



MULTISENSORY IMPAIREMENT DEVICE FOR PHYSICALLY CHALLENGED PEOPLE

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Abstract: It helps in dealing the issues physically challenged people in single device is a difficult job. Researches focus on dealing with one challenge but not all the challenges. The main focus is on making a versatile technique that helps physically challenged people by giving more confidence to communicate with other physically challenged people. All these functionalities are being developed and made to be available in one device.

Keywords: Tesseract OCR, pyttsx, speech to text, text to speech, Image to speech.

1. INTRODUCTION

According to World Health Organization (WHO), around 5% of the world population suffers from hearing loss. In percentage, this number may seem lower, but when it comes to numbers, more than 360 million people in the World are deaf or have hearing loss problems. This may be during birth or during accidents. As the world is getting digitalize, here the aim is to helping these people with the multisensory device who don't need the assistance from the other people. The deaf and mute people do not have any particular language to communicate. Also, it is not possible for all the people to learn or understand these languages. That is why the communication gaps still exists between deaf and mute. Therefore, in solving these multisensory issues we are using raspberry pi. Using this device, the solution can be found for all the three multisensory impairments that is blind, deaf and dumb. For blind people image is changed to speech. For deaf people speech is changed image.

2. LITERATURE REVIEW

Development of user centered interfaces and technologies have become crucial in the process designing for the differently abled people. Adding an extra element is just not enough to assist the use of technology for the visually disabled. Many device-based hardware and software technologies exist to assist the visually disabled.

They have functions like reading printed or writ- ten text, expanding characters on braille systems and machines Based on computer vision. Prototypes that function with cell phone, cameras, help in processing images to identify patterns of movement, are applied for musicians who are blind With the help of hand gestures and facial expressions, sign language primarily relies on manual communication to connect with listeners and communicate messages.

Lorenzo Glove Pi is a wearable gadget invented by Lorenzo Monti that allows deaf-blind users to recognise the faces and positions of persons in front of them as well as their facial expressions.

Kumar K Using Tesseract, a Python OCR algorithm, the visually impaired can understand words, the vocally impaired can express themselves and communicate through text that is read aloud through E-speak, and the audibly impaired can hear through speech to text conversion using OpenCV, according to Kumar K et al.

Rohit Rastogi have put up an ideology that consists of a Sharon bridge which is a wearable technology that makes communication between differently abled on the extent of their capabilities. The Sharon Bridge comprises of small units to form a complete circuit to enable them to convey messages among the differently abled and their different combinations.

3. PROPOSED SYSTEM:

We are developing a software in which for the visually impaired person text or picture is changed to speech by using tesseract optical character recognition. This tesseract software makes the blind people to understand the words clearly.



People who are mute or vocally impaired text is changed to voice signals on entering the input in the input screen which gives out the speech of the text by using a module called pyttsx in the python library we get convert text to speech. For hearing impairment voice is converted into text with the use of speech recognition module which is imported from python library.

- TEXT \longrightarrow SPEECH
- SPEECH \longrightarrow TEXT
- IMAGE \longrightarrow SPEECH

4. HARDWARE AND SOFTWARE REQUIREMENTS

HARDWARE SYSTEM CONFIGURATION:

- Processor - i5
- Speed - 1.1 G Hz
- RAM - 4 GB (min)
- Hard Disk - 20 GB

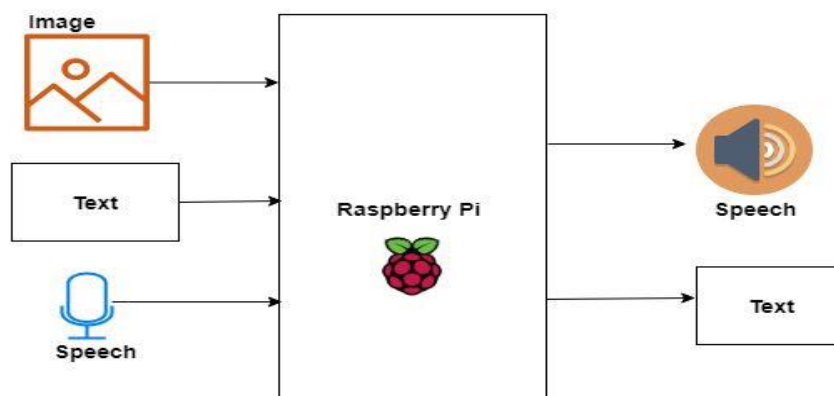
SOFTWARE SYSTEM CONFIGURATION:

- Operating System - Windows xp,10
- Technology - Python
- Package - Tkinter
- IDLE - Python 2.7 or higher

5. DESIGN

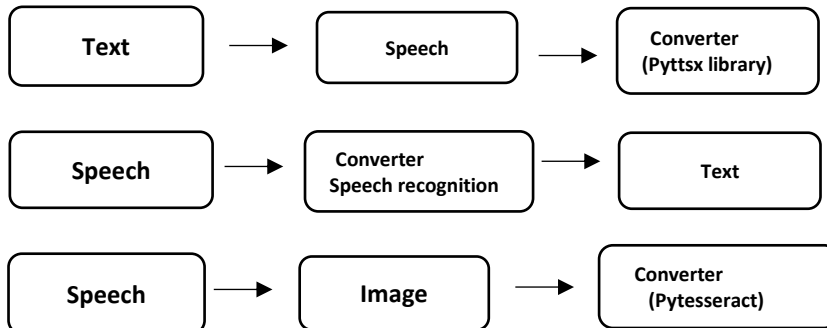
The raspberry pi is the backbone of the device which connects the camera, microphone, LCD display as well as speaker. For deaf people the microphone takes the words spoken by user as input and displays it as text on led display, for the dumb people the user types information in LCD Screen and the output will in the form of audio signals.

SYSTEM DESIGN:

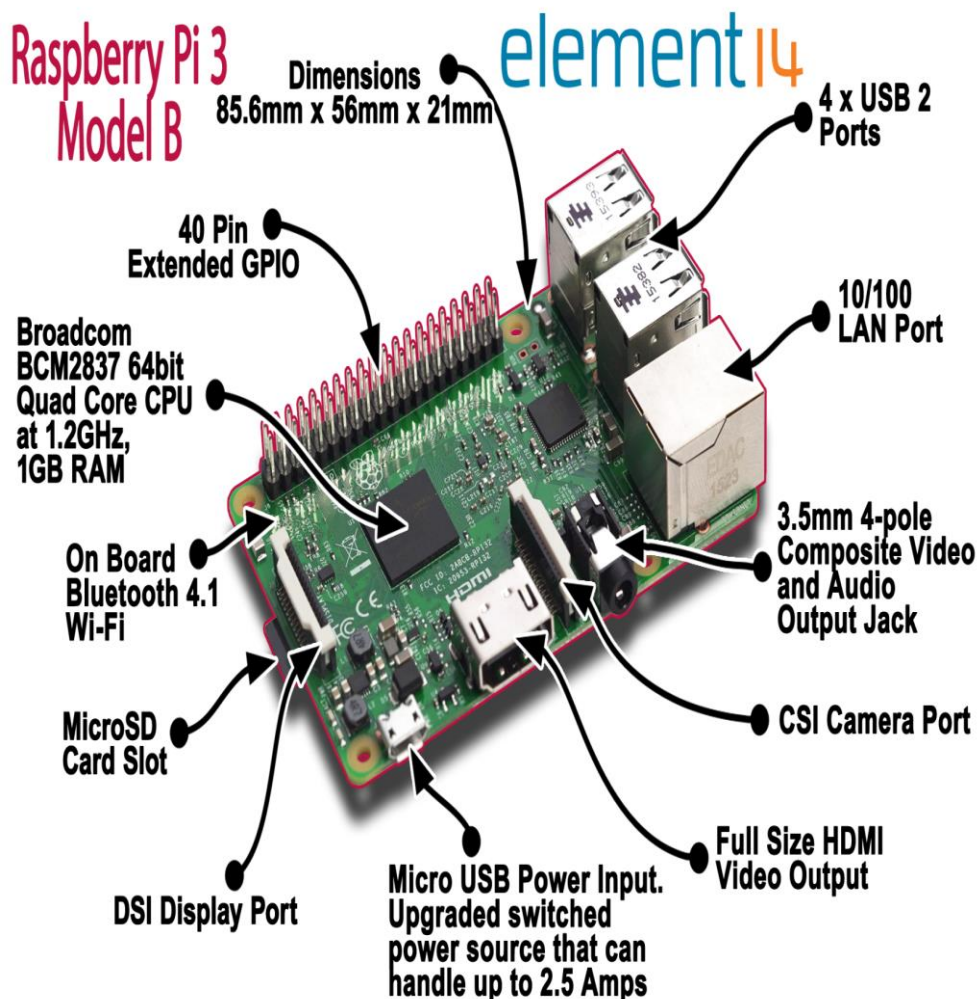




DATAFLOW MODEL:



RASPBERRYPI:



Raspberry pi, shown in figure is a less price, credit card size processor, can be plug TV, and uses keyboard and mouse. It provides GPIO pins to plugin with other components. It is used in this project just because it is efficient to communicate with another domain.



6. IMPLEMENTATION

1. TEXT TO SPEECH:

- Text-to-speech (TTS) is a form of speech synthesis software that produces a spoken sound version of the text in a computer document, like a help file or a Web page.
- TTS is frequently applied to voice recognition software.
- Library Pyttsx.

2. IMAGE TO SPEECH:

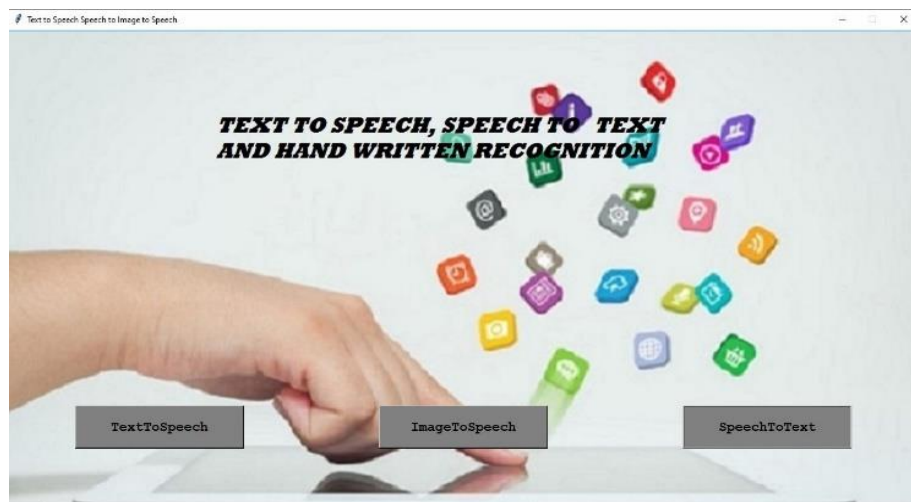
- An image is turned to text, which is then translated into speech.
- Text-to-speech conversion completes the character recognition process.
- Pytesseract, Pyttsx library, and more.

3. SPEECH TO TEXT:

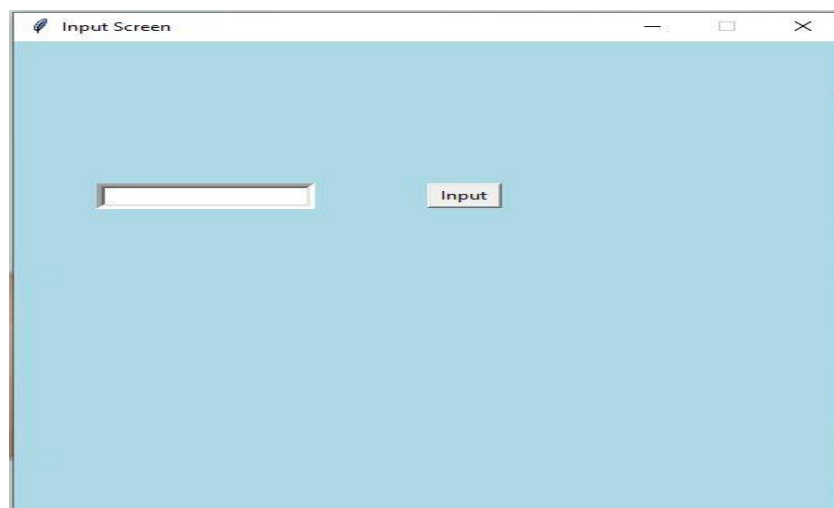
- The main two models for speech to text converters are
- An aural model
- Language model • Speech recognition • Call routing, speech-to-text conversion, voice dialling, and voice search are some of the most frequently used speech recognition applications in the workplace.

RESULT

- This is the generated page once we run the project.



- This page pops up once we click on Text to Speech button.

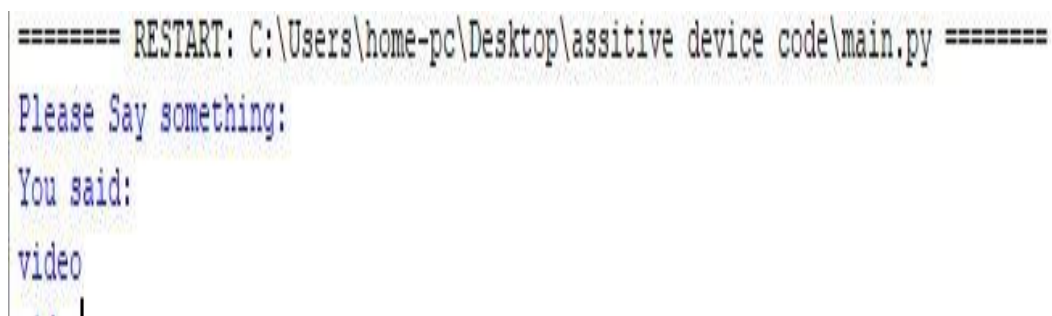




- This page pops up once we click on Image to Speech button.



- This is generated once we click on Speech to Text.



CONCLUSION

From this work we have sketched a prototype model for physically challenged using a single solution. The main pros of this system are it is light weight and it is portable. It makes them more confident and communicate with others normally without any hesitation. This can make physically challenged people easy to live and manage their things and needs on their own without anybody's help or need.

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