

# SPEECH GENERATION OF TRANSLITERATED HINDI TEXT

Snehali K.Nandurkar<sup>1</sup>, Zakir M.Shaikh<sup>2</sup>

<sup>1</sup>M.E (CSE)\*, Assistant Professor in Department of Computer Science & Engineering

<sup>2</sup>Assistant Professor in Department of Computer Science & Engineering

Nagesh Karajagi Orchid College of Engg. & Technology  
Solapur, Maharashtra, India

## ABSTRACT

*Text to Speech Conversion System is basically used for converting text into equivalent speech. Research is going on to produce more natural speech. A lot of work is already done in developing English Text to Speech system. In this paper we are explaining method to perform transliteration from Hindi to English and vice versa and simple approach to improve voice quality Hindi Text to Speech System. We are considering two types of input. In first method User can manually enter any text in Hindi language by using English characters (i.e. using transliteration). In Second method user can browse any text file written in Hindi (Devnagari Script). Single .mp3 sound file will be generated as an output which represents speech equivalent to the given text. As in Hindi and Marathi language most of the vowels, consonants are same (except some letter's pronunciation), so proposed solution can also be used to generate Marathi text to speech system and transliteration.*

**Keywords:** Text to Speech, Transliteration, Hindi Barahkhadi, Devnagari.

## 1. INTRODUCTION

Text to Speech synthesis is developing technology which has been used in many real applications. Existing text to speech technology produces speech but quality of speech is not so natural. It is much like robotic speech. Research is going on in developing natural, fluent speech. There is still a long way to reach the goal. Compared to Indian Languages more work is done in foreign languages related to text to speech conversion. However researchers are now concentrating on certain areas like prosodic, text preprocessing and pronunciation in order to produce natural and pleasant speech, improve voice quality and linguistic analysis. Hindi Language is used by more than 400 million people across the world .As there is a need to research in text to speech synthesis for Hindi Language, we are proposing a solution to improve the quality of Text to Speech System so that it will produce more fluent, natural Hindi speech sound. This can be helpful for people who cannot read Hindi language, vision disable person etc.

## 2. LITERATURE REVIEW

Paul Taylor, Alan W Black, Richard Caley described a new method for storing linguistic data in a text to Speech system. Linguistic entities such as words and phones are stored as feature structures in a general object called a linguistic item. Items are configurable at run time and via the feature structure can contain arbitrary information. Linguistic relations are used to store the relationship between items of the same linguistic type. Relations can take any graph structure but are commonly trees or lists. Utterance structures contain all the items and relations contained in a single utterance [1]. Deepa S.R., Kalika Bali , A.G. Ramakrishnan, Partha Pratim Talukdar addresses the problem of Hindi compound word splitting and its relevance to developing a good quality phonetizer for Hindi Speech Synthesis. The constituents of a Hindi compound word are not separated by space or hyphen. Hence, most of the existing compound splitting algorithms cannot be applied to Hindi. They propose a new technique for automatic extraction of compound words from Hindi corpus [2]. N. Sridhar Krishna, Partha Pratim Talukdar, Kalika Bali, A.G. Rama Krishnan reports preliminary results of data-driven modeling of segmental (phoneme) duration for Hindi .They have presented Classification and Regression Tree (CART) based data-driven duration modeling for segmental duration prediction[3] . Lakshmi Sahu and Avinash Dhole explained single text-to-speech (TTS) system for Indian languages (Viz., Hindi, Telugu, Kannada etc.) to generate human voice or speech (text to a spoken waveform). In a text-to-speech system, spoken utterances are automatically generated from text. They present a corpus-driven text-to-speech (TTS) system based on the concatenative synthesis approach [4]. M. Habibullah Pagarkar, Lakshmi Gopala krishnan, Nimish Sheth proposed a method to develop a complete speech compression system using Devanagari script [5].

### 3. METHODOLOGY

The working of the proposed system is as follows:

- 1) Record Hindi barakhadi (all vowels, consonants), most commonly occurring words in .wav form. Recording can be done by using a microphone. We can record all barakhadi in single .wav files by giving some stop while speaking two letters and two words. Then we have cut all files using Sound forge software. There are many softwares available that can cut the sound file into multiple files by detecting the gaps between two wav files. We can also stores words that are most commonly used in Hindi. For testing purpose we have recorded 1000 words.
- 2) Store all .wav sound files in one folder.
- 3) Input text file written in Hindi devnagari script. We can also enter any text in textbox that we want to listen.
- 4) Tokenize text into letters in Hindi and map letter to sound.
- 5) We have used the concatenation approach for developing text to speech. Normally when we read any paragraph or sentences there is a very small gap between two words. It is in milliseconds. We have played Space file when gap between two words is detected .This approach will improve the Hindi text to Speech System.

#### 3.1 Hindi Text To Speech Conversion Logic

To give input through textbox, user will enter Hindi text but written using English letters so Transliteration engine is required so that it can convert English characters to corresponding Hindi characters (not translation). So if the input is "meraa" output should show "मेरा" i.e. it will not check any semantic meaning of "meraa". We have used two String tables, one table contains Hindi letters, and other table contains equivalent English text. We have recorded Hindi barakhadi, and most probable words in Hindi and saved every letter, word separately. English letters are used for naming stored files, so if the user types any Hindi letter or word using English text we can simply concatenate the speech files with the name to get a final output. For example if user types 'स', its English equivalent is 'S'. So we have a speech file by name 's.wav' which will be played when 'स' is to be pronounced.

#### 3.2 Form Design

The screenshot shows a software interface for Hindi text-to-speech conversion. It features an 'English Text Box' where the user enters text like 'meraa naam raanii hai'. A 'Convert to Hindi Equivalent' button is positioned below this box. The result is shown in a 'Hindi Text Box' as 'मेरा नाम रानी है'. To the right, there is a 'Segmented English Words' box displaying the text broken down into individual words: 'me raa', 'naa m', 'raa nii', and 'hai'. A 'Speak' button is located at the bottom right of the interface.

**Figure 1** Screenshot of Form design

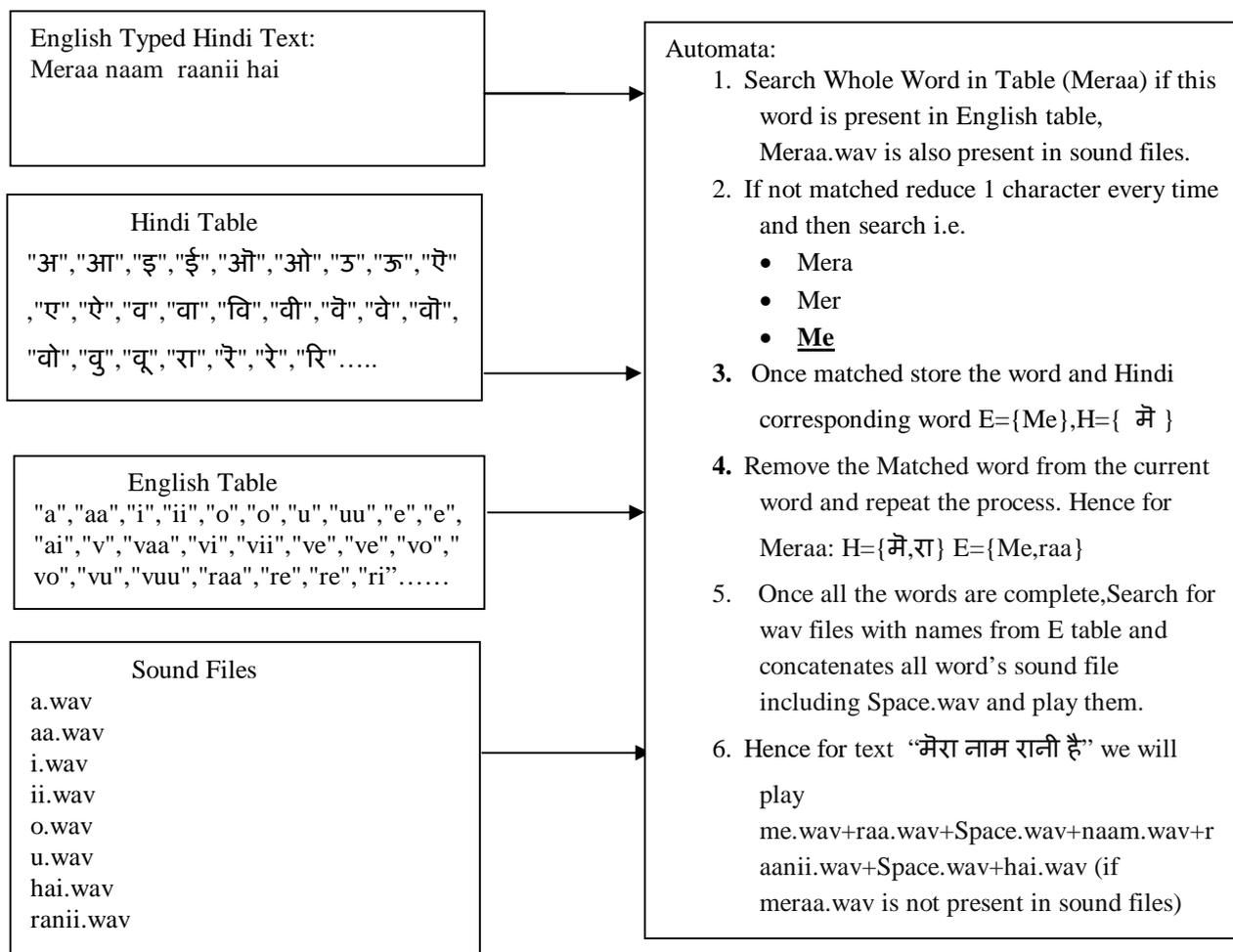
As shown in above figure, User needs to type Hindi words using English letters (i.e. transliteration). For example “मेरा नाम रानी है” should be written as “Meraa naam raanii hai”. Now first using the transliteration table given below, it will

convert the English text to Hindi text (Devnagari script) and should display “मेरा नाम रानी है”. Now it is role of the Speech system to synthesis the text. While the transliteration is performed, the system creates a table of transliteration.

**Table1** Transliteration Table

मे	Me
रा	raa
ना	naa
म	m
र	raa
नी	nii
है	hai

We have created sound files and stored them by the name of English letters of the table i.e. a.wav, aa.wav, au.wav and so on. Once the above table is ready, system concatenates the appropriate wav files sequentially and play it as speech file. Figure below gives an overview of how speech is generated when we give input in Hindi language using English characters.



**Figure 2** Working of Hindi transliteration and Text to Speech for given example

**4. CONCLUSION**

This paper explains a simple approach to perform transliteration (i.e. Hindi to English character mapping) and vice-versa and generates speech from Hindi text. This work can be extended to read a Hindi pdf file written in devnagari

script .To support Marathi text to speech some letter's pronunciation required to change (e.g. 'जा', 'चा', '□□□',.....) and some additional letters ('□,....') and Marathi words required to store in the dataset.

#### **REFERENCES**

- [1] Paultaylor, Alan W Black, Richard Caley, "THE architecture of the festival speech synthesis".
- [2] Deepa S.R., KalikaBali , A.G. Ramakrishnan, Partha Pratim Talukdar, A.G. Ramakrishnan "Tools for the development of a Hindi speech synthesis system",5th ISCA Speech Synthesis Workshop – Pittsburg.
- [3] N. Sridhar Krishna, Partha Pratim Talukdar, Kalika Bali, A.G. Ramakrishnan , "Duration Modeling for Hindi Text-to-Speech Synthesis System".
- [4] Lakshmi Sahu and Avinash Dhole, "Hindi & Telugu Text-to-Speech Synthesis (TTS) and inter-language text Conversion",International Journal of Scientific and Research Publications, Volume 2, Issue 4, April 2012, ISSN 2250-3153
- [5] M. Habibullah Pagarkar, Lakshmi Gopalakrishnan, Nimish Sheth, Rizwana Shaikh, Virag Shah "Language Independent Speech Compression using Devanagari Phonetics" , cs.jhu.edu. 2002