

# Fake Product Review Monitoring System

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**Abstract:** In the current scenario, the data on the web is growing to a larger extent. Social Media is generating a large amount of data such as reviews, comments and customer's opinions on a daily basis. This huge amount of user generated data is worthless unless some mining techniques are applied to it. Nowadays, there are several people using social media reviews to order anything through online. Online spam detection is one of the herculean problems since there are many faux or fake reviews that are created by organizations or by the people themselves for various purposes. Such organizations tend to write fake reviews to mislead readers or automated detection systems by promoting or demoting the targeted product services. Fake reviews detection has recently become a limelight that's capturing attention. Fake reviews are generated intentionally to mislead readers to believe false data that makes it tough and non-trivial to discover supported content. Hence, it is highly necessary to create a monitoring system which thoroughly checks for fake reviews among various product websites and removes them promptly.

**Key words:** Social Media ,detection systems ,monitoring system, websites

## I INTRODUCTION

One of the very rapid growth areas is ecommerce. Generally e-commerce provides facility for customers to write reviews related with its service. The existence of these reviews can be used as a source of information. For examples, companies can use it to make design decisions of their products or services but unfortunately, the importance of the review is misused by certain parties who tried to create fake reviews, both aimed at raising the popularity or to discredit the product. They share their thoughts on internet. Before purchasing anything, it is a normal human behaviour to do a survey on that product. Based on reviews, customers can compare different brands and can finalize a product of their interest. These online reviews can change the opinion of a customer about the product. If these reviews are true, then this can help the users to select proper product that satisfy their requirements. On the other hand, if the reviews are manipulated or not true then this can mislead user. This boosts us to develop a system which detects fake reviews

for a product by using the text and rating property from a review. The honesty value and measure of a fake review will be measured by utilizing the data mining techniques. An algorithm could be used to track customer reviews, through mining topics and sentiment orientation from online customer reviews and will also blocked the fake reviews.

### A) Objective of the project

In the current scenario, the data on the web is growing exponentially. Social media is generating a large amount of data such as reviews, comments, and customer's opinions daily. This huge amount of user generated data is worthless unless some mining operations are applied to it. As there are a number of fake reviews so opinion mining technique should incorporate Spam detection to produce a genuine opinion. Nowadays, there are a number of people using social media opinions to create their call on shopping for product or service. Opinion Spam detection is an exhausting and hard problem as there are many faux or fake reviews that have been created by organizations or by the people for various purposes. They write fake reviews to mislead readers or automated detection system by promoting or demoting target products to promote them or to degrade their reputations. The proposed technique includes Ontology, Geo location and IP address tracking, Spam words Dictionary using Naïve Bayes, Brand only review detection and tracking account used.

## II. LITERATURE SURVEY

### Opinion Mining Using Ontological Spam Detection

Duhan & Mittal proposed a paper "Opinion Mining Using Ontological Spam Detection" which will help us to find out fake reviews by using Naïve Bayes as algorithm. 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 Tracking IP address of the user to detect if the reviews are from a Spammer. If multiple reviews are from the same IP address then the Reviews are considered Spam. Using Account Used to check whether the reviews are done using the same account. Brand only Review detection i.e.

whether the reviews are on only Brand not the product. It's not helpful to consider only the Brand value to judge a product. Using Negative Dictionary i.e. the negative words are identified in the review. If there are more than five Negative Words then the review is a Spam. For instance, a user has posted a Review: "This product is not good; the design is bad, quality is worst and it is worthless to buy." 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 Senti strength algorithm. According to this approach, probability of given review to be Spam is more so it will be considered a Spam. Using Ontology: For instance, if the review posted on a product is not about that product but talking about something else then ontology is used to identify and classify such reviews as spam. If Class: Toshiba Context: Laptop Review: Dell is not so good. Here User is Posting Reviews about Laptop that comes under the class Toshiba. But his Review contains Dell Keyword. In order to identify this Review as Spam we are going to use Ontology. This system uses data mining methodology and Opinion mining technology. This system helps the user to find out correct review of the product, will also help the user to detect fake review and makes them to block the fake reviews automatically.

Fake Product Review Monitoring and Removal for Genuine Online Product Reviews Using Opinion Mining Kohli, Mishra & Gupta proposed a paper "Fake Product Review Monitoring and Removal for Genuine Online Product Reviews Using Opinion Mining" which help us in detecting the fake reviews and track down the user. As most of the people require review about a product before spending their money on the product. So people come across various reviews in the website but these reviews are genuine or fake is not identified by the user. In some review websites some good reviews are added by the product company people itself in order to make product famous this people belong to Social Media Optimization team. They give good reviews for many different products manufactured by their own firm. User will not be able to find out whether the review is genuine or fake. To find out fake review in the website this "Fake Product Review Monitoring and Removal for Genuine Online Product Reviews Using Opinion Mining" system is introduced. This system will find out fake reviews made by the social media optimization team by identifying the IP address. User will login to the system using his user id and password and will view various products and will give review about the product. And the user will get genuine reviews about product. And while reviewing he needs to enter the email id from which he is reviewing and it would be verified. If he writes a fake review then his id will be blocked bot allowing him to share his opinions again. System works as follows: Admin will add products to the system. User need to enter their email id and OTP no to enter the system User once access the system, user can view product and can post review about the product. For

posting reviews, the user's id will be verified. And admin will also block the email id of the user if reviews are spammed. Admin will delete the review which is fake. Admin Login: Admin login to the system using his admin ID and password. Add product: Admin will add product to the system. Delete Review: Admin will remove the review which tracked by the system as fake. User Login: User will login to the system using his user ID and password. View product: - User will view product. Post Review: User can post review about the product.

A New Approach for Identifying Manipulated Online Reviews using Decision Tree Now-a-days an internet has become an essential thing, as it provides more facilities to its users. There are many social networking sites which offer users to share their views. People share their thoughts about politics, social issues as well as about different products. It is a common practice today that before purchasing anything user checks the reviews of that product online. There are multiple sites which deal with these reviews. They provide ratings for the products as well as show comparison between different products. Some enterprises attempt to create fake reviews to affect customer behaviours and increase their sales. But, how to identify those fake reviews is a difficult task for customers. In today's world of competition it is necessary for any enterprise to maintain its reputation in a market. So it is necessary for both, i.e. enterprise and customer to identify manipulated reviews. This paper studies different approaches for identifying manipulated reviews and proposes a new approach to identify those manipulated reviews using Decision Tree (DT).

A study on Review Manipulation Classification using Decision Tree Identifying review manipulation has become one of hot research issues in e-commerce because more and more customers make their purchase decisions based on some personal comments from virtual communities and e-business websites. Customers consider these personal reviews are more reliable than the existing internet advertisements. Consequently, some enterprises attempt to create fake personal comments to affect customer behaviours and increase their sales. But, how to identify those manipulated reviews is a difficult task for customers. Therefore, this study employs Decision Tree (DT) to improve the classification performance of review manipulation by introducing eight potential review manipulation attributes. In addition, we attempted to discover the important factors of identifying manipulated reviews using correlation analysis and extracted knowledge rules. Finally, a real case of online users' comments regarding smart phones has been employed to testify the effectiveness of the proposed method.

Multiple Aspect ranking using the Good Grief Algorithm We address the problem of analyzing multiple related opinions in a text. For instance, in a restaurant review such opinions may include food, ambience and service. We formulate this task as a multiple aspect ranking problem, where the goal is to produce a set of numerical scores, one for each aspect. We present an algorithm that jointly learns ranking models for individual aspects by modelling

the dependencies between assigned ranks. This algorithm guides the prediction of individual rankers by analyzing meta-relations between opinions, such as agreement and contrast. We prove that our agreement based joint model is more expressive than individual ranking models. Our empirical results further confirm the strength of the model: the algorithm provides significant improvement over both individual rankers and a state-of-the-art joint ranking model.

A Joint Model of Text and Aspect Ratings for Sentiment Summarization

Online reviews are often accompanied with numerical ratings provided by users for a set of service or product aspects. We propose a statistical model which is able to discover corresponding topics in text and extract textual evidence from reviews supporting each of these aspect ratings a fundamental problem in aspect-based sentiment summarization (Hu and Liu, 2004a). Our model achieves high accuracy, without any explicitly labelled data except the user provided opinion ratings. The proposed approach is general and can be used for segmentation in other applications where sequential data is accompanied with correlated signals.

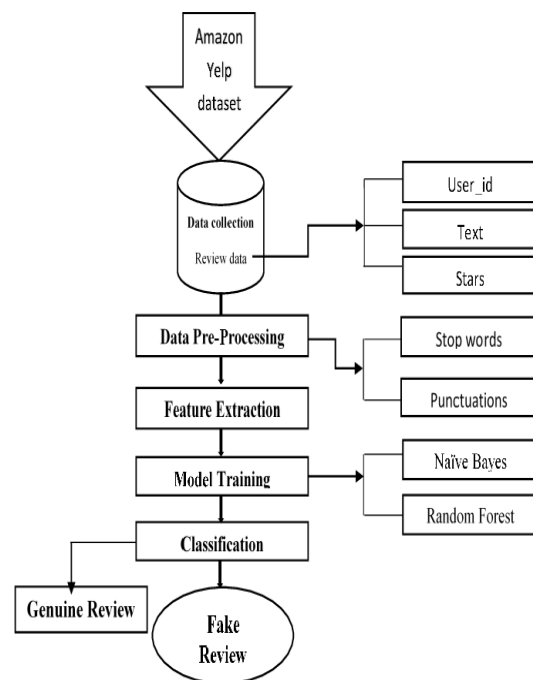
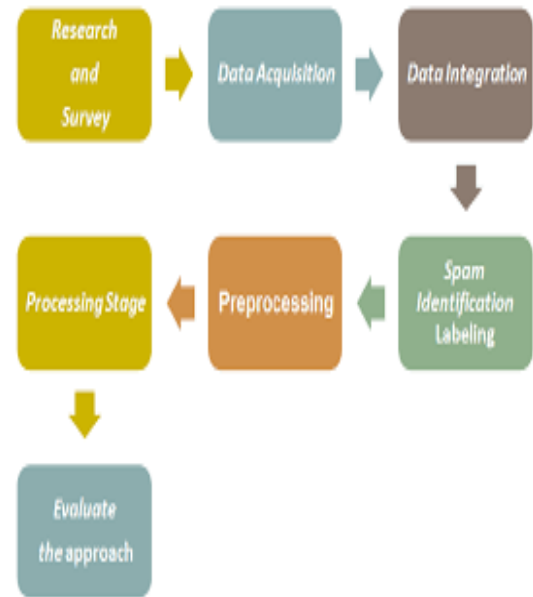
A) Analysing and detecting review spam

Mining of opinions from product reviews, forum posts and blogs is an important research topic with many applications. However, existing research has been focused on extraction, classification and summarization of opinions from these sources. An important issue that has not been studied so far is the opinion spam or the trustworthiness of online opinions. In this paper, we study this issue in the context of product reviews. To our knowledge, there is still no published study on this topic, although Web page spam and email spam have been investigated extensively. We will see that review spam is quite different from Web page spam and email spam, and thus requires different detection techniques. Based on the analysis of 5.8 million reviews and 2.14 million reviewers from amazon.com, we show that review spam is widespread. In this paper, we first present a categorization of spam reviews and then propose several techniques to detect them.

B) Opinion spam and analysis

Evaluative texts on the Web have become a valuable source of opinions on products, services, events, individuals, etc. Recently, many researchers have studied such opinion sources as product reviews, forum posts, and blogs. However, existing research has been focused on classification and summarization of opinions using natural language processing and data mining techniques. An important issue that has been neglected so far is opinion spam or trustworthiness of online opinions. In this paper, we study this issue in the context of product reviews, which are opinion rich and are widely used by consumers and product manufacturers. In the past two years, several start-up companies also appeared which

aggregate opinions from product reviews. It is thus high time to study spam in reviews. To the best of our knowledge, there is still no published study on this topic, although Web spam and email spam have been investigated extensively. We will see that opinion spam is quite different from Web spam and email spam, and thus requires different detection techniques. Based on the analysis of 5.8 million reviews and 2.14 million reviewers from amazon.com, we show that opinion spam in reviews is widespread. This paper analyzes such spam activities and presents some novel techniques to detect them



III RELATED WORK

TF-IDF Vectorizer: TF-IDF Vectorizer (Term Frequency-Inverter Document Frequency): TF-IDF which stands for Term Frequency– Inverse Document Frequency is a statistical method of evaluating the significance of word

in given documents. This is very common algorithm to transform text into a meaningful representation of numbers which is used to fit machine algorithm for prediction. TF- IDF vectorizer is defined with parameter (stop words= 'English') which eliminates all the common English words.

*Naïve Bayes Classifier:* Naïve Bayes Classifier is one of the simple and most effective Classification algorithms which helps in building the fast machine learning models that can make quick predictions. It is a probabilistic classifier, which means it predicts based on the probability of an object. It is called Bayes because it depends on the principle of Bayes theorem, which is used to determine the probability of a hypothesis with prior knowledge. It depends on the conditional probability. Naïve Bayes Classifier works on the following steps:

Convert the given dataset into frequency tables. Generate Likelihood table by finding the probabilities of given features. Now, use Bayes theorem to calculate the posterior probability. Formula:  $P(c|x) = P(x|c) P(c) / P(x)$  Referred from Bayes's theorem, in probability theory, a means for revising predictions considering relevant evidence, also known as conditional probability or inverse probability.

Passive Aggressive Classifier Passive-Aggressive algorithms are called so because Passive- If the prediction is correct, keep the representation and do not make any interchanges. i.e., the data in the example is not enough to cause any changes in the representation. Aggressive- If the prediction is incorrect, make interchanges to the representation. i.e., some interchange to the representation may correct it. Understanding the mathematics supporting this algorithm is not very simple and is supporting the scope of a single article. This section provides just an overview of the algorithm and a simple implementation of it. To learn more about the mathematics supporting this algorithm.

#### IV CONCLUSION:

They are various ways to detect Spam Reviews in order to the Opinion mining to be more accurate and useful have been studied. A detailed discussion about the existing techniques, to find out the whether the review is spam or not is presented. Other Techniques are incorporated like IP Address Tracking and Ontology to detect Spam Reviews in order to get more accurate results from Opinion mining. After detecting the spam reviews from the existing Dataset, a new Dataset is created which doesn't contain spam reviews and then opinion mining is performed on the new Spam Filtered Dataset. At last a new algorithm is proposed that detects spam reviews more precisely and performs opinion mining using spam filtered data.

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