

Text to Speech Conversion with Language Translator under Android Environment

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Abstract—

The fast development of android application in market results in the attraction of number of users toward the android devices. Text to speech conversion with language translator is one of major natural language processing and translating application. The whole work is performed on the android platform and lookup table and voice conversion libraries provided by the android environment. The work is defined in various main aspects. First aspect is to convert the English text to English speech. Second work is the regional language to speech conversion. Third work is to translate the text from one national language to another while maintaining the original data format. The another significant aspect is the integration of the presented system on android environment. The android platform used in various mobile devices so this application can be attached to a mobile phone/ tablets or the system so that reliable communication will be performed between two parties. In this work the input text is splitted to the individual words and classification of the work is done. After that identify the phonetic equivalent of the individual words and connect it with the lookup library to identify the voice representation of that specific word. Moreover the text from one regional language is translate to another regional language text with voice representation.

Keywords—TTS, NLP, Lookup library, Aspects, Database

I. INTRODUCTION

Text to Speech conversion with language translator is performed on android platform. It is one of the major applications of Natural Language Processing (NLP). The NLP module contains various blocks: preprocessor, text analyzer, morphological analyzer, contextual analyzer, syntactic prosodic parser, letter to sound module and prosody generator [1]-[3]. The text Analyzer comprises pre-processing module which organizes the input sentences into manageable lists of words and identifies numbers, abbreviations, idiomatic and acronyms and transformed them into full text when needed. A morphological analyzer aims to propose all the part of speech categories for each individual word. It reads the inflected surface form of each word in a text and provides its lexical form as it make use of lexicon. It contains the assignment of grammatical information to grammatical categories and lexical information to a particular lexeme. The inflected form of a word contains free and bound morpheme. The contextual analyzer examine the context information and also able to reduce the possible part of speech by removing those does not match with the context. Syntactic praser examines the text structure which is closely relates to its expected prosodic realization. The letter-to-sound module aims to convert input letters into phonetic code that will be added with prosody information by make use of the prosody generator module. Prosody information includes intonation and rhythm which is necessary to make the resulting speech sounds natural [4]-[9]. Multilingual dictionary system designed as help system for human translator and its purpose is to make the convenient use of dictionaries. The dictionary is considered as a required tool in the process of translation. The research work describes the working model of speech synthesizer [6], [10] for English language as well as for other regional languages with language translation and make use of English speech database for android mobiles. We need a library of English text to its phoneme equivalent which is required for the implementation of work. There are number of such libraries available online. The TTS conversion with language translation is implemented for the mobile on android environment [11]. It is Natural Language Processing module that provides easy communication for the person who cannot speak but can communicate verbally and for the person who cannot understand other regional languages can choose the language manually while making conversion of text to speech by using this application. TTS conversion with language translator [12] converts normal language text into artificial production of human speech. This work converts the written text form to a phonemic representation and after that converts the phonemic representation to waveforms that can be output as intonation sound. NLP is an area of human-computer interaction which enable computers to understand and manipulate natural(human) language text or speech. An android is a open source operating system (OS) based on linux kernel and developed by Google is one of the most popular OS used to develop mobile application.

II. PROPOSED WORK

A) ALGORITHM FOR ENGLISH TEXT TO ENGLISH SPEECH CONVERSION

The flow chart shows the basic flow of work for English text to English speech conversion. By getting start, get the input text in the English language. After getting the text in English, the operation to be performed is the separation of the

English words from the text. Then perform the library lookup to get the phonetic equivalent of the text and arrange these entire phonetic equivalents in a series respective to text. After that the speech synthesis is performed and the speech quality is maintained. Implemented the application in android environment and check the robustness of the implementation. The work is done on android platform using android 4.4 version. The application is defined in terms of flowchart given as:

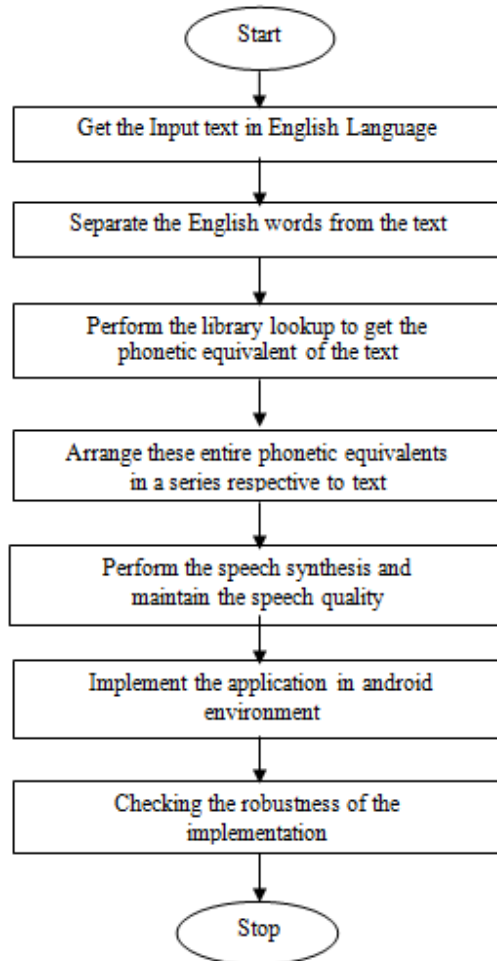


Fig. 1: Basic flow of work

B) ALGORITHM FOR HINDI TEXT TO HINDI SPEECH CONVERSION

The presented work is performed as a two layer process to resolve the problem of sound equivalent for half words..The rule based technology is used in this research work. The rule-based synthesizer creates rules that formally describe the influence of phonemes on one another. By getting start, get the input text in Hindi language. This Hindi text is converted to token. The whole data is mapped into English language. After getting the text in English language, separate the English words from the text. Then perform the library lookup to get the phonetic equivalent of the text. The entire phonetic equivalents are arranged in a series respective to text. After that the speech synthesis is performed and the speech quality is maintained. The information includes intonation and rhythm which is necessary to make the resulting speech sounds natural. The application is implemented in the android environment. The robustness of the implementation can be checked. This is the flow of the work for Hindi text to Hindi speech conversion for mobile devices.

C) ALGORITHM FOR FRENCH TEXT TO FRENCH SPEECH CONVERSION

The presented work is performed as a two layer process.By getting start, get the input text in French language. The French text is converted to token. The whole data is mapped into English language and then separate the English words from the text. Once, the separation of words is done, perform the library lookup to get the phonetic equivalent of the text. The entire phonetic equivalents are arranged in a series respective to text. After that the speech synthesis is performed and the speech quality is maintained. The application is implemented in the android platform. The robustness of the implementation can be checked. This is the basic flow of the work for French text to French speech conversion for mobile devices.

D) ALGORITHM FOR GERMAN TEXT TO GERMAN SPEECH CONVERSION

The presented work is performed as a two layer process. By getting start, get the input text in German language.The German text is converted to token. The whole data is mapped into English language and then separate the English words from the text. Once, the separation of words is done, perform the library lookup to get the phonetic equivalent of the text.

The entire phonetic equivalents are arranged in a series respective to text. After that the speech synthesis is performed and the speech quality is maintained. Implement the application in the android platform and check the robustness of the implementation. This is the basic flow of the work for German text to German speech conversion for mobile devices. The whole work is implemented on android 4.2 version.

E) ALGORITHM FOR TEXT TO SPEECH CONVERSION WITH LANGUAGE TRANSLATOR

The Language Translator work done by Microsoft Translator API. It is a cloud-based translation system. Built for business, Microsoft Translator is a proven, customizable, and scalable solution for automatic translation. To start using the Translator API follow these steps:

- i) Sign up for Microsoft Translator.
- ii) Register you applications and Create your credentials.
- iii) Develop your application .
- iv) Obtain your access token & use.

III. RESULTS

A) ENGLISH TEXT TO ENGLISH SPEECH CONVERSION

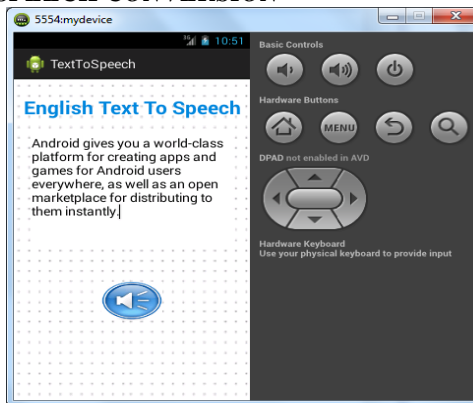


Fig. 2: English text to English speech conversion

B) HINDI TEXT TO HINDI SPEECH CONVERSION

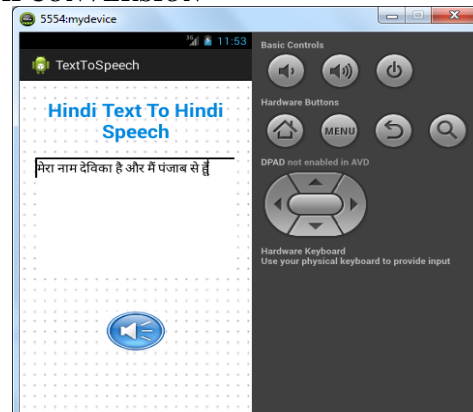


Fig. 3: Hindi Text to Hindi speech conversion

C) FRENCH TEXT TO FRENCH SPEECH CONVERSION

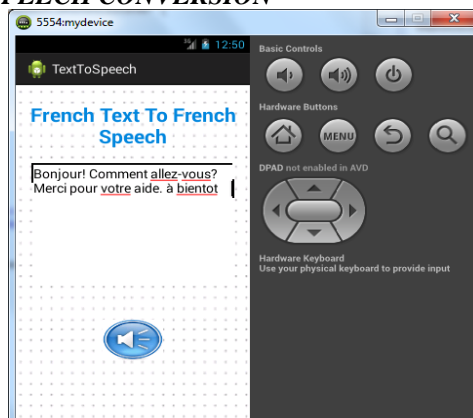


Fig. 4: French text to French speech conversion

D) GERMAN TEXT TO GERMAN SPEECH CONVERSION

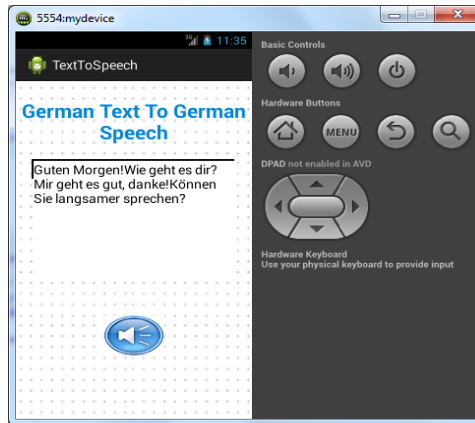


Fig. 5: German text to German speech conversion

E) TEXT TO SPEECH CONVERSION WITH LANGUAGE TRANSLATOR



Fig. 6: Text to speech conversion with language translator

1) ENGLISH TEXT TO FRENCH SPEECH CONVERSION:

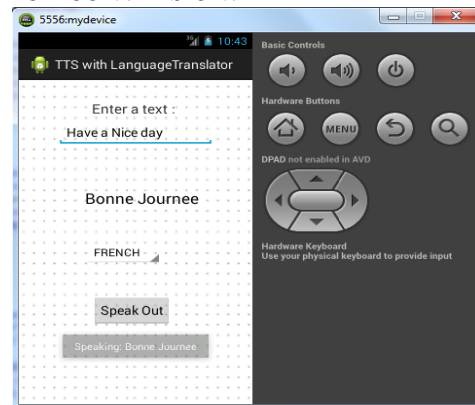


Fig. 7: English text to French speech conversion

2) ENGLISH TEXT TO GERMAN SPEECH CONVERSION:

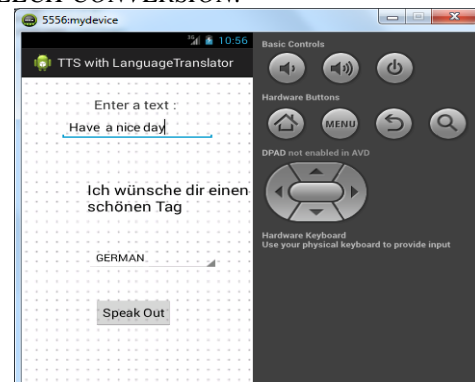


Fig. 8: English text to German speech conversion

IV. CONCLUSION

In this research work, the text to speech conversion with language translator shows the effective result. The Language Translator work done by Microsoft Translator API. The voice is audible with punctuation ambiguity and paragraphs. The rule based technology and cloud-based translation system is used in this research work for the generation of overall signal. Rule-based synthesizer creates rules that formally describe the influence of phonemes on one another. The work is performed as a two layer process to resolve the problem of sound equivalent for half words. It is also useful for blind person to hear the document after text is getting converted to speech. If a person is not able to understand other national languages then using this application a person can choose the language manually and will not only be able to hear but also read the translated text. These are some advantages of the work but there are also some limitations exists. The audible system is voice dependent. The output speech is same for every person. Current speech recognition API's are only capable of recognizing a single word. This will enhance the speech recognition to recognize sentences. The time required for communication between the caller and the receiver will be less by making use of two voice modem at the server side. A homophone is a word whose pronunciation is the same but distinct in meaning (example Idle, Idol). The speech recognition engine detect those words according to the sentence. A person can also understand a sentence if it is pronounced correctly. The text to speech conversion has been done for the English, Hindi, French, German language alongwith language translator for one who cannot understand other national languages can choose the language manually. The person can not only able to hear the translated text but also can read the translated text. This work can also be done for the other Indian regional and other national languages.

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