

Opinion Mining and Opinion Spam Detection

Pooja H. Ghelani¹, Tosal M. Bhalodia²

¹Student, Dept. Of Computer engineering, Atmiya Institute of Technology & Science, Gujarat, India

²Professor, Dept. Of Computer engineering, Atmiya Institute of Technology & Science, Gujarat, India

Abstract - Now a days the Sharing Your review or opinion on particular thing is very common task in the social networking sites. Anyone can express their level of satisfaction, feelings on any product by giving their opinion. These opinions are very important for consumer and for manufacture too. Because based on these opinions any one can decide whether products are useful or not. So there may be chance that spammer can write spam review to gain profit. So it is very necessary to identify this kind of spam review. This papers aims to represent a literature survey on opinion mining and opinion spam.

Key Words: Opinion Mining, Opinion Spam, review Spam, Product Review.

1. INTRODUCTION

Social Media plays very important role in anyone's day to day life. Because social media allow anyone to convey their feelings, level of satisfaction or what they think about any particular product. This is known as opinion or review of any person. In today's era consumer use online product information before making purchase decision. Based on review on any product consumer can decide whether they want to buy a product or not. Opinion on any product may be negative or positive. It depends on peoples feeling about product. This positive and negative feeling of people is called as sentiment. Positive review mainly used for gain fames or profit for company or any product. And negative reviews are used to demote or damage the image of company or any product. Opinion from social networking sites is many times used by any person or company for marketing and product design. Because of their impact, manufactures are highly concerned. So any spam review should be detected in order to ensure that the social media continues to be a trusted source of public opinion, it is important to develop technique to detect spam reviews. Machine learning technique has potential to solve the problem of review spam. This paper introduces some basic concept of opinion mining and opinion spam detection.

This paper is organize as follow: Section 2 includes introduction to Opinion Mining in which it contain component of opinion mining, types of classification, method of classification and section 3 include introduction to opinion spam.

2. OPINION MINING

Opinion : An opinion is a belief about matters commonly considered to be subjective, and is the result of emotion or interpretation of facts. it can be positive, negative or neutral.

2.1 Components of Opinion Mining

There are mainly three component of opinion mining are as follow [1]:

1. **Opinion Holder:** who is giving opinion or who is holding opinion is called as opinion holder.
2. **Opinion Object:** opinion holder gives their opinion on particular product or object is called as opinion object.
3. **Opinion Orientation:** it determines that given opinion is positive or negative or neutral.

For example if seema says "this is great book" then here opinion holder is seema because she gives the opinion means she hold the opinion, opinion object is book because she gives opinion about book, and opinion orientation is positive because she says it is great.

2.2 Types of classification

Sentiment Analysis can be considered a classification process [2]. There are mainly 3 types of Classification can be done as follow:

1. **Sentence-level:** Sentence-level Sentiment Analysis aims to classify sentiment expressed in each sentence. The first step is to identify whether the sentence is subjective or objective. If the sentence is subjective, Sentence-level Sentiment Analysis will determine whether the sentence expresses positive or negative opinions [2].
2. **Document-level:** There is not main basic different between sentence and document level because sentences are just short part of document.
3. **Aspect-level:** Aspect-level SA aims to classify the sentiment with respect to the specific aspects of entities.

2.3 Opinion classification technique

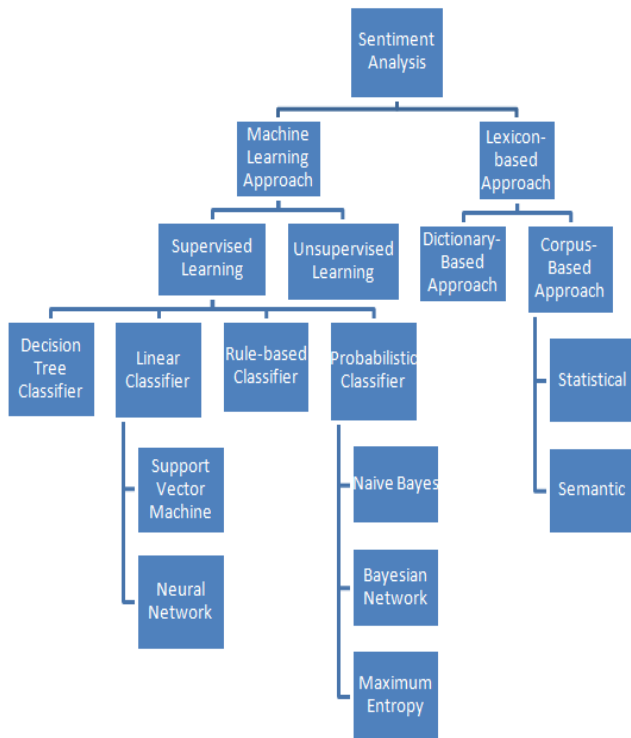


Fig -1: Sentiment Classification Techniques

3. OPINION SPAM

Spam refers to irrelevant posting, content that is out of place. Opinion mining refers as Human activities that try to deliberately mislead readers or automated opinion mining systems by writing positive or negative review on particular product. In general any user can give fake review to gain their benefit is called as opinion spam.

3.1 Types of Spam Review

There are mainly three types of spam review identified [3]:

1. **Type 1 (untruthful opinions):** Those that deliberately misdirect readers. Again there are two type:
 - Positive spam review: undeserving conclusion to an item to promote them.
 - Negative spam review: give negative review to damage their popularity.
2. **Type 2 (reviews on brand only):** Those that comment on the brand instead of commenting on the products.
3. **Type 3 (non-reviews):** Those that are not reviews. It has two main sub-types: (1) advertisements and

- (2) other irrelevant reviews containing no opinions (e.g. questions and random texts)

Type 1 is very hard to detect whether it is spam or not. Type2 and Type 3 is comparatively easy to detect it means it can be easily recognize by human.

3.2 Types of spammers

People who write fake review on particular product to gain their benefit are called as spammer. Those people can be hired by any other people or organization to promote their product or demote others product. There are mainly two types of spammer as below:

- **Individual Spammer:** It is a single user who registers multiple times in single web-site using different user-id. They write only positive review to promote own product or write only negative review on the products of competitors but not write both.
- **Group Spammer:** There are many people in group who write spam review on product. Everyone in group write fake review on particular product using their user-id to promote or demote product.

3.3 Spam detection methods:

The main goal of opinion spam detection is to identify each and every fake review or reviewer. So there are mainly three methods to detect spam reviews are supervised detection method, unsupervised detection method, semi-supervised learning method.

- **Supervised detection methods:** It is used to detect spam review by classification problem of separating reviews into two classes as spam review and non-spam review [4]. The supervised learning methods depend on the existence of labeled training data.
- **Unsupervised detection methods:** it is difficult to accurately producing labeled datasets, so supervised detection method is not every time works and not always applicable. So one of solution is to used unsupervised detection method. It doesn't require labeled data.
- **Semi-supervised detection method:** it has been found that using unlabeled data in conjunction with a small amount of labeled data can considerably improve learner accuracy compare to other method.

3.4 Types of Feature:

There are many types of features that can be extracted from the review or from the behavior of reviewer. It is used to identify whether review or reviewer is spam or not. There are mainly three types of feature as listed below [4]:

- **Review centric feature:** review centric features are characteristics of reviews. These characteristic could be review's length, time, date, rating, reviewer id, review id, store id or feedback. It is beneficial for review spam detection. Strange reviews can be identified using this feature.

Some of feature of review are listed below:

- a) Length of review: longer reviews tend to get more attention of customer, spammer want to use this as advantage.
- b) Review date: it is seen that review which are written early tend to get more attention of user and give benefit to product.
- c) Number of feedback: number of useful feedback is helpful to judging review quality.
- d) Rating: rating of review is most important feature to detect spam review. As high rating review is true. And if rating of review is low then review might be spam review.

- **Reviewer centric feature:** reviewer centric features are characteristics of reviewers. The most efficient way to detect spam review is through identifying spammers. Some of the reviewer centric features are maximum number of reviews, percentage of positive reviews, review length, reviewer deviation, and maximum content similarity [5]. some of feature are briefly explain below:

- a) Deviation rate: Reasonable reviews are consistent with the product's quality and do not deviate from all reviews' average. According to this feature, we can judge whether a review is fake.
- b) Content similarity: spammer can copy other customer's review and use them with or without slight modification. Cosine function can be used to evaluate the similarity between two reviews.
- c) Review relevancy: many times it is possible that customer's review does not match with product. so it can be identify that if review does not match with product then that is spam review
- d) Content length: it is also important feature of reviewer to identify spam review. When content of review is too short we can assume that customer does not consider product's experience seriously.
- e) User rate: in social networking websites they provide the user rate basis on various factor like their total consumption, activeness of user etc. base on that we can identify whether review is spam or not.

- **Product centric feature:** product centric features are information about the product. some of the product centric features are listed below:

- a) Sales rank of the product
- b) Price of the product
- c) Rating of the product
- d) Standard deviation of product

4. CONCLUSIONS

In this paper, some introduction about opinion mining and opinion spam. Component of opinion mining and types of classification are given. There are many classification technique are available which is shown in fig. opinion write by any customer should be trustful. So types of spam review and types of spammer are discussed. Supervised spam detection method and unsupervised spam detection method are used to detect spam review. feature are used to detect spam review so review centric, reviewer centric and product centric features are discussed. Basically some basic information about opinion spam and spam detection are given in this paper.

REFERENCES

- [1] Pawar, A. B., M. A. Jawale, and D. N. Kyatanavar. "Fundamentals of Sentiment Analysis: Concepts and Methodology." *Sentiment Analysis and Ontology Engineering*. Springer International Publishing, 2016. 25-48.
- [2] Medhat, Walaa, Ahmed Hassan, and Hoda Korashy. "Sentiment analysis algorithms and applications: A survey." *Ain Shams Engineering Journal* 5.4 (2014): 1093-1113
- [3] Sheibani, Amir A. "Opinion mining and opinion spam: A literature review focusing on product reviews." *Telecommunications (IST)*, 2012 Sixth International Symposium on. IEEE, 2012.
- [4] Crawford, Michael, et al. "Survey of review spam detection using machine learning techniques." *Journal of Big Data* 2.1 (2015): 23.
- [5] Liu, Pan, et al. "Identifying Indicators of Fake Reviews Based on Spammer's Behavior Features." *Software Quality, Reliability and Security Companion (QRS-C)*, 2017 IEEE International Conference on. IEEE, 2017.