

Sentiment Analysis Of Tweets Using Natural Language Processing

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Abstract – Millions of people use Twitter and other social media sites to share their everyday thoughts in the form of tweets. It is a short and straightforward way of expressing oneself, which is a hallmark of tweeting. As a result, we concentrated on sentiment analysis of Twitter data in our research. Sentiment Analysis is a subset of natural language processing and text data mining. It is feasible to investigate sentiment analysis using Twitter data. performed in a number of different circumstances The technique of finding valuable patterns from textual data is referred to as sentiment analysis. Using particular analysis tools, these valuable patterns include evaluating and categorizing feelings as neutral, positive, or negative.

The study's authors look at a range of information processing approaches, including sentiment analysis, Twitter's network structure, event dispersion across the network, and impact identification. There have been several ways described for exploring semantics for sentiment analysis, which can be classified into contextual semantic and conceptual semantic approaches. One of the most important disciplines of natural language processing is sentiment analysis. The technique of finding valuable patterns from textual data is referred to as sentiment analysis. According to this research, sentiment analysis applications will continue to develop in the future, and sentiment analytical approaches will become more standardized across systems and services. Because of the vast amount of data available, Twitter is one of the best virtual environments for tracking and monitoring information.

Keywords – *Sentiment Analysis, Natural Language Processing, Twitter Data.*

Citation: Shihab, F., Ekmekci, D. (2022). Sentiment Analysis Of Tweets Using Natural Language Processing . International Journal of Multidisciplinary Studies and Innovative Technologies, 6(1): 58-60

I. INTRODUCTION

Twitter is a prominent micro blogging platform that allows users to post status updates (called "tweets"). These tweets contain a lot of human expressions, such as enjoying, disliking, and contributions to many issues. Sentiment Analysis is a technique for identifying and extracting opinions from text. Natural Language Processing The simplest definition of NLP is the processing and analysis of (spoken) natural languages represented by texts; With the aim of achieving optimal interaction between humans and computers. Returning to the main topic of the article, sentiment analysis is one of the most important branches of NLP. by sentiment analysis, we mean the process of extracting useful patterns from textual data. These useful patterns include interpreting and categorizing feelings into: neutral, positive, or negative, from that data using certain analysis techniques. proposed a method that focuses on the distribution or frequency of sentiment classes in the dataset they're looking at. to study and forecast a situation, a based classification algorithm is used. The polarity of a user's feelings. On words, it used positive, comparative, and superlative degrees of comparison. Our study aimed to apply sentiment analysis to evaluate public opinion and detect any rising antagonistic or unfavorable feelings on social media.

Despite the fact that we believe censorship is unjust, This recent trend in sentiment research is a good example of one to follow.

Twitter mining can be applied to a wide range of situations. a variety of real-world applications, ranging from business (market research, product and service development) Applications as subcomponent technology (recommender systems; benchmarking and improvement); to applications in (summarization; question-answering) politics. As a result, we came up with a model. Using the Twitter API, obtains tweets on a specific subject. And determines each sentiment's sentiment orientation/score tweet.

II. RELATED WORK

Many articles have talked about sentiment analysis. I will summarize some of them, Boia et al. [1] and Manuel et al. [2] developed two ways that use emoticons to detect tweet polarity and slang terms to provide an emotion score to online writings, respectively. Akcora et al. [3] provided a method for determining public opinion changes over time and identifying the news that led to public opinion breakpoints. Gao and Sebastiani [4] .proposed a method that focuses on

the distribution or frequency of sentiment classes in the dataset they're looking at. Mandal, to study and forecast a situation, a based classification algorithm is used.

The polarity of a user's feelings. On words, it used positive, comparative, and superlative degrees of comparison.[5] companies can respond to their needs, and improve their services and products to suit those needs.[6] For example, a company used sentiment analysis to analyze more than 3,000 opinions about a particular product of its own, and the company discovered that those opinions were satisfied with the price of that product but in return complain about the company's customer service. What this information helps us not only understand the current context of a particular topic, but also enables us to predict the future, in addition to the possibility of using that information contained in the texts to calculate the positive/negative index, which is an important indicator in the decision-making process. Case in point: some governments use sentiment analysis results during their election campaigns.

Despite the fact that sentiment analysis and emotional intelligence are sometimes employed interchangeably, they are not the same thing. While sentiment analysis relies on data to classify sentiments as positive, negative, or neutral, EQ digs deeper into the nuance of the emotions expressed in the remarks. EQ is far more challenging and complex than sentiment analysis.[7]

Sentiment analysis, for example, will determine if a given statement is good, negative, or neutral, but emotional intelligence will determine whether the comment causes grief, discontent, or sarcasm if it is determined to be negative.

III. MATERIAL AND METHOD

Sentiment analysis is based on several models (according to the goal), starting with the models that are concerned with polarity only (positive, negative, neutral), and passing through the models capable of determining emotion (anger, love, happiness...), ending with those that are concerned with revealing intentions (interested, not interested).[8]

2.1 Fine-grained Sentiment Analysis:

In some cases, polarity accuracy is required, and then the classes of polarity are expanded as follows: very positive, positive, neutral, negative, very negative. Items in this model can also be viewed as a numerical rating, such as those based on five stars. very positive = very negative.

2.2 Emotion Detection:

In this model, the goal is to identify emotions, such as: happiness, fear, anger, etc., and dictionaries are usually used here (a list of words with their corresponding emotions), and automatic learning algorithms can also be used. Here it is worth noting that when using these dictionaries, the problem of different emotions in words arises, especially that humans can express their emotions in different ways. An example of this is: "Oh, peace!" It can have a meaning of joy or a negative meaning, such as sarcasm.

2.3 Aspect-based Sentiment Analysis:

In this model, the goal is to identify emotions, such as: happiness, fear, anger, etc., and dictionaries are usually used here (a list of words with their corresponding emotions), and automatic learning algorithms can also be used. Here it is

worth noting that when using these dictionaries, the problem of different emotions in words arises, especially that humans can express their emotions in different ways.

An example of this is: "Oh, peace!" It can have a meaning of joy or a negative meaning, such as sarcasm. Sentiment analysis systems rely on a number of natural language processing algorithms and methods, and we will mention them below:

1- rule-based methodologies: rule-based methodologies.

These methodologies rely on manually defining a set of rules to determine the polarity and target entity (eg product name). Some of the techniques used to build these bases: Stemming, tokenization, and parsing. Dictionaries (a group of words and expressions with corresponding feelings). Example: Create two strings of words that directly identify polarity (negative words, such as: bad, failed..., and positive words, such as: good, great...).

Count the words with positive feelings and words with negative feelings, that are in a particular context.[9] rule-based methodologies: rule-based methodologies. These methodologies rely on manually defining a set of rules to determine the polarity and target entity (eg product name). Some of the techniques used to build these bases: Stemming, tokenization, and parsing.

2-Methodologies based on machine learning techniques. Based methodologies. Unlike the previous methodology, these methodologies do not rely on hand-written rules, but rather on machine learning algorithms. The issue of sentiment analysis is a classification problem. The input to this classifier is textual data, and its output is one of the kinds of sentiment (for example: positive, negative, neutral). The following figure shows how the sentiment analysis classifier works:

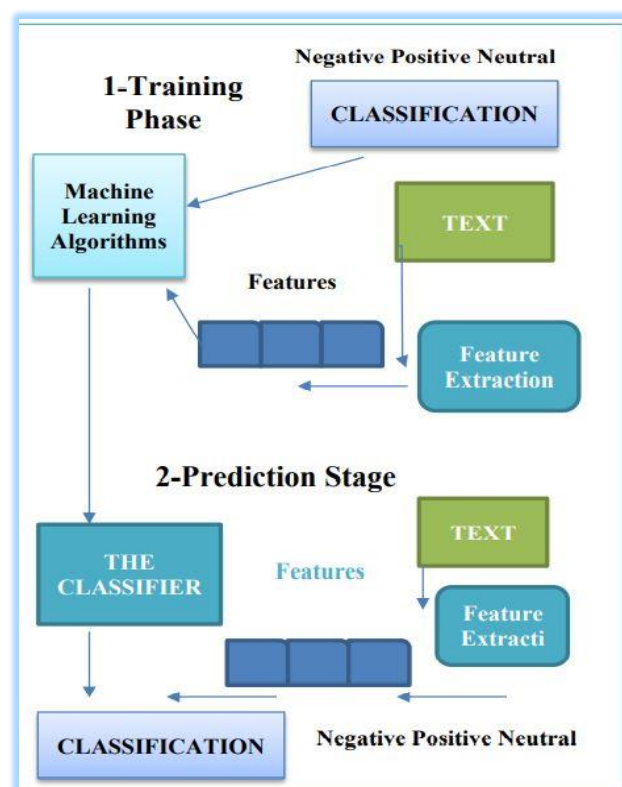


Fig. 1 analysis classifier works

IV. RESULTS AND DISCUSSION

Twitter posts on electronic products were used to create the dataset. Tweets are short statements that are rife with slang and misspellings. As a result, we conduct a sentiment analysis at the sentence level. This is accomplished in three stages. Pre-processing is completed in the first phase. Then, utilizing relevant features, a feature vector is produced. Finally, tweets are divided into positive and negative categories using several classifiers. The final emotion is calculated based on the number of tweets in each class.

HUANG, Lei generated a novel dataset by collecting tweets over a period of time lasting from April 2013 to May 2013 because conventional Twitter datasets are not accessible for the electronic products industry.[10]

The Twitter API is used to automatically collect tweets, which are then manually tagged as good or negative. Using 600 good and 600 negative tweets, a dataset is produced.

Creation of a Dataset

Table 1 shows how the dataset is divided into two sets: training and test.

Table 1. STATISTICS OF THE DATASET USED

Dataset	Positive	Negative	Total
Training	500	500	1000
Test	100	100	200

V. CONCLUSION

In this review, Customers' opinions on the key to success in the marketplace are analysed using Twitter sentiment analysis. Machine-based learning is used in the software. Method for evaluating a feeling that is more accurate; Natural language processing techniques will be used in conjunction with each other. We studied how to collect data from users of the Twitter platform and study the content of their posts and analyse them using machine learning features that benefit companies, advertisements. Twitter sentiment analysis was created to examine customers' perspectives on the critical to market success. The program employs a machine-based learning approach that is more accurate for sentiment analysis; natural language processing techniques will also be employed

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