

Sentiment Analysis for Two Sides of Review using Dual Prediction

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Abstract: Now-a-days, Bag-of-words (called BOW) is the one of the most popular way for modeling text in case of statistical machine learning approaches during sentiment analysis. However, sometimes the performance of BOW will remain limited because of some fundamental deficiencies in case of handling the polarity shift problem. A model known as dual sentiment analysis (called DSA) is proposed for addressing this problem for sentiment classification. A novel data expansion technique is proposed by creating a sentiment-reversed review for each of the training and test review. Based on this, a dual training algorithm is proposed in order to make use of original and reversed training reviews in pairs for the purpose of learning a sentiment classifier and also a dual prediction algorithm for classifying the test reviews with the consideration of two sides of one review. The DSA framework is extended from polarity (called positive-negative) classification to 3-class (called positive-negative-neutral) classification, by taking the neutral reviews into account. Lastly, a corpus-based method is developed for constructing a pseudo-antonym dictionary that removes DSA's dependency present on an external antonym dictionary for the purpose of review reversion.

Keywords: Sentimental Analysis, Feedback, Opinion Mining, Classification, Sentiment Identification.

I. INTRODUCTION

With the explosive growth of the social media content on the internet in the past few years, the world has been transformed. E Commerce sites, online communities, forums, discussion groups, web logs, product rating sites, chat rooms are some of the sources on which people can now express their views on almost anything in discussion. Sentiment analysis refers to the use of natural language processing, text analysis and computational linguistics to identify and extract subjective information in source materials. Sentiment analysis is widely applied to reviews and social media for a variety of applications, ranging from marketing to customer service. Analysers used for polarity identification. Analysers are of two types manual (domain oriented) and automatic (generalized oriented) we used domain oriented in are methodology. In manual analyser predefined data set exist which similar/ related term have to feed and result occurs and other hand automatic analyser consist huge data set and also capable to handle multiple language at a time. Sentiment analysis is used to classify polarity and the sentiment

analyser is used to define polarity opinion expressed is (+) tive, (-) tive or (=) neutral[1]. Sentiment is a sincere and refined sensibility, a tendency to be influenced by emotion rather than reason or fact: to appeal to sentiment. Sentimentality implies affected, excessive, sometimes mawkish sentiment: weak sentimentality. The study of emotions in text can be conducted from two points of view. Firstly, one can investigate how emotions influence a writer of a text in choosing certain words and/or other linguistic elements. Secondly, one can investigate how a reader interprets the emotion in a text, and what linguistic clues are used to infer the emotion of the writer [4]. Sentiment Analysis is process of computationally identifying and categorizing opinions expressed in a piece of text, especially in order to determine whether the writer's attitude towards a particular topic, product, etc. is positive, negative, or neutral. "Sentiment Analysis is the task of identifying positive and negative opinions, emotions, and evaluations". Sentiment Analysis has many names. It's often referred to as subjectivity analysis, Opinion mining, and appraisal extraction, with some connections to affective computing (computer recognition and expression of emotion) [5]. Dual Sentiment Analysis A model called dual sentiment analysis (DSA), to address this problem for sentiment classification. We first propose a novel data expansion technique by creating a sentimentreversed review for each training and test review. On this basis, we propose a dual training algorithm to make use of original and reversed training reviews in pairs for learning a sentiment classifier, and a dual prediction algorithm to classify the test reviews by considering two sides of one review [1].

II. PROPOSED SYSTEM

A simple yet efficient model known as dual sentiment analysis (called DSA) is proposed in order to address the polarity shift problem in case of sentiment classification. With the use of the property that the sentiment classification has two opposite class labels (called positive and negative), a data expansion technique is proposed by creating sentiment reversed reviews. The original and reversed reviews were constructed in a one-to-one correspondence. Later, a dual training (called DT) algorithm and a dual prediction (called DP) algorithm are proposed in order to make use of the original and reversed samples in pairs for the purpose of training a statistical classifier and to make predictions. In case of Dual Training, the classifier is learnt through

maximizing a combination of likelihoods for the original and reversed training of data set. In case of Data Predictions, the predictions were made through considering two sides of one review. That is, the measurement is not only done on how positive or negative the original review is, but also on how negative or positive the reversed review. Further, it extended framework of DSA from polarity (i.e., positive vs. negative) classification to three class (i.e., positive vs. negative vs. neutral) sentiment classification, by considering the neutral reviews into account in case of both dual training and dual prediction. For reducing DSA's dependency on an external antonym dictionary will develop a corpus-based method in order to construct a pseudo-antonym dictionary. The pseudo antonym dictionary is of language-independent and also domain- adaptive. It will make the DSA model possible that is to be applied for a wide range of applications.

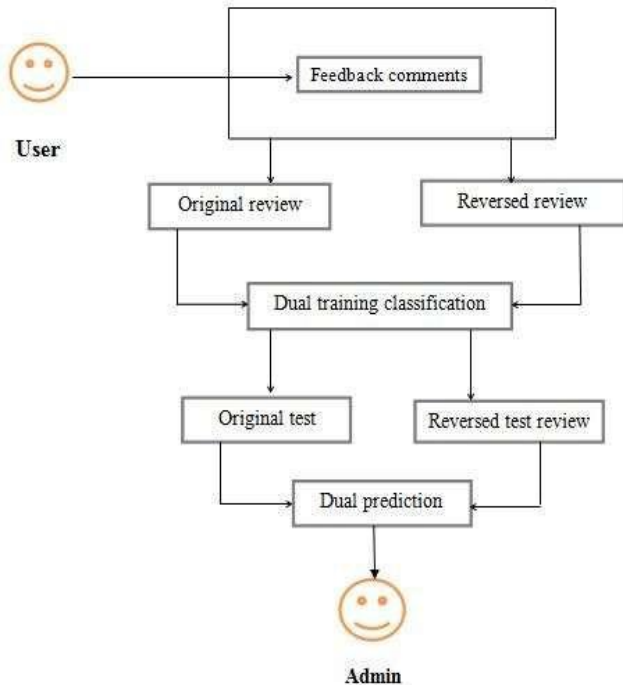


Fig.1. System Architecture.

III. IMPLEMENTATION PROCEDURE

1. Creating sentiment-reversed reviews.
2. The Dual training prediction module
3. Expansion of Selective Data

IV. CREATING SENTIMENT-REVERSED REVIEWS

Depending on antonym dictionary, for each of the original review, the reversed review is created based on the following rules:

1. **Text reversion.** In case if there is a negation, the scope of negation is first detected. All sentiment words out of the scope for negation are reversed for their antonyms. In the choice of negation, the negation words (for example, “no”, “not”, “don’t”, etc.) were removed, however the sentiment words are not reversed
2. **Label reversion.** In case of each of the training review, the class label is also reversed for its opposite (for example, positive to negative, or vice versa), as the class label for the reversed review.

V. DUAL TRAINING PREDICTION MODULE

In case of **training stage**, all of the original training samples were inverted to their opposites. It is referred to them as “original training set” and also “reversed training set” respectively. In case of data expansion technique, there is a one-to-one correspondence among the original and reversed reviews. The classifier is usually trained by maximizing a combination of the likelihoods for the original and reversed training samples. This process is known as dual training prediction module. In case of **prediction stage**, for each of the test sample x , a reversed test sample $\sim x$ is created. It is to be noted that our aim is not only to predict the class of $\sim x$. Instead, $\sim x$ is used for assisting the prediction of x . This process is known as dual prediction.

VI. EXPANSION OF SELECTIVE DATA

The dual training procedure is introduced in which all of the training reviews were used in case of data expansion. Though, in several cases, not all of the reviews that have such distinct sentiment polarity. Thus, a selective data expansion procedure is proposed to select a part of training reviews to expansion of data. Let us first observe two reviews that are a bit more complex compared to earlier examples:

Review (a). The book is very interesting, and the price is very cheap. I like it.

Review (b). The book is somehow interesting, but the price is too expensive. I don't dislike it

A. User Feedback Comments

Our analysis of feedback comments on eBay and Amazon divulge that even if a buyer gives a positive rating for a transaction, s/he still consent comments of mixed opinions respecting different aspects of transactions in feedback comments. For example for comment c2, a purchaser gave a positive feedback classification for a transaction, but left the subsequent comment: “bad communication, will not purchase from repeatedly. super slow ship(ping). item as described.”. Apparently the buyer has negative opinion almost the communication and delivery aspects of the transaction, against an overall positive.

B. Dual Training

The original training specimens are reversed to their opposites. Indicate to them as “original training set” and “reversed training set. In our data expansion technique, there is a one-toone correspondence among the original and reversed reviews. The classifier is trained by maximizing a combination of the likelihoods of the original and reversed training samples. This process is called dual training. Note that our method can be easily adapted to the other classifiers such as naïve Bayes and SVMs

C. Dual Prediction

Dual prediction works in addressing the polarity shift problem. This time we think “I don't like this book. It is boring” is an original test review, and “I like this book. It is interesting” is the reversed test review. Accordingly, it is very likely that the original test review will be missclassified

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as Positive. While in DP, due to the removal of negation in the reversed review, “like” this time the plays a positive role. Therefore, the probability that the reversed review being classified into Positive must be high. In DP, a weighted combination of two component predictions is used as the dual prediction output.

VII. CONCLUSION

Sentiment analysis is essential for anyone who is going to make a decision. Sentiment analysis is helpful in different field for calculating, identifying and expressing sentiment. It is helpful for everyone when they want to buy a product and they can decide which product is best. Sentiment analysis is very important for Enterprises and helps them to know what customers think about their products. Therefore companies can take decisions about their products based on customer’s feedback Thus companies can modify their products features and introduce new products according to customers’ opinions in a better and faster way.

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