

# Assistive Technology using New Eyes to Read [NETR] for Visually Impaired and Blind Individuals

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**Abstract**— Assistive technology using NETR for visually impaired and blind individuals is to assist the blind individuals to decide on or to pick a good object whereas holding them in their hands. As in current days for every product, text label is written mandatory that has the subsequent details like product name, worth of the merchandise, factory-made and end/expiry dates. The users ought to capture the image of the merchandise mistreatment camera, within the same manner the administrator conjointly captures the image product pictures and stores it in his info. By doing the image comparison between those two pictures, supported the results of the image comparison the output is resulted within the format of voice i.e., in speech format. Here we have a tendency to also playacting the text extraction technique from image by mistreatment the text – space localization rule. The optical character recognition is employed to extract the text region from the image.

**Key words:** Distribution of Edge Pixels, Histogram of RGB, Blindness, Text Region Localization, OCR – Optical Character Recognition.

## I. INTRODUCTION

Right to access the info is an elementary right (Fundamental right). If info is just created out there in print but not in Braille, giant print, or audio formats then blind or visually impaired or print-disabled folks often stop from accessing information. This impacts on their ability to be absolutely educated and ends up in illiteracy and lack of opportunities for several disabled folks. Regarding 285MM folks are visually impaired. In worldwide millions of people are blind and have low vision (severe or moderate visual impairment) regarding ninetieth of the world's visually impaired folks living in developing countries. This range is increasing speedily because of someone generation ages. Recent developments in PC vision, digital cameras, and movable PC'S build it possible to help these people by developing camera-based merchandise that mix computer vision technology with alternative existing commercial merchandise such as optical character recognition(OCR) systems/technology.

In today's society, Reading is clearly essential. Written text is present everywhere within the style of any official group action, any merchandise etc, where these blind people cannot see the text and read it. There are few devices that may offer sensible access to common hand-held. The power of individuals United Nations agency are blind or have important visual impairments to scan written labels and products packages can enhance freelance living. Thus, here we tend to progress to propose a system that it helpful to blind folks.

Today there are some products available to help out the blind people from their daily needs. But, those can't full fill their need in full-fledged manner. There are some

readers available, but those functioning were not up to the mark.

## II. RESEARCH METHODOLOGY

### A. Image Comparison:

The main task performed by this is the image comparison based on the pixel positions and the "RGB- HISTOGRAM" values ranges from 0 – 255. Every image has pixels and RGB values. So simply by creating the histogram chart by looking at each and every pixel of an image and finding the property which you needed in the image using RGB which typically ranges from ( 0 – 255). Similarly all the pixels were done. i.e., total 266 pixels are being performed the same operation.

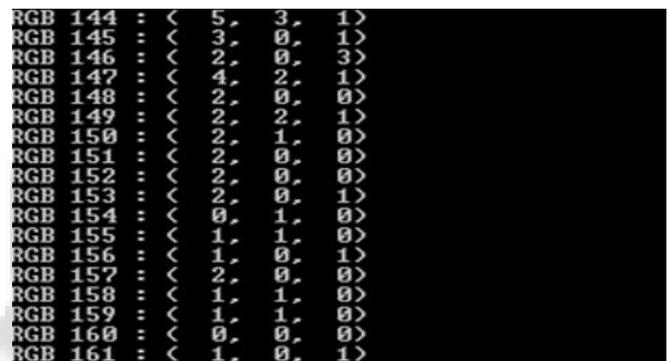


Fig a) Pixel Position and its RGB Value.

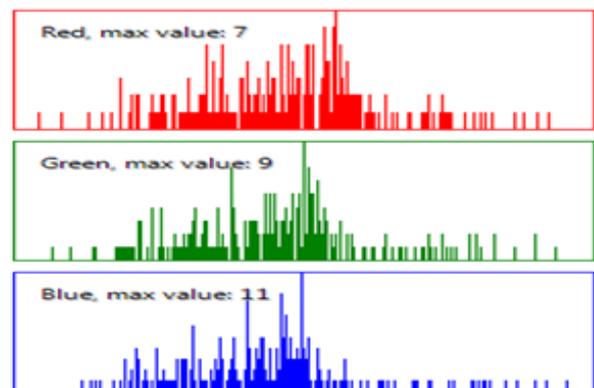


Fig b) Histogram Based RGB Values

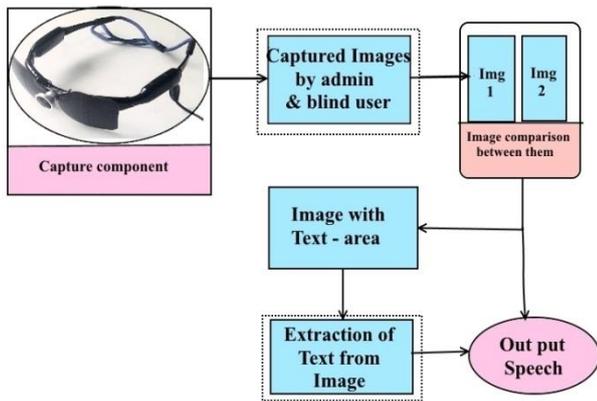


Fig 1 : Architecture of system working process

Admin captures the merchandise image, and stores the relevant info of the merchandise captured. When the user captures the image of any product he needed, the text is recognized from the image and then the comparison is being done between them and then graying is done a pixel difference is done between them. Based on those results the relevant information is given as output in speech format to the blind user.



Fig i: Comparison Between Images

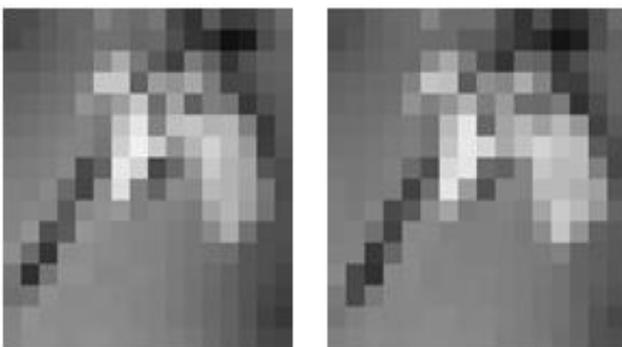


Fig ii: Graying the comparison images.

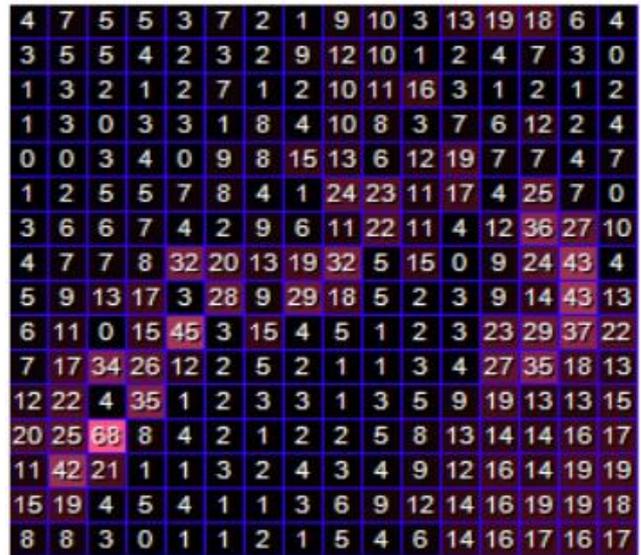


Fig iii: Pixels Difference found in both images

In this algorithm it also finds the differences between the images which are not visible to the naked eye which is not accepted any more in our project as it results in more differences, even though, the object captured by the user is the right one. So we introduce a concept called threshold concept.



Fig iv: Image to Image Diference with Thresh-hold irrespective of size

In the above image we can see the values 0,1,2,3 those are the threshold values and the representation is as follows:

- 1) Threshold value of 0 gives the difference of 52percentile.
- 2) Threshold value of 1 gives the difference of 7percentile
- 3) Threshold value of 2 gives the difference of 1percentile
- 4) Threshold value of 3 gives the difference of 0percentile.

### B. Excavation/Recognition of Text from Image:

Text recognition is performed by OCR methodology, which extracts the text from an image, and converts into a normal text as an output. It is done by finding the rectangular/square boxes in which the text is placed. In that text, it mainly focuses on the text regions that contact the edge boundary.

It follows the following process

- 1) Finding the margin areas in an image.
- 2) OCR generates the better text regions which are given high priority of margin areas.
- 3) That text is binarized into segments.
- 4) Recognized text codes are recorded in a script files.
- 5) The Microsoft Speech Package Development Kit is used to load the script files and show the output of a text in audio format.

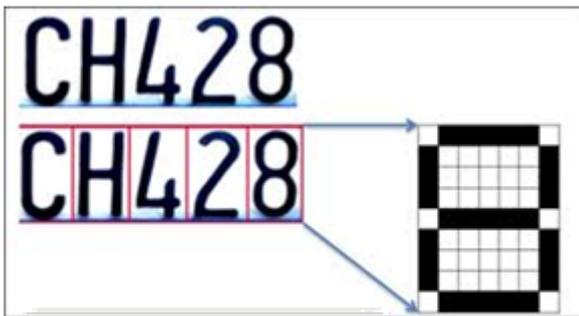


Fig v: Text is Binarized into Segments

### III. CONCLUSION

In this paper, we have described a prototype to assist blind persons with the help of several techniques like reading the text from the object and comparing the images for the most accuracy result which helps a lot for the blind persons. we proposed a system of comparison of images of the product taken by the user and the admin. Thus most accurate product can be chosen by the user (blind person) including the product name related info regarding to that product like make on a large scale with machinery date, end date of a product to be used and where the product is now all can be retrieved. With the help of text histogram at each and every position the values of RGB are calculated and image comparison is done, and with the help of OCR technology the text from the image is extracted and through speech it is made audible to the end user (blind person).

### REFERENCES

- [1] C. Yi and Y. Tian, "Portable camera based assistive text reading from hand held objects" IEEE Trans Mechatronics, IEEE/ASME Transactions on (Volume: 19, Issue: 3) PP 808 – 817, June 2014
- [2] Haojin Yang, Siebert M, Luhne P, Sack H and Meinel C, "Lecture Video Indexing and Analysis Using Video OCR Technology" Signal-Image Technology and Internet-Based Systems (SITIS), 2011 Seventh International conference , vol.20, no. 9, pp. 54 - 61, Dec - 2011.
- [3] K. Kim, K. Jung, and J. Kim, "A Novel character Segmentation Method for text images Captured by

Cameras" IEEE Trans. Pattern Anal. Mach. Intell., vol. 25, no. 12, pp. 1631-1639, Dec. 2003.

- [4] You Yang "OCR Oriented Binarization Method of Document Image" vol 4, pp622-625, May2008.
  - [5] S. Kumar, R. Gupta, N. Khanna, S. Chaudhury, and S. D. Joshi, "Text Extraction and Document Image Segmentation Using Matched Wavelets and MRF Model", IEEE Trans Image process., vol. 16, no. 8, pp. 2117-2128, Aug. 2007.
  - [6] X. Yang, S. Yuan, and Y. Tian, "Recognizing clothes patterns for blind people by confidence margin based feature combination." in Proc. ACM Multimedia, 211, pp. 1097-1100.
  - [7] Li Guanzhang, Li Pei, Luo Wusheng, and Lv Haibao, "Fusion Enhancement of Color Image Based on Global Histogram Equalization" in Computer Science and Software Engineering, 2008 International Conference , 2008, vol 6, pp. 205 - 208.
- Bourbakis, N.G. "A methodology of separating images from text using an OCR approach" pp311-317, nov-1996