A Review: Text to Speech Conversion

Udisha Gupta,   Uzma Badar, Mansi Varshney, Shivam,   Guided By Ms. Jyoti Verma
Department of Computer Science & Engineering
ADGITM, New Delhi, India
udishagupta73@gmail.com, badar4031@gmail.com, mansivarshney188@gmail.com, chauhans600@gmail.com,
Jyotiverm@gmail.com.

Abstract -**Text-To-Speech (TTS) is a computer based system that can be able to read any text aloud. There are many systems which convert text to speech. The main aim of this paper is to study TTS which helped us in making our project. This project consist the solution for the problem that differently able person, old age people and illiterate people face while using social media. Our application is user friendly voice based chat application in which it can verbally respond on the basis of predefined commands in "Text" format and also take voice inputs then convert them into text. This paper consist design, implementation of our application. This application consist two modules voice to text and text to voice.**

Keywords- **Text-to-speech(TTS); OnInitListener; TTS Engine; Android TTS; Speech Processing; Speech Generation; Speech Synthesis**

I. INTRODUCTION

Communication is a way of expressing your thoughts to someone. To convey thoughts, one can use gestures, music, words, or some symbol language. But, Human beings are blessed with this structured system „Speech‟ to convey their emotions and thoughts. To feed such intelligence into electronic systems various methods are available. TTS is one of those available methods. What is TTS? [4]TTS is an acronym for Text-to-Speech. TTS is a form of speech synthesis that converts text into spoken voice output. It can enable the reading of display information for the visually challenged person. It helps them to listen the messages which they received .TTS system is capable of "reading"[2] Any string of text characters from original sentences. Now-a-days, TTS use everywhere and in every field so that the disabled person can work anywhere they want without any problem or without taking help form any other person. TTS helps them to live their life like any other person. It is very time saving technology.

II. METHODOLOGY

1. Speech Synthesis (Text-to-Speech) [1]:-
Text-To-Speech synthesizer is an automated system which can read any text and convert it into computer generated voice in the specified language.
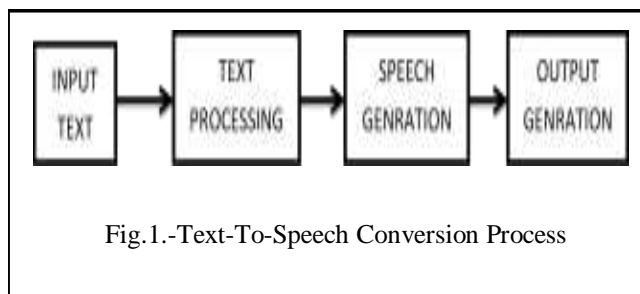
2. What is speech synthesis:-
Main task of Text-to-Speech class of android is to convert an arbitrary text in a spoken waveform. It is an abstract class, of which desired methods can be override as per the requirement.

This task generally consists of following steps:-
* Text Analysis
* Text Normalization
* Text processing
* Speech processing
* Speech generation

1. **Text Analysis:** Text Analysis is done at pre-processing, which reads the input text analyze it and then convert it into a list of words. In process of text analysis, the string is brake down into tokens and then converts it into list of words.
2. **Text Normalization:** Text Normalization is conversion of text into its pronounceable form. Main objective of text normalization is to identify punctuation marks and insert a pause according to that. To give essence of human speaking ability with the understanding of where to take a pause, or wait can be done in this step of process.
3. **Text processing:** In text processing TTS engine converts the text into synthesis unit. TTS engine is capable of converting written text into synthesis unit which can be process in next steps.
4. **Speech Processing:** In this step, text will started converting into spoken signal. It is done internally without in the knowledge of user.
5. **Speech Generation:** Speech generation is generation of a sound wave from each unit. In this final step the output of previous step is taken asinput and generate sound wave from using various modulation techniques internally. Developer has nothing to do in modulation part.

Fig.1.-Text-To-Speech Conversion Process

1. Implementation of Text-to-Speech (Application specific)

Initialize TextToSpeech: First step is to initialize an object of TextToSpeech abstract class present in „android.speech.tts" package. This object take two parameters first, instance of its own class and second, instance of OnInitListner class which is an inner class.

2. Initialize OnInitListner [6] :

In constructor TextToSpeech we have to initialize the instance of OnInitListner and override onInit methodof Text To Speech.On In it Listner in the parameter.Override onInit () method of TextToSpeech class. In this listener, one can define various properties for TextToSpeech object, such as its language, pitch etc. Inside the method definition of onInit(), if the size of object of TextToSpeech engine is zero it means TTS is unavailable. Because as mention earlier TTS engine holds the converted tokens or list of words. If its value is zero means it holds no value.

3. Checking size of TTS engine:

When the TTS engine is checked for its value and if it have zero then TTS will not be load.And if size of TTS engine is not equal to 0 then we have to set a language for speech synthesis.

4. List of languages available in Android TTS are:-

Provide feature of listening back the typed message.
Read out aloud all the unseen messages to the user.

- Locale.ENGLISH[5]
- Locale.US[5]
- Locale.CANADA[5]
- Locale.CANADA_FRENCH[5]
- Locale.CHINA[5]
- Locale.GERMAN[5]
- Locale.GERMANY[5]
- Locale.ITALIAN[5]
- Locale.ITALY[5]
- Locale.JAPANESE[5]
- Locale.KOREA[5]
- Locale.KOREAN[5]
- Locale.PRC[5]
- Locale.ROOT[5]
- Locale.TAIWAN[5]
- Locale.UK[5]

4. Calling Speak (): In this method, we have to define the method by providing some parameters one of them is "Message" that we want to Spoke out. Second, is the TextToSpeech.QUEUE_FLUSH is a constant which remove all the garbage value which might come during the whole speech synthesis process.

5. Merits

1. Provide flexibility.
2. Time and efforts saving.
3. Correct pronunciation word.
4. It helps in communicate very easily.
5. [3]Also helps blind people, physically challenged people to freely use the application.Provide feature of listening back the typed message.
6. Read out aloud all the unseen messages to the user.

6. Demerits

1. Facing Difficulty in phonetic conversion.
2. Sometime accent is unable to understand by user.

REFERENCES

[1]. A Review: Text To Speech Conversion International Journal of Science and Research (IJSR), ISSN (Online): 2319-7064,Impact Factor (2012): 3.358
[2]. Arduino Based Voice Generator Text to Speech Robot International Journal of Trend in Scientific Research and Development (IJTSRD) Volume 3 Issue 5, August 2019 Available Online: www.ijtsrd.com e-ISSN: 2456 − 6470
[3]. The Benefits of Text to Speech (TTS) https://www.readspeaker.com/learn-more/benefit s-of-text-to-speech/
[4]. TTS https://www.computerhope.com/jargon/t/tts.htm
[5]. Text To Speech https://developer.android.com/reference/android/ speech/tts/Text To Speech
[6]. OnInitListener https://stackoverflow.com/