Speech Recognition for Physically Challengeable Using Sonogram Techniques

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ABSTRACT: The main objective of this project is to identify the tamil vowels (a,aaa,e,eee,u,uuu) or words speak by different aged persons. It can be done using Haar wavelet, by various decomposition levels the mean and standard deviation is obtained by simulating the various vowels in .wav file. The mean and standard deviation values are plotted as graph by using microsoft excel and the tamil vowels or words are identified by using that values.

The simulation results obtained for the following age groups in various decomposition levels.

- The age group between 11 to 12.
- The age group between 23 to 24.
- The age group between 50 to 60.

I. ANALYSIS OF TAMIL VOWELS USING MATLAB

MATLAB is a numerical computing environment programming language. The sound can be visualized and analyzed in several ways with the help of this tool. The basic document we work with is sound files of 3 male and 3 female speakers with letters 'a','aaa','e','eee','u','uuu' fo different age people.The standard speech analysis of the letter 'a' such as Waveform and statistical value such as mean and standard deviation are analyzed and the samples are shown in following figures.
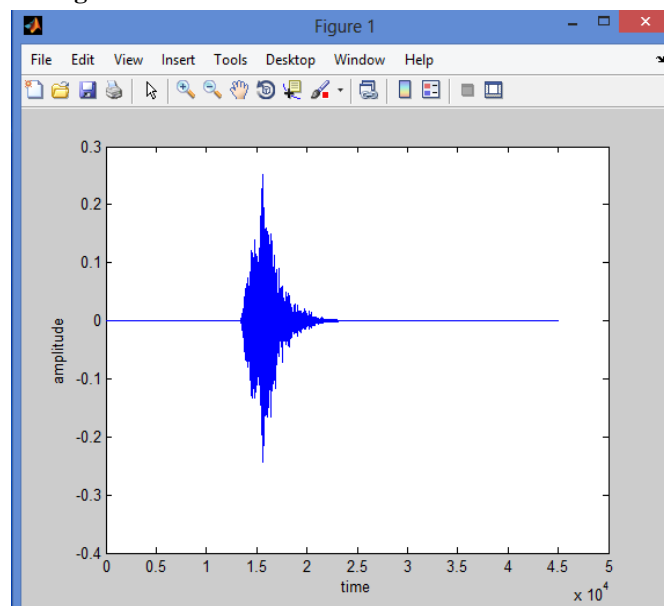
Stimulated Waveforms for the Age 11-12

Fig. 1 Input Waveform Image for Letter 'a' of Age Person (11-12)

The figures show 'a' letter simulationfigures of male person, the input signal is given as .wav file and the wave is read to produce input waveform
The input waveform of letter 'a'

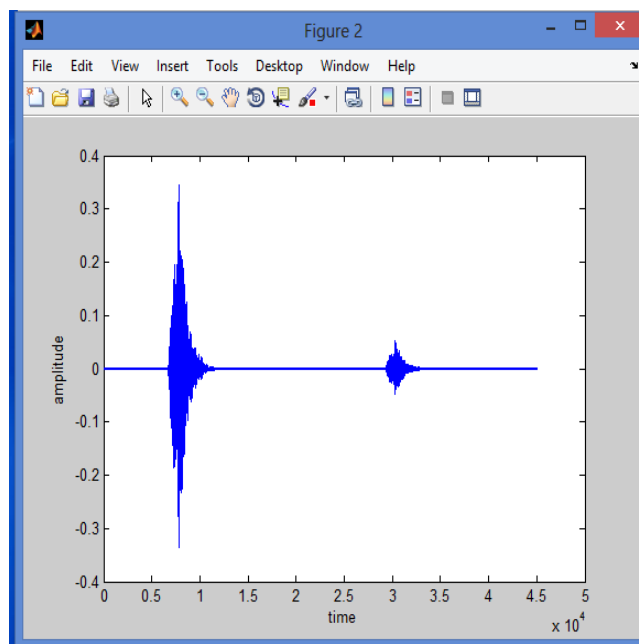The first decomposition level of the input waveform

Fig. 2 First Decomposition Waveform for Letter 'a' of Age Person (11-12)

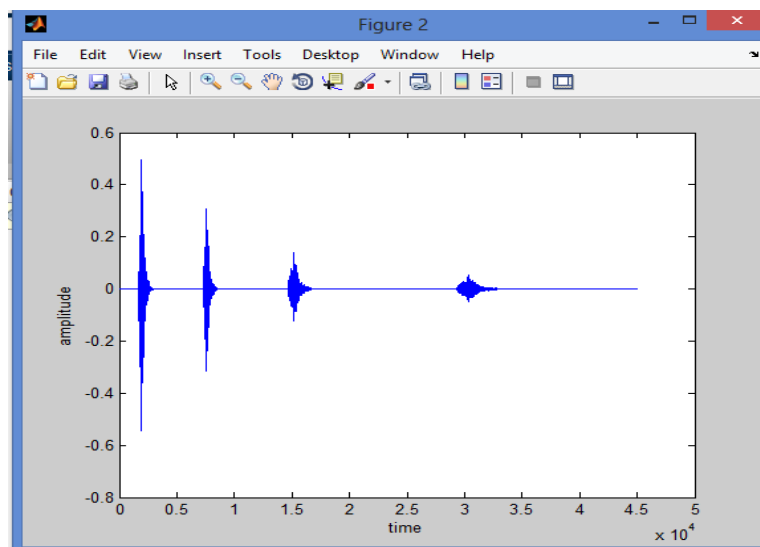The third decomposition level of the input waveform

Fig. 3 Third Decomposition Waveform for Letter 'a' of Age Person (11-12)

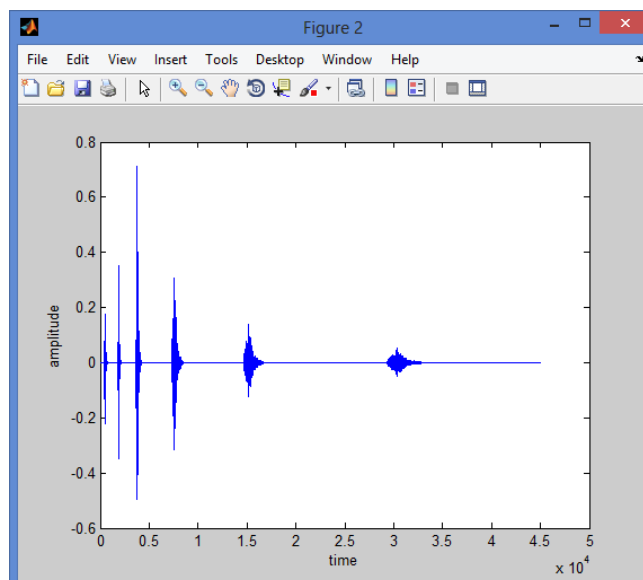The fifth decomposition level of the input waveform

Fig. 4 Fifth Decomposition Waveform for Letter 'a' of Age Person (11-12)

Stimulated Waveforms for the Age 50-60

The figures show 'a' letter simulation figures of male person, the input signal is given as .wav file and the wave is read to produce input waveform
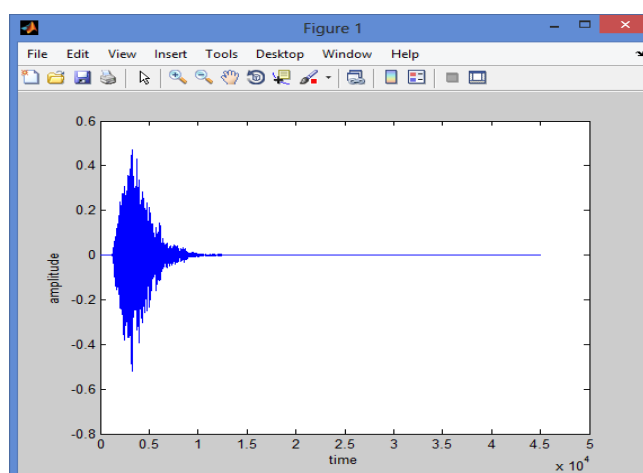
The input waveform of letter 'a'

Fig. 5 Input Waveform Image for Letter 'a' of Age Person (50-60)

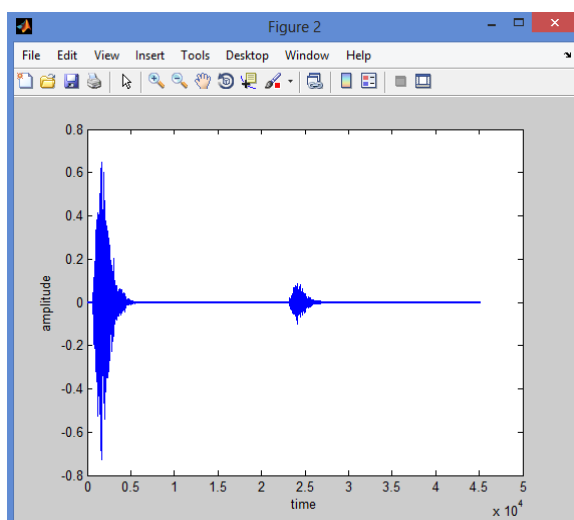The first decomposition level of the input waveform

Fig. 6 First Decomposition Waveform for Letter 'a' of Age Person (50-60)

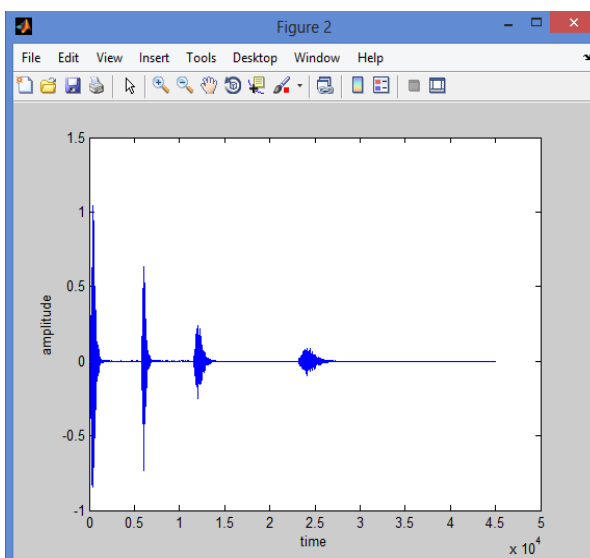The third decomposition level of the input waveform

Fig. 7 Third Decomposition Waveform for Letter 'a' of Age Person (50-60)

The fifth decomposition level of the input waveform

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(An ISO 3297: 2007 Certified Organization)
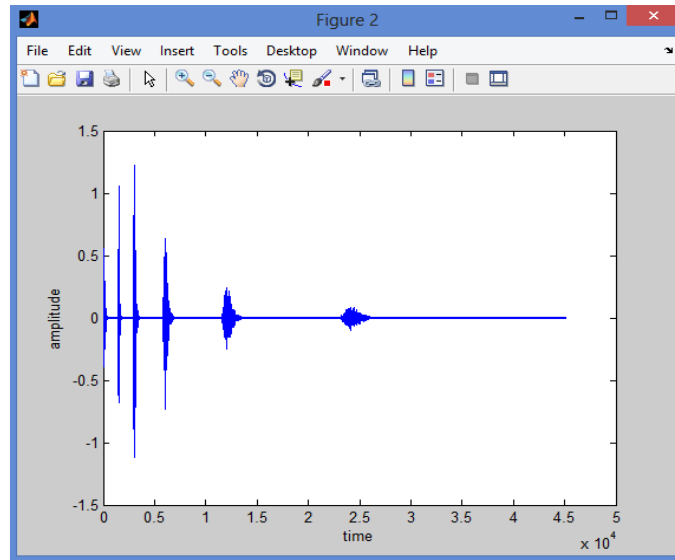
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Fig. 8 Fifth Decomposition Waveform for Letter 'a' of Age Person (50-60)

II. MEAN AND STANDARD DEVIATION GRAPHS FOR DIFFERENT LETTERS

The analyzed mean and standard deviation is tabulated for tamil vowels 'a', 'aaa', 'e', 'eee', 'u', 'uuu' for different decomposition level and the graph is plotted by using Microsoft excel.The mean and standard deviation is same for different decomposition level of the same letter.

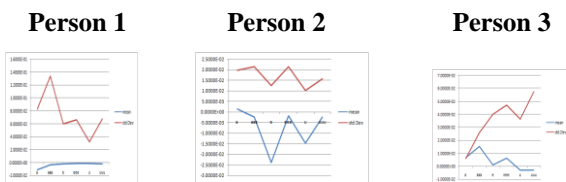**Mean and Standard Deviation Graphs for Different Aged Persons**
MALE (11-12)

Fig. 9 Mean and Standard Deviation Graph for the Male Person of (11-12)

FEMALE (11-12)

Fig. 10 Mean and Standard Deviation Graph for the Female Persons of (11-12)

MALE (23-24)

Person 1 **Person 2** **Person 3**

Fig. 11 Mean and Standard Deviation Graph for the Male Persons of (23-24)

FEMALE (23-24)

Person 1 **Person 2** **Person 3**

Fig. 12 Mean and Standard Deviation Graph for the Female Persons of (23-24)

MALE (50-60)

Person 1 **Person 2** **Person 3**

Fig. 13 Mean and Standard Deviation Graph for the Male Persons of (50-60)

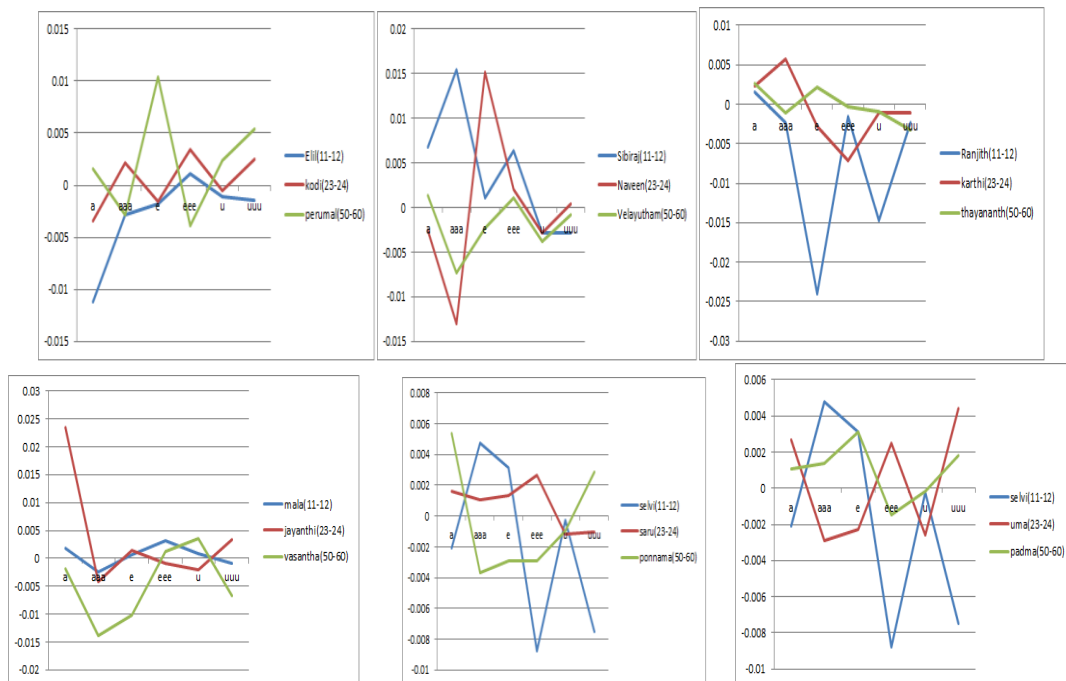## III. COMPARISION MEAN GRAPHS FOR ALL AGE GROUP PERSON

Fig. 15 Compared Mean Graphs for the Different Aged Persons

The fig 15 show the mean graphs for different aged persons between 11 to 12, 23 to 24 and 50 to 60.
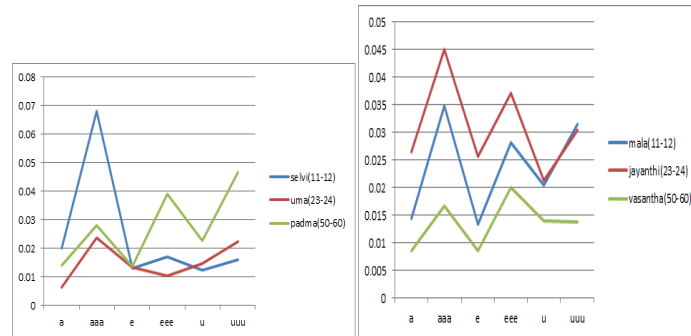
Fig. 16 Compared Standard Deviation Graphs for Different Aged Persons

The fig 16 show the Standard Deviation graph for different aged persons between 11 to 12, 23 to 24 and 50 to 60.

IV. CONCLUSION

 The decomposition of speech signals through Haar wavelet is very efficient compared to other wavelet techniques such as Daubechies, Coiflet, Symlet, Meyer . In this work the normal speech is analyzed for the age group of 11-12, 23-24 and 50-60 for some Tamil vowels such as 'a','aaa','e','eee','u','uuu'. By analyzing the speech signals the parameter's mean and standard deviation of the various Tamil vowels are calculated by using MATLAB Then the parameters are tabulated and plotted.

From the graph the mean and standard deviation values are between some specific ranges based on the age groups. Further these values will be used for identifying the various vowels of Non-Audible Murmuring(NAM) and recognitionzation of words will be done for the same. In Future, the normal person's speech is to be implemented using Stellar is hardware and various parameters such as mean and standard deviation are compared with (NAM) speech signals and without the knowledge of English also it it can be used in web browsing of converting speech to text in Tamil.

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