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SMART SYSTEM TO AID BLIND PEOPLE

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Abstract - *In this paper the author described the problem of Specially-abled (Blind) people operating computers for their day to day tasks. The Specially-abled (blind) people currently need support to start the PC , login their user id and passwords and then the access to certain browsers to do browsing. Author have tried to resolve this problem by designing a device for Specially-abled (Blind) people for reading / browsing / performing word documentation.*

Solution of this problem is done by creating a service in operating system that listens to the finger print sensors and if the sensors match to the PC owner, allow the person to login and immediately start listening to commands as the blind person will not be able to see the next window / or won't be able to open something. The app begin as a service that run in the background. Allow to register the disabled person with one time help from non-disabled person. The service allow to start accepting the commands to perform MS-word document. The service is generic to accept new interfaces like using read out loud feature in pdf to open and read a pdf and integrate / operate the other windows applications.

Key Words: Raspberry Pi, Specially-Abled, NVDA(Non-Visual Desktop Access)

1. INTRODUCTION

The system will provide a whole new way for disabled people to perform day to day tasks, just with the help of their voice. The person has to do is just a registration with one time help of a non-disabled person and then the app allows the person to do day to day task like writing a word file, browsing, launching other applications, etc. with the help of voice commands.

The Specially-abled (blind) people currently need support to start the PC, login their user id and passwords and then access to certain browsers to do browsing.

It will also have a read out loud feature which narrates the pdf/word file and can also navigate the person about the commands being implemented by the computer.

2. Related Work

NVDA use normal desktop or laptop computers which are expensive.

NVDA(Non-Visual Desktop Access) software, reads content on screen of the computer and narrates or show on braille displays, which is more complex and time taking process.

3. Proposed System

We will make our system adaptable to any kind of Computer either Desktop or Laptop, as people may have their own Computer and may not want to change it.

We will make this system such that a normal person's life will also become easier as it is fully voice based system.

We focus on how these functionalities can be provided to the user that too in least amount of money.

4. Working

The disabled person is registered with one time help from non-disabled person.

As the computer starts, the application starts running as a service in the background and listens to the fingerprint scanner, it captures the fingerprints and check if person is already enrolled or not, if it matches, person is allowed to login and immediately start listening to commands.

The commands are then converted to intermediate text after removing noisy words.

The Database of the application contains command sets and the name of scripts corresponding to the set, when any of the command set matches to the intermediate text, corresponding script will get executed.

Scripts can either launch an application or give some information to the user.

5. Work Examples

Assume that user said **"what is the time"** then this command gets converted into **"what time"** after removing the noisy words **"is"** and **"the"**, then system will understand by word **"what"** that user wants to know something, then by word **"time"** it will understand that user wants to know the time. In this example no application is launched rather an information is given to the user.

Let's see another example, assume that user said **"Play the music"** then this command gets converted into **"play music"** after removing the noisy word **"the"**, then system will start

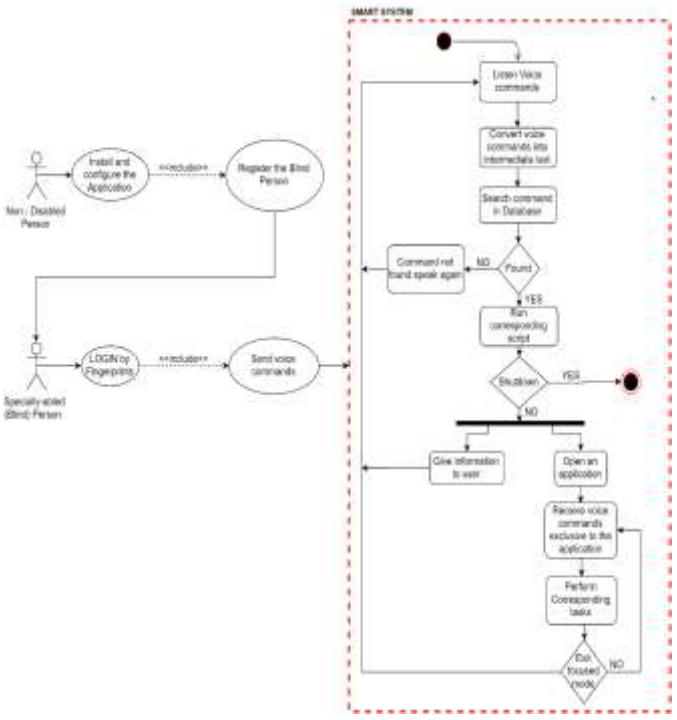
playing music with full control of music player, now system will accept the commands exclusive to music player like **"play", "pause", "next", "previous", "stop",** etc. and perform action accordingly.

After exiting from the application system again starts listening to the user.

Table-1: Hardware Required

Hardware Parts	Qty	Description
Raspberry Pi model 3 B+	1	The Raspberry Pi is a low cost, credit-card sized computer.
Microphone with sound card	1	To take commands as input from blind person.
Speaker	1	To give feedback as output to the blind person.
Optical Fingerprint sensor (R307)	1	To take fingerprint's image as input for authentication.
USB to TTL converter	1	To convert USB port into Serial UART port, so that asynchronous connection between fingerprint sensor and raspberry pi can be established. Also, so that the fingerprint sensor can easily be detected.

Use Case Diagram:



6. CONCLUSIONS

This system will be more easy to operate than NVDA(Non-Visual Desktop Access) software, as it reads content on screen of the computer and narrates or show on braille displays, which is more complex and time taking process. NVDA use normal desktop or laptop computers but our software run on worlds cheapest CPU (Raspberry Pi) which is a credit card size computer, which implies that our device is cheapest.

Our software can also run on normal desktop or laptop if user wants.

Our system does not require external display, keyboard and mouse. It is operates hands free.

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