A NLP Approach For Generating Speech From Literature

[1]Dr. Shubhangi D.C, [2]Syeda Afshan Naaz
[1]Professor, Department of CSE, [2]M.Tech II year
[1]Department of studies in Computer Science and Engineering,
Visvesvaraya Technological University Centre for PG Studies, Kalaburagi, Karnataka India

***Abstract*—** This paper present a system, GenMusic,for translating literature into sound using NLP approach. GenMusic uses natural language processing (NLP) approach to extract the most important and central ideas from literature and it also uses file converter to support different file types. GenMusic uses text summarization to get the summary of the literature. We have used NLP for sentiment analysis to find out the emotion in each sentence. Finally the summarized contents are converted into speech.

***Index Terms*—** Text summarization, GenMusic, Speech processing, Search engines, Sentiment analysis, Natural Language Processing (NLP) Algorithm

I. INTRODUCTION

Automatic text summarization, or just text summarization, is the process of creating a short and coherent version of a longer document. Automatic text summarization methods are greatly needed to address the ever-growing amount of text data available online to both better help discover relevant information and to consume relevant information faster. Summarization is the course of margarine a text document by software, so as to generate a summary with the key points of the innovative document. There are two main approaches to summarizing text documents, they are Extractive methods and Abstractive methods. Extractive text summarization involves the selection of phrases and sentences from the source document to make up the new summary. Techniques involve ranking the relevance of phrases in order to choose only those most relevant to the meaning of the source. Abstractive text summarization involves generating entirely new phrases and sentences to capture the meaning of the source document. This is a more challenging approach but is also the approach ultimately used by humans. Classical methods operate by selecting and compressing content from the source document.Text summarization is the problem of creating a short, accurate, and fluent summary of a longer text document.

There is an enormous amount of textual material, and it is only growing every single day. For example, internet, comprised of web pages, news articles, status updates, blogs and so much more. The data is unstructured and the best that we can do to navigate it is to use search and skim the results. There is a great need to reduce much of this text data to shorter, focused summaries that capture the salient details, both so we can navigate it more effectively as well as check whether the larger documents contain the information that we are looking for. Sentiment analysis is the procedure of computationally recognizing and sorting feelings expressed in a piece of text. Sentiment is like a combination of tone of voice, word choice, and writing style all rolled into one. The input to natural language processing will be a simple stream of Unicode characters. Natural language processing is only half the battle though. Human communication isn't just words and their explicit meanings. Human communication is nuanced and complex. You can tell based on the way a friend asks you a question whether they're bored, angry, or curious. Basic processing will be required to convert this character stream into a sequence of lexical items (words, phrases, and syntactic markers) which can then be used to better understand the content. The basics include Summarize blocks of text using Summarizer to extract the most important and central ideas while ignoring irrelevant information.

Use sentiment analysis to identify the sentiment of a string of text, from very negative to neutral to very positive. Structure extraction identifying fields and blocks of content based on tagging. Identify and mark sentence, phrase, and paragraph boundaries these markers are important when doing entity extraction and NLP since they serve as useful breaks within which analysis occurs. Language identification will detect the human language for the entire document and for each paragraph or sentence. Language detectors are critical to determine what linguistic algorithms and dictionaries to apply to the text. Tokenization to divide up character streams into tokens which can be used for further processing and understanding. Tokens can be words, numbers, identifiers or punctuation (depending on the use case) Lemmatization/Stemming reduces word variations to simpler forms that may help increase the coverage of NLP utilities. Lemmatization uses a language dictionary to perform an accurate reduction to root words. Lemmatization is strongly preferred to stemming if available. Search Technologies has lemmatization for English and our partner, Basis Technologies, has lemmatization for 60 languages. De-compounding for some languages (typically Germanic, Scandinavian, and Cyrillic languages), compound words will need to be split into smaller parts to allow for accurate NLP. Entity extraction identifying and extracting entities (people, places, companies, etc.) are a necessary step to simplify downstream processing.

II. Related Work

Apoorv Agarwal BoyiXie**[**3] Presented results for sentiment analysis on Twitter for classifying "tweets" into positive, negative and neutral sentiment. They build models for two classification tasks: a binary task of classifying sentiment into positive and negative classes and a 3-way task of classifying sentiment into positive, negative and neutral classes. Hannah Davis and Saif M. Mohammad et al.[2] Show a framework, TransProse that consequently produces melodic pieces from content. TransProse utilizes known relations between components of music. SaimaAman and Stan Szpakowicz et al. [4] Address the issue of recognizing articulations of feeling in content. They depict the undertaking of explaining sentences in a blog corpus with data about feeling classification and power. They found the annotators to concur most in recognizing cases of dread and bliss. Kai Siedenburg, Ichiro Fujinaga& Stephen McAdams et.al[1] Sketched out undertaking contrasts and epistemological establishments of the two fields. They are for the most part which manage diverse feature of timbre-related assignments: MIR frequently considers instrument arrangement, brain research has prevalently managed timbre difference observation.

S.Omar ali and Zehra f. Peyni .rci .o glu et.al[5] Imitated past discoveries and exhibited that commonality with melodic boosts expanded 'preferring' or 'inclination' for the jolts. Cecilia Ovesdotter Alm1 and Richard Sproat et.al**[**6] Talked about enthusiastic appropriations in 22 tall tales as far as examples of passionate sequencing and situating, and furthermore as far as passionate advancement, transiently over the story. Jerome R. Bellegarda**[7]**Have proposed an information driven technique for feeling examination which centers around two coupled stages: (I) independently typify both the establishments of the area considered and the general full of feeling texture of the dialect, and (ii) abuse the developing connection between these two semantic levels of depiction with a specific end goal to illuminate the feeling characterization process. Samuel Brod and Nicholas Diakopoulos et.al[8]Investigated the wonder of extending words by rehashing a solitary letter. This discovering drives us to build up an unsupervised technique in view of stretching for distinguishing new slant bearing words that are not in the current dictionary, and finding their extremity. Nick Collins[9]This article to clear up a portion of history and wording encompassing generative music by concentrating on procreative music PC programs explicitly.The approach laidout in this article is beached in programming testing procedure and in writing on sound combination and music comprehension.

III. Implementation

The Proposed application called GenMusic is a web based portal using which admin can upload various e books or any literature. User can browse the available contents and send request to server for music. Server once receive the request process the file and extract the text out of it. The complete text is then summarized using text summarization technique and summary is further processed for sentiment analysis. We have used NLP for sentiment analysis. Based on the summarized content with sentiment the music is generated.

System architecture of proposed approach is shown in fig.1

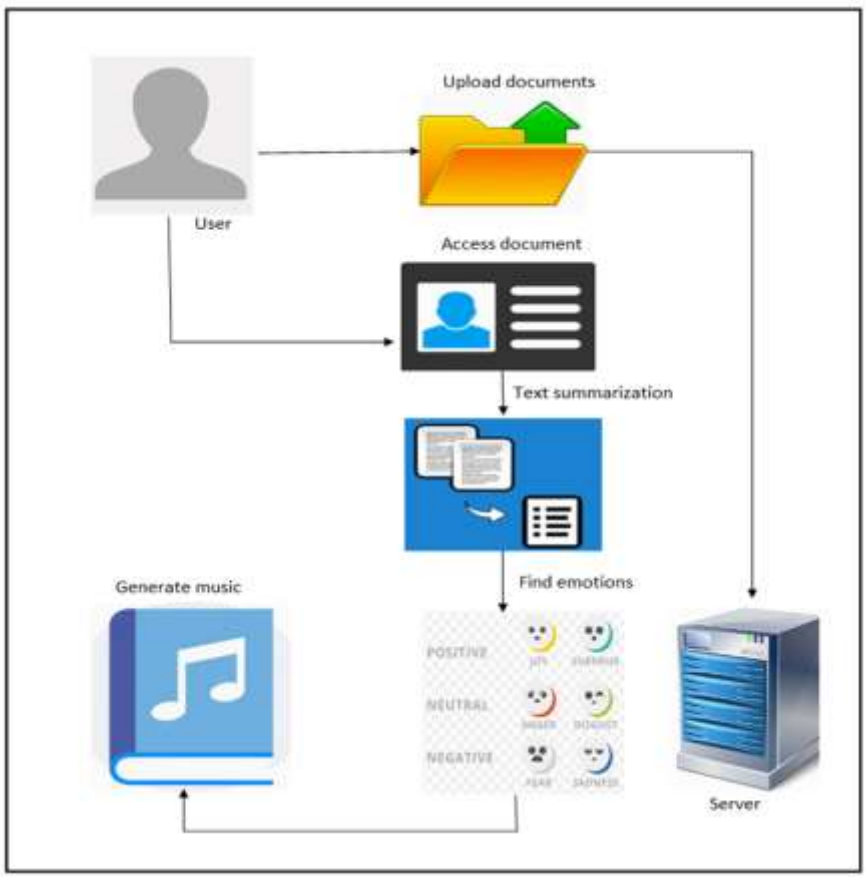


Figure1: Proposed Architectural Structure

1. Text Summarization:

Text summarization is the issue of making a short, exact, and familiar outline of a more drawn out text record. Programmed text summarization strategies are significantly expected to address the consistently developing measure of text information accessible online to both better help find important data and to expend pertinent data speedier. There is a tremendous measure of textual material, and it is just developing each and every day. Think about the web, involved site pages, news articles, announcements, sites thus substantially more. The information is unstructured and as well as can be expected do to explore it is to utilize pursuit and skim the outcomes. There is an extraordinary need to diminish quite a bit of this text information to shorter, centered rundowns that catch the notable points of interest, both so we can explore it all the more successfully and in addition check whether the bigger archives contain the data that we are searching for. Programmed text summarization, or just text summarization, is the way toward making a short and lucid adaptation of a more extended record.

2. Sentiment Analysis:

Sentiment analysis determine the evaluative nature of text*:* positive, negative, or neutral. Sentiment is like a combination of tone of voice, word choice, and writing style all rolled into one. Emotion analysis involve the detection of emotions such as joy, anger and sadness in text. Text to-speech synthesis employs emotion detection to produce speech consistent with the emotions in the text. Natural Language Processing (NLP) algorithm is used here for sentiment analysis to find out the emotion in each sentence.

NLP ALGORITHM:

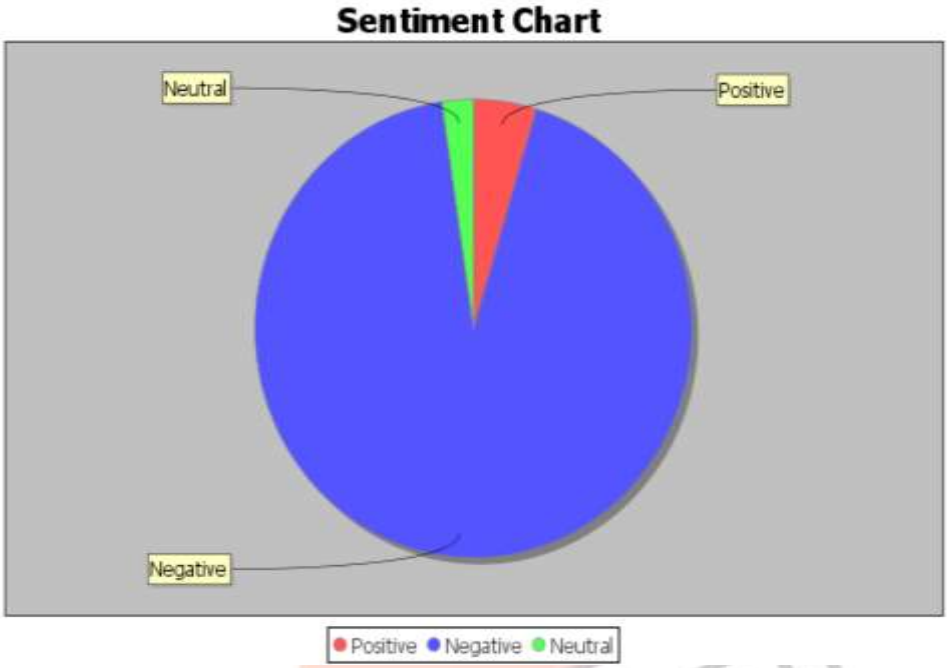
//Input: input the Sentence which are extracted by summarizer
//Output: Sentiment Score
//Using NLP find the text summary with sentiment and based on sentiment score speech is generated
//NL: Negations List. Negation list(NL) contains negative words if word is come under negation list then reverse the direction of that word to positive one
//IL: Intensifiers List. Intensifier is a word that is use to strengthens another word and they increases the emotional content of an expression. The basic intensifier is 'Very'
Function Senti_Score(Sentence**)**
ptext = preprocessor(Sentence)
tokens = tokenize(Sentence)
Tokenization is a step which splits longer strings of text into smaller pieces, or tokes. lager chunks of text can be tokenized into sentences, sentences can be tokenized into words.
Tasks
#(i) If word is in NL then reverse polarity of word+1
#(ii) If word is in IL then modify polarity of word+1
#(iii) If all letters in the word are in upper case then add fraction to word score
#(iv) Enhance word score if it contains repeated letters
Exclamation count Xc = exclam(ptext)
For word in tokens
If word in emotions **Then**
score = emotion score
Else
Searching opinion lexicons/dictionaries
If word found in lexicon assign score.
score = lexicon score
do task (i) to (iv)
If word not found, check its synonyms and antonyms and assign score.
score = lexicon score
do task (i) to (iv)
If not found, check in SentiWordNet and calculate its score.
score = SentiWordNet score
do task (i) to (iv)
If not found in SentiWordNet, search Slang's dictionary/Web and calculate its score.
score = Slang's score
If not found, assign score zero
score = 0
End If
sentimentscore = sentimentscore + score
Next
score = (Xc+1)/2* sentimentscore
End Function

IV. RESULT AND DISCUSSION

The proposed method has 3 main parts which are (i) Text summarization for creating a short, accurate, and fluent summary of a longer text document ,(ii) Sentiment analysis and emotion detection using NLP extract the assess nature of text and (iii) Generate speech with summarized contents and displaying the results.
We observe the three sentiments, positive, negative, neutral and also total number of lines in original file and total number of lines in summarized file.

Sentiment Features	***Total no Of sentiments***
Positive	11
Negative	30
Neutral	7

Table 1: Shows the Sentiment features produced by NLP approach from which the following graph is obtained.



Number of Original file Lines	***Number of Summarized file Lines***
694	140
42	9
29	6

Table 2: Shows the Sentiment lines produced by NLP approach from which the following graph is obtained.

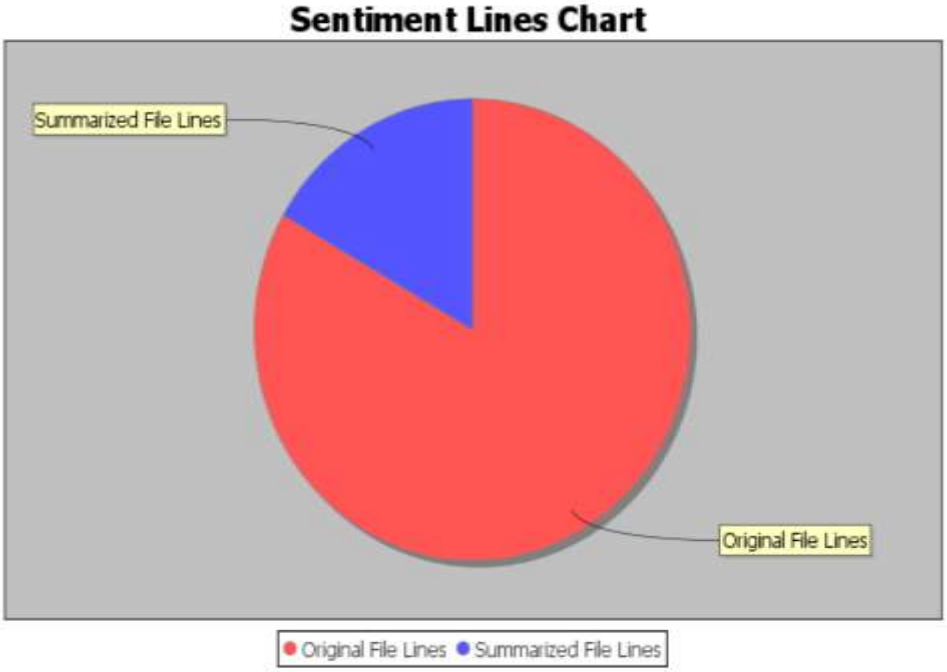


Figure2: Initialization of NLPserver

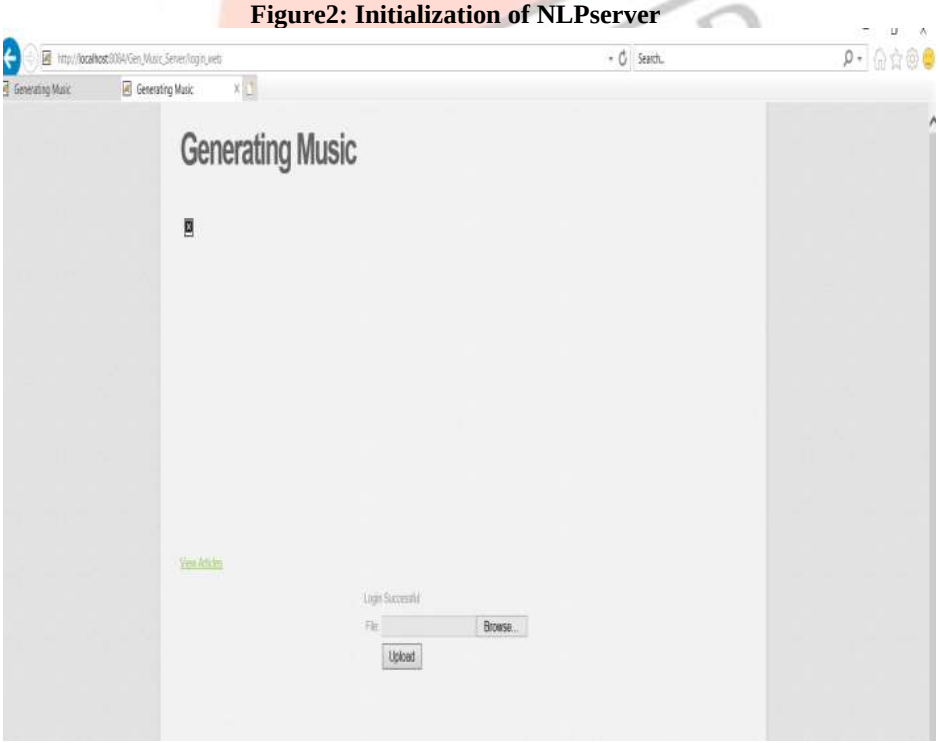


Figure 3: Upload File

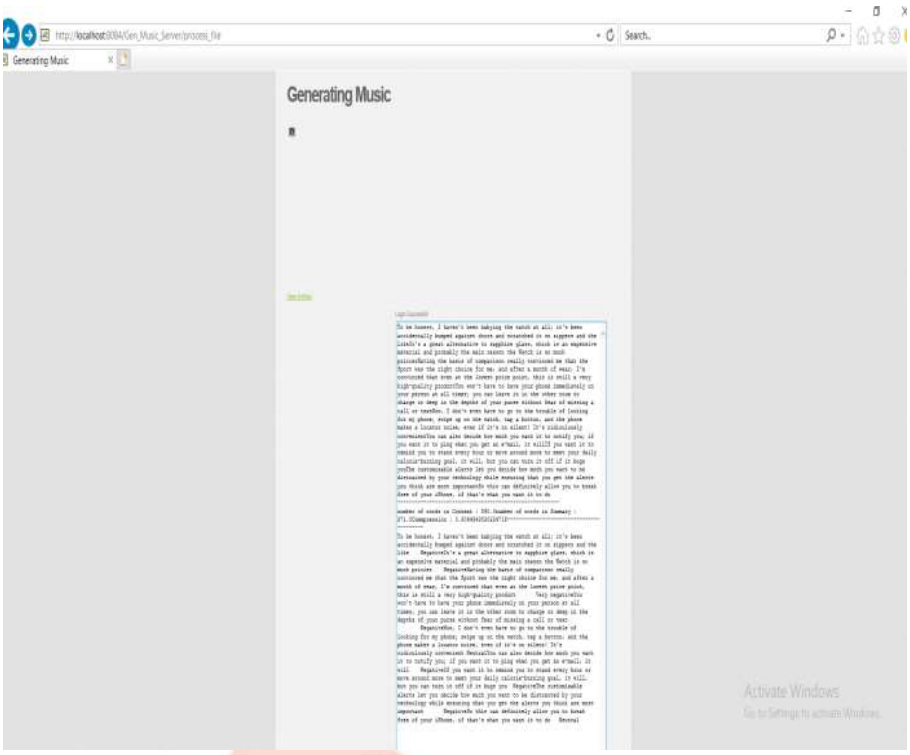


Figure 4: View Articles

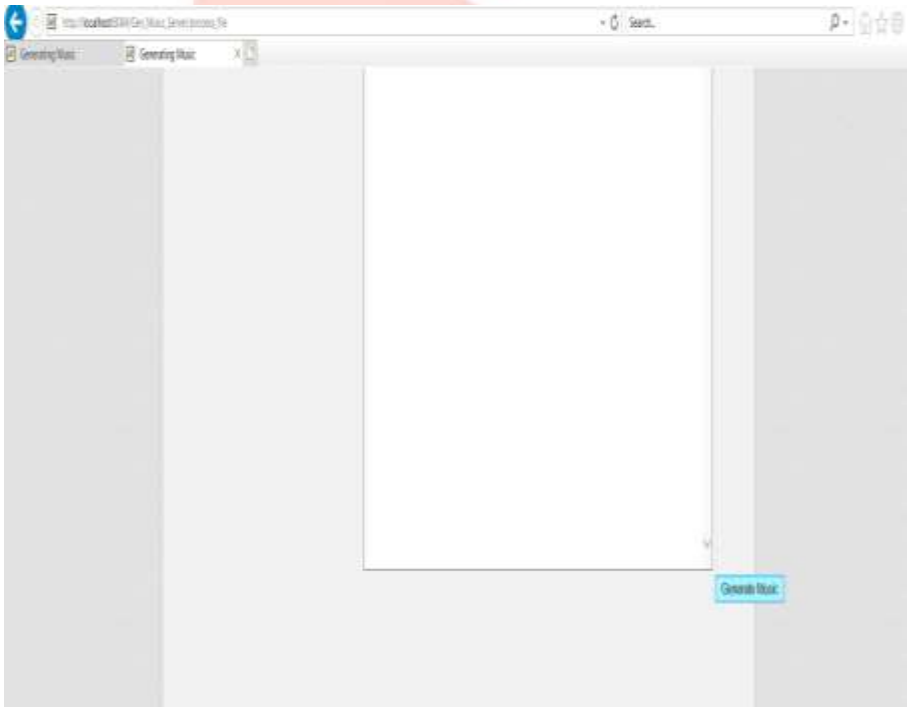


Figure 5: Generate Music

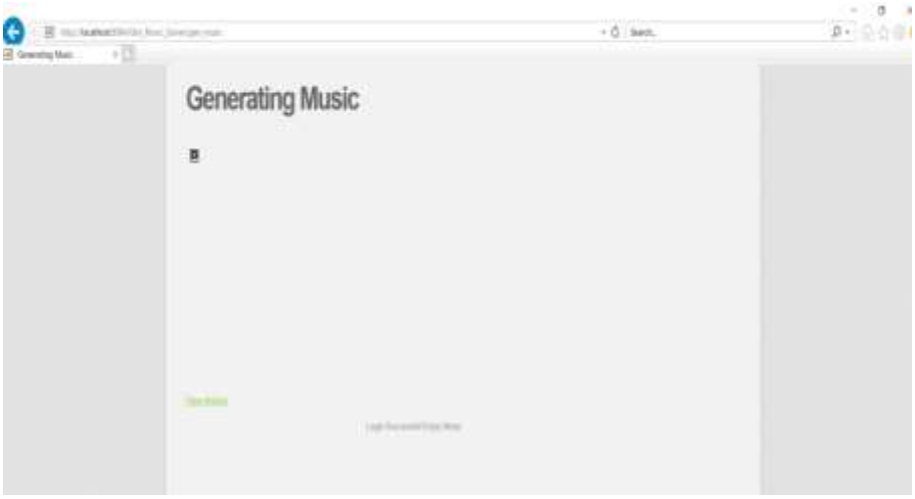


Figure 8: Conversion from Text to Speech

V. CONCLUSION

We have designed and developed GenMusic system using NLP approach. The proposed GenMusic system for text summarization and sentiment analysis using NLP approach is successfully implemented and executed. The NLP is suitable for finding emotion in each sentence using sentiment analysis. Where sentiment analysis is the procedure of computationally recognizing and sorting feelings expressed in a piece of text and also detremines the evaluative nature of text i,e positive ,negative and neutral sentiment. GenMusic uses file converter to support various types of files and also uses text summarization to get the summary of the literature. Finally based on the summarized contents with sentiment the speech is generated.This system will generate audio that is related to the characteristic ambiance of the text.

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