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Voice Assisted Text Reading For Visually Impaired People

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A B S T R A C T

As the earlier survey American Foundation there are more than more than 6 trillion people who are visually Impaired, In order to help them a method is proposed to develop self assisted text to speech. A camera module and OCR is used to capture the image and analyze it. The observed text is stored in RAM with the captured image and it synthesizes the speech as output.The Advantage of this method is it reduces the dataset memory required for comparison and character recognition is being done.

Keywords: IoT, WSN, Cloud computing, Big Data, Crop production, High Tech Agriculture

1. Introduction

Text converting system to speech is the process of devices to communicate. There are different text reading techniques such as label reading, voice stick, brick pi reader. These methods can perform text to speech by creating datasets. In this process image is captured through a camera and recognises it. And there are two main technologies that are central to these systems namely Text Information Extraction (TIE) and Text to Speech(TTS). Speech synthesizers convert captured images to audio as output.

2. Literature Survey

Our project is highly inspired from currently existing technologies and is a high end simplified implementation of the same. An Article penned by MH.O'Malley.The article penned by MH.O' Malley which is partially extracted from Berkeley speech technologies is the foundation node of our project and is highly influential.

3. Related works

As we know there are some text reading applications such as label reading,voice stick ,pen aiding but these methods always depend upon the datasets for storage in order to overcome this issue we implement the reading technique using camera and raspberry pi technique. It eliminates the datasets created and stored previously.As it stores the text in RAM and hence the data possesses in volatile nature.

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4. Proposed Voice Assisted Text Reading System

Recognition or capture of the text present in the image and conversion of those text into the speech that is providing the captured image or document aurally is the main purpose of this system. Our system begins with the camera module for capturing the text and goes through the raspberry pi module and finally results in the audio form of the output can be extracted.

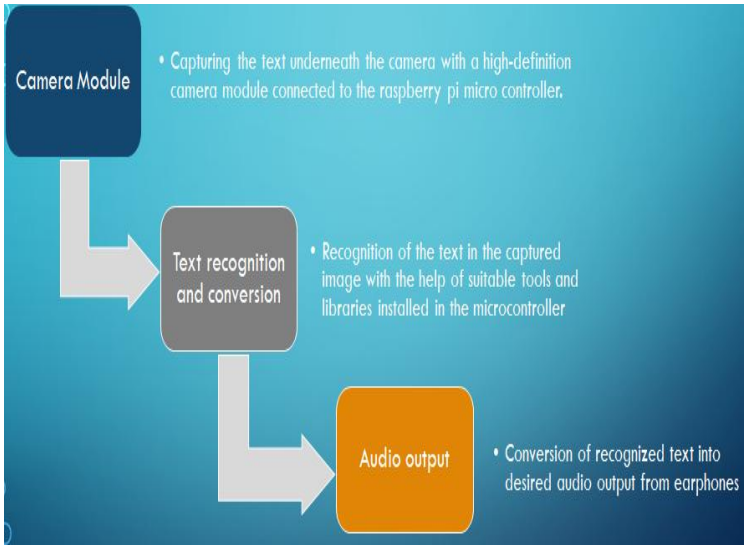


Fig Proposed System Block Diagram

5. Flow of Process

Installation of raspbian-os

Same as any other microcontroller raspberry requires the unique operating system for performing all the operations on the corresponding microcontroller. This particular operating system specifically meant for raspberry pi can be found and installed from the official raspberry pi webpage. Installation of os on the sd card must be done only after formatting the card properly for a couple of times.

Connecting pi to network

As the complete process is done through raspberry pi and it is mandatory to connect the raspberry pi to a network in order to configure it as per our requirements, the raspberry pi need to be connected to the network in which the device is being operated.

This whole process is done in the user homepage of the particular internet service provider.

As the raspberry pi needs to be booted for numerous times the Ip address of the pi alters all the time. But for connecting the pi to the remote desktop the Ip address of the pi device should always be tracked down, which is pretty hectic work. Hence, instead of allowing the DHCP server to assign a dynamic IP address to pi, a static IP address can be assigned to the pi with the help of its own mac address from the router configuration settings in the service provider user home page.

Text recognition

This process involves several steps they are:

Image capturing:

The first and foremost step is to capture the image with the camera interfaced with raspberry pi.

Pre-Processing:

Here the captured image is adjusted in terms of lighting, and then boundary detection and noise removal takes place at this particular step.

Segmentation:

The image captured and binarized in the previous step is scanned for interline spaces and gaps. Then this scanned text is segregated into a number of letters as per the gaps and interline spaces. The decomposition of these words into characters is also done at this particular step. As the sentences are being splitted into words and then into characters this process is called segmentation.

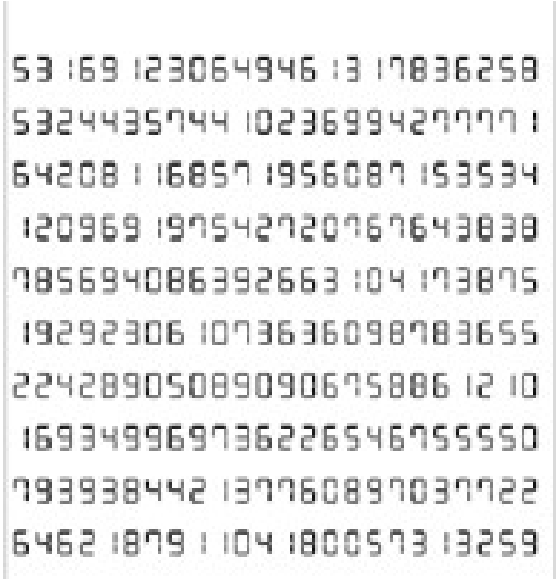
Image to text: These text characters so formed are compared with the characters in the library installed (here tesseract and openCV) and stored as the corresponding ASCII (American standard code for information interchange) values.

6. Simulation Result

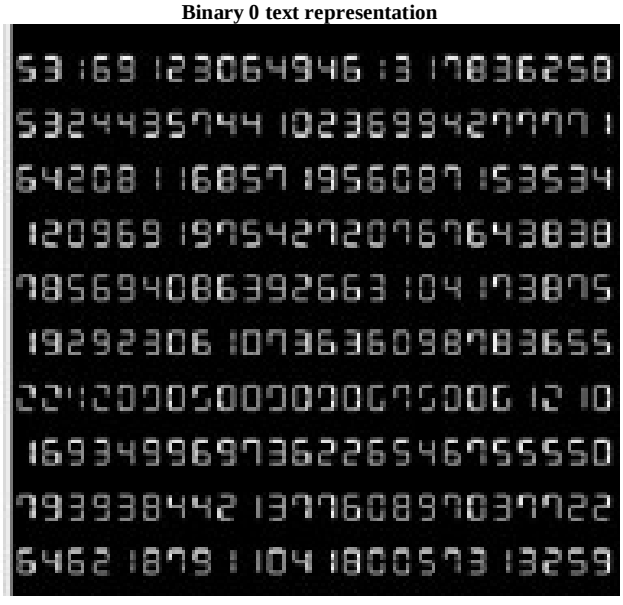
Post the capturing of images all the processes mentioned above regarding the recognition of text and storing are done in the MATLAB. As all this process is internally simulated through MATLAB we can just have a brief surfing over the simulation.

6.1 Binary conversion

As the image can be in different colors and contrasts it needs to be converted into binary form for the sake of system scrutiny. The areas with text in the image are stored as 1 and the empty spaces are stored as 0 or vice versa. Both ways can produce results in a way to identify the text.



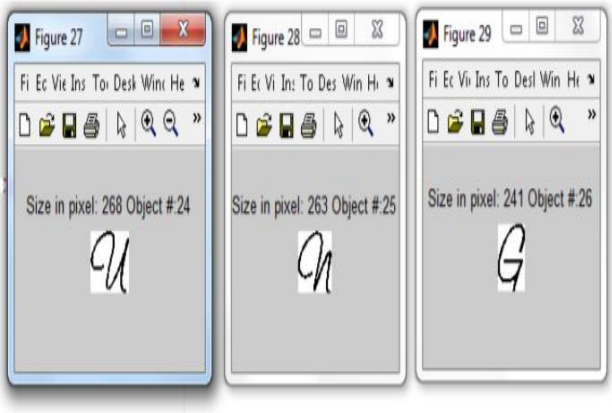
Binary 0 text representation



Binary 1 text representation

Segmentation

The binarized image will be segmented and labelled as per the order present in the image.



Character skeletonization

Skeletonization is the process in which the segmented image is then converted as a skeleton of that particular character. This step is done with the reduction of the foreground dense regions in the binary image and extracting the blueprint of the character. The machine simulates it in the same way as the wire which is arranged in a particular shape is fired. I.e., when a thin wire is arranged in a particular shape and both ends of the wire are torched then the flame follows the exact path in which the wire is arranged.

Same as in this case the image is converted in the form of the skeleton and then the machine starts to examine the skeletal character from both the ends and keeps track of the path in which the simulator has been travelled and this record will be compared with the pre installed libraries like Opencv with the help of tools like tesseract. Post this skeletonization the final output of text recognition will be extracted.

7. Speech Conversion

So formed text is recognized by the microcontroller and with the help of simple commands this text is stored in the volatile memory of the pi and then with the enablement of audio output in the raspberry pi configurations this extracted text will be heard aurally. The mode of audio output can also vary like through bluetooth speaker or headphones as per the necessity.

Recognition or capture of the text present in the image and conversion of those text into the speech that is providing the captured image or document aurally is the main purpose of this system. Our system begins with the camera module for capturing the text and goes through the raspberry pi module and finally results in the audio form of the output can be extracted.

8. Advantages

- ❖ It helps them to be independent.
- ❖ It makes comparatively confident and comfortable as well.
- ❖ No specific training is required for users.
- ❖ It helps them to fill or read mandatory forms or documents.

9. Conclusion

We converted an image to speech conversion techniques through raspberry pi. And the simulations results are successfully verified and output as well. This text to speech converting device helps the visually impaired people in an economical way as it ignores the costly magazines that are printed in the brailee and normal magazines or newspapers or any types of study materials are captured and analyzed through OCR and converted into audio makes them to lead their life in an easier way. And we have implemented our algorithm on many images(like captured or printed) and we found that it has done all its conversions from text to speech.

10. Result

This device has proven many algorithms and converted the captured image from text to speech and good results are generated.

REFERENCES

1.International Journal of MC square Scientific Research volume 9, No.2 2017.

2. IOSR Journal of VLSI and Signal Processing (IOSR-JVSP) Volume 6, Issue 3, Ver. III (May. - Jun. 2016), PP 15-23 e-ISSN: 2319 – 4200, p-ISSN No. : 2319 – 4197 www.iosrjournals.org

3. Kumar, A., Patra, R., Manjunatha, M., Mukhopadhyay, J. and Majumdar, A.K., 2011, January. An electronic travel aid for navigation of visually impaired persons. In Communication Systems and Networks (COMSNETS), 2011 Third International Conference on (pp. 1-5). IEEE.