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Sentiment Analysis on STT data

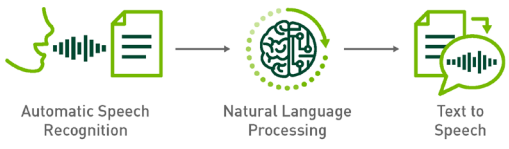
Introduction:

There are huge number of videos revolving around the internet. Every second thousand of videos gets uploaded on internet and many of them also contains hate speeches which can be a possible threat to a country. The idea is if we have a system that can process these videos and identify the sentiment of it then we will be able to identify some possible threats helping us take proactive steps to solve it.

Statement of project:

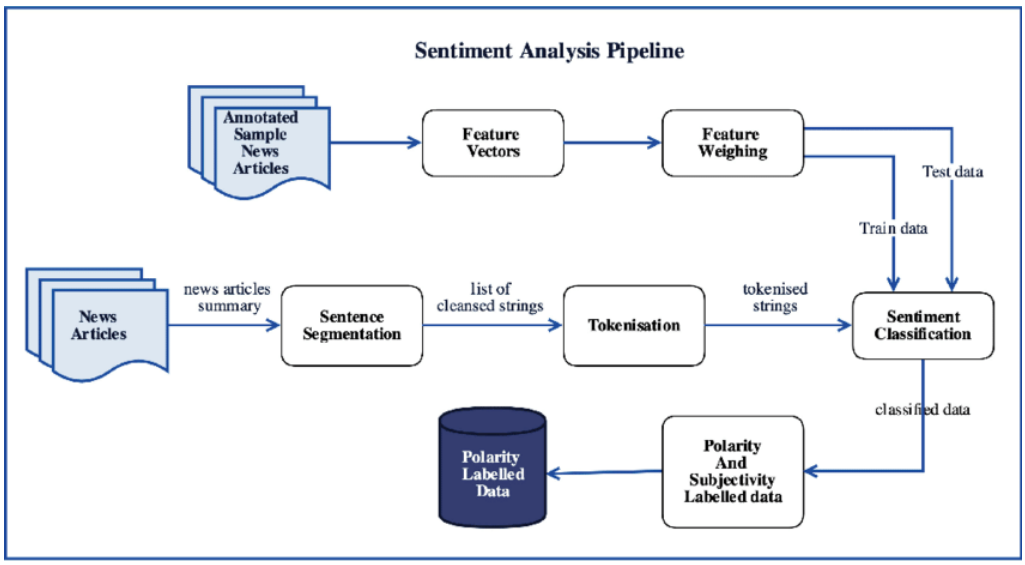
There are huge number of videos revolving around the internet. Every second thousands of videos gets uploaded on internet and many of them also contains hate speeches which can be a possible threat to a country. The idea is if we have a system that can process these videos and identify the sentiment of it then we will be able to identify some possible threats helping us take proactive steps to solve it.

The pipeline looks like as shown below:



The Input to the pipeline is a wav file which we pass to a STT pipeline which uses natural language processing to extract text of the audio. Once we have the output, we will save it into a text file which we will pass to a sentiment analysis pipeline to extract the sentiment of each sentence and then we will calculate an overall sentiment.

The sentiment analysis pipeline looks like as shown below:



Technology Used: Python, Jupyter Notebook, Speech to text, Natural Language processing

Dataset Used: wav files downloaded from internet were used to train the model and test on it.

Framework:

For sentiment analysis tasks based on aspect that strongly rely on syntactic parsing findings, sentiment sentence reduction may be considered a preprocessing step.

shows the framework for aspect-based sentiment analysis that makes advantage of sentiment sentence reduction. To show the model's efficacy, we use it to analyse simple aspect-based sentiment analysis jobs.

Previous Work:

1.) The term "speech recognition" refers to the ability of a device to capture the words uttered into a microphone by a human being. As a result of voice recognition, the system generates words that have been identified. In the following sections, we'll go through each stage of the speech recognition process in detail.

Speak to people from all over the globe in their own language, eliminating the language barrier in global business and cross-cultural encounters, thanks to speech translation. Achieving worldwide voice translation would be a huge step forward for mankind in terms of science, culture, and the economy. The goal of our initiative is to break down the language barrier and allow people to communicate in the language of their choice. It is possible to classify speech recognition systems based on their capacity to grasp a variety of different terms and word lists that they have. The ability to hear the uttered word is a desired requirement in the speech recognition process. The voice recognition engine takes into account all of the words a speaker says, but the accuracy of the recognition relies on a number of circumstances. Key dependent factors for speech recognition engines include terminology, concurrent users, and loud environments. The translation of meaning from one language (the source) to another language (the target) is called translation. There are two basic reasons why speech synthesis is used:. It's first and foremost the translation of

spoken words into text, and secondly, the construction of software that allows a person to run different voice applications is required for the operation of equipment. The PC sound card creates a digital representation of the audio that is received via the microphone input. It is called digitization when the analogue signal is converted to digital form. So, quantization is the process of estimating a continuous collection of values by sampling and turning it into a discrete signal.
Input processing strategies for neural networks that enable the network to concentrate on certain parts of complicated input one at a time, until the full dataset is classified, are known as attention model input processing. Complex jobs should be divided into smaller chunks so that they may be dealt with in a logical, sequential fashion. All of the components of the model are vectors: the query, the key–value pairs (key–value pairs), and the final result (output) are all vectors. This is how an attention model works. As a result, the output is a weighted sum, with each value being given a weight based on how well it matches the query's key–value pair. An artificial neural network predicts the likelihood of a succession of phrases, generally in a single integrated model, modelling full sentences. Neural network technology has been utilised to tackle issues in a number of ways in recent years.

2.)Sentiment categorization, rather than identifying a sentence's sentiment orientation, was the emphasis of earlier sentiment analysis research. Those positions, on the other hand, are of a coarser nature and can't provide any more detailed information. Fine-grained aspect-based tasks, which can recognize both the text conveying

the viewpoint and its aspect, have lately been moved toward analysis of the polarity of the viewpoint and their aspect (e.g., positive, neutral, or negative). Aspect-based sentiment analysis is primarily responsible for extracting AP collocations.

Most approaches focused on finding connections between the polarity terms and the attributes to solve this problem. Researchers used to identify an aspect first, and then choose a polarity word from a predetermined range of options. However, since this approach is too heuristic, the results were severely constrained. It was discovered that a syntactic pattern better explains the connection between aspects and polarity terms to address this issue. With the usage of syntactic patterns to extract collocation candidates in their two-stage framework, a linkage specification lexicon with 31 patterns offered a twofold propagation technique that included eight heuristic syntactic patterns.

3.) In the past, sentences could be compressed using tree-based methods, which included editing the syntactic tree of the original phrase to produce a compressed one instead. However, the results of automated parsing may not be accurate; as a consequence, the compressed tree (after eliminating components from a poor parse) may not yield an acceptable compressed phrase. In order to figure out which words might be omitted, they looked at classifiers that included characteristics from the words themselves as well as voice tags and parser trees from the text. When making this decision, the parser trees provided some ambiguous evidence that might be weighed against one another. Parsing mistakes were

decreased as a result of reducing the causes. In addition, new research on polynomial time inference algorithms and approximation inference algorithms for phrase compression have been conducted to enhance the efficiency of the compression model.
As of right now, all current sentence reduction techniques are geared toward formal statements, with emotion phrases getting little attention. Due to the specificity of aspect-based sentiment analysis, existing compression methods cannot be simply transferred to sentiment sentences, as described above. Because of this, it's necessary to develop a new compression model for emotive phrases

Objective:

In the field of engineering, speech recognition is one of the most rapidly expanding fields. It may be used in a variety of ways and has a wide range of possible advantages. Due to linguistic issues, many individuals are unable to converse with each other. There will be fewer obstacles for individuals to communicate information by utilising a computer with voice input, thanks to our project, which was built to accomplish solutions that give considerable support in certain instances. Keeping this in mind, our product makes an attempt to identify speech and transform input audio into text; it also allows a user to conduct file actions such as Save, Open, or Exit via voice-only input. We're working on a system that can translate between English and Hindi by recognising the human voice and audio samples. We give choices to convert audio from one language to another, and the result is text. A dictionary-like feature

for Hindi and English terms is expected to be added in the future. Neural machine translation (NMT) is the most widely used method for machine translation in the business. Neural machine translation is based on the employment of two recurrent neural networks in tandem to build an encoder–decoder structure. It begins with an overview of voice recognition technology and its applications in many industries. A portion of the article is based on voice recognition software advancements.
It is a relatively young and extremely active area of study to determine people's ideas represented in written language. Researchers in a variety of domains, including natural language processing, machine learning and data mining, text mining, management and marketing, and even psychology, have been able to conduct study using publically accessible data sources because of the Internet's widespread availability. Document, phrase, and aspect levels of abstraction are often used for sentiment analysis and opinion mining. Concept-level sentiment analysis, a kind of aspect-level sentiment analysis in which aspects may be multi-terms, has recently been investigated by academics. Topic modelling approaches have been used, modified, and extended to handle sentiment analysis and opinion mining. An unstructured collection of documents may be analyzed using topic models, which are probabilistic strategies for identifying the major topics. In this book chapter, we'll discuss and explain some of the more modern techniques to sentiment analysis. Our introduction to sentiment analysis and opinion mining and some of its applications in many fields is the first step in this chapter. Some of the key issues in sentiment analysis and opinion mining are examined and several available methodologies are

outlined. Sentiment analysis and opinion mining have recently taken new avenues. To wrap up this chapter, we'll take a closer look at the research presented in these papers.

There are huge number of videos revolving around the internet. Every second thousand of videos gets uploaded on internet and many of them also contains hate speeches which can be a possible threat to a country. The idea is if we have a system that can process these videos and identify the sentiment of it then we will be able to identify some possible threats helping us take proactive steps to solve it.

In paraphrase, sentence compression is the process of creating shorter phrases while maintaining the same amount of information. A powerful compression system is useful in a wide range of situations. We may utilize the method, for example, to cut down on duplication in phrases and to create useful summaries. It's also useful for compressing difficult-to-parse sentiment phrases into simpler ones so that we can obtain more accurate syntactic characteristics and enhance tasks that depend heavily on syntactic features, such as semantic role categorization and relation extraction
In the past, sentences could be compressed using tree-based methods, which included editing the syntactic tree of the original phrase to produce a compressed one instead. However, the results of automated parsing may not be accurate; as a consequence, the compressed tree (after eliminating components from a poor parse) may not yield an acceptable compressed phrase. In order to figure out which words might be omitted, they looked at

classifiers that included characteristics from the words themselves as well as voice tags and parser trees from the text. When making this decision, the parser trees provided some ambiguous evidence that might be weighed against one another. Parsing mistakes were decreased as a result of reducing the causes. In addition, new research on polynomial time inference algorithms and approximation inference algorithms for phrase compression have been conducted to enhance the efficiency of the compression model.

Algorithm:

```
   Data: File ["Aspect specific sentences"]
   Result: "Sentiment Polarity score & Sentiment"
 1 Sentiment Analysis() ← File
 2 while not the end of lines do
 3 |   Calculate Sentiment Polarity Score;
 4 |   For each 'line'
 5 |   if Sentiment Polarity Score(line) >0 then
 6 |   |   Sentiment ← Positive;
 7 |   else
 8 |   |   if Sentiment Polarity Score(line) <0 then
 9 |   |   |   Sentiment ← Negative;
10 |   |   else
11 |   |   |   if Sentiment Polarity Score(line) =0 then
12 |   |   |   |   Sentiment ← Neutral;
13 |   |   |   else
14 |   |   |   end
15 |   |   end
16 |   end
17 end
```

Conclusion:

Sentiment analysis relies heavily on computational intelligence technologies, which have shown to be useful tools for gaining a better understanding of consumers' views on goods and services. Despite the fact that this profession has only been around for a

short time, there has been a lot of progress. There has been a lot of study done so far on the semantics of written language, and this research is affected by numerous linguistic problems. It's still possible to find client attitudes, views, and elements from historical research, which has been found to connect quite well with customer satisfaction numbers. The degree to which the probabilistic computational intelligence methodologies may be generalized across other contexts or domains is yet unclear.
As a result, there is a lot of room for further study in this area, which might lead to a major shift in the way companies and their consumers perceive and assess their goods and services.

Data Visualization:

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