

Fake Product Review Monitoring and Removal for Genuine Product Reviews

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Abstract:

Online reviews principally influence a customer's decision to purchase a product/service. To understand and grasp the standard of those products or services, customers search online reviews, which are important and useful sources of data to know the general public opinion on products and/or services. But one cannot depend upon these online reviews since they could give rise to the potential concern that spammers could give deceitful reviews so as to synthetically promote or belittle products and services. This practice is understood as Opinion Spam, where spammers manipulate reviews by making fake, untruthful, or deceptive reviews to gain profit and boost their products, and devalue a competitor's products. In order to tackle this problem, this paper propose to create a fraud risk management system and removal model. This technique captures hoax transactions based on user behaviours and network, analyse them in real-time using Data Mining, and accurately predicts the suspicious users and transactions. To successfully execute these functions, two algorithms, NLP and TF-IDF, are used to differentiate between fake and genuine reviews or feedback received by the customers.

Keywords —Genuine Reviews, Fake Reviews, Opinion Spam, Opinion Mining.

I. INTRODUCTION

The internet is consistently growing in size and importance, and hence the number and impact of online reviews is increasing continuously. Reviews can influence people of all areas but notably e-commerce is one among the foremost important aspect, where comments and reviews regarding products and services are often the foremost most convenient and straightforward way for buyers to form a choice on whether or to not

buy a product. Whenever a customer buys any product online on any online sites like amazon.com, flipkart.com, and a lot of others, they first tend to see for the products reviews. If they deem that the product has nice and wonderful reviews, they have a tendency to right away press the buy button, trusting these reviews. Albeit most of those reviews are from genuine customers posting and sharing their feedback, there is an enormous possibility that a number of these reviews could be fake that are

given to falsely gain profit by attracting customers to these fake reviews.

That is to not say that online reviews aren't helpful, in fact, online reviews can often be helpful by helping customers understand if he should or should not buy a product, but blind trust on these reviews is treacherous for both the vendor and buyer. Moreover, business owners might allure people to write good reviews about them and then hire someone to write awful reviews about their competitor's products or services. These fake reviews are considered review spam and may have an impact within the online marketplace.

Statistically, only 54% of customers do not buy a product if they suspect it to have fake reviews while 95% of customers search for reviews, and if they don't find reviews criticizing the product, they assume that most of these reviews are fake. Over 93% customer say that online reviews impact their purchasing decision. That is why automatic detection and monitoring of reviews and dividing them into fake and real is an important work. There are other types of spam that could be found in the form of web spam and email spam. But unlike web spam or email spam, review spams are far more difficult to detect. Product review spam are easily distinguishable, and so it is difficult for customers to recognise these.

With the growing popularity of online shopping, reading product reviews has become a custom for potential customers. If they want to buy a product, they usually read reviews from the website selling it. This ongoing presence of fake reviews are good for no one but the growth of fake reviews throughout the last few years is astonishing. The on-going increase of fake reviews tells how big reviews are playing a part in a customer's decisions to buy products. This system will successfully distinguish between fake and genuine reviews.

II. PROBLEM DEFINITION

It is hard to find genuine reviews among millions of reviews. So, there is a need for a system to find out genuine reviews. A company might hire

someone to write fake reviews in order to falsely promote their product. So, that's why fake product review monitoring system is needed.

III. LITERATURE SURVEY

TABLE I
LITERATURE PAPER

Sr. no	Title	Publication and Author/s	Work Done
1	Towards Online Anti-Opinion Spam: Spotting Fake Reviews from the Review Sequence	Yuming Lin, Tao Zhu, Hao Wu, Jingwei Zhang, Xiaoling Wang and Aoying Zhou {IEEE/ACM(2014)}	In his paper, he and his team explore the issue on fake review reduce online opinion spam. They used supervised solutions and a threshold-based solution. The experimental results show that their methods could identify the fake reviews orderly with high accuracy and recall.
2	Review Spam Detection Using Semi supervised Technique	R.Narayan, J. Rout and S. Jena {AICS(2018)}	This proposed work is based on PU-learning algorithm which learns from a very few positive example and unlabeled data set.
3	Using Supervised Learning to Classify Authentic and Fake Online Reviews	S. Banerjee, A. Chua, J. Kim {ACM(2015)}	This paper is significant on two counts. First, it shows that authentic and fake reviews could be distinguished based on their understandability, level of details, writing style, and cognition indicators.
4	Opinion spam detection in online review	A. Rastogi, M. Mehrotra {Journal of information and knowledge manageme	To Understand the current progress on opinion spam detection research. This paper briefly describes some of the crucial spamming features

		nt (2017)}	and methods adopted in the existing studies along with accuracies
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IV. PROPOSED SYSTEM

A. System Architecture

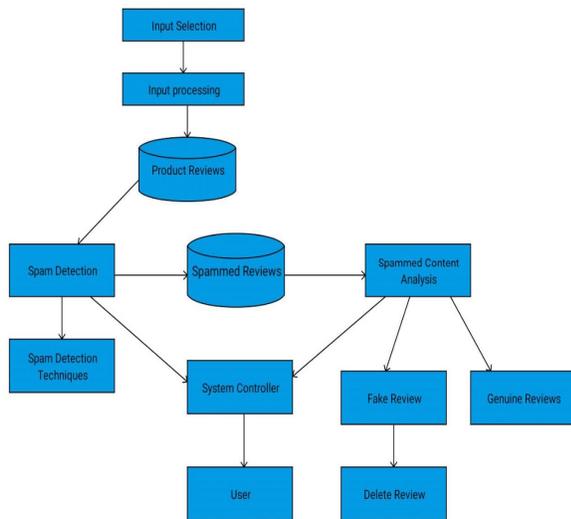


Fig. 1 System Architecture

B. Explanation of System Architecture

Firstly, a certain dataset is used for identifying and differentiating the good and the bad reviews with the help of keywords typically used for the reviews and then, the input from users is selected for detecting spammed reviews. After selecting the user input, the product is reviewed for spam detection. Spam detection technique is used to check for spams in the reviews and such reviews are differentiated using the decision tree and the spam reviews are detected. After detecting the spam, the spam content is separated from the legit reviews and then, the spam content is analysed so as to ensure the nature of the spam. Later in the process, admin deleted the fake spam reviews and to detect this system controller is used. After the process the users can view the final set of legit reviews for buying their favoured products from the website.

In input selection the input or data is selected. In this system the dataset from kaggle.com is used. This input or data is then sent to pre-processing, where any punctuation marks and stop words such as the, a, an, in, and, etc are removed. Also, lemmatization is also done here. Lemmatization is the process of producing inflected words from word stem. Here, words such as “finally”, “final” and “finalize” will become “final”. This is done to determine whether the words in the reviews are positive or negative. The dataset is accessed in this block.

Input processing is done, where the input obtained after input selection is processed and readied. Here the data is collected. Input from users is taken here and later cleaned for any stop words. Stop words are those words that are filtered out before natural language is processed. Stop words refers to words that are commonly used in a language. These words don't add much meaning to a sentence. Some examples of stop words are ‘the’, ‘is’, ‘at’, ‘which’, etc. Data management is also done in input processing.

In spam detection, any dual view data, that is, any redundant data is removed. Also, duplicated reviews and unknown reviews are also removed.

Next, spam detection techniques are applied. NLP is one of those spam detection techniques used here. NLP algorithm is used to predict if reviews are positive or negative, and is done using bag of words. Sentimental analysis is also done. Sentimental analysis uses natural language processing, text analysis, computational linguistic to identify, extract and study information. Sentimental analysis is mostly applied when customers are involved such as reviews, survey responses, etc. Reviews given by users from same IP addresses are removed. Duplicate products are removed here as well.

In feature extraction stage, where NLP and TF*IDF algorithms are applied. NLP algorithm is used to predict if reviews are positive or negative, and is done using bag of words. TF-IDF is used to analysis the importance of a word by analysing and

checking the keyword's importance throughout internet.

After spam detection, the spammed reviews are sent to spammed content analysis, where first the reviews are classified and divided into fake reviews and spammed reviews. Fake reviews filtered are then deleted by the admin. Now the data is sent to system controller, where the genuine reviews are visible to the user.

V. ALGORITHM OF PROPOSED SYSTEM

- 1) Tokenize the sentences

Tokenize the sentences instead of words. And give weight to these sentences.

- 2) Create the frequency matrix of the words in each sentence

Calculate the frequency of words in each sentence. Sentence is the key and the value is a dictionary of word frequency.

- 3) Calculate term frequency and generate a matrix

$TF(t) = \frac{\text{Number of times term } t \text{ appears in a document}}{\text{Total number of terms in document}}$

- 4) Creating a table for documents per words

Calculate how many sentences contain a word.

- 5) Calculate IDF and generate a matrix

$IDF(t) = \log_e(\frac{\text{Total number of documents}}{\text{Number of documents with term } t \text{ in it}})$

- 6) Calculate TF-IDF and generate a matrix

Multiplying the values from both the matrix and generating new matrix.

- 7) Scope the Sentence

Scoring a sentence is differs with different algorithm. Using TF-IDF score of words in a sentence to give weight to the paragraph.

- 8) Find the Threshold

Calculate the average sentence Score.

- 9) Generate the summary

Select sentence for a summarization if sentence score is more than average score.

VI. FEATURES OF PROPOSED SYSTEM

- 1) This system helps the user to find out right reviews of a product or service.
- 2) This system will help to detect fake reviews and the admin blocks those users.
- 3) Features such as detection of IP address and review's user ID, helps making the application more reliable.

VII. APPLICATION OF PROPOSED SYSTEM

- 1) This application will be used by the people who like to spend their money on valuable products.
- 2) This application firmly believes that phoney reviews are not only harmful, but also to the economy of the whole country so, this application helps solve this problem.
- 3) The commercial websites, who only want real reviews to be shown on their websites, can use this application.

VIII. UML DIAGRAMS

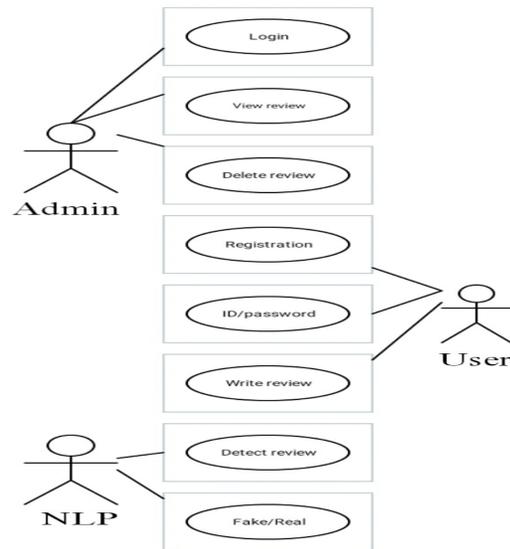


Fig. 2 Use case diagram

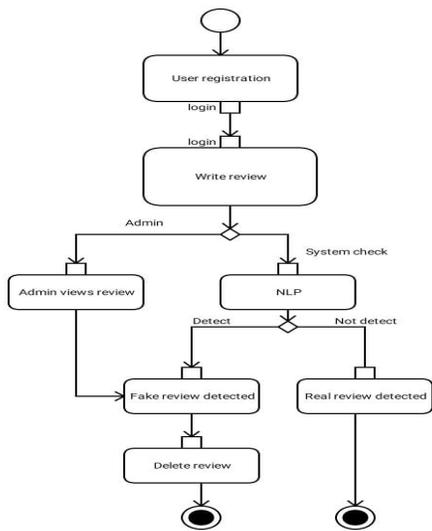


Fig. 3 Activity Diagram

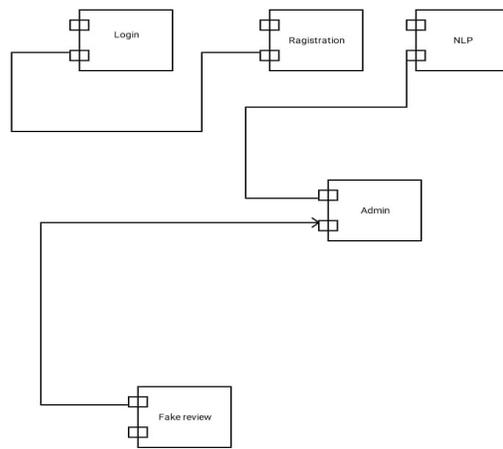


Fig. 5 Component Diagram

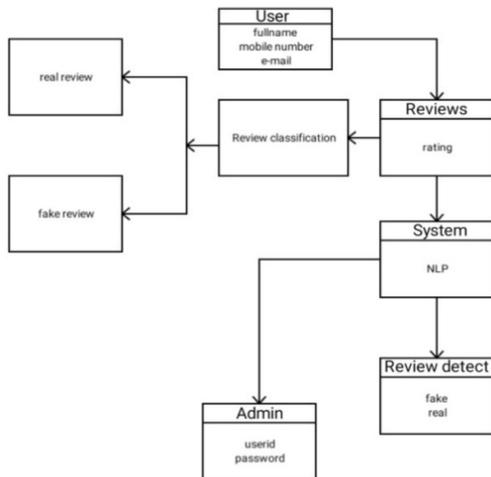


Fig. 4 Class Diagram

IX. RESULT SCREEN-SHOTS

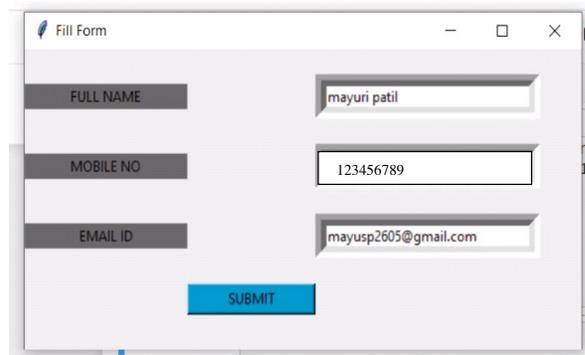


Fig. 6 Sign Up screen

For signing up, this system will prompt to enter full name along with mobile number and email address after entering this information, successfully sign-up of user is done.

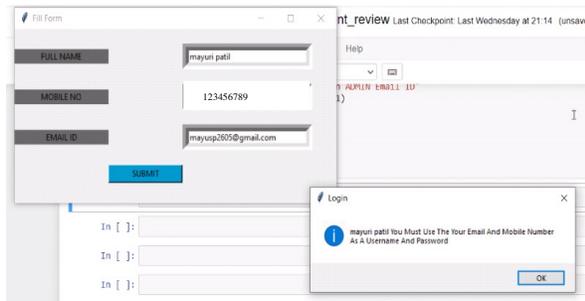


Fig. 7 Successful sign-up

Fig. 7 shows the output of successful sign up with a Pop up message box saying the customer should use the name, email and phone number that they used to sign-up.

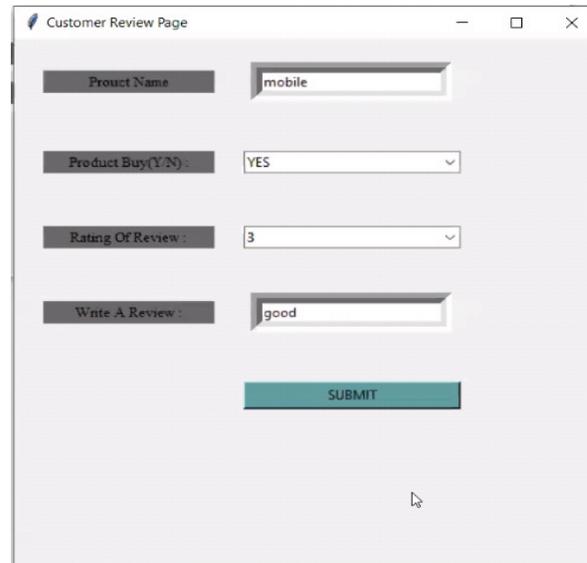


Fig. 9 Write Review Page

Fig. 9 shows the user entering their reviews and rating the product after they had successfully log-in

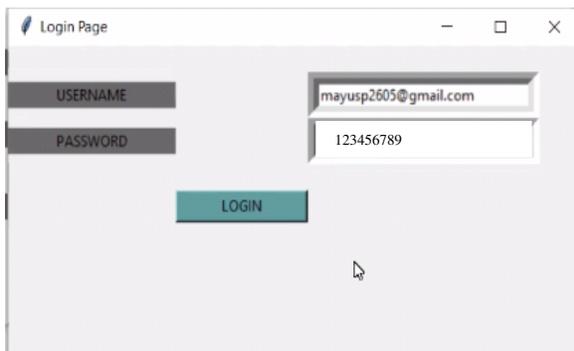


Fig. 8 Log-in page

Fig. 8 shows a login in screen, where user is prompted to enter their username and password. After entering this information, the user is successfully logged-in. Once logged-in, the user now can review any product they have purchased.

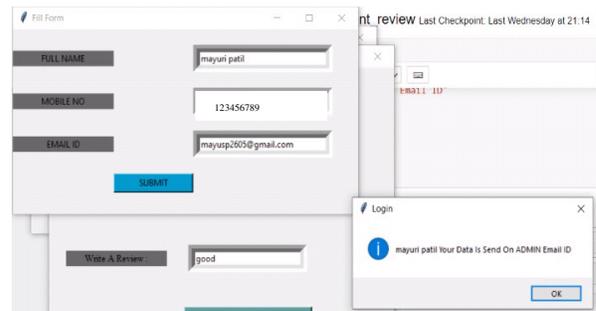


Fig. 10 Review Successfully Send to Admin

In fig. 10, the review written by the user is send to the admin for further monitoring of the review. Once the review is sent to the admin, the admin will then accept or delete a review.

X. CONCLUSIONS

Due to rapid improvement of internet the size of fake and real reviews are increasing. Some of the false review causes bad selection of product, genuinity is missing in these products. Therefore, in this system using TF*IDF, the false review detection is designed with the help of python. In

recent years, online reviews have been playing an important role in making purchase decisions. This is because, these reviews can provide customers with large amounts of useful information about the goods or service.

To promote falsely or lower the quality of the products or services of competitors, spammers may give fake reviews. So, our system will analysis, and then, only let the genuine reviews of genuine products be displayed to possible customers. The main objective of our system is to detect spam and redundant reviews and to filter them so that user get correct knowledge about the products. Our project will also increase customer satisfaction by making sure they get right and quality products by monitoring fake reviews and deleting them. This system classifies fake reviews from genuine reviews and hence, saves customer from any huge loss.

REFERENCES

- [1] Yuming Lin, Tao Zhu, Hao Wu, Jingwei Zhang, Xiaoling Wang and Aoying Zhou, "Towards Online Anti-Opinion Spam: Spotting Fake Reviews from the Review Sequence", IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining (ASONAM), 2014, pp.261-264.
- [2] R.Narayan,J. Rout and S. Jena, "Review Spam Detection Using Semisupervised Technique", Progress in Intelligent Computing Techniques: Theory, Practice, and Applications, pp. 281-286, 2018.
- [3] S. Banerjee, A. Chua, J. Kim, "Using Supervised Learning to Classify Authentic and Fake Online Reviews ", Proceeding of the 9th International Conference on Ubiquitous Information Management and Communication", ACM, 2015.
- [4] A. Rastogi, M. Mehrotra, "Opinion spam Detection in Online Reviews", Journal of information and Knowledge Management, vol. 16, no. 04, pp. 1-38, 2017
- [5] J. Rout,S. Singh, S. Jena, and S. Bakshi, "Deceptive review detection using labeled and unlabelled data", Multimedia Tools and Applications,vol.76, no. 3, pp. 3187-3211, 2016.
- [6] S. Banerjee and A.Y.K. Chua. 2014. "Applauses in hotel reviews: Genuine or deceptive ?", 2014 Science and Information Conference (2014), pp. 938-942,2014.
- [7] Huayi Li, Zhiyuan Chen, Bing Liu, Xiaokai Wei and Jidong Shao, "Spotting Fake Reviews via Collective Positive-Unlabeled Learning".
- [8] R.Narayan,J. Rout and S. Jena, "Review Spam Detection Using Semisupervised Technique", Progress in Intelligent Computing Techniques: Theory, Practice, and Applications, pp. 281-286, 2018.
- [9] C. Lai, K. Xu, R. Y. Lau, Y. Li, and L. Jing, "Toward a Language Modeling Approach for Consumer Review Spam Detection," 2010 IEEE 7th International Conference on E-Business Engineering, pp. 1-8, 2010.
- [10] M. Ott, Y. Choi, C. Cardie and J.T. Hancock, "Finding deceptive opinion spam by any stretch of the imagination", ACM, pp.309-319,2011.
- [11] S. Shojaei, A. Azman, M. Murad, N. Sharef and N. Sulaiman, "A Framework for Fake Review Annotation", 2015 17th UKSIM-AMSS International Conference on Modelling and Simulation, IEEE, pp. 153-158,2015.
- [12] W. Zhang,R. Y. K. Lau and Li. Chunping, "Adaptive Big Data Analytics for Deceptive Review Detection in Online Social Media", Thirty Fifth International Conference on Information Systems, Auckland 2014,pp.1-19,2014.
- [13] Vinod Bharat et al. "A review paper on data mining techniques", International Journal of Engineering Science and Computing (IJESC), 2016, Volume 6 Issue 5, pp 6268-6271.