A PROJECT REPORT

On

SENTIMENT ANALYSIS BASED ON COMMENTS FROM ONLINE SOCIAL NETWORK

Submitted in partial fulfillment of the requirement of
University of Mumbai for the Degree of

Bachelor of Engineering
In
Information Technology

Submitted By
Vedant D. Patil
Jayesh S. Thakur
Kapildev B. Yadav

Supervisor
Prof. Deepti Lawand

Department of Information Technology
PILLAI COLLEGE OF ENGINEERING
New Panvel – 410 206
UNIVERSITY OF MUMBAI

Academic Year 2018 – 19

DEPARTMENT OF INFORMATION TECHNOLOGY
Pillai College of Engineering
New Panvel – 410 206

CERTIFICATE

This is to certify that the requirements for the project report entitled **'Sentiment Analysis Based on Comments from Online Social Network'** have been successfully completed by the following students:

Name	**Roll No.**
Vedant Patil	B 21
Jayesh Thakur	B 58
Kapildev Yadav	B 67

in partial fulfillment of Bachelor of Engineering of Mumbai University in the Department of Information Technology, Pillai College of Engineering, New Panvel – 410 206 during the Academic Year 2018 – 2019.

_____

Supervisor

(Prof. Deepti Lawand)

_____ _____

Head, Department of Information Technology **Principal**

(Dr. Satishkumar L. Varma) **(Dr. Sandeep M. Joshi)**

DEPARTMENT OF INFORMATION TECHNOLOGY
Pillai College of Engineering
New Panvel – 410 206

PROJECT APPROVAL FOR B.E

This project entitled "Sentiment Analysis Based on Comments from Online Social Network" by Vedant D. Patil, Jayesh S. Thakur and Kapildev B. Yadav are approved for the degree of Bachelor of Engineering in Information Technology.

Examiners:

1. _____

2. _____

Supervisors:

1. _____

2. _____

Chairman:

1. _____

Date:

Place:

DEPARTMENT OF INFORMATION TECHNOLOGY
Pillai College of Engineering
New Panvel – 410 206

DECLARATION

We declare that this written submission for B.E. project entitled "Sentiment Analysis Based on Comments from Online Social Network" represent our ideas in our own words and where others' ideas or words have been included, we have adequately cited and referenced the original sources. We also declare that we have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any ideas / data / fact / source in our submission. We understand that any violation of the above will cause for disciplinary action by institute and also evoke penal action from the sources which have not been properly cited or from whom prior permission have not been taken when needed.

Project Group Members:

Vedant Patil:

_____

Jayesh Thakur:

_____

Kapildev Yadav:

_____

Date:

Place:

Table of Contents

Abstract

Internet is the platform where most of us share our happiness or other feelings. Recent years are devoted in studying and mining the data which is on social platform. This task includes understanding explicit and implicit information conveyed by sentiments. It can be extracted from the comments on social media using dictionary-based sentiment analysis or Review-Seer. Comments of the person are important to analyze the sentiments of the person at the time of writing the comment. The task is to classify the comments into positive, negative and neutral sentiments further into different emotions, for which it uses the concept of Plutchik's wheel of emotions and further makes a dictionary. The system will take input from user to classify and predict the emotions and strength of that emotion (Negative Emotions). There are basic eight emotions and system will primarily focus on negative emotions. Plutchik's wheel of emotion gives joy and sadness, anger and fear, trust and disgust, surprise and anticipation. The use of Plutchik's wheel of emotions will provide the real emotional view of comments. The polarity of emotion will be given that will indicate the strength of feeling. It uses Naïve Bayes algorithm for prediction and generates output.

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Fundamentals

The task of mining sentiments and opinions from natural language is difficult one. It involves an intense understanding of most of the implicit and explicit information which is conveyed by structure of language. The availability of a dynamic corpus contains the user generated data, such as reviews for products or polling data. Big data is the large amount of easily available data on web, Social media, remote sensing data, etc. in form of structured data, semi-structured or unstructured data. We can use this large data for sentiment analysis. Sentiment analysis is the opinion mining used on the web for identifying the text. It is nothing but to get the real voice of people for specific product, services, movies, news, issues from online social networking site like Twitter.

1.2 Objectives

The objectives of the project are as follows:

1. The objective of the project is to build a software that can initiate the analysis of the text extracted from the social media.
2. This extracted text is further analyzed using the concept of plutchik's wheel to give the depth of emotions of sentiments from the text extracted from social media.
3. The objective involves working with the most efficient and reliable algorithms and processes to give best output as possible.

1.3 Scope

The Sentiment Analysis basically contains analysis of the positive, negative and neutral comments further detecting the polarity of the emotions & uses the concept of Plutchik's Wheel of Emotions. The plutchik's wheel primarily contains the Eight basic emotions like Joy, Fear, Anticipation, Disgust, Sadness, Anger, Surprise, Acceptance. System will primarily focus on positive and negative emotions for sub-classification.

1.4 Organization of the Report

Including this the synopsis in all contains 5 chapters. The next chapter include the literature survey wherein all the previous work on the related topics have been studied and presented. The papers are deeply studied and each paper studied is mentioned along with their methodology, their advantage

and the conclusion.

The third chapter, background knowledge is explained, along with the techniques and algorithms used in the development. It presents a high-level view of the system produced. It also covers the design patterns applied, the requirements gathering process, both functional and non-functional, and what methodologies have been used. Then, the Implementation Chapter demonstrates a low-level view of the system. The methods of execution or the flow of the system has been depicted with the help of Activity and Use Case diagram. The basic hardware and software requirements have also been stated.

The fourth chapter guides through the social and technical application of the studied model. Lastly, the Summary of the entire methods, techniques and algorithms has been explained in the reflective chapter. In addition, the references which are used for developing the model has been stated along with the words of Acknowledgement.

Chapter 2

Literature Survey

2.1 Introduction

Sentiment Analysis is basically used to express sentiment of the individual person. Current state of the art in sentiment analysis classified sentiments into two categories positive, negative. Some works classified sentiments as positive, negative and also in a third category objective (or neutral).

2.2 Literature Review

[1] Xianchao Wu, Hang Tony, Momo Klyen, "Fined grained sentiment analysis with 32 dimensions", University of Tokyo, 2017 IEEE. [1]

This model created understands capricious and complicated human emotions, they have proposed a sentiment analysis system wherein the input text emotion is classified into 32 categories. The model covers more detailed emotion and on the other hand, they have further measured each emotion with strength such as describing angry by range, anger and annoyance. They have used deep neural network classifiers, build the datasets using various methods and evaluated those models. Firstly, they extended those 32 Japanese emotion labels in the wheel of emotions by word2vec. This extension collects candidate seed words which are likely to have similar word meanings with the corresponding emotion labels. However, the defect of the extension is that contextually similar words can actually have opposite emotions. To alleviate this shortage, they followed and utilized a bilingual phrase translation table to translate Japanese words into English and then translate back to Japanese to finally obtain another synonym set for each seed word. They made word frequency vocabulary for each label. From the vocabulary, they calculated the probability of the words contained by emotions. They utilized this vocabulary to re-calculate the sentence emotion labels. They focused on the intensity of emotions to confirm the effect of direct and ensemble learning. Besides directly predicting 32 classes), they also propose to classify 16 emotions, composed of 8 primary emotions and 8 combined emotions and then an intensity classifier to further predict the intensity of these 8 primary emotions. This 'Ensemble' method is more alike a cascaded decision-making network that first attempts to separate briefly an input sentence into primary emotions and then predict a fine-grained strength of that emotion. One motivation of building this method is by

the observation of shared adverb or adjective modifier words for these emotions, such as quite/extremely angry/happy.

[2] Erik Tromp, Mykola Pechenizkiy, "Rule-Based emotion detection on social media: Putting tweets on Plutchik's wheel", Netherlands, 15 Dec 2014. [2]

This paper studies and analyze sentiments beyond polarity and uses Plutchik's wheel of emotions. It uses extension of Rule based emission model. This model thinks beyond the normal metrics of sentiment analysis using polarity and uses Rule-Based Emission Model (RBEM) algorithm (Tromp and Pechenizkiy, 2013) that can be used for polarity detection assigning new messages a label that is one of positive, neutral, negative. Important in algorithm is that positivity and negativity are opposite and allows negation to simply invert the emission. RBEM uses pattern matching and uses wildcards for it. The model used is compact as well as complete which works well with RBEM-Emo which is stated as extension of Rule Based detection algorithm. The data was collected from Twitter where a language detection algorithm was used to filter out those messages that are written in English, Dutch or German as a first step. All messages wrongly identified by language are later on filtered out by the annotators.

[3] Felipe Bravo-Marquez, Marcelo Mendoza, Barbara Poblete, "Combining strength, emotions and polarities for boosting Twitter sentiment Analysis", Chile, 11 Aug 2013. [3]

This paper proposes an approach for boosting twitter sentiment classification using different sentiment dimensions as meta-level features. This research shows the combination of sentiments improves the twitter sentiment classification tasks. The scopes of tweets are categorized upon some categories as polarity, emotion, strength. It does different testing with different types of algorithm. It uses classification approach like OpinionFinder Lexicon, AFFIN Lexicon, SentiWordNet Lexicon, SentiStrength Lexicon, Senti140 method, NRC Lexicon. So, when it classifies tweets into polarity classes, we are essentially projecting these multiple dimensions to one single categorical dimension. But also, sentiment classification of tweets can lead to loss of valuable sentiment information. That the classification performance varies considerably for different parameters values. Therefore, it is important to remark that the tuning process of machine learning parameters is crucial to obtain accurate classifiers.

[4] Dhanshri Chafale, Amit Pimpalkar, "Sentiment Analysis on Product reviews using Plutchik's Wheel of Emotion with Fuzzy Logic", Nagpur University, Dec 2014. [4]

The model consists of stemming and stop word techniques. This filtering removes almost all unwanted noise from comment. The filtered comment is then split to get the separate words for comparing. Then each single word is compared with the sentiment words dictionary. If the word is matched with the positive or negative dictionary then it is placed in the corresponding box, that is positive word in positive words text and in the same way negative words are placed. The comparison is done between number of positive word and number of negative words in a given comment. The condition is checked whether the positive words are more or negative and accordingly the comment is decided to be positive or negative. If both the positive and negative words are same or if there are no positive or negative, the comment is treated as neutral comment. Then, the Plutchik's wheel of emotion is used. It further classifies the positive and negative sentences into different Plutchik's emotions. For this work machine learning based Neural network technique is used. Along with this the corpus showing feedbacks classification is developed in hierarchical form. The corpus will contain detailed classification. Finally, the fuzzy logic is used for prediction purpose and gives the best product.

[5] Hamid Bagheri, Md Johirul Islam, "Sentiment Analysis of Twitter data", IOWA State University, 2015. [5]

In this system they have used python to implement sentiment analysis. Some packages have utilized including tweepy and textblob. The second step is downloading the dictionary by running the particular required command. The textblob is a python library for text processing and it uses NLTK for natural language processing. Corpora is a large and structured set of texts which we need for analyzing tweets After that it involves connection to twitter using APIs.

Their implementation has followed various steps like:

1. Start with downloading and caching the sentiment dictionary.
2. Download twitter testing data sets, input it into the program.
3.Clean the tweets by removing the stop words.
4. Tokenize each word in the dataset and feed in to the program.
5. For each word, compare it with positive sentiments and negative sentiments word in the dictionary. Then increment positive count or negative count.
6. Finally, based on the positive count and negative count, we can get result percentage about sentiment to decide the polarity.

2.3 Literature Summary

Following are the paper referred for the project and their short description.

Table 2.3.1 Summary of Literature Survey

Paper	Advantages and Disadvantage
Xianchao Wu, Hang Tony, Momo Klyen, "Fined grained sentiment analysis with 32 dimensions", University of Tokyo, 2017 IEEE. [1]	The emotions have 32 classes which are divided from 8 basic types of emotions. This system has wider and accurate scope. The emotions classification becomes unnecessarily detailed and dictionary becomes messy.
Erik Tromp, Mykola Pechenizkiy, "Rule-Based emotion detection on social media: Putting tweets on Plutchik's wheel", Netherlands, 15 Dec 2014. [2]	The model proposed is relatively compact and yet complete. This classification model is highly coupled with Plutchik's wheel. It takes amount of time for rule creation and hence increases time.
Felipe Bravo-Marquez, Marcelo Mendoza, Barbara Poblete, "Combining strength, emotions and polarities for boosting Twitter sentiment Analysis", Chile, 11 Aug 2013.	This system uses existing system and further enhances the classifier accuracy with more precision Only useful for particular type of sentence. Also dependent on platform.
Dhanshri Chafale, Amit Pimpalkar, "Sentiment Analysis on Product reviews using Plutchik's Wheel of Emotion with Fuzzy Logic", Nagpur University, Dec 2014. [4]	This system uses Fuzzy logic for prediction. Additionally, which helps to predict which product is good or bad and thus has wider scope. Accuracy is good but requires large amount of data for training.

Paper	Advantages and Disadvantages
Hamid Bagheri, Md Johirul Islam, "Sentiment Analysis of Twitter data", IOWA State University, 2015. [5]	Easy for implementation and works with probabilistic manner. Considers the polarity of emotion. Numerical data is easier for calculation. Error in calculation can cause wrong analysis. Due to only numeric factors this system is basic. Also, time consuming when a lot of data is considered.

Chapter 3

Sentiment Classifier System

3.1 Overview

The system is trained to analyze the texts in comments and then classify according to classes with specific classifier. Different classifiers give different levels of accuracy.

3.1.1 Existing System Architecture

The existing system performed aspect level sentiment analysis on twitter data based on three classes:

1) Positive

2)Negative

3)Neutral

Twitter is a Social Networking service that is restricted to 140 Characters in length using various emotions, Hashtag etc.

Existing System Has Following Steps [8]:

1)Data collection using twitter API: Publicly large sets of Twitter data are not available. Hence, they first extracted twitter data through twitter API

2)Data Preprocessing: It involved cleaning of data by spell correction punctuation etc. Reducing noise from the data.

3)Applying Classification Algorithm: The Classification Algorithm is applied on tweets to categories them with highest accuracy.

4) Classified tweets and result: The tweets are further classified three defined categories. Result of which is displayed in form of pie chart.

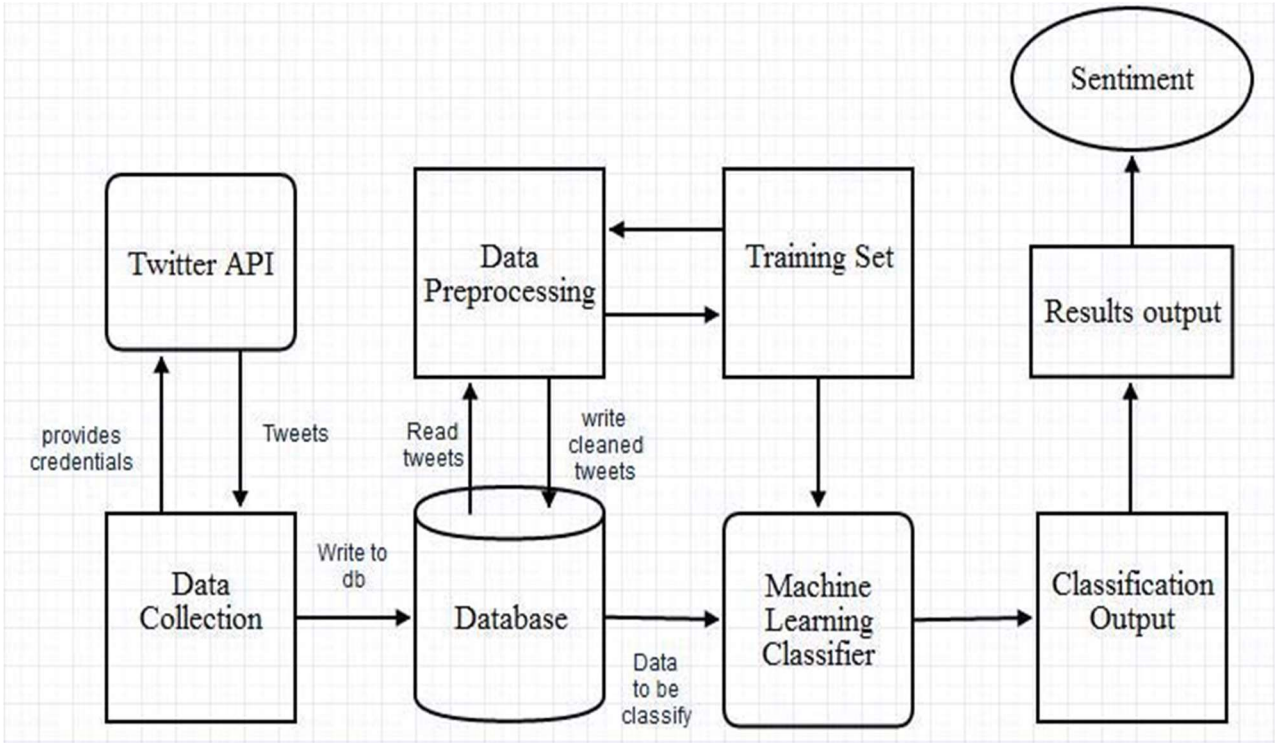

Fig. 3.1.1 Existing system architecture [8]

Data Preprocessing

Following are steps generally followed in data preprocessing:

1)Converting to lower/upper case: The whole text is converted into single case which make it easier.

2)Removing URLS: hyperlinks do not play an important role in sentiment classification so they are removed.

3)Removing Unicode character: Unicode characters are used to represents emoticons and many other complex symbols are removed in order to reduce the complexity of data preprocessing step.

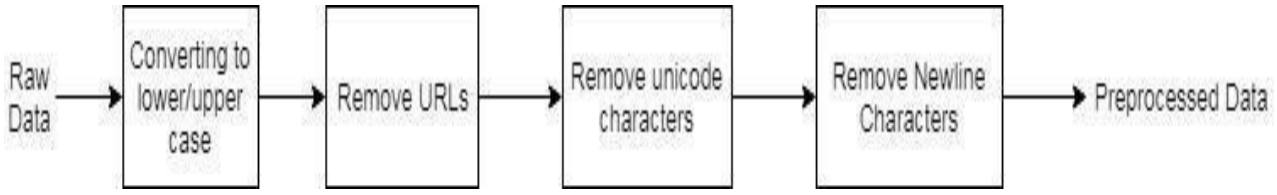

Fig. 3.1.2 Steps in Data Preprocessing

3.1.2 Proposed System Architecture

Today people are uploading and expressing themselves on social media platform. These comments will affect the strategy designed by companies. It will also have impact on ups and downs of market. The proposed system will primarily classify emotion into positive, negative, neutral and further into 8 basic emotions. Firstly, the data required for analysis will be divided into testing and training datasets, this dataset are downloaded from official twitter APIs. The Naive Bayes classifier will be trained according to this dataset.

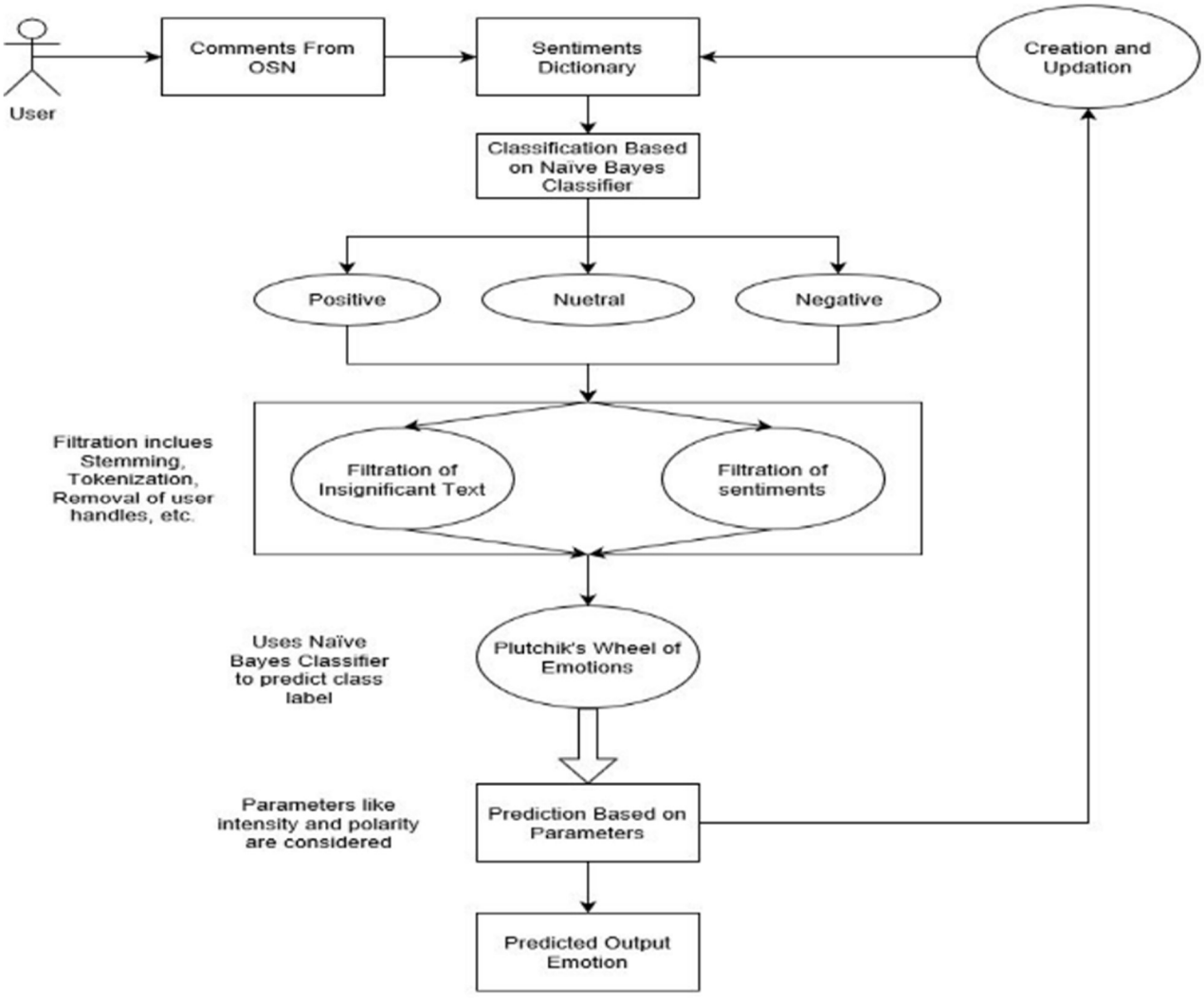

Fig. 3.1.3 Architecture of proposed system

After data collection filtration of data will be done using pre-defined tokenizers. This tokenizer does feature extraction, part of speech, stemming and other filtration of data. Filtered data is further used

for classification into emotions.

Naive Bayes classifier will train using previous training and test datasets. This naive Bayes classifies the comments into 8 classes named as anticipation, joy, anger, sadness, surprise, disgust, fear and trust. This comment will be saved along with its tag of class into sentiment dictionary for further learning of system.

The next prediction of system is done based on previous results by system.

3.2 Implementation Details

Algorithm is built upon taking comment from user. Before fetching comment as string to classifier algorithm implemented, it must be pre-processed in order to get classified. This is achieved by pre-processing the input comment from the user.

The techniques which are used for data preprocessing is done using predefined library function of python called textblob. Textblob preprocesses data by stemming the data and further steps like lemmatization, tokenization as well as part-of-speech tagging

After preprocessing comment becomes ready for processing in classifier.

3.2.1 Naive Bayes Classifier Algorithm

After preprocessing, the sentence which needs to be classified using same textblob library function. The predefined Naive Bayes classifier function of textblob is trained using training dataset. The dataset is chosen with .csv file. The training dataset is used with f_read function.

We can train classifier with

cl = NaiveBayesClassifier(train)

We can also find accuracy of test set using

cl.accuracy(test)

After training output which has to be given using naive Bayes classification technique. We know the formula which can be used for classification as,

$$P(A|B) = P(B|A) * P(A) / P(B)$$

Where, P(A|B) is probability the A belongs to class B

P(B|A) is evidence

P(A) is probability of class A is seen and similar with B.

The P(A|B) is calculated for each word and then the class tag is selected with maximum probability. Maximum probability is selected and saved into dictionary for further increasing accuracy of

classifier.

3.2.2 Activity Diagram and Use Case Diagram

Following shows the activity flow of the system. It starts from used entering comments and then processing that comment through naïve Bayes algorithm which will give results to user that comment is positive, negative, neutral along with emotion.

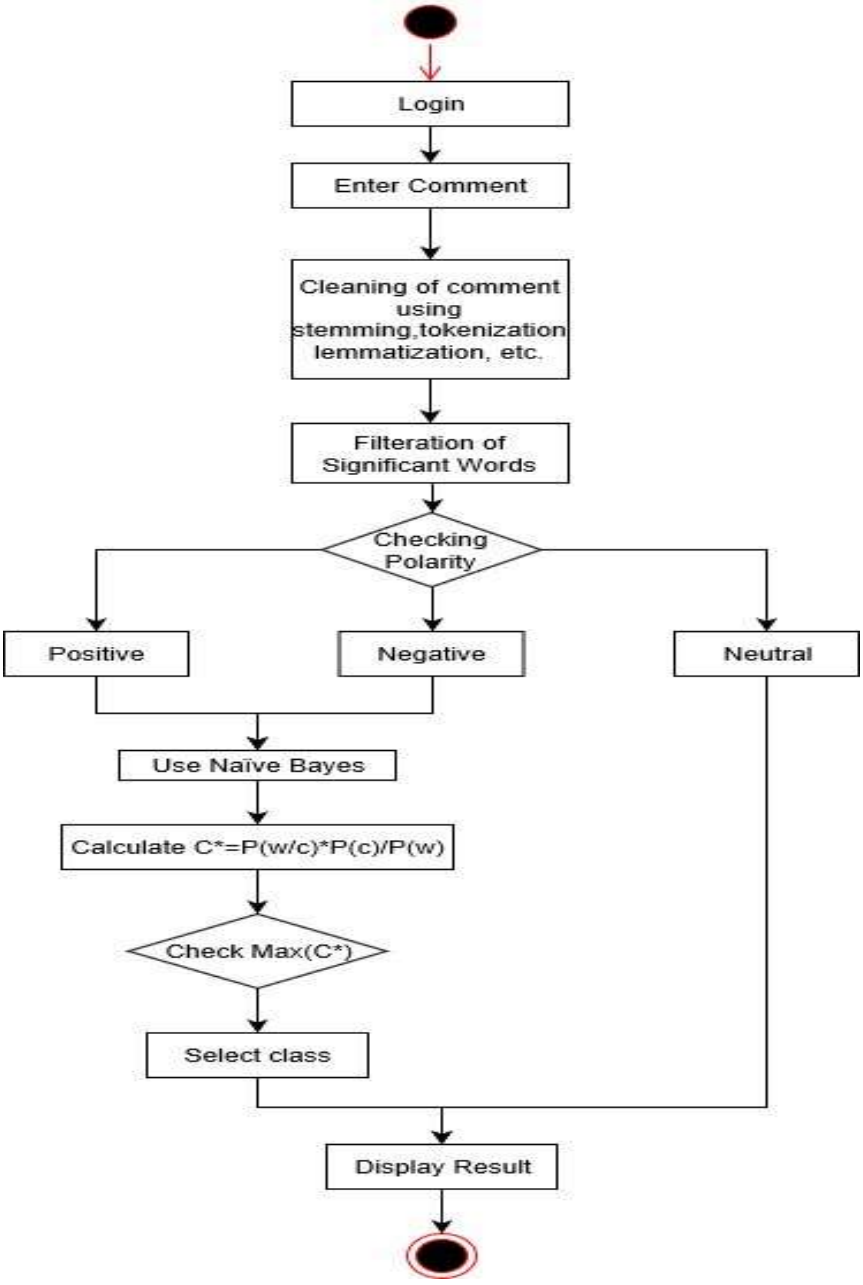

Fig. 3.2.1 Activity Diagram

Following is use case diagram which show the interaction between the user and system. User

entering login credentials is first interaction. Afterwards user enters comment and gets result.

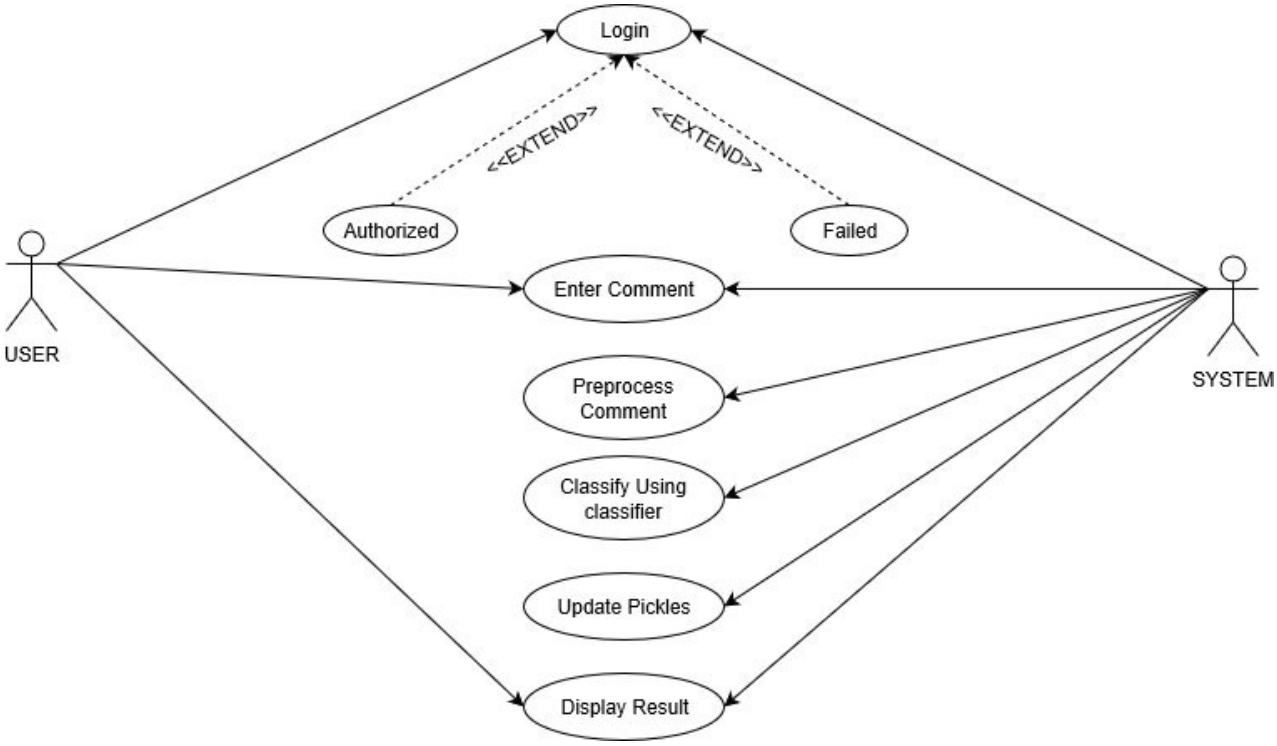

Fig. 3.2.2 Use Case Diagram

3.2.3 Hardware and Software Specification

The experiment setup will be carried out on a computer system which has the different hardware and software specifications given in Table 3.2 and Table 3.3 respectively.

Table 3.2.1 Hardware Details

Processor	2 GHz Intel Processor
HDD	180 GB
RAM	2GB

Table 3.2.2 Software Details

Operating System	Windows 10
Programming Language	Python with Flask framework, HTML

Chapter 4

Performance Evaluation Metrics

4.1 Standard Datasets Used

The dataset contains sentences labelled with positive or negative sentiment. It contains sentences labelled with positive or negative sentiment. Score is either 1 (for positive) or 0 (for negative).
The sentences come from three different websites/fields:

1. imdb.com
2. Amazon.com
3. twitter.com

For each website, there exist 500 positive and 500 negative sentences. Those were selected randomly for larger datasets of reviews.
We attempted to select sentences that have a clearly positive or negative emotion, the goal was for least neutral sentences to be selected.

Table 4.1.1 Dataset Used for Experiment [10]

Dataset	Number of comments	Emotions
imdb.com	1000	Positive, Negative, Neutral
Amazon	1000	Positive, Negative, Neutral
Twitter	1000	Positive, Negative, Neutral

Sentence	Sentiment (0 for negative, 1 for positive)
Omg it's already 7:30	1
Baddest day ever	0
Bathroom is clean. Now more enjoyable tasks...	1

Sentence	Sentiment (0 for negative, 1 for positive)
but I'm proud.	0
Going to See Harry Sunday Happiness	1
I missed new moon trailer	0
I think my bf is cheating on me	0
OK that's it you win	0
Thanks to all guys	1
Miss you already	0

4.2 Evaluation Metrics

Evaluation of good classifier can be done with different parameters like accuracy, precision, recall and F-measure.

Precision: a measure of exactness, determines the fraction of relevant output out of all possible outputs. Precision for classifier is 85.98% as per dataset combination.

Recall: a measure of completeness, determines the fraction of relevant outcomes out of all relevant outcomes. Recall for classifier is 85.36% as per dataset combination.

Accuracy: a measure of correctness, determines the relevant outputs out of all possible outcomes. Accuracy for classifier is 83.95% as per dataset combination.

4.3 Performance Analysis

In order to evaluate the proposed system, experiments were conducted on data selected from imdb.com, a web-based movie reviewer system. The data was collected from hundreds of users who visit imdb.com to rate and receive recommendations for movies. The data was collected was fetched to the classifier to test the working of classifier with vast amount of data.

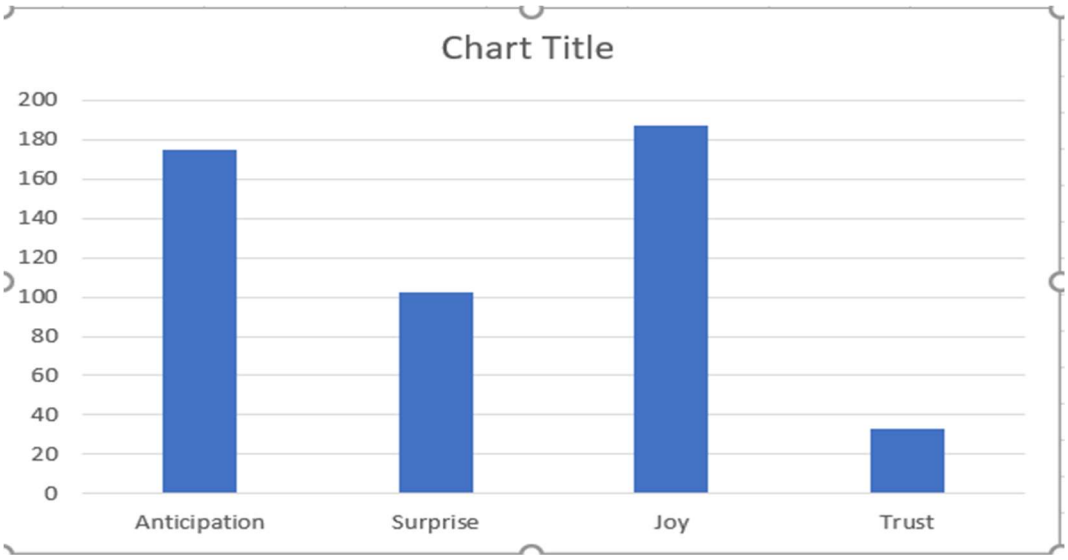

Fig. 4.3.1 Analysis of dataset containing positive words.

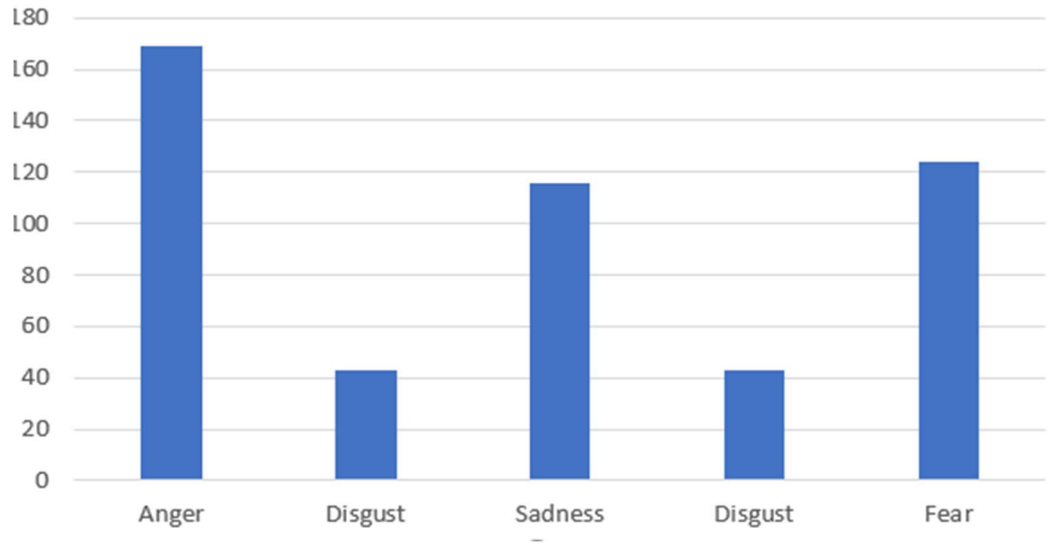

Fig. 4.3.2 Analysis of dataset containing negative words.

The analysis of the dataset which are depicted in the graphs shows the count of particular emotions in the dataset of positive and negative emotions as well and thus gives us a clear insight that what will be the outputs most of the time. In positive dataset the sentiment Joy has highest amount of emotion in the dataset whereas the sentences having Anger sentiment are maximum in negative database set.

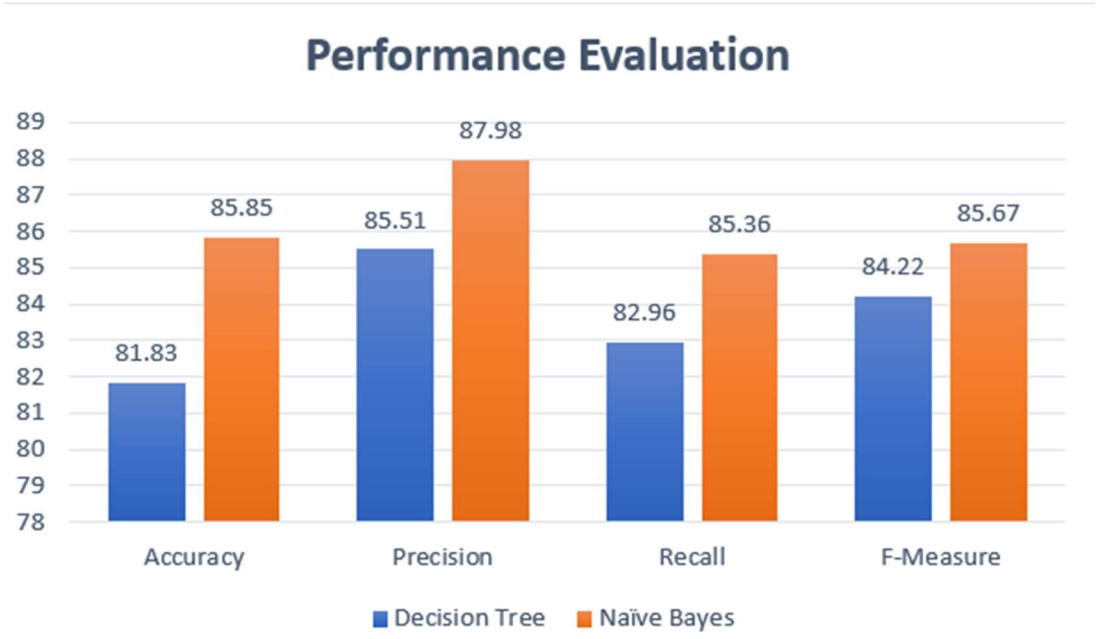

Fig.4.3.3 Performance evaluation of different Classification methods

The above graphs give a clear insight or a clear solution to why Naive Bayes was elected to perform the classification for our system over decision tree. The Naive Bayes classification outshines decision tree in terms of all the important and necessary factors.

Chapter 5

Conclusion and Future Scope

5.1 Conclusion

In the world of expressing feelings on social platform, Sentiment analysis could be best way to study and analyze human behavior. New techniques being developed for analysis proves usefulness till some extent. It cannot classify emotions into further subclasses. So, in this report we demonstrate the working of system which completely classifies the emotion into further deeper classes. Use of Plutchik's wheel of emotion introduced different emotion classes which were essential for implementation. As per studies of this system it has been concluded that this system has good accuracy of prediction along with deeper content for classification. It does classify sentiment not only into polarities but also classify in the six different emotion given by the Plutchik's wheel of emotions.

5.1 Future Scope

Many adaption and extension could be done using this concept. It could be interesting to consider use of specific emotion in Psychoanalytic tests. Using psychoanalytic test along with this system we can find out the true feeling behind the textual expression of user. It can also give us personality traits of user.

We can infuse this system along with platform which will suggest the user their product according to the emotion exhibited by user. It can be also infused with the recommendation system for songs and music. For example, User can get his own playlist depending on the previous history of songs and current mood from comment he/she entered. So, user won't have to select songs personally. This can increase the customer satisfaction of product resulting in popularity of software.

This system can also be upgraded to text analysis tool which will analyze the tone of writing user is typing and can suggest words and sentences which will be according to the tone of writings. So, it will be easier for user for typing mails or informal writing. It will prove efficient typing assistant.

References

[1] Xianchao Wu, Hang Tony, Momo Klyen, “Fined grained sentiment analysis with 32 dimensions”, University of Tokyo, 2017 IEEE.

[2] Erik Tromp, Mykola Pechenizkiy, “Rule-Based emotion detection on social media: Putting Tweets on Plutchik’s wheel”, Netherlands, 15 Dec 2014.

[3] Felipe Bravo-Marquez, Marcelo Mendoza, Barbara Poblete, “Combining strength, emotions and polarities for boosting Twitter sentiment Analysis”, Chile, 11 Aug 2013.

[4] Dhanshri Chafale, Amit Pimpalkar, “Sentiment Analysis on Product reviews using Plutchik’s Wheel of Emotion with Fuzzy Logic”, Nagpur University, Dec 2014.

[5] Ms. Umaa Ramakrishnan, Ms. Rashmi Shankar, Mr. Ganesha K, “Sentiment Analysis of Twitter Data: Based on User-Behavior” International Journal of Applied Engineering Research ISSN 0973-4562 Volume 10, Number 7 (2015) pp. 16291-16301.

[6] Hamid Bagheri, Md Johirul Islam, “Sentiment Analysis of Twitter data”, IOWA State University, 2015.

[7] Aliza Sarlan, Chayanit Nadan, Shuib Basri, “Twitter Sentiment Analysis”, Universiti Teknologi Perak, Malaysia, 18 Nov 2014.

[8] Pragya Tripathi, Santosh Kr Vishwakarma, Ajay Lala, “Sentiment Analysis of English Tweets using RapidMiner”, GGITS Jabalpur, India, 2015 IEEE.

[9] M Trupthi, Suresh Pabjour, G Narsimha, “Sentiment Analysis using Streaming API”, CBIT Telangana, 2017 IEEE.

[10] Zhaoxia Wang, Chee seng Chong, Landy Lan, Yinping Yang, Seng Beng Ho, Joo Tong, “Fined grained sentiment of social media analysis using emotion sensing”, IHPC Singapore, 7 Dec 2016.

[11] UCI Machine Learning Repository: Sentiment Labelled Sentences Data Set. [Online]. Available: https://archive.ics.uci.edu/ml/datasets/Sentiment Labelled Sentences. [Accessed: 21-Oct-2018].

List of Publications

1. Paper Name “Sentiment Analysis Based on Comments from Online Social Network” is accepted by IJLTET (International Journal of Latest Trends in Engineering and Technology) - Volume 13 Issue 2, April, 2019

2.Paper Submitted to 2nd International Conference on Computer Networks and Inventive Communication Technologies [ICCNCT 2019 Springer Conference] is accepted.

ICCNCT 2019

International Conference on Computer Networks and Inventive Communication Technologies (ICCNCT – 2019)

23-24, May 2019 | http://icocnct.com/ | iccnct.conf@gmail.com

2nd International Conference on Computer Networks and Inventive Communication Technologies [ICCNCT 2019]

Letter of Acceptance

Authors Name : Vedant Patil,Jayesh Thakur, Kapildev Yadav, Prof. Deepti Lawand

Presentation Type : Oral Presentation

Accepted Title : Sentiment Analysis Based on Comments from Online Social Network

Institution Name : PCE, Navi Mumbai, India - 410206

Paper ID : **ICCNCT-068**

Dear Author

The 2nd International Conference on Computer Networks and Inventive Communication Technologies [ICCNCT 2019] would congratulate you on your research manuscript acceptance to the ICCNCT 2019 Springer Conference, which will be held on May 23-24, 2019 Organized by RVS Technical Campus at The Hotel Arcadia, Coimbatore, India. You have been selected to present your paper at the Springer international conference 2019. Conference Link: http://icocnct.com/

ICCNCT 2019 is an internationally-recognized springer conference, offering a forum for scholars, academicians and industrialists to facilitate discussion on the next-generation networking and communication technologies.

Kindly register to the conference at your earliest convenience. The registration form can be accessed at http://icocnct.com/registration.html.

Authors are instructed to check the conference website (http://icocnct.com/home.html) periodically for additional information like conference schedule, accommodation and local transportation.

On behalf of the conference committee we cordially welcome you to the conference site.

Sincerely,

Dr. S. Smys

RVS technical Campus,
Coimbatore, India.

Our Previous Publication Link: https://link.springer.com/book/10.1007/978-981-10-8681-6

Acknowledgement

We would like to express our specials thanks of gratitude to our **Principal Dr. Sandeep Joshi** who gave us the golden opportunity to do this wonderful project in the topic Sentiment analysis using Plutchik's wheel, which also helped us in doing lot of research and we came to know about so many new things.

We would also like to thank **Prof. Satishkumar Verma** for giving us opportunity to get practical exposure into actual environment and solidifying our theoretical thinking and changing it to applicative way.

We also convey our thanks to Project Coordinator **Prof. Gayatri Hegde** and Project Supervisor **Prof. Deepti Lawand** for providing us constant support, encouragement and guidance and sharing their pearls of wisdom with all of us, which was great help.

We are also thankful to everyone who supported us, for that we have completed our report successfully, efficiently and moreover on time.

Lastly, but not least, we are thankful to all of those who gave us helpful comments which helped us a lot in preparing this assigned project.

Vedant D. Patil
Jayesh S. Thakur
Kapildev B. Yadav