

Customer sentiment analysis

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Abstract

An analysis of emotions or Sentiment Analysis is a computer study of human ideas, emotions, attitudes, and emotions expressed in written language. It is one of the most active research areas in the field of natural language and text mining in recent years. Its popularity is mainly due to two reasons. First of all, it has a wide variety of applications because ideas are important in almost all human activities and have a profound effect on our behavior. Whenever we need to make a decision, we want to hear from others. Second, it presents many challenging research problems, which had not been tried before the year 2000. Part of the reason for the lack of previous research is that there was a small piece of text with ideas on digital methods.

Keywords: Emotional Analysis, Ideas, Product Analysis, Customer Review Analysis, Product Monitoring

1. Introduction

Sentiment analysis allows businesses to use a large amount of free information to understand customer needs and their attitude towards their brand. Organizations monitor online conversations to promote products and services and maintain their reputation. Analysis takes customer care to the next level. Customer support systems with SA included categorize incoming queries urgently, allowing staff to help customers in dire need first. Emotional analysis is a powerful tool for employee analysis. Consider these steps if you decide to use the emotional analysis in Easy Use of Use. Analysis takes customer care to the next level. Customer support systems with SA included categorize incoming queries urgently, allowing staff to help customers in dire need first. Emotional analysis is a powerful tool for employee analysis.

This project aims to make the emotional separation of product reviews online using various stages of machine learning. This project analyzes emotions in the database from the document level (review level). The information used in this project is a review of online products collected from amazon.com. The Amazon update database used for this project contains updates from Amazon. The data lasted 18 years, including a review of 35 million up to March 2013. The project includes comparative study of the performance of 4 Machine Learning classifier models - Multinomial Naïve Bayes, Logistic Regression, Linear SVC and Random Forest. The best separator is chosen to match the model to differentiate any future product reviews with promising results. User reviews considered input are categorized using the selected model with respect to the categories / categories of emotions - Good and Bad, based on the Sentimental Orientation of the ideas it contains

2.Literature Survey

Sentiment analysis allows businesses to use a large amount of free information to understand customer needs and their attitude towards their brand. Organizations monitor online conversations to promote products and services and maintain their reputation. Analysis takes customer care to the next level. Customer support systems

with SA included categorize incoming queries urgently, allowing staff to help customers in dire need first. Emotional analysis is a powerful tool for employee analysis.

Consider these steps if you decide to use the emotional analysis in your practice:

- a) Collect answer details
- b) Ensure that the data is of sufficient analysis quality
- c) Check for customized software and APIs
- d) Hire a data science team if you work in a particular industry such as health care, finance, or transportation.

Emot Emotional analysis is the process by which information is extracted from people's opinions, assessments and implications for their organizations, events and symbols. In making decisions, the opinions of others have a profound effect on making customers feel comfortable, making decisions about buying online, choosing events, products, organizations. Methods of textual analysis often work to a certain extent such as the level of a sentence, sentence or document. It applies mathematical mixing, natural language processing (NLP), and machine learning to identify and extract subtitle data from text files, for example, reviewer's feelings, thoughts, judgments, or evaluations on a particular topic, event, or company and its activities as mentioned above. This type of analysis is also known as the mining of ideas (with a focus on output) or a preferred scale. Some experts use terms separation and exclusion. Comments or tweets are constructive but are considered bad when thumbnails are used to express their ideas.

Here are some of the methods used for sentiment analysis by above researchers:

2.1.Opinion Mining

Opinion mining is another well-known method of algorithm namely natural language processing (NLP), text mining, web removal which involves studying the ideas and ideas contained in the text. Opinion mining can be used in a variety of fields such as law, research, education, politics and marketing. Organizations use these ideas to make their product more popular with consumers and to have the jobs they dream of and aspire to.

2.2.Lexicon Based Approach

In this way, the aforementioned word list is used when each word refers to a specific idea. Their meanings change according to the context in which the list is compiled and include semantic calculations of texts and phrases used in the concept.

Steps used in Lexicon methods are:

1. Prepare tweets by removing punctuation.
2. Set the polarity points to 0.
3. Check whether the token is present or not.
 1. If a token is present, s becomes + ve
 2. If token is not available, s becomes -ve
4. Compare the polarity points of the tweets from the post
 1. If $s > \text{limit}$, tweet is classified as positive
 2. If $s < \text{threshold}$, tweet is classified as negative

2.3.Machine Learning Based Approach

Supervised machine learning using systematic data or human annotations. Which machine do you learn to make the next thought.

1. Slowly guided machine learning methods help to translate unstructured data without guidelines.
2. Advanced learning algorithms are advanced algorithms that use algorithms such as SVM and ANN to obtain high accuracy in results

3.Problem Statement

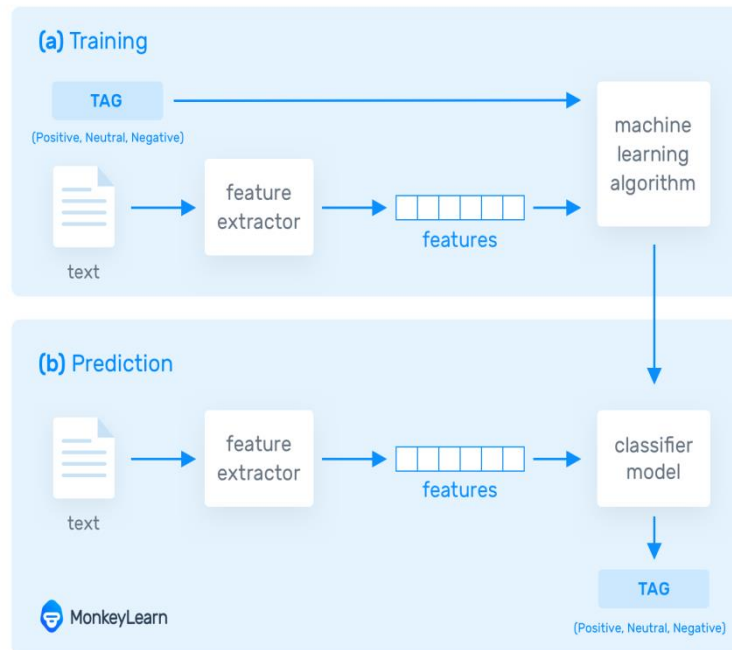
The main problems with current strategies are: inability to perform well in a variety of domains, inadequate accuracy and performance in the emotional analysis based on insufficient label information, inability to deal with complex sentences that require more than sensory words and simple analysis. I believe that the biggest problem still lies with the correct translation of the context in which certain words are used. It is still difficult for many tools to accurately assess what a negative, neutral, positive statement is. I'm not really sure about the

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equipment behind it, but at the moment it's not developing enough to deal effectively with the sarcasm or context of some of the conversations. Consider the example of someone who jokes about his Tweets, Facebook posts, or whatever. Sometimes it is difficult to pick it up during a face-to-face conversation, let alone a tool that analyzes the context of a humorous social media review.

4. Proposed System

How Does Sentiment Analysis Work?



Emotional analysis process.

(a) The training process for the emotional analysis algorithm with the element output and the machine learning algorithm;

(b) Predictability process for sensory analysis algorithm with feature output and separation model

While it is difficult to predict how a less mature system might emerge in the future, there is a general perception that emotional analysis requires a transition from one positive to the negative.

The database contains 1.3 million commentary comments from the online comment website Reddit, which is listed as sarcastic and unscrupulous. The source of the database is a paper entitled: "The Big Corpus of Identity for Sarcasm". The processed type of database can be found in Kaggle, Let's explore the database before using various dividing algorithms.

4.1. Importing the data

```
import numpy as np
import pandas as pd
import datatable as dt
import matplotlib.pyplot as plt
%matplotlib inline

df = pd.read_csv('sarcasm_data.csv')
print(df.shape)

(1010826, 10)
```

The database has one million rows and each record has ten attributes:

Extruded reviews (data) are used for the purpose of further purposes. In this process icons are labeled under the categories of intensely +ve, intensely -ve, positive (+), negative (-) and neutral. For example: “**J**” is labeled as positive whereas “**L**” is labeled as negative.

Table 1: Emoticons dictionary

Emoticons	Emoticons-Polarity
J J ; -) ;P	+ve (positive)
>: D ;) < 3	Intensely +ve
L :(:c :s	-ve (negative)
=K; D= XD XDDD	Intensely -ve
:	Neutrality

Table 2: summary and their English expansion

Acronym	English expansion
Gr8	Great
Tbc	To be continued
Not, no never, n't	Not
Lovv, luv, love	Love

The database has one million rows and each record has ten attributes:

```
df.head(5)
```

	label	comment	author	subreddit	score	ups	downs	date	created_utc	parent_comment
0	0	NC and NH.	Trumpbart	politics	2	-1	-1	2016-10-10 23:55:23	2016-10-16 23:55:23	Yeah, I get that argument. At this point, I'd ...
1	0	You do know west teams play against west teams...	Shbshb906	nba	-4	-1	-1	2016-11-11 00:24:10	2016-11-01 00:24:10	The blazers and Mavericks (The wests 5 and 6 s...
2	0	They were underdogs earlier today, but since G...	Creepeth	nfl	3	3	0	2016-09-22 21:45:37	2016-09-22 21:45:37	They're favored to win.
3	0	This meme isn't funny none of the "new york ni...	icebrotha	BlackPeopleTwitter	-8	-1	-1	2016-10-10 21:03:47	2016-10-18 21:03:47	deadass don't kill my buzz
4	0	I could use one of those tools.	cush2push	MaddenUltimateTeam	6	-1	-1	2016-12-12 17:00:13	2016-12-30 17:00:13	Yep can confirm I saw the tool they use for th...

We are mainly interested in the following two columns:

- label : 0 for sarcastic comment and 1 for non-sarcastic comment
- Comments: A text column that will be used to perform the test

4.2.Exploratory data analysis

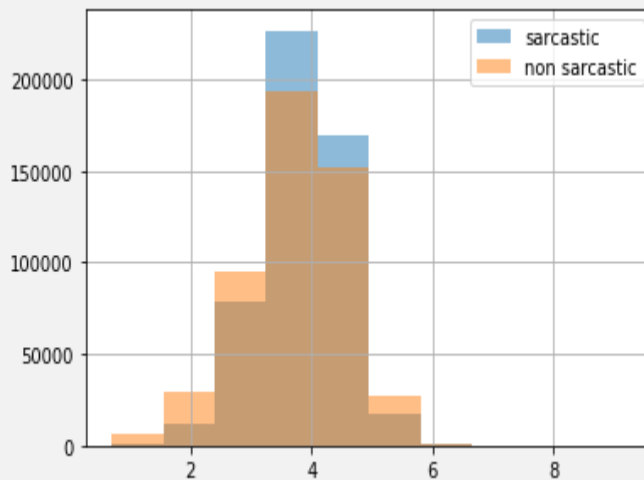
The database is completely limited, with an equal number of sarcastic and non-humorous tweets.

```
df['label'].value_counts()
1      505413
0      505413
Name: label, dtype: int64
```

The length distribution of humorous and general comments is almost the same.

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```
df.loc[df['label'] == 1, 'comment'].str.len().apply(np.log1p).hist(label='sarcastic', alpha=.5)
df.loc[df['label'] == 0, 'comment'].str.len().apply(np.log1p).hist(label='non sarcastic', alpha=.5)
plt.legend();
```



Distribution of Sarcastic vs Non-Sarcastic Comments

5.Result And Declaration

Sentiment analysis allows businesses to use a large amount of free information to understand customer needs and their attitude towards their brand. Organizations monitor online conversations to promote products and services and maintain their reputation. The analysis takes customer care to the next level. Customer support programs with SA include urgent inquiries, allowing employees to help the neediest customers first. The emotional analysis is a powerful tool for employee analysis.

Consider the following steps in deciding whether to use emotional analysis in your practice:

- Collect feedback data

Make sure the data is of sufficient analysis quality • See ready-made software and APIs.

References

- [1] K.Jose, N. Bhatia and S Krishna, "Twitter Sentimental Analysis". National Institute of Technology Calicut 2010.
 - [2] Celikyilmaz, Asli, DilekHakkani-Tur, and Junlan Feng. Emotional performance according to the twitter messaging model. Spoken Language Technology Workshop (SLT), 2010 IEEE.
 - [3] Li, Gang, and Fei Liu, "An Integrated Method of Emotional Intelligence. Intelligent Programs and Engineering Information" International Conference. IEEE, 2010.
 - [4] Li, Lianghao, et al. "Effective reading of various text classifications. Procedures "ACM International Conference, 2012.
 - [5] Liang, Po-Wei, and Bi-Ru Dai, "The Perspective of Social Communication. Mobile Data Management (MDM) ", IEEE International Conference 2013 Vol. 2. IEEE, 2013.
 - [6] A. Agarwal, B. Xie, I. Vovsha, O. Rambow, R. Passonneau, "Sentiment Analysis of Twitter Data", In Proceedings of the ACL 2011 Workshop on Languages in Social Media, 2011, pages 30 - 30. 38
 - [7] Akshi Kumar and Teeja Mary Sebastian "Twitter Analysis" Delhi Technology University Delhi 2012
 - [8] J. Read. "Images are used to reduce dependence on sensory learning techniques." Continuing ACL-05, the 43rd Conference of the Language Technology Association. Research Language Association, 2005
 - [9] S. Batra and D. Rao, "Twitter-Based Business Analysis on Twitter", at Stanford University, 2010
- UT. Wilson, J.Wiebe, and Ph. Hoffman. 2005. Recognizing the cooling of content in emotional analysis