Speech Based Control Panel for Desktop

CS 566

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Introduction

In this project we have developed an "Speech Based Control Panel for Desktop" named 'PAMN' which is an Desktop based GUI application that provided the user the functionality to OPEN certain Application by voice commands given by the user using C programming implemented on Visual Studios.

'PAMN' application should satisfy the following:

1. Allow user to open a set of certain application by voice commands.
2. Allow user to train new model for voice recognition i.e. Add new speaker so as to recognize the voice.
3. It also tells voice instructions to help user to perform different task on the application.

Frontend and Backend

Frontend: Frontend is made on Visual Studio to provide GUI for friendly interface along with voice command which guides the user with different modules and functionalities of the PAMN.

GUI consist of 2 screens i.e. home screen and Help screen.

Home Screen: Home screen consists of 3 buttons(modules):

   i.   Live Training.
   ii.   Assistant
   iii. Help

Along with that when the cursor is moved on any of the button the application also provides 'VOICE INSTRUCTION' of what is the purpose of each individual button in the program this helps any '*USER WITH LOW EYESIGHT TO OPERATE THE PAMN BY EASE AS IT INSTRUCTS THE USER OF WHAT THE MODULES DO BY GIVING VOICE INSTRUCTION*'.
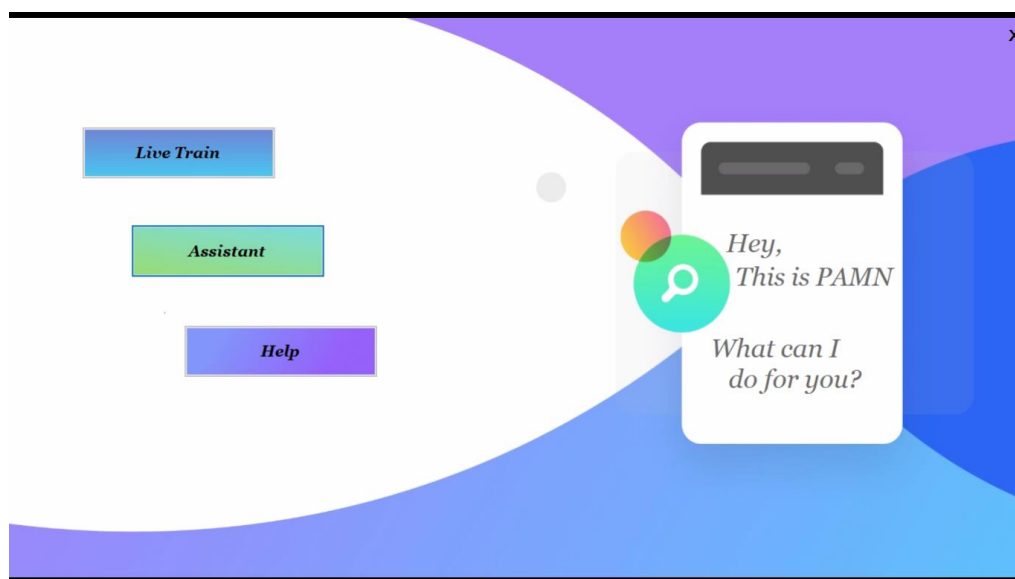

Fig 1. Home Page Displaying all the buttons and Interface

➤ **Live Training**: It takes 5 iteration of the words which are used in the program to train models for any new user and adds the data in the model so if new user tries to operate the Application then it easily recognizes the new speaker.

Voice Instruction On Bringing Cursor : "*Live Training*".

➤ **Assistant:** It open the automated recording module to take the voice input from the user i.e. the name of the Application Listed in the application lists of the program:
i.   Games
ii.   Paint
iii.   Web
iv.   Word
v.   Notepad
vi.   Photos
vii.   Skype
viii.   Camera
ix.   Excel
x.   Alarm
And after taking the input voice command it checks its model and compute the probability of the spoken word that if it matches which any of the words listed above and open the Application.

Voice Instruction On Bringing Cursor : "*Hey This is PAMN tell name of application to open*"

after correctly identifying the application spoken by the user it opens the application along which tells an voice instruction of which application is recognized and being open

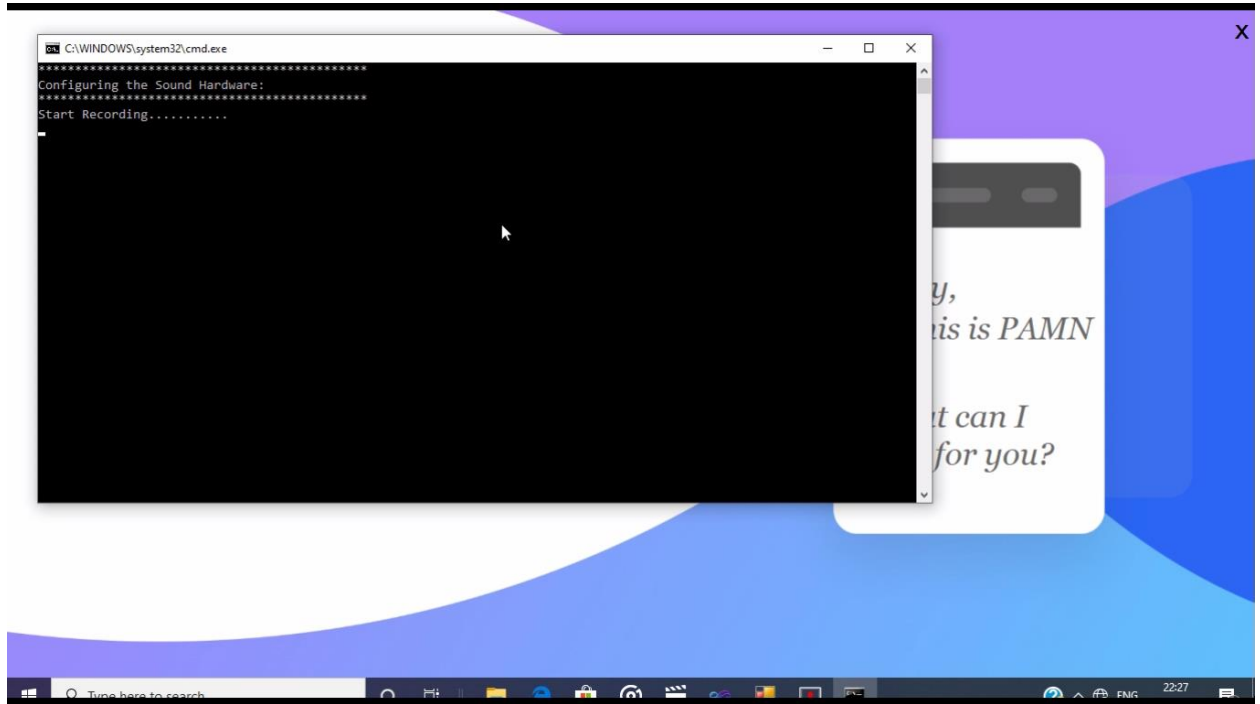ex. *If user speak : 'Skype' it gives Voice feedback i.e. 'Opening Skype'.*

Fig 2. Opening the Recording Module to take Input as voice command.

➢ **Help:** This screen displays about the application i.e. what is the application is about and how will user should operate the application , list of the words or application that can be managed by the PAMN and also displays the information of the developers.
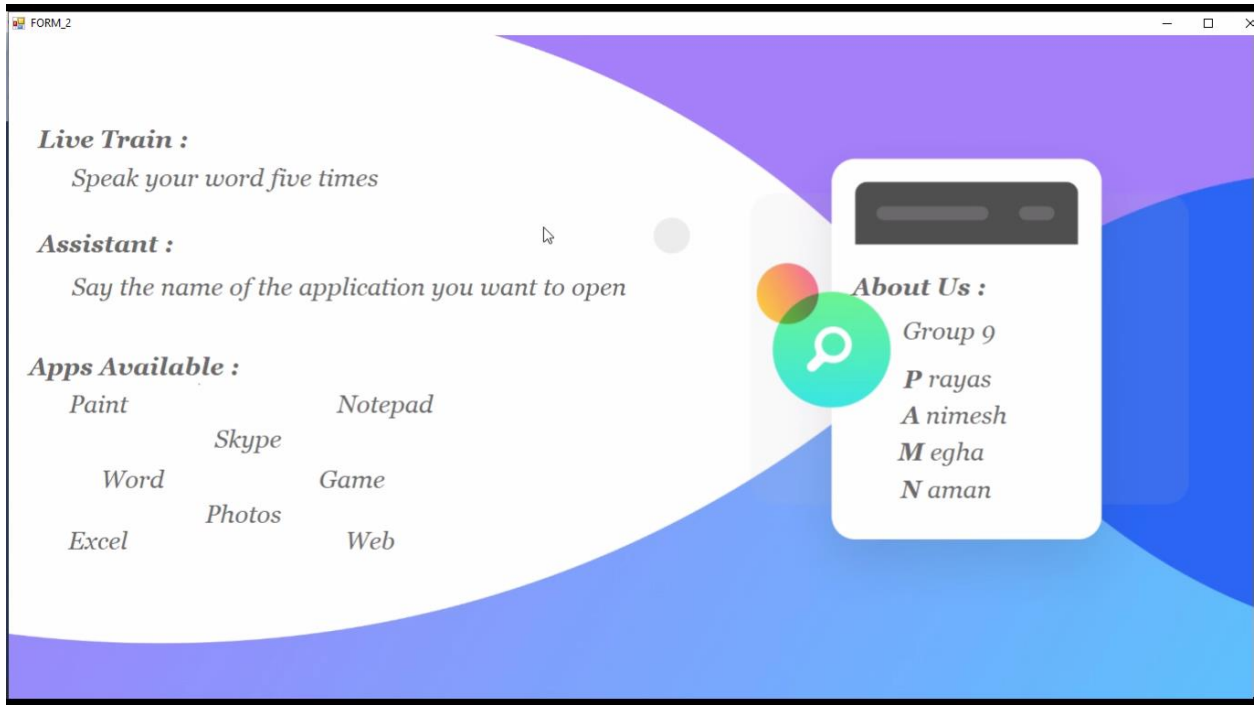
Fig 3. Help Screen Displaying Information about Application.

Backend: The backend is also made by C programming on Visual Studios. Purpose of backend are:

i.   To manage the Recording Module i.e. taking voice input and taking out samples from it.

ii. Calculate the Probability of the spoken word by which it matches the most by HMM algorithm.

iii. Take input for Live Training module i.e. taking 5 input in voice and making new models i.e. A and B matrix and store it in the pre-stored models for future uses.

Future Enhancement

To bring modifications and additional features this work can be taken into more details. The current software application "PAMN" does not support a large vocabulary, the work will be done to train the model for new words and increase the efficiency of the application. This is a desktop application modification can be done on it so as to implement it in Android Devices.

Also the application can be made fully automated to only be operated by voice commands as it gives voice instructions of what the modules are used for so it can be further enhanced to so only user is needed to give voice commands and the application communicate with the user using the voice command making the application useful even for physically challenged people who don't have clear vision current the Voice instruction provided by the PAMN is good enough for the peoples having low eyesight as they can here the instruction just by getting cursor over the button.

Conclusion

Speech based control system will be used to automate the process of opening the various applications. This tool will minimize the efforts of users to manually search for an application and the open.