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Review on Aspect Based Sentiment Analysis Using Sentence Minimization

M. Likhar[1*], S. L. Kasar[2]

[1*]Dept. of Computer Science and Engineering, JNEC, Babasaheb Ambedkar Marathwada University, Aurangabad, India
[2] Dept. of Computer Science and Engineering, JNEC, Babasaheb Ambedkar Marathwada University, Aurangabad, India

**Corresponding Author: mplikhar@gmail.com*

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Abstract: The idea behind the sentiment analysis is to determine the sense trailing the response of product, present in a series of words. It assists us to determine the possible approach mention online. To achieve an idea present in the response of reviews, sentiment analysis is quite useful and defines the overview of public opinion behind the social media elements. Natural language is too complex for machine to follow. To instruct the machine regarding all the feelings, culture, slang and innovation are one of the major challenges for developer. Portray the system to realize the affect of tone is even more difficult. Natural language processing plays a vital role for categorizing the words as 'positive' or 'negative, without having the knowledge regarding the context, it becomes very difficult to analyze the sentiment. In basic way feedback shows the better information about what exactly required, this helps to automate the system using natural language processing

Keywords **-** Sentiment Analysis, Methods of Sentiment Analysis, Minimization methods, Benefits of minimization.

I. INTRODUCTION

In recent years the Sentiment Analysis is gaining much interest for detecting the redundancy in the text. It is used to analyze the feeling of consumers, helping the team-member working for the social media. To support marketing and customer services sentiment analysis is an effective tool it is easily applied on feedback of products. These feedbacks are beneficial for customers to judge the importance of product and help them in purchasing. [1]. The customer receives various opinion via blogs, tweets and other social media provide proper guidelines for easy decision making. Sentiment analysis also used to uncover the customer's satisfaction, and use to examine the response of new product. This minimization process has many applications and even beneficial from robust compression system. It helps in area where there is limited time and space like mobile screen, where the space remains very small to display the entire review. Instead of reading whole information from the reviews, minimization helps to have the useful contents for making the decision regarding the product. Natural Language Processing (NLP) is an excellent way to figure-out the language and reveal the sentiment behind it. Sentiments are deliberated as meaningful value of the feedback expressed using social media. These are observed as positive or negative sentiment, it used to express the affluent set of facts that address the consumer's choice and even conclude their decisions [2].

The paper is organized in such a way that Section I contains the introduction of the sentiment analysis its benefits, gives information that how it supports customers, and shows the usefulness of minimization of reviews with the help of natural language processing, Section II contain the related work of sentence minimization, its model and how it works and use of rule based approach, Section III contain sentiment analysis methods with its different approaches, Section IV contains three different sentence minimization methods, Section V contain benefits of minimization, Section VI shows the conclusion that minimization is the process that helps in easy decision making for purchasing the product.

II. RELATED WORK

Sentence minimization is the process of removing the undesirable element from the sentence that does not affects its original meaning, in that case various studies were conducted in which the author proposed the sent-comp model where the compression of sentence is done and sentiment analysis is performed. Some specified features related to sentiments and syntactic relation is included for fast the compression. For improving the performance of aspect-based sentiment analysis according to them sent-comp is quite beneficial[1].

The work refers to the use natural language processing for the education purpose. The basic use of this approach is found in student's academician progress. It is obtained through its inventive application like source rater and

language muse. Making use of e-learning process, achieving the web information becomes easier for the user[2].

The model uses the produced document compression that is capable of generating the informative coherent sentences. Model defines the theories of local coherence and applied it in linear programming. The process is used to generate the logical text by applying the compression model on the complete document [3].

The work of text compression relies on assumption of deletion of words not the substitution, particular subset of sentence is get deleted from the original sentence. The work is based on swap operation with parser model. It also supports the use of reordering and paraphrasing model for the compression process [4].

In this diversified-order-alignment is applied on the sentences collected from the proportionate text which are not in annotated form. Work continues with three processes, calculating the lattices to find similarities within fundamental sentences, taking two different text documents and finding the lattices that interpret each other in such a way where mesh possesses the equal argument, for paraphrasing input is provided it continually get matched with the lattices and output shows the matched mesh[5].

Rule based approach is used for sentiment analysis using the association rule mining method and some specified rule for extracting the features of product. For sentence opinion extraction naive approach is applied and only adjectives are kept for preserving the opinion, identification of opinion is completely domain dependent. Method needs the improvement by using verb for opinion term [6].

Methods of sentence compression were discussed that gives the summary of sentences. Different approaches are considered that can be applied precisely on grammatical parse tree like noisy channel, decision tree, lexicalization, Markovization, some of it results in proper representation of tree structure while other shows the exact compressed form of sentence. Method also follows the discourse framework for compressing the sentences not taking the individual sentence as input [7].

It provides the new collection of text with proper annotated interpretation is used. It resolves the problem like copying the text in the former work, to periodically acquire accumulative changes occurred in the system. Paraphrasing task is done by adjusting the text and expression within linguistically identical sentences. The observer is asked to find each and every element of text that retains the possible meaning[13].

The work defines the advancement of Stanford core NLP using different annotation scheme, that adds more related information to the text. The annotation pipeline helps the beginner's to start with minimum coding knowledge and experience; it is applied on the entire text and managed by the object properties in Java. To use rule- based approach regexner annotator applied on keywords to obtain the Java regular expression[20].

III. SENTIMENT ANALYSIS METHODS

Sentiment analysis includes two techniques, these are supervised and unsupervised

A. Supervised Method

Machine learning is a supervised approach. In this approach training data is used for predictive modelling. For making the prediction outside the training set, predictive models used such as decision trees, logistic regressions or neural networks. It proves beneficial in automated and efficient prediction. It uses algorithms that are capable of discovering unknown images and patterns resolve the complex problem. [13] Two types of datasets are required for training the classifier, in supervised machine learning: - training sets and test sets. To classify the document various types of classifier is provided they are Naive Bayes, Support Vector Machine (SVM), and Maximum Entropy (ME) for performing the sentiment classification. Supervised machine learning includes the input variable (P) and output variable (Q) and using some mapping function between inputs to output, training dataset is used to learn the mapping function to predict the output (Q), algorithm helps to provide meaningful results.

$$Q = f(P) \qquad (1)$$

B. Unsupervised Method

Natural language processing is called unsupervised approach. Artificial intelligence includes natural language processing that deals with automatically extracting meaning from natural language text. It makes use of entities and syntactic patterns of the text, to realize its meaning. It uses combination of language dictionaries, linguistic constructs like parts of speech and noun phrases along with a range of operators. Rule based approach provides the major advantage; it gives freedom to the rule developers to use domain knowledge for analyzing purpose. Training data is not required for the rule-based methods and is completely unsupervised. It is beneficial where the training data availability is very less, scarcity of training data does not affect the running process. It is useful in real-life application.

To adjust the model, subject experts are provided with the additional facility to refine the rules over the feedback.

Human involvement is the major requirement in NLP approach. It is one of the drawbacks of the NLP that they require a lot of human involvement in developing the rules and it completely rely on the domain knowledge of rule developers. Unsupervised learning includes the input variable (P) but does not provide the corresponding variable (Q).

Approaches for unsupervised learning includes: K-means, Hierarchical Clustering, Mixture model.

IV. SENTENCE MINIMIZATION METHODS

Sentence minimization process presents the sentences for sense-based sentiment analysis. The minimization model reduces duplication in sentiment phrases it is the common phrase compression process. It resolves various problems like casual feeling sentences can be define in more precise form and becomes easier to analyze. The sentence holds its actual meaning and produce simplified sentence. The different sentence minimization methods are:-

A. Noisy Channel Method:-

It is generative model, at the time of test, gives the long sentence l, and finds the short original sentence q. p(s) is the source model and p (s|l) is the channel model.

B. Decision Tree Method:-

It is effective model that performs the different operation on tree. To rewrite the tree *t* operations are listed for minimizing the sentences, it is done by applying the shift-reduce-drop model in a deterministic manner. It incrementally convert the original parse tree to compressed tree by learning the tree with decision method.

C. Rule Based method:-

Rule based method involves the use of human crafted rule, required learning approaches for the classifier; it is a type of rule based system. The rule based learning involves some algorithm to identify the rules. Machine translation by rule based approach required linguistic information. From dictionary and grammar the source and target language is retrieved. The rules using regular expression involves synchronous context free grammar for compression of sentences.

V. BENEFITS OF MINIMIZATION

A. Produces the shorter sentences that become easier to analyse.
B. Reduces redundancy from the sentences.
C. It helps in summarizing the news events.
D. It helps in conventional shopping.

VI. CONCLUSION

Minimization of sentences for the analysis of feelings-based aspects has a wide variety of applications in information systems, including the classification of exams; summarize the examination and other applications in real time. Probably there may be other applications that are not covered. It is found that sentiment classifiers are strictly dependent on domains or subjects. Sentiment analysis becomes easy with minimization, it used to provide the sense behind the reviews, gives information that how it support the customers to buy the product and helps to make the proper decision regarding that product. The different methods for sentiment analysis and sentence minimization are discussed in an efficient way to classify the reviews. Finally the idea of implementations is obtain which includes the machine learning approach with natural language processing; it involves its task to be done by the heuristic rule. To classify the sentiments with naive bayes classifier training it with positive, negative and neutral words. Minimization to be done using natural language generation that completely relies on the dependency analyzer. In this way the further implementation idea is obtained.

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