HOST

(Hierarchy Of Speech Targets)

Software Manual

1. Program Description

HOST (Hierarchy Of Speech Targets) is a universal open-source software which can be used remotely in telemedicine that will allow diagnosis of speech impaired children all around the world. Especially, in remote location where speech-language pathologists are not available, children born with Cleft Palate who are underserved in the rural area.

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2. Program Requirements

HOST (Hierarchy Of Speech Targets) software is developed in python 3 platform with tkinter, panda, numpy, openpyxl and other packages. The beta version (v1.0) requires Windows 7 to 11, with 2GB RAM (4GB preferable).
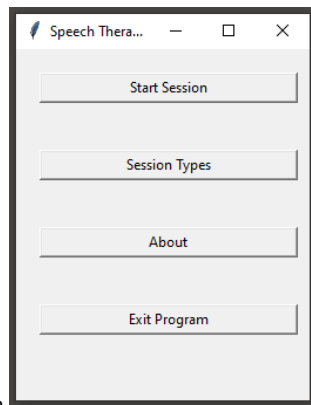
3. Installation

The software is sent in whole package as a zip file. Therefore, no installation is necessary. The user may use the software by only clicking the software (.exe file).

Alternatively, the software can be used with a shortcut which may be convenient to the user.
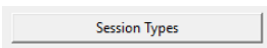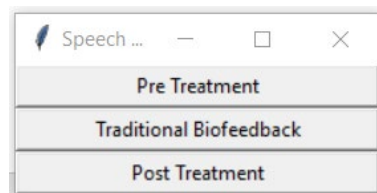
4. Starting the program:
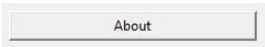

1. Double-Click on the icon   to start the program.
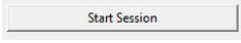

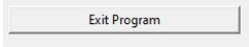2. The Start-Screen   will appear.

3. Button session type   shows the options for the sessions.

4. Button About   shows the description and developer information of
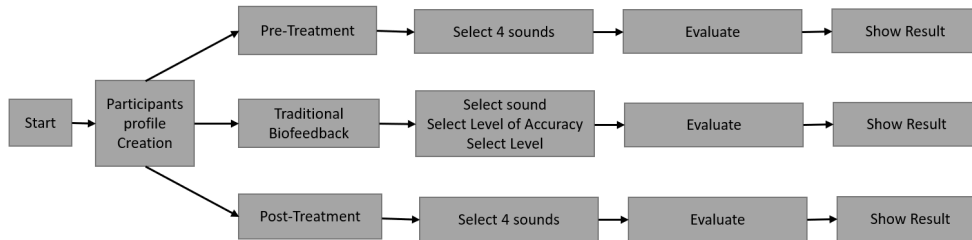
   the software.

5. Button Start Session **Start Session** starts the program.

6. Button Exit Program **Exit Program** exits the program.

5. Software Flowchart:

The software is a complex web of logics meticulously crafted to evaluate the speech profile of a participant. The simplest flowchart of the software is shown below:
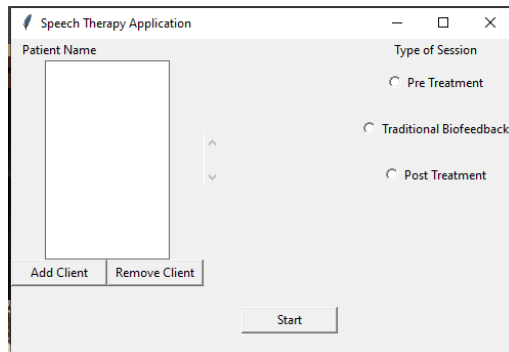
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                    ┌──────────────┐     ┌───────────────┐     ┌───────────┐     ┌──────────────┐
                    │ Pre-Treatment│ ──> │ Select 4 sounds│ ──>│  Evaluate │ ──> │ Show Result │
                    └──────────────┘     └───────────────┘     └───────────┘     └──────────────┘

┌───────┐   ┌──────────────┐  ┌──────────────┐   ┌─────────────────────────┐   ┌───────────┐     ┌──────────────┐
│ Start │──>│ Participants │─>│  Traditional │──>│      Select sound       │──>│  Evaluate │ ──> │ Show Result │
└───────┘   │   profile    │  │  Biofeedback │   │ Select Level of Accuracy│   └───────────┘     └──────────────┘
            │   Creation   │  └──────────────┘   │      Select Level       │
            └──────────────┘                     └─────────────────────────┘

                    ┌──────────────┐     ┌───────────────┐     ┌───────────┐     ┌──────────────┐
                    │Post-Treatment│ ──> │ Select 4 sounds│ ──>│  Evaluate │ ──> │ Show Result │
                    └──────────────┘     └───────────────┘     └───────────┘     └──────────────┘
```

Pre-Treatment: Assessment of the participant before the traditional biofeedback evaluation

Traditional Biofeedback: Traditional biofeedback evaluation process incorporates sound level, syllable level, word level, phrase level and sentence level prompts for evaluation of the participants.

Post-Treatment: Assessment of the participant after the traditional biofeedback evaluation
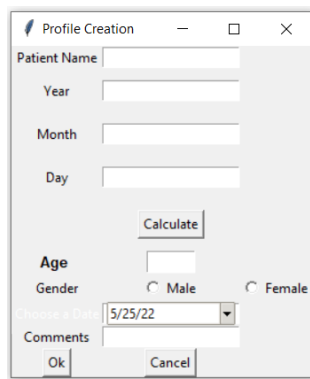
6.   *Profile Creation:*

User profile is created using the window below. After the program starts, this window will appear to enlist the participant.
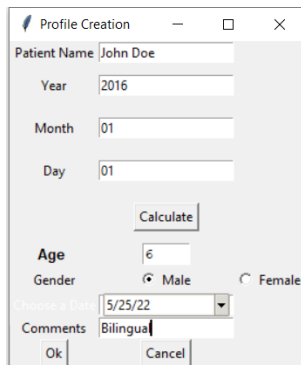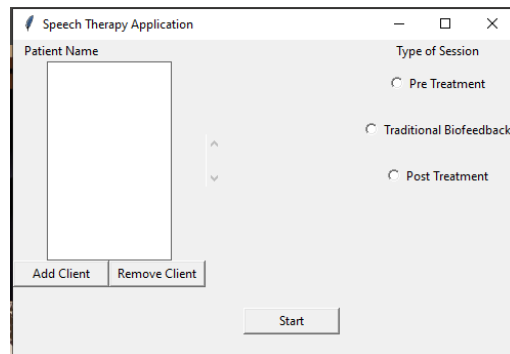

6.1 Add Client:

Pressing the OK button includes the name of the participant in the list box.
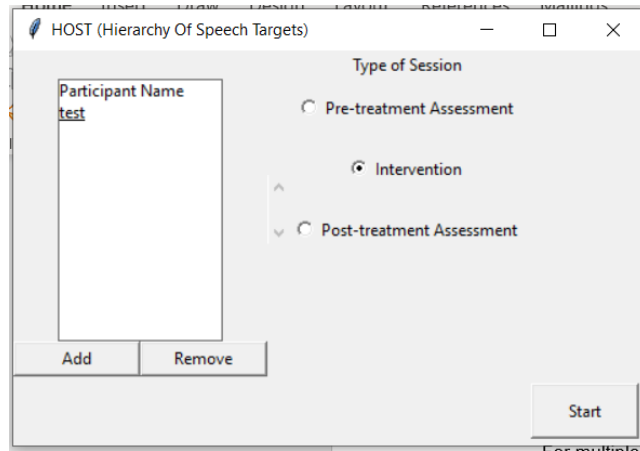
Increasing number of participants will additionally show a scroll bar to access the participant.

6.2 Remove Client:
Selecting a participant and clicking the remove client button removes the entire profile of the participant.
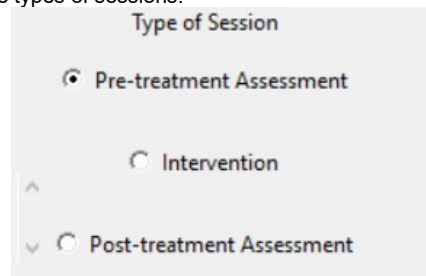

6.3 Multiple Visit:
For multiple visits, the user do not need to create profiles for the same participants. Just clicking on the name of the participant will allow the user to conduct the study with further input.

6.4 Types of Session:
The radio buttons include the types of sessions.

6.5 Saving the Data:

When the user adds a participant, a folder is created with the first visit as visit 0. The program also creates 3 separate excel files automatically, each with individual info. 'Database_subjects.xlsx' saves the patients coming to the evaluation process. Under the participant's name, 'Subject_name_database.xlsx' is created with the subject information. The 'Subject_name_database.xlsx' saves the visit information.
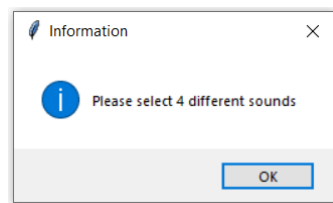
7. *Pre-Treatment:*

7.1. **Flowchart**: The pre-Treatment flowchart (simplified user version) is depicted below.
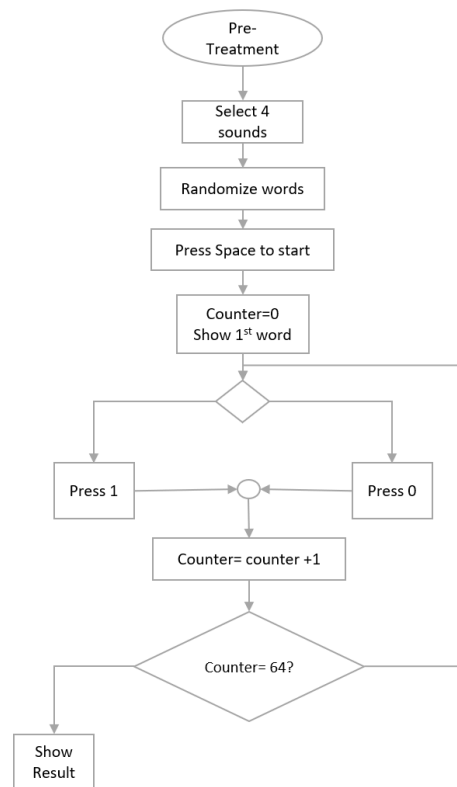
7.2. **Starting Pre-Treatment Session:**

Selecting the Pre-Treatment Radio button starts the pretreatment session.

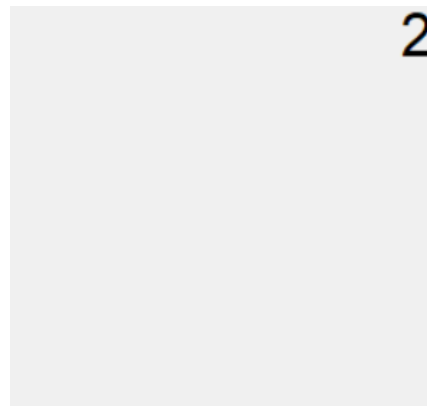Clicking the **start button** with the pretreatment option will prompt user to select 4 different sounds

from the check box window below:

-

The **Show Result** button will start the evaluation process.

7.3. Counter:

At the right top of the window, the counter will show the number of prompts.

Pressing '1' for 'Correct' and '0' for 'Incorrect' will be used for evaluation process.

This process selects 16 words of each sound with visual cues and shows all 64 sounds randomly. At the end of the evaluation process, the screen shows the user the result on the screen.

Pressing other buttons other than 1s and 0s will not change the evaluation process until the user presses the correct button.

7.4. Saving the data:

The evaluation data is saved in the 'visit 0' folder under the participant's name in the 'Speech Therapy Application' program of the software mother folder. The excel file named 'Pre-Treatment Assessment.xlsx' saves the assessment information.
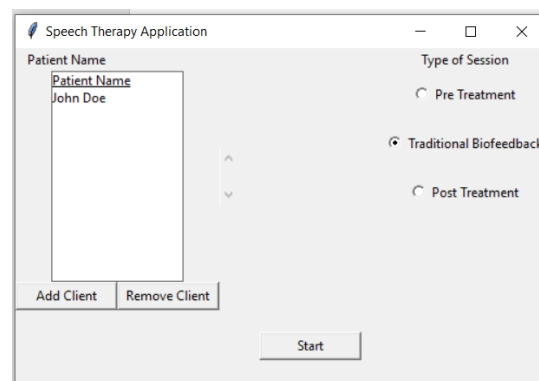
8. Traditional Biofeedback:

8.1. **Flowchart**: The Traditional BioFeeback flowchart (simplified user version) is depicted below.
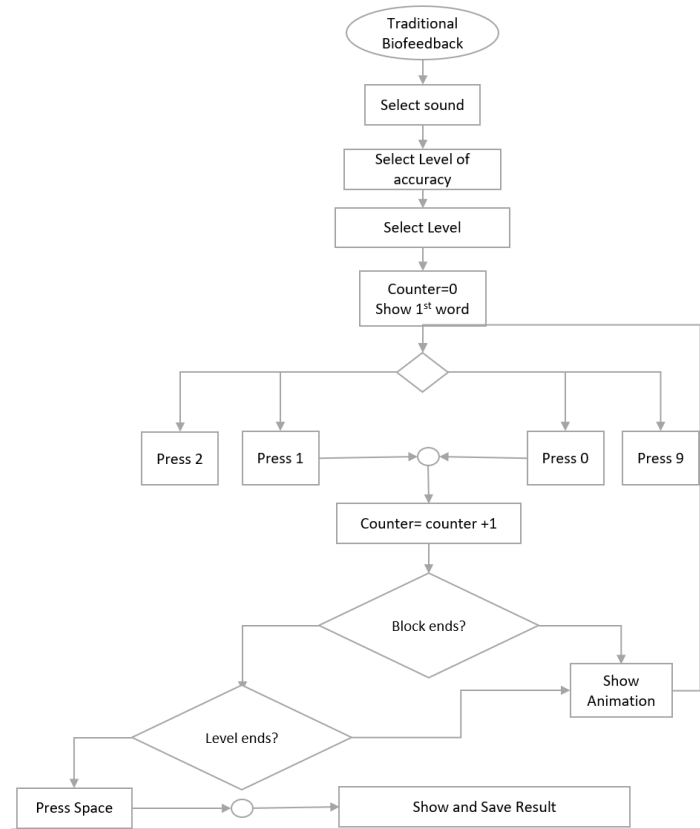
8.2. Starting Traditional Biofeedback Session:

Selecting the Pre-Treatment Radio button starts the pretreatment session.

Clicking the **Start** button with the Traditional Biofeedback option will prompt user to the window below:

The window includes the visit summary list box, Sounds, Vowel Context, Level of Accuracy and Level options.

For the first visit, the list box will show empty. Selecting a sound, selecting level of accuracy and putting level number and clicking the Show Result button starts the evaluation process.

Initially, the user will put level 1. However, it is up to the user from which level s/he wants to start the evaluation process.

8.3. Visual Feedback:

8.3.1.   Block and Level completion feedback:

An animation is shown after the participant completes a block or a level. This is to engage the participants.
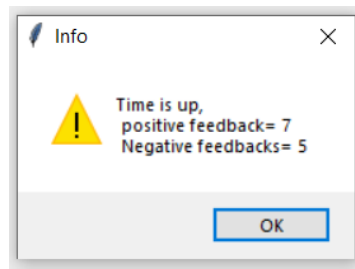
8.3.2. Word level feedback:

Words are also visually shown with cues.

8.4. Feedbacks:

Feedback	Response
Correct	1
Incorrect	0
Good Job	2
Needs to improve	9

The feedbacks will be shows at the end of the session on the screen.

Info   ✕

! Time is up,
positive feedback= 7
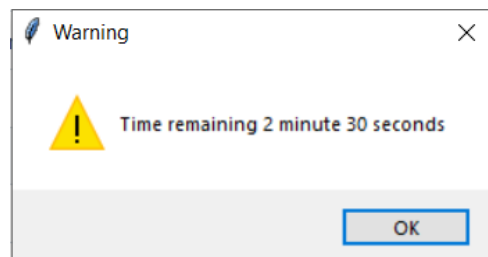Negative feedbacks= 5

OK

8.5. Counter:

At the right top of the window, the counter will show the number of prompt in the level.

8.6. Time Constrain:

The evaluation process will automatically shut down for that sound at 10 minutes. At 7 minutes.30 seconds, program prompts a warning message.

Warning   ✕

! Time remaining 2 minute 30 seconds

OK

After the window shuts down, the user can start again with the same sound or a different sound.

Info   ✕

! Time is up,
positive feedback= 7
Negative feedbacks= 5

OK
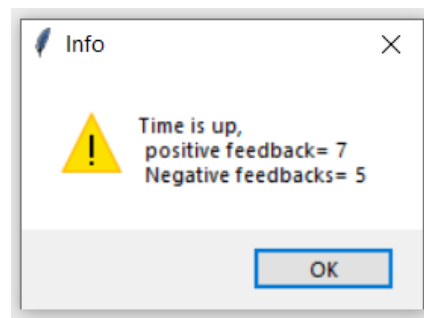
8.7. Saving the Data:

When the user selects a sound, the whole evaluation prompts for 150 levels are created and saved in result_X.xlsx file. For two individual sounds, two separate files (result1.xlsx and result_X.xlsx) will be created.

Each of these files will save the prompts, responses (1s and 0s) and feedbacks (2s and 9s).
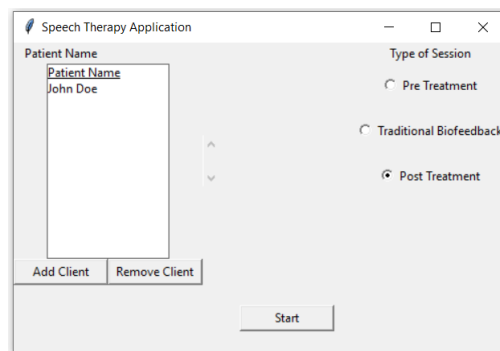
9. Post-Treatment:

9.1. **Flowchart**: The Post-Treatment flowchart (simplified user version) is depicted below.
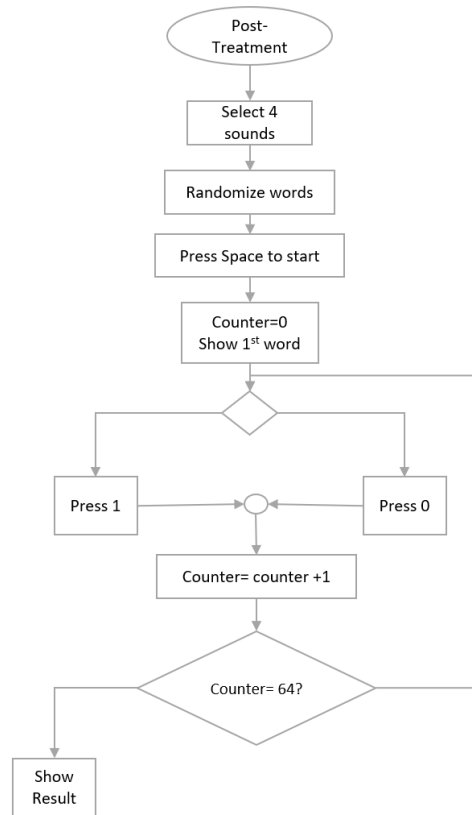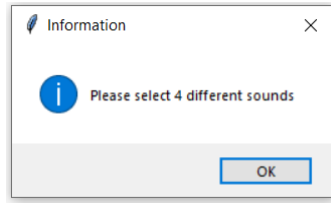

9.2. **Starting Pre-Treatment Session:**

Selecting the Post-Treatment Radio button starts the post-treatment session.

Clicking the start button with the post- treatment option will prompt user to select 4 different sounds

Clicking the **start button** with the pretreatment option will prompt user to select 4 different sounds

from the check box window below:
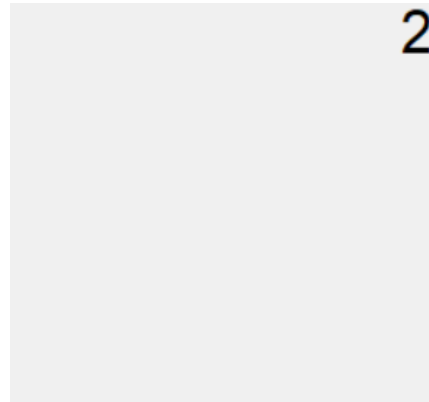

The **Show Result** button will start the evaluation process.

8.3. Counter:

At the right top of the window, the counter will show the number of prompts.

Pressing '1' for 'Correct' and '0' for 'Incorrect' will be used for evaluation process.

This process selects 16 words of each sound with visual cues and shows all 64 sounds randomly. At the end of the evaluation process, the screen shows the user the result on the screen.

Pressing other buttons other than **1**s and **0**s will not change the evaluation process until the user presses the correct button.

8.4. Saving the data:

The evaluation data is saved in the 'visit n' (n= last visit) folder under the participant's name in the 'Speech Therapy Application' program of the software mother folder.

Customizing the software:

There is option for customizing the software (time constrain, segment customization, feedback response and title/prompt). If any specific functionality is required, the developers can be contacted to customize the program to the users' choices.

Reference:

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Software Update log

May 31st, 2022

Kamrul H Foysal, Bipasha Kundu, Yifan Li.

Updated Speech Therapy Intervension for the version 1.0 (Beta).

June 8th, 2022

Kamrul H Foysal, Bipasha Kundu, Yifan Li.

Updated Speech Therapy Intervension for the version 2.0 (Beta).