



e-ISSN: 2278-8875
p-ISSN: 2320-3765

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

Volume 10, Issue 7, July 2021

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.122



9940 572 462



6381 907 438



ijareeie@gmail.com



www.ijareeie.com



Image to Text Processing Using Raspberry Pi

S. R. Yadav¹, S. C. Nalawade², M. J. Soudagar Bagwan³, P. S. Bhendwade⁴

UG Student, Dept. of E&TC, Ashokrao Mane Group of Institution, Vathar, Maharashtra, India¹

UG Student, Dept. of E&TC, Ashokrao Mane Group of Institution, Vathar, Maharashtra, India²

UG Student, Dept. of E&TC, Ashokrao Mane Group of Institution, Vathar, Maharashtra, India³

Professor, Dept. of E&TC, Ashokrao Mane Group of Institution, Vathar, Maharashtra, India⁴

ABSTRACT: Text recognition in images is a research area which attempts to develop a computer system with the ability to automatically read the text from images. These days there is a huge demand in storing the information available in paper documents format in to a computer storage disk and then later reusing this information by searching process. One simple way to store information from these paper documents in to computer system is to first scan the documents and then store them as images. But to reuse this information it is very difficult to read the individual contents and searching the contents form these documents line-by-line and word-by-word.

KEYWORDS:Image processing, machine learning, open CV

I.INTRODUCTION

Now-a-days, there is growing demand for the software systems to recognize characters in computer system when information is scanned through paper documents as we know that we have number of newspapers and books which are in printed format related to different subjects. These days there is a huge demand in “storing the information available in these paper documents in to a computer storage disk and then later reusing this information by searching process”. One simple way to store information in these paper documents in to computer system is to first scan the documents. Whenever we scan the documents through the scanner, the documents are stored as images format in the computer system. These images containing text cannot be edited by the user. But to reuse this information it is very difficult for computer system to read the individual contents and searching the contents form these documents line-by-line and word-by-word. The reason for this difficulty is the font characteristics of the characters in paper documents are different to font of the characters in computer system. As a result, computer is unable to recognize the characters while reading them. This concept of storing the contents of paper documents in computer storage place and then reading and searching the content is called document processing. Sometimes in this document processing we need to process the information that is related to languages other than the English in the world. This process is also called Document Image Analysis (DIA). Thus our need is to develop some text recognition algorithm to perform Document Image Analysis which transforms documents in paper format to electronic format.

II.WORKING

There Are Three Phases

- (1) Image Capturing
- (2) Optical Character Recognition
- (3) Pre-Processing

Image Capturing: The initial phase in which a device is moved over the printed page were an inbuilt camera captures the pictures of the content. The nature of the picture captured will be high in order to have quick and clear recognition because of the high-definition camera.

Optical Character Recognition: A typical OCR system consists of several components. a common setup is illustrated. The first step in the process is to digitize the analog document using an optical scanner. When the regions containing text are located, each symbol is extracted through a segmentation process. The extracted symbols may then be preprocessed, eliminating noise, to facilitate the extraction of features in the next step. The identity of each symbol is



found by comparing the extracted features with descriptions of the symbol classes obtained through a previous learning phase. Finally, contextual information is used to reconstruct the words and numbers of the original text.

The OCR architecture is broken down in following stages:

Pre-Processing:This performs certain activities such as scanning document, storing them as images. The module supports the following services: -

- a. Scanning printed documents and storing the documents as snapshots or images.
- b. Processing those image-based documents, converting these image-based documents into proper format (also called structured documents) such as Greyscale and Binary format.

Raspberry Pi: The Raspberry Pi is a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. Raspbian Is the Operating System of **Raspberry Pi**. **Raspberry** is a reference to a fruit naming tradition in the old days of microcomputers There's Tangerine Computer Systems, Apricot Computers, and the old British company Acorn, which is a family of fruit. **Pi** is because originally, we were going to produce a computer that could only really run Python. The model with the highest specification is the Raspberry Pi 3 Model B, so for many general-purpose projects it is widely used. Model B is powerful Pi, with the fastest clock speed, the good RAM, and best feature set.

III.COMPONENT

Raspberry pi: Raspberry Pi 3 is a 64-bit quad core processor running at 1.4GHz, dual-band 2.4 GHz and 5 GHz wireless LAN, Bluetooth 4.2/BLE, 40-pin extended GPIO, faster Ethernet and PoE capability via a separate PoE HAT. For the face recognition system, we used a raspberry pi with a raspberry pi camera module which is connected to the CSI (Camera Serial Interface) port of the Pi.

There are other components also be used like keypad, motor wheels, dc motors, battery, lcd screen etc.

Camera Module: The Raspberry Pi camera module can be used to take high-definition video, as well as stills photographs. It's easy to use for beginners, but has plenty to offer advanced users if you're looking to expand your knowledge. There are lots of examples online of people using it for time-lapse, slow-motion and other video cleverness. You can also use the libraries we bundle with the camera to create effects. If you're interested in the nitty-gritty, you'll want to know that the module has a five-megapixel fixed-focus camera that supports 1080p30, 720p60 and VGA90 video modes, as well as stills capture. It attaches via a 15cm ribbon cable to the CSI port on the Raspberry Pi. The camera module is very popular in-home security applications, and in wildlife camera traps.

V. RESULT AND DISCUSSION

To ON the camera module:

```
from picamera import picamera
```

```
import time
```

```
camera = picamera()
```

```
camera.start_preview()
```

```
time.sleep(10)
```

```
camera.stop_preview()
```

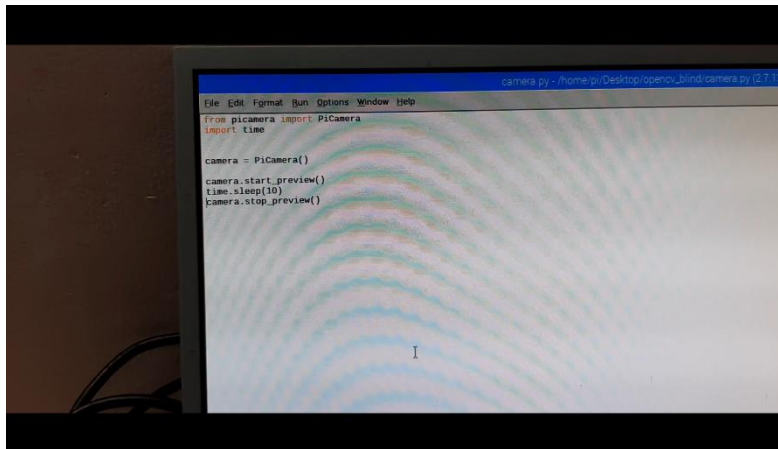


Fig. 1



Fig. 2

Processing to image to text programming:

```
from PIL import image
from pytesseract import image_to_string
import pyttsx3

img = image.open('/home/pi/Desktop//opencv_blind//demo.jpg')
text = image_to_string(img)
engine = pyttsx3.init()
engine.say(text)
print(text)
engine.runAndWait()
```

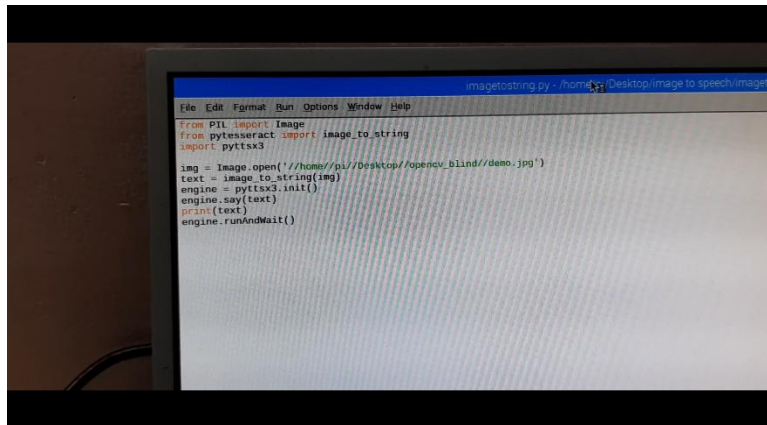


Fig .3

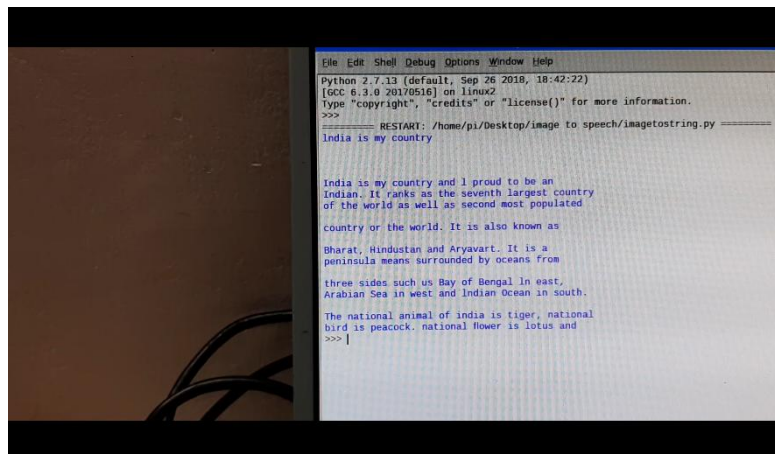


Fig.4

V.CONCLUSION

In this analysis, one’s we got represent to scan image and detecting text for reducing work. OCR is employed to perform word recognition on the localized text regions and rework into text output. During this analysis, the camera acts as input for the paper. Because the Raspberry Pi board is high-powered the camera starts streaming. The streaming knowledge are going to be displayed on the screen. We developed one system that can detect text from scanned image and give output in the form of editable text.

We have introduced optical character recognition to extract text from images and used festival library to convert it into speech. Text-to- device can change the text in image into sound. This portable device can be used by visually impaired people to read boards, books, computer screens etc. Through this method, we can make editing process of books or web pages easier. The system enables the visually impaired to not feel at a disadvantage when it comes to reading text not written in Braille. We have implemented an image to speech conversion technique using raspberry pi. The simulation results have been successfully verified and the hardware output has been tested using different samples. Our algorithm successfully processes the image and reads it out clearly. This is an economical as well as efficient device for the visually impaired and travellers. We have applied our algorithm on many images and found that it successfully does its conversion.

VI.FUTURE SCOPE

This is the project where we are going to overcome the existing drawbacks of previously developed system. The future scope of this project is as following:

The raspberry pi has better future scope because its limitless applications.

The foundation wants to improve pi so that it could be used by every electronic and computer science lover.

There are many ongoing projects using raspberry pi whose outcomes will be beneficial to students or to common man.

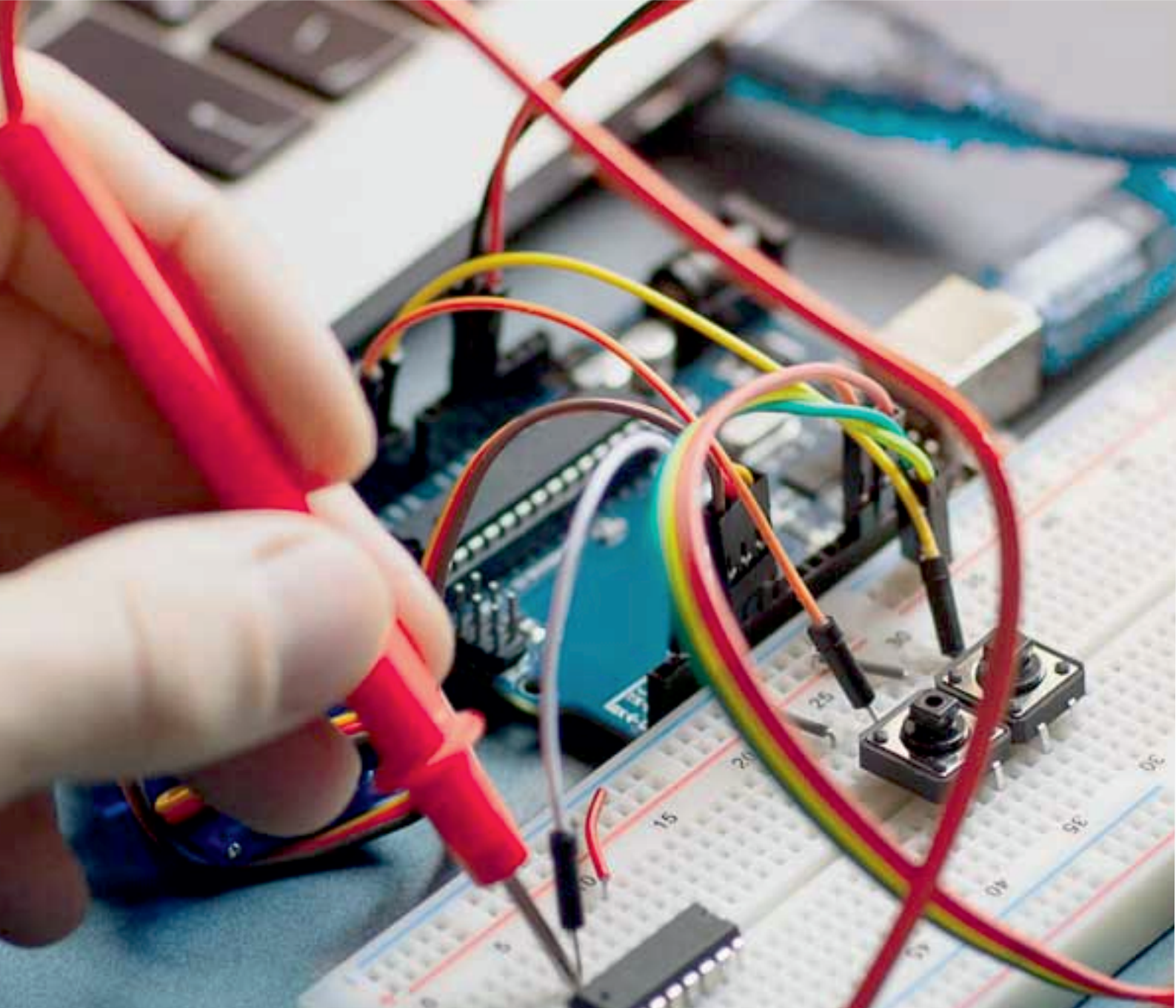


“A project called Open relief is building an autonomous flying drone which uses Raspberry Pi as its core technology to provide help for the disaster relief organizations and develop communications tools.”

“Astro-pi” is also a similar ongoing project. The pi has been sent to INTERNATIONAL SPACE STATION with some astronauts by UK Space Agency because of its compactness and unlimited applications to run experiments using the unique environment of space and to try new technologies that may become crucial when humans begin to visit other planets such as Mars.

REFERENCES

- [1] C. Yao, X. Zhang, X. Bai, W. Liu, Y. Ma, and Z. Tu,” Detecting Texts of Arbitrary Orientations in Natural Images,” in Proc. IEEE Int’l Conf. Computer Vision and Pattern Recognition, pp.1083-1090, 2012.
- [2] L. Neumann, J. Matas,” On Combining Multiple Segmentations in Scene Text Recognition,” in Proc. IEEE Int’l Conf. Document Analysis and Recognition, pp. 523- 527, 2013.
- [3] H. Koo, D.H. Kim,” Scene Text Detection via Connected Component Clustering and Non-text Filtering,” IEEE Trans’s Image Processing, vol. 22, no. 6, pp. 2296-2305, 2013.
- [4] J. Lee, P. Lee, S. Lee, A. Yuille and C. Koch,” AdaBoost for Text Detection in Natural Scene,” in Proc. IEEE Int’l Conf. Document Analysis and Recognition, pp. 429-434, 2011
- [5] Pratik Madhukar Manwatkar (2015),” *Text Recognition from Image*”, IEEE sponsored 2nd International Conference on Information, Embedded and Communication system (ICIIECS), Text Line Detection from Images, Department of computer technology, YCCE, Nagpur (M.S.),441 110, INDIA.
- [6] Chowdhury MdMizan, Tridib Chakraborty and SuparnaKarmakar (2017),” Text Recognition using Image Processing”, International Journal of Advance Research in Computer Science, Volume 8, No 5.



INNO  **SPACE**
SJIF Scientific Journal Impact Factor
Impact Factor: 7.282



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

 **9940 572 462**  **6381 907 438**  **ijareeie@gmail.com**



www.ijareeie.com

Scan to save the contact details