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Survey on Spam Review Detection Using Spam Filtering Algorithms

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Abstract*: Generally the people trust on product on the basis of that product reviews and rating. Reviews can affect an organization or profile of a brand. The corporation has to assess market reactions towards its goods. However, it is not straightforward to track and organize popular reviews. Many public views are hard to manually process in social media. A methodology is then required to categories positive or negative public assessments automatically. Online feedback will provide customers with an insight into the consistency, efficiency and advice of the product; this provides prospective buyers with a better understanding of the product. One such unrealized opportunity is the usability of web assessments from suppliers in order to fulfill client requirements by evaluating beneficial feedback. Good and negative reviews play a major role in assessing customer needs and in quicker collection of product input from consumers. Sentiment Analysis is a computer study that extracts contextual data from the text. In this study a vast number of online mobile telephone ratings are analyzed. We classify the text as positive and negative, but we also included feelings of frustration, expectation, disgust, apprehension, happiness, regret, surprise and confidence for spam review detection. This delimited grouping of feedback helps to holistically assess the product, allowing buyers to decide better.

Keywords: Machine Learning, Social Media, Text Mining, Text Classification, Sentiment Analysis, Online Reviews.

I. INTRODUCTION

Many businesses and software sectors store their data in Social networking creation provides the customer with an ability to share his or her views. That means the organization can't monitor the contents of the virtual universe now. Complaints in social media are submitted by customers who are not pleased by a company's services or goods. On the other hand, consumers are still optimistic for a commodity in the social media. This view could affect other potential clients, including positive or negative ones. Potential consumers can find out about a certain product before deciding to purchase goods.

An appraisal of the sentiment is expected to immediately decide whether the feeling is negative or positive. Feeling analyses are a subset of text mining that focuses in the text of a person's feeling, mood and attitude. The fundamental theory of sentiment analysis consists of categorizing the polarity of texts and determining whether they are positive or negative. Sentiment analyses are commonly used as rapid social network growth. For different places public opinion is becoming really critical. There have been some difficulties in collecting public examination. Many product evaluation pages have recently been published on the Internet. It invites scientists to carry out a consumer review sentiment analysis.

II. RELATED WORK

Dematis, E. Karapistoli and others[1], proposes an approach which integrates content and usage information to detect fake product reviews. The proposed model exploits both product reviews and reviewers' behavioral traits interlinked by specific spam indicators. In this paper, fine-grained burst pattern detection is employed to better examine reviews generated over "suspicious" time intervals. Reviewer's past reviewing history is also exploited to determine the reviewer's overall "authorship" reputation as an indicator of their recent reviews' authenticity level.

S. Zhou and others[2], adopts a big data analytical approach to investigate the impact of online customer reviews on customer agility and subsequently product performance. Authors develop a singular value decomposition-based semantic keyword similarity method to quantify customer agility using large-scale customer review texts and product release notes. Using a mobile app data set with over 3 million online reviews, our empirical study finds that review volume has a curvilinear relationship with customer agility. Furthermore, customer agility has a curvilinear relationship with product performance. This study contributes to innovation literature by demonstrating the influence of firms' capability to utilizing online customer reviews and its impact on product performance. It also helps reconcile inconsistencies found in literature regarding the relationships among the three constructs.

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In this reference paper[3], it discovered that reviewers' posting rates (number of reviews written in a period of time) also follow an interesting distribution pattern, which has not been reported before. That is, their posting rates are bimodal. Multiple spammers also tend to collectively and actively post reviews to the same set of products within a short time frame, which we call co-bursting. Furthermore, the author found some other interesting patterns in individual reviewers' temporal dynamics and their co-bursting behaviors with other reviewers. Inspired by these findings, authors first propose a two-mode Labeled Hidden Markov Model to model spamming using only individual reviewers' review posting times. Authors then extend it to the Coupled Hidden Markov Model to capture both reviewer posting behaviors and co-bursting signals.

M. Hazim and others[4] Aiming to improve the detection of opinion spams in mobile application marketplace, this study proposes using statistical based features that are modelled through the supervised boosting approach such as the Extreme Gradient Boost (XGBoost) and the Generalized Boosted Regression Model (GBM) to evaluate two multilingual datasets (i.e. English and Malay language). From the evaluation done, it was found that the XGBoost is most suitable for detecting opinion spams in the English dataset while the GBM Gaussian is most suitable for the Malay dataset. The comparative analysis also indicates that the implementation of the proposed statistical based features had achieved a detection accuracy rate of 87.43 percent on the English dataset and 86.13 percent on the Malay dataset.

In this reference paper[5], it explains that a novel hierarchical supervised-learning approach to increase the likelihood of detecting anomalies by analyzing several user features and then characterizing their collective behavior in a unified manner. Specifically, the author models user characteristics and interactions among them as univariate and multivariate distributions. Then stack and these distributions using several supervised-learning techniques, such as logistic regression, support vector machine, and k-nearest neighbors yielding robust meta-classifiers. Authors perform a detailed evaluation of methods and then develop empirical insights. This approach is interest to online business platforms because it can help to reduce false reviews and increase consumer confidence in the credibility of their online information. This study contributes to the literature by incorporating distributional aspects of features in machine-learning techniques, which can improve the performance of fake reviewer detection on digital platforms.

N. Hussain and others[6], has identified different performance metrics that are commonly used to evaluate the accuracy of review spam detection models. Lastly, this work presents an overall discussion about different feature extraction approaches from review datasets, the proposed taxonomy of spam review detection approaches, evaluation measures, and publicly available review datasets. Research gaps and future directions in the domain of spam review detection are also presented. This research identified that success factors of any review spam detection method have inter-dependencies. The feature's extraction depends upon the review dataset and the accuracy of review spam detection methods are dependent upon the selection of the feature engineering approach. Therefore, for the successful implementation of the spam review detection model and to achieve better accuracy, these factors are required to be considered in accordance with each other.

C. Pandey and D. S. Rajpoot[7], reference shows that nowadays online reviews play an important role in customer's decision. Starting from buying a shirt from an e-commerce site to dining in a restaurant, online reviews have become a basis of selection. However, people are always in a hustle and bustle since they don't have time to pay attention to the intrinsic details of products and services, thus the dependency on online reviews have been hiked. Due to reliance on online reviews, some people and organizations pompously generate spam reviews in order to promote or demote the reputation of a person/product/organization. Thus, it is impossible to identify whether a review is a spam or a ham by the naked eye and it is also impractical to classify all the reviews manually. Therefore, a spiral cuckoo search based clustering method has been introduced to discover spam reviews. The proposed method uses the strength of cuckoo search and Fermat spiral to resolve the convergence issue of cuckoo search method. The efficiency of the proposed method has been tested on four spam datasets and one Twitter spammer dataset.

In this reference paper[8], it shows that nowadays with the increasing popularity of the internet, online marketing is going to become more and more popular. This is because; a lot of products and services are easily available online. Hence, reviews about all these products and services are very important for customers as well as organizations. Unfortunately, driven for profit or promotion, fraudsters used to produce fake reviews. These fake reviews written by fraudsters prevent customers and organizations reaching actual conclusions about the products. These fake reviews or review spam must be detected and eliminated so as to prevent deceptive potential customers. In this paper, we have applied supervised learning techniques to detect review spam. The proposed work uses different set of features along with sentiment score to build models and their performance were evaluated using different classifiers.

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R. Barbado, O. Araque, and C. A. Iglesias[9], it proposes a feature framework for detecting fake reviews that has been evaluated in the consumer electronics domain. The contributions are four fold: (i) Construction of a dataset for classifying fake reviews in the consumer electronics domain in four different cities based on scraping techniques; (ii)definition of a feature framework for fake review detection; (iii) development of a fake review classification method based on the proposed framework; (iv) evaluation and analysis of the results for each of the cities understudy.

In this reference paper[10], it shows that a review processing method is proposed. Some parameters have been suggested to find the usefulness of reviews. These parameters show the variation of a particular review from others, thus increasing the probability of it being spam. This method introduced classifies the review as helpful or non-helpful depending on the score assigned to the review.

Ch. Xu and J. Zhang[11], it shows that spam campaigns spotted in popular product review websites (e.g., amazon. com) have attracted mounting attention from both industry and academia, where a group of online posters are hired to collaboratively craft deceptive reviews for some target products. The goal is to manipulate perceived reputations of the targets for their best interests. The pairwise features are first explicitly utilized to detect group colluders in online product review spam campaigns, which can reveal collusions in spam campaigns from a more fine-grained perspective.

In this paper[12], reference shows that online product reviews have become an important source of user opinions. Due to profit or fame, imposters have been writing deceptive or fake reviews to promote and/or to demote some target products or services. Such imposters are called review spammers. In the past few years, several approaches have been proposed to deal with the problem. In this work, take a different approach, which exploits the burrstones nature of reviews to identify review spammers.

J. Minnich and others[13], it shows that online reviews on products and services can be very useful for customers, but they need to be protected from manipulation. So far, most studies have focused on analyzing online reviews from a single hosting site. How could one leverage information from multiple review hosting sites? This is the key question in our work. In response, develop a systematic methodology to merge, compare and evaluate reviews from multiple hosting sites. Focus on hotel reviews and use more than 15 million reviews from more than 3.5 million users spanning three prominent travel sites.

In this reference paper[14], it shows that users increasingly rely on crowd sourced information, such as reviews on Yelp, Amazon, liked posts and ads on Facebook. This has lent to market for black hat promotion techniques via fake (e.g., Sybil) and compromised accounts and collusion networks. Existing approaches to detect such behavior relies mostly on supervised (or semi-supervised) learning over known (or hypothesized) attacks. They are unable to detect attacks missed by the operator while labeling or when the attacker changes strategy.

H. Li and others[15], it shows that online reviews have become an increasingly important resource for decision making and product designing. But review systems are often targeted by opinion spamming. Although fake review detection has been studied by researchers for years using supervised learning, ground truth of large scale datasets is still unavailable and most existing approaches of supervised learning are based on pseudo fake reviews rather than real fake reviews. Working with Dianping1, the largest Chinese review hosting site, present the first reported work on fake review detection in Chinese with filtered reviews from Damping's fake review detection system.

In this paper[16], it explains that online reviews are quickly becoming one of the most important sources of information for consumers on various products and services. With their increased importance, there exists an increased opportunity for spammers or unethical business owners to create false reviews in order to artificially promote their goods and services or smear those of their competitors. In response to this growing problem, there have been many studies on the most effective ways of detecting review spam using various machine learning algorithms. One common thread in most of these studies is the conversion of reviews to word vectors, which can potentially result in hundreds of thousands of features.

H. Xue, F. Li, H. Seo, and R. Pluretti[17], in this paper it providing an efficient and effective method to identify review spammers by incorporating social relations based on two assumptions that people are more likely to consider reviews from those connected with them as trustworthy and review spammers are less likely to maintain a large relationship network with normal users. The contributions of this paper are two-fold: (1) elaborate how social relationships can be incorporated into review rating prediction and propose a trust based rating prediction model using proximity as trust weight; and (2) design a trust-aware detection model based on rating variance which iteratively calculates user-specific overall trustworthiness scores as the indicator for spam city.

In this paper[18], reference shows that to detect fake reviews for a product by using the text and rating property from a review. In short, the proposed system (ICF++) will measure the honesty value of a review, the trustiness value of the reviewers and the reliability value of a product. The honesty value of a review will be measured by utilizing the text mining and opinion mining techniques. The result from the experiment shows that the proposed system has a better accuracy compared with the result from the iterative computation framework (ICF) method.

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R. Hassanzadeh[19], it shows that Online Social Networks (OSNs), which captures the structure and dynamics of person-to-person and person-to-technology interaction, is being used for various purposes such as business, education, telemarketing, medical, entertainment. This technology also opens the door for unlawful activities. Detecting anomalies, in this new perspective of social life that articulates and reflects the off-line relationships, is an important factor as they could be a sign of a significant problem or carrying useful information for the analyzer.

G.D. Upadhye and others[20], reference shows that mangoes are graded in four types like Green Mango, Yellow Mango and Red Mango which are based on machine learning methods. This system considers RGB values, size and shape of mangoes. Following analysis is used to obtain a good probability. This helps to train the system to identify appropriate maturity of mangoes. This research is conducted on two machine learning method i.e. Naive Bayes and SVM (Support Vector Machine).

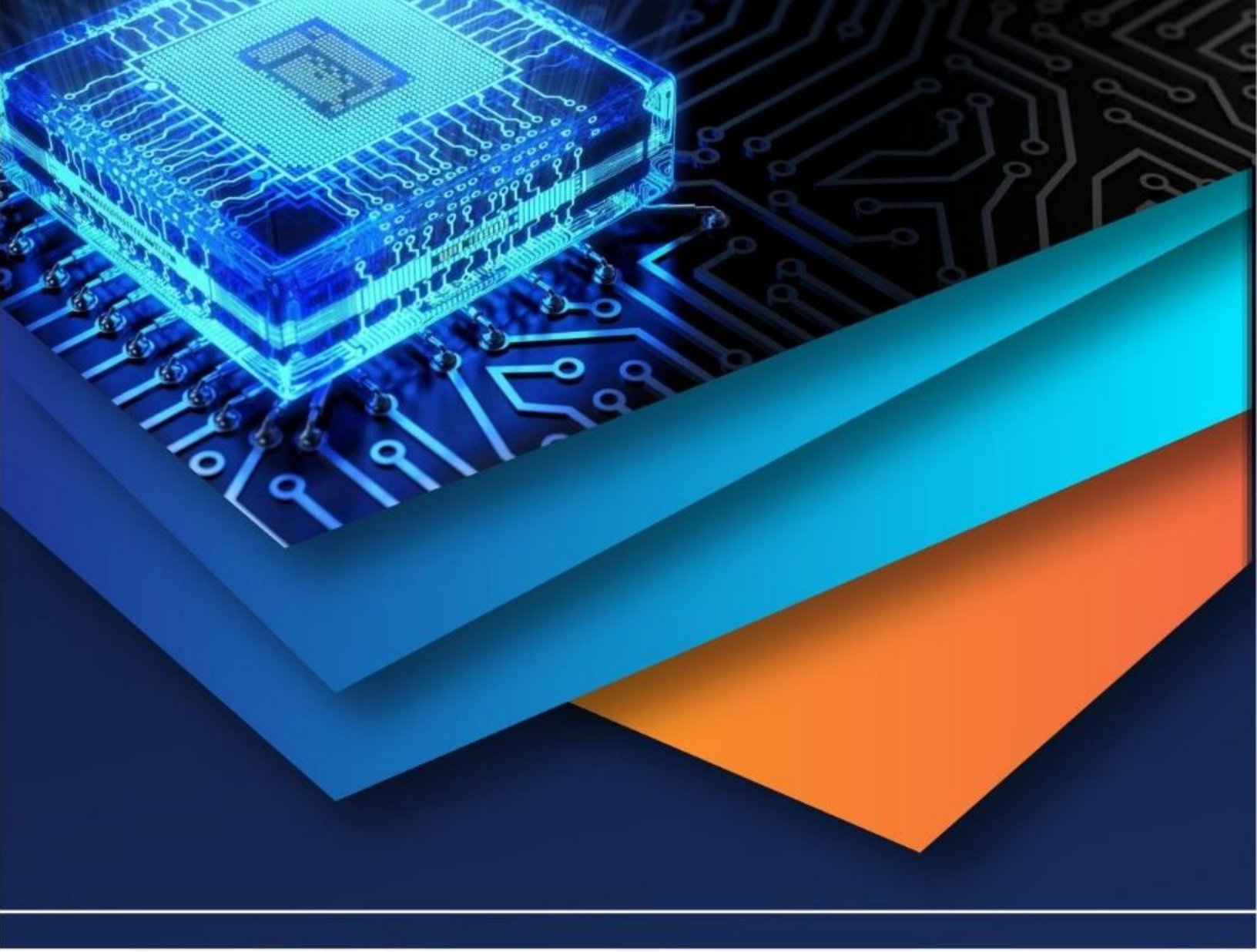
III. CONCLUSION

Sentiment Analysis is a case study that looks at the feeling, mood, entropy or feelings of people. This paper addresses a basic issue of the study of feelings and the classification of feelings of polarity for spam review detection. Data was compiled from online product reviews of Amazon.com. A method known as the categorization of emotion polarity along with through explanations of each phase was proposed. These measures include pre-processing, pre-filtering, partitioning and data consistency. Functionality that includes machine learning expertise. Much work has been done in opinion mining and consumer evaluation in the form of a study of documents, sentences, and features. Opinion Mining can become a most interesting field of study for potential preferences by using a number of found function expressions derived from the reviews. More novel and successful approaches need to be invented to address the existing difficulties of mining opinion and sentiment analysis.

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