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Sentimental Analysis on Audio and Video using Vader Algorithm

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Abstract - *Sentimental Analysis is a reference to the task of Natural Language Processing that is NLP to determine that whether a text data contains objective information, subjective information and what information it expresses i.e., whether the point of view behind the text is positive, negative or neutral. Sentimental Analysis is the best way to evaluator people's opinion regarding a particular post. This paper mainly focuses on the several machine learning techniques which are used in analyzing the sentiments and in opinion mining which is present in the converted text data. Sentimental analysis with the combination of machine learning could be useful in predicting the product reviews and consumer attitude towards to newly launched product. This paper takes the input as audio and video which is then converted into text and this text data is analyzed using suitable machine learning techniques. This paper presents a detailed survey of various machine learning methods and then compared with their accuracy, advantages, and limitations of each technique.*

Key Words*: *Sentiment Analysis, Opinion, Vader algorithm, NLP, Machine learning.

1. Introduction

With the rapid development of e-commerce websites, people can "live with the web". Nowadays people are used to reviewing the comments and posts on the product which are known as opinion, emotion, feeling, attitude, thoughts or behavior of the user. Sentimental Analysis is a method for identifying the ways in which sentiment is expressed in terms of texts.

In sentiment analysis, there are three classification levels: document-level classification, sentence-level classification, and aspect-level sentiment analysis. In document-level classification, the main aim is to classify an opinion in the whole document as positive and negative. It speculates the entire document as a single unit. The aim of the sentence-level analysis is to categorize emotion expressed in the respective sentences. In sentence-level, the basic step is to recognize the sentence as subjective or objective. Suppose sentence is subjective, it will decide whether it expresses a negative or positive opinion. In the aspect-level analysis, it aims to categorize the sentiment in respect of particular entities.

Our approach towards sentiment extraction from audio and video. Here in this proposed system, we use the machine learning algorithm for analysis of the text data that is converted from audio and video. An important characteristic of our technique is the ability to identify the individual contributions of the text features towards sentiment estimation or analysis. We evaluate the proposed sentiment estimation on both publically available text databases, audios, and videos.

Here, in this proposed system we take audio and video data from different sites such as youtube, facebook, etc. In this system audio extract, the text data from that text data sentiment analysis is to be applied. In the same way, video extracts the audio and from that, it extracts the text data then after sentiment analysis is to be applied. The output is getting in terms of positive and negative percentage after applying the machine learning algorithm.

1.1 Problem Statement

Achieve Sentimental analysis over audio and video reviews of Products on social media. Social sites like Youtube, Facebook, Twitter contain a lot of unprocessed reviews that go unchecked for sentimental analysis.

2. Literature Survey:

[1]Comparative Study of Machine Learning Techniques in Sentimental Analysis, Bhavitha B K, Anisha P Rodrigues and Dr. Niranjan N Chiplunkar,2017

The paper presents a detailed survey of various machine learning techniques and then compared with their accuracy, advantages, and limitations of each technique. This paper includes an outline of current works done on sentimental classification and analysis. A more innovative and effective techniques required to be invented which should overcome the current challenges like the classification of indirect opinions, comparative sentences, and sarcastic sentences.

[2]Audio and Text-based Multimodal Sentiment Analysis using Features Extracted from Selective Regions and Deep Neural Networks, Harika Abburi,2017

While developing multimodal sentiment analysis, instead of taking entire input and extracting several features from the toolkit, they identify selective regions of input and experiment is performed on those regions by extracting specific features. In this paper, the selective regions concept is not applied to deep neural network classifiers because of less data. The performance of deep neural networks is depend on the amount of training data. In this work the main focused only on two modalities text and audio. The performance can be improved by combining these two modalities with video modality.

[3] SENTIMENT ANALYSIS ON PRODUCT REVIEWS, Chhaya Chauhan, SmritiSehgal,IEEE2017

The main focus of sentiment analysis on product reviews is to review different algorithm and techniques to extract feature wise summary of a product and analyze it to form an authentic review. The system provides more successful sentimental classification based reviews. The future work is to use data from websites such as EBay and twitter to aggregate their reviews and provide a larger number of numbers of reviews because in previous work, data are extracted from Amazon and Flipkart.

[4]Sentiment Analysis on Speaker Specific Speech Data, Maghilnan S, Rajesh Kumar M,2017

This work presents a generalized model that takes audio which contains a conversation between two people as input and studies the content and speakers' identity by automatically converting the audio into text and by performing speaker recognition. It has some flaws, right now the system can handle a conversation between two speakers and in the conversation only one speaker should talk at a given time, it cannot understand if two people talk simultaneously. Our future work would address the issue like only one speaker should talk at a given time, it cannot understand if two people talk at the same time and improve the accuracy and scalability of the system.

[5]Large-scale Affective Content Analysis: Combining Media Content Features and Facial Reactions, Mohammad Soleymaniand Daniel McDuff 2017

This paper mainly focuses on a novel for affective content analysis, they combine the basic audio, visual and deep visual sentiment description from different media content with automated face action measurements from the naturalistic response to media. In that, they mainly focus on affective video content analysis to predict the response elicited in viewers by content. For emotional content analysis, they use deep learning. They used a convolutional neural network for generating the adjective-noun pairs. For face detection code they use the automated software, which extracts different feature, SVM is used to classify the different facial action. They used Principle component analysis(PCA) to reduce the dimensionality of media. They introduce facial action feature so because of that error rate will be reduced by 23%.the given model have an accuracy of 63% and a weighted score of 0.62.

[6]Comparative Analysis of Sentiment Orientation Using SVM and Naïve Bayes Techniques, Shweta Rana and Archana Singh,2016

This paper mainly focuses on a sentimental analysis of film's user reviews which contain positive and negative reviews. In data collection and pre-processing model, they identified user reviews and detect opinion and unnecessary data are removed from that. In the mining model, Naive Bayes and linear SVM is used for classification of a dataset. this model is trained to check the performance.T hey use the dataset, name as,' Internet Movie Database(IMDb)'. They use" Porter stemming algorithm" is a process for removing suffixes from words in English. For evaluation, they use confusion matrix, from that they calculate accuracy, precision, recall. They used rapid miner software. The sentiment orientation describes that the user prefers to watch a drama type of movie. The graph shows the polarity of the different words. The future scope of the work is that we can explore our data to a wider genre of different products on social networking sites or e-commerce as day by day the user is moving online and they prefer buying stuff online so we can identify the accuracy rates of the products like books, games, etc.

[7]Onto-based sentiment classification using Machine Learning Techniques, Ms.K.Saranya, Dr.S.Jayanthy,2017

In this paper, the use of semantics and ontology for text classification is combined with machine learning. The input text is given in the form of the word or a sentence or a document that separate the user emotion or feedback or review is given to the Natural Language Processing Toolkit (NLTK) and the features of the text are extracted. In emotional word extraction, WordNet is used for emo words extraction using the synsets in WordNet. An Ontology is being created based on the domain of analysis which gives the semantic meaning and relationship among the words. This ontology creation paves the way to add new emotion words too for better classification of the input text. The words that are being categorized by ontology used to train

the Machine Learning Algorithm and thus classify each sentiment into two classes as positive and negative sentiments.

[8]Image Sentiment Analysis Using Latent Correlations Among Visual, Textual, And Sentiment Views, Marie Katsurai and Shin'ichi Satoh,2016

In this paper, a novel image sentiment analysis method that uses latent correlations among visual, textual, and sentiment views of training images. In the proposed method, the first extract features from pairs of images and text to construct visual and textual views. they introduce an external sentiment knowledge base, Senti-Word.Net, which forms the sentiment view. Using a framework of multi-view canonical correlation analysis (CCA).They calculate a latent embedding space in which correlations among the three views are maximized.

[9]Sentiment Analysis of Speech, Kajal Shivarkar, Aishwarya Murarka, Sneha, Vani Gupta, Prof.Lata Sankpal,2017

In this paper believe that multimodality will also help in detecting whether a speaker is expressing his own opinion or merely parroting somebody else's views. In such cases, a mere text-based approach will fail, as the most important clues will be found in intonation and facial expressions. Hence multimodality can be used in multiple applications in a broader spectrum such as lie detection, analyzing interviews, interrogations, etc. Multimodal Sentiment Analysis is very much an open-ended topic. Lots more research needs to be done as evident from the results of the discussed experiment.

[10] Sentiment Extraction From Natural Audio Streams, Lakshmish Kaushik, Abhijeet Sangwan, John H. L. Hansen

In this paper, we have proposed a system for automatic sentiment detection for a spontaneous natural speech and evaluated this result on YouTube data. The proposed system uses ASR to obtained transcripts for the videos. We have also demonstrated ME model tuning and feature selection strategies that provide more accurate and domain independent models. Our results show it is possible to automatically detect sentiment in natural audio with high accuracy. In this paper also shown that our system is capable of providing keywords/phrases that can be used as valuable tags for YouTube videos.

3. Proposed System:

In the proposed system, we collect data from different social sites such as Facebook, Youtube to collect reviews of products. Depending upon the data such as audio and video, they are divided for further processing .system uses videos as a source for analyzing the content for sentiments. From Video, audio and will be separated to be processed. Audio and video will be converted to a .wav file and after that .wav file can be converted into a text file. This text file is given to the VADER algorithm as input. VADER belongs to a type of sentiment analysis that is based on the lexicons of sentiment-related words. In this approach, each of the words in the lexicon is rated as to whether it is negative or positive, and neutral. From that, we found out the accuracy of the given data.

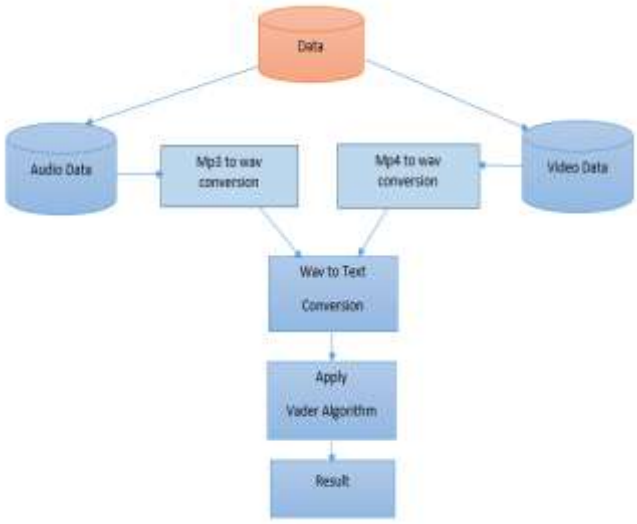

Fig- 1: Proposed system

3.1 Vader working:

VADER is referred to as Valence Aware Dictionary and sEntiment Reasoner. VADER is a rule-based sentiment analysis library and lexicon. With VADER you can be up and run the performance of sentiment classification very fast even if you don't have negative and positive text samples to train a classifier or need to write a code to search for words in a sentiment lexicon. VADER is also computationally efficient when compared to other Machine Learning and Deep Learning approaches.VADER algorithm consists of an inbuilt training library that means we can not train our model separately.

VADER algorithm uses subjectivity and polarity concept. Polarity concept defines positive and negative words as well

as it defines the range of polarity which is in between 0 and 1. Polarity, also known as orientation is the emotion expressed in the sentence. It can be positive, negative or neutral. Subjectivity is when text is an explanatory article which must be analyzed in context. Subjectivity is in between -1 to +1.

The results of VADER analysis are not only remarkable but also very encouraging. The outcomes highlight the tremendous benefits that can be attained by the use of VADER in cases of micro-blogging sites wherein the text data is a complex mix of a variety of text.

VADER belongs to a type of sentiment analysis that is based on the lexicons of sentiment-related words. In this approach, each of the words in the lexicon is rated as to whether it is negative or positive, and in many cases, how positive or negative.

To work out whether these words are positive or negative the developers of these approaches need to get a bunch of people to manually rate them, which is obviously pretty expensive and time-consuming. In addition, the lexicon needs to have good treatment of the words in your text of interest, otherwise, it won't be very accurate. On the other side, when there is a good fit between the lexicon and the text, this approach is accurate, and additionally quickly returns results even on large amounts of text. Incidentally, the developers of VADER used Amazon's Mechanical Turk to get most of their ratings, which is a very quick and cheap way to get their ratings!

When VADER analyses a chunk of text it checks to see if any of the words in the text are present in the lexicon. Consider the example, the sentence "The juice is good and the dress is nice" has two words in the lexicon with ratings of 1.9 and 1.8 respectively.

VADER generate four sentiment metrics from these word ratings, which you can see below. The first three, negative, neutral and positive, represent the proportion of the text that falls into those categories. As you can see, our example sentence was rated as 45% positive, 55% neutral and 0% negative. The final metric, the compound score, is the sum of all of the lexicon ratings which have been standardized to range between -1 and 1. In this case, the example sentence has a rating of 0.69, which is pretty strongly positive.

Table-1: Sentiment metric

Sentiment metric	Value
Positive	0.45
Negative	0
Neutral	0.55

4. Mathematical model:

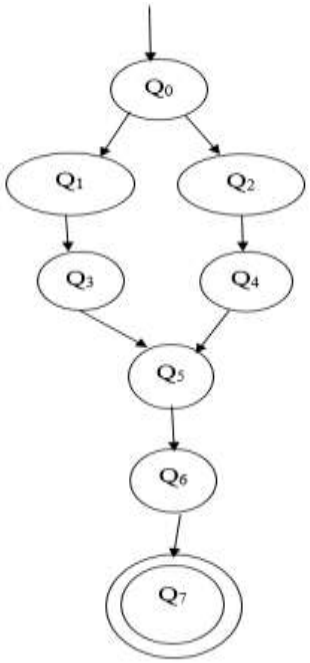

Fig-2 Mathematical model

Q0 initial State

Q1 audio separation

Q2 video separation

Q3 mp3 to wav conversion

Q4 mp4 to wav conversion

Q5 wav to text conversion

Q6 Apply Algorithm

Q7 Result Display

U= {Q, F,Q_0, S, F, }

Where,
Q= {Q_1, Q_2,Q_3, Q_4, Q_5, Q_6, Q_7}
F= final State
Q_0-Initial State

S: Success:
 Data converted successfully
 Accuracy obtained successfully

F: Failure:
 If data is not converted successfully
 Connection failure

5. Result:

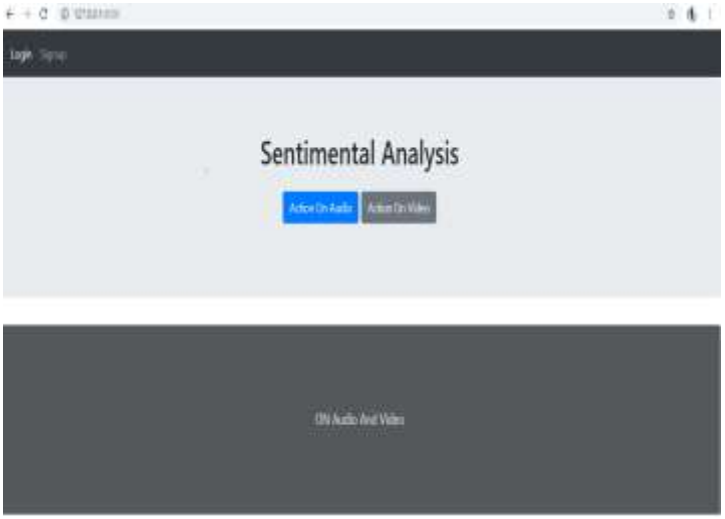

Fig -3: Home page

Fig-4: Main page

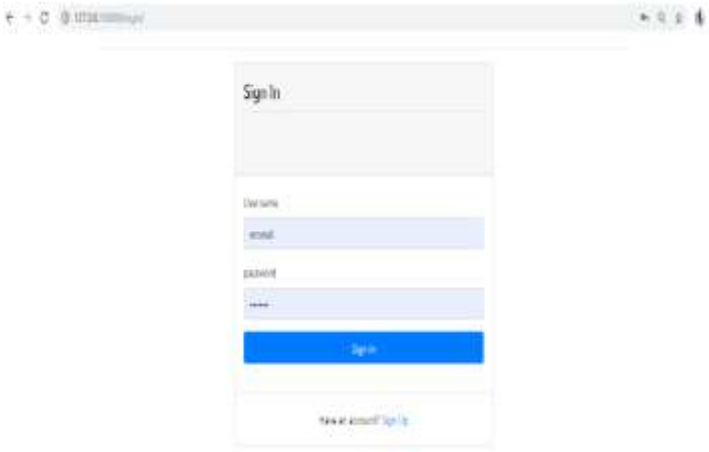

Fig-5: Login page

Fig-6: Video input

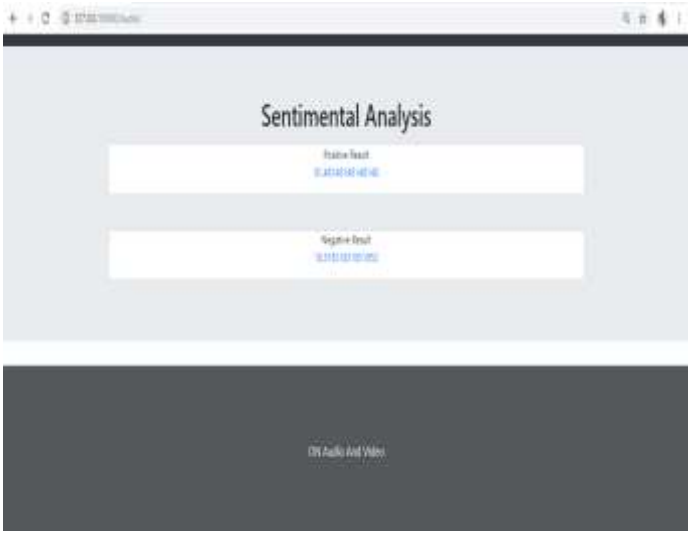

Fig-7: Result

6. Conclusion:

Products reviews published by users are valuable for both purchasers and producers. Nowadays audio and video monitoring is vital in many social sites like facebook, tweeter, youtube, etc. Using our system we can analyze the usage and also detect the Opinion in a particular product. In this paper, we take the audio and video from different sites such as youtube, facebook, etc this audio and video files first converted into text data, then from that converted data we have applied the sentiment analysis. In this paper, we have used the VADER algorithm the functionality of the VADER algorithm is that it does not require separate data for training become the VADER algorithm already has the training data set. VADER algorithm uses the concept of polarity and subjectivity from that they find out the analysis. The proposed system gives the output in terms of positive and negative percentage.

Future Work:

In this system, we apply the sentiment analysis on audio and video as audio is converted into text data and video is extracted so that we get audio data then this audio data is converted into text data after that we apply the sentiment analysis on that text data. But the main thing is that from a video we only extract the audio data, here we have not extracted the image data. So our future work is that from a video we extract the audio data as well as image data after that we apply image processing on that image data and finally, this image data is compared with audio data so as to get a final output that is we apply sentiment analysis on that data that we get.

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