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Spam Review Analysis and Detection System

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Abstract - *As Customers are mostly dependent on the reviews and comments before purchasing any product. This dependence has prevailed the entries of fake and spam reviews which get camouflaged among authentic ones. These reviews are written to mislead readers or automated detection systems when promoting a target product or downgrading it to boost their reputations. We propose a framework to detect fake product or content reviews or spam reviews by using Opinion Mining and different Machine Learning and Deep learning algorithms. The Opinion mining is also known as Sentiment Analysis. Here we use Spam dictionary to identify the spam words in the reviews. In Text Mining we apply several algorithms from Machine learning and detect the reviews as the spam and the real ones.*

Key Words*: *Opinion Mining, Sentiment analysis, Spam Reviews, Machine Learning, Deep learning, Neural Network.

1. INTRODUCTION

One area of explosive growth is e-commerce. Online stores generally allow their customers to write reviews of the service they have purchased, and these reviews can be used as a source of information. For examples, However, today's technological advancement has made it possible to use the reviews to design new products or services, but unfortunately, the importance of the review is misused by certain parties, who generate fake reviews to promote their products or discredit them. The original product review and rating can be found once you have access to the system. Then, it is the source of satisfaction and reliability for you. A technique for identifying fake reviews is proposed in which the system extracts reviews related to a given product and then analyzes them to identify the most credible reviews for that product. Previous research detects fake reviews using different approaches including identification address, opinion mining and sentiment analysis, machine-learning approach. Here, as an add on work we are also trying to add the YouTube comments classification tab provided that the link for the video is given, where comments below a certain video on YouTube will be classified as genuine and spam.

2. RELATED WORK AND LITERATURE SURVEY

"Opinion Mining Using Spam Detection" paper which will help us to find out fake reviews by using machine learning algorithms. To find out fake review in the website this "Fake Product Review Monitoring System" system is introduced. This system will find out fake reviews made by the customers and it will block the users. To find out the review is fake or genuine, we will use some classification such as

1. If multiple reviews are coming from the same IP address then the Reviews are considered Spam.

2. Using Account Used to check whether the reviews are done using the same account.

3. If there are more than five negative words in the review, then it was identified as Spam. For example, a user has posted a review: "This product is a piece of junk, the design is bad, the quality is inferior, and the price is as low as at minimum. Here, this sentence consists of 4-5 negative words. So, the system will check the count of negative words, if the count exceeds, then it will be considered as spam review. Therefore, Negative Word Dictionary will be used with customized Sentiment strength algorithm. According to this approach, probability of given review to be Spam is more so it will be considered a Spam.

Second Paper titled "Spam Review Detection Using Deep Learning" where different Deep learning algorithms are used for the classification of reviews and to find its accuracy. Algorithms like LSTM, KNN, TF-IDF and N-gram techniques have been used and proven the accuracy of classification. The deep learning concepts as Multilayered Perceptron (MLP), Convolutional Neural Network (CNN) and Recurrent Neural Network(RNN) is used in the paper which we have also included heavily in our paper.

3. PROPOSED METHODOLOGY

3.1 Algorithms and Process

1. The proposed system takes the URL or the csv converted file of comments from E-commerce We scrape products from websites like Amazon, Flipkart based on the URL, and then store all the reviews related to each product in a CSV file. Apply sentiment analysis and add sentiment polarity column. Sentiment is given based on polarity values given below. Polarity > 0 (positive) Polarity < 0 (negative) Polarity

= 0 (neutral).

2. The data was pre-processed when it was extracted using Naive Bayes and Decision Tree algorithms, resulting in a csv file of positive and negative reviews and a confusion matrix.[5] Decision trees are an extremely useful tool for making decisions. It is a tree-like graph or decision model and their possible outcomes, including utility, resource cost and chance event outcomes. It is one of the ways of displaying the conditional control statements. Among the various functions of decision trees, the most commonly used are research of operations, usually in analyzing decisions.

3. Approach for Non-verified Purchase- The technique to detect the fake reviews of the non-verified purchase, we use another approach. For this first step is to collect the text related to the reviews of the product, then system applies preprocessing on each review related to the product and then extracts features from the reviews. After features extraction, the next step is to apply the SVM model and after it the results corresponding to the genuine or fake reviews is to be shown to the user.

4. Feature Identification by N-grams- is one of the most widely used approaches in natural language processing (NLP). The most important feature in text classification is a n-gram that is word based or character centered. System uses this model in order to generate features to classify the reviews. In the proposed approach, bigrams (N = 2) is using to find whether the reviews are deceptive or truthful. After converting each review in bigram form, system is done with the preprocessing step and now system is ready move to the feature extraction technique.

5. A proposed system is meant to classify reviews from fake to genuine ones. It collects the data, classifies it using lemmatization and inserts punctuation and stop words in the words of the reviews and then processes it using the bigram technique. The next step in the classification process is to select features using the Count Vectorizer that converts each review into a two-dimensional matrix and then apply the TF-IDF transformer on each word.

6. Similarly, the link to the YouTube video can be given by the user and the system will extract the comments under that video and apply the same algorithm for the spam classification.

3.2 System Flow

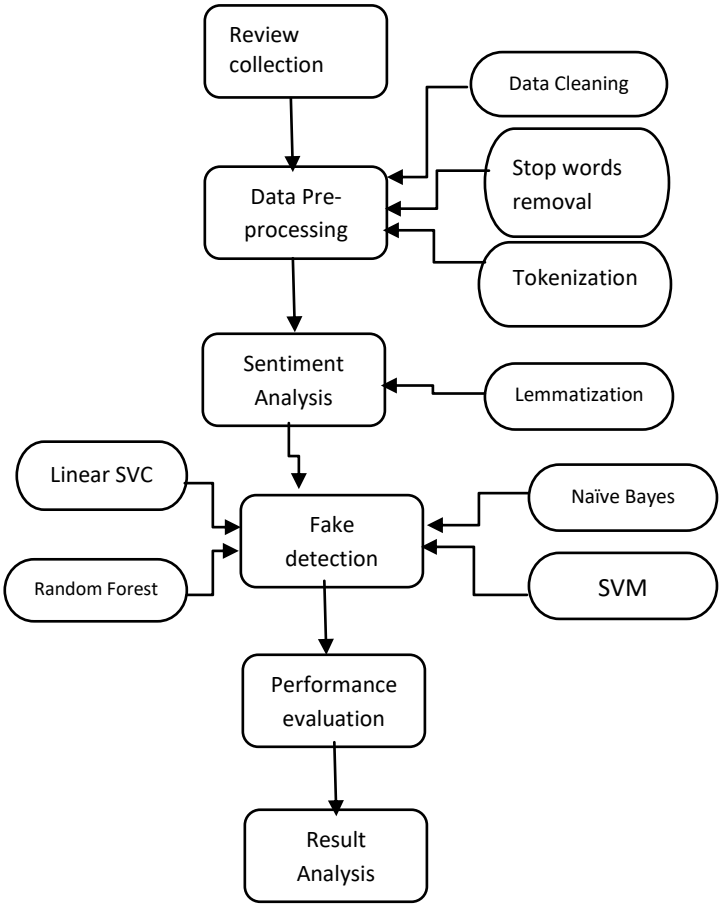

Fig -1: Process Flow Diagram

- ✓ Admin will handle the system and the users.
- ✓ Users need to enter their email id and OTP no to enter the system.
- ✓ User once access the system; user can insert the link or upload the csv file for classification.
- ✓ Complete process as shown in the process flow diagram is applied by the algorithm step wise.
- ✓ The result of spam reviews or content will be shown after applying the algorithms.
- ✓ Admin Login: - Admin login to the system using his admin ID and password.
- ✓ User Login: - User will login to the system using his user ID and password.
- ✓ Post Review: - User can post review about the product.

4. CONCLUSION

We proposed a System which helps the users to find out the spam reviews or content. Use of algorithms like Naïve Bayes, Decision Tree and Support Vector Machine (SVM) makes it possible to classify the data and use it for the spam detection with a certain accuracy. Also, Deep learning has been an

important player as its algorithms makes it possible to get greater accuracy and its Neural Network Algorithms and techniques helps in precision.

Our software will help the user to pay for the right product. We added a feature of classifying YouTube comments also because of increasing irrelevant comments on unrelated video. It monitors the spam review made on any product/video. And user can be sure about the products availability on that application and reviews too.

5. FUTURE WORK

- The admin has to remove the spam reviews manually from the system, in the future work it could be automated.
- Only the verified purchaser can be allowed to make a review a certain product.
- Dynamically in real time the data or comments can be extracted and prevented from posting on unrelated content/video.
- Review Spammers could also be detected in the future.

6. REFERENCES

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