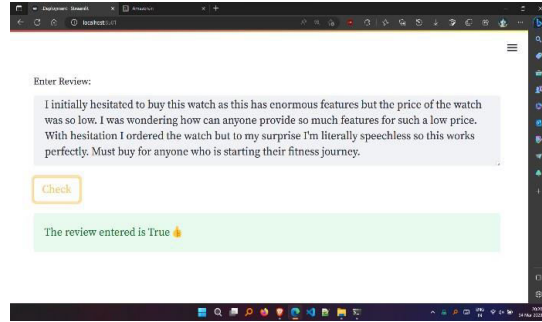
Figure2: Prompt to enter review

Figure3: Fake review

Figure4: True Review

Conclusion

Finally, using machine learning techniques for false review identification systems is a potential approach to dealing with the problem of phoney reviews. The system can learn to discover patterns and attributes that distinguish real and false reviews by training the algorithms on vast datasets of genuine and phoney reviews. This can assist businesses in accurately assessing the quality of their products and services, as well as consumers in making informed purchasing decisions based on trustworthy information. It is crucial to note, however, that fake review detection algorithms are not perfect and may yield false positives or false negatives. As a result, it is critical to integrate the usage of these systems with other review analysis approaches, such as human moderators or crowdsourcing. Furthermore, businesses can take proactive steps to prevent the creation and spread of fake reviews, such as adopting review verification methods or offering incentives for real evaluations. Ultimately, the application of machine learning for false review detection is a valuable tool that can benefit both businesses and

consumers in the online marketplace, but it is only one component of the continuous fight against fraud and deception. However with any technology, there are crucial aspects to keep in mind, such as the requirement for vast amounts of high-quality data.

Limitations

Notwithstanding the potential benefits of machine learning-based fake review detection systems, there are several crucial constraints to consider. For one thing, these systems rely on enormous amounts of data to reliably recognise patterns and make predictions, which in some situations can be difficult to get. Furthermore, the accuracy of these systems can be influenced by the quality of the data on which they are trained, as well as changes in how people write and interact online. There is also no text-tospeech or speech-to-text functionality.

Future Enhancements

In the long term, we aim to implement textto-speech and speech-to-text, as well as add more pre-trained datasets to improve accuracy. We will also attempt to construct a dashboard that will separate the highest rated false reviews from the genuine reviews.

References

[1] Zheng, X., Zeng, D., Wang, Z., & Zhao, X. (2020). A deep learning framework for fake review detection in e-commerce. Electronic Commerce Research and Applications, 41, 100943.

[2] Cao, X., Guan, Z., Liu, X., Liu, Y., & Zhang, J. (2021). A Multi-Granularity Attention Network for Fake Review Detection. IEEE Access, 9, 68515-68524.

[3] Wang, Y., Hou, J., Zhang, J., & Chen, C. (2021). A comprehensive survey of fake review detection in e-commerce. Electronic Commerce Research and Applications, 48, 101068.

[4] Huang, C. Y., Chen, M. Y., & Hsieh, M. H. (2021). A comparative study of machine learning algorithms for fake review detection. Journal of Business Research, 133, 372-383.

[5] Chen, Y., Zhang, S., & Chen, X. (2021). A Survey on Fake Reviews Detection Methods in E-commerce. Journal of Computers, 16(2), 168-179.