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"Camera Based Product Information Reading For Blind People"

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Abstract- ***Nowadays printed text appears everywhere like product names, restaurant menus, instructions on bottles, signed boards etc. Thus blind people need some assistance to read this text .This paper presents a camera-based product information reader to help blind persons to read information of the products. Camera acts as main vision in detecting the label image of the product then image is processed internally and separates label from image by using MATLAB and finally identifies the product name and identified product information is pronounced through the optical character recognition (OCR).The OCR is used to convert the text from text regions and then converted to voice output.***

Keywords*:* blind people, optical character recognition (OCR), text area localization,text extraction.

I.INTRODUCTION

Recent developments in computer vision, digital cameras, and portable computers make it feasible to assist these individuals by developing camera-based products that combine computer vision technology with other existing commercial products such optical character recognition (OCR) systems. Reading is obviously essential in today's society. Printed text is everywhere in the form of reports, receipts, bank statements, restaurant menus, classroom handouts, product packages, medicine bottles ,etc .And while opticalaids ,video magnifiers, and screen readers can help blind users and those with low vision to access documents, there are few devices that can provide good access to common hand-held objects such as product packages, and object sprinted with text such as prescription medication bottles. The ability of people who are blind or have significant visual impairments to read printed labels and product packages will enhance independent living and foster economic and social self sufficiency.

Today,there are already a few systems that have some promise for portable use, but they cannot handle product labeling. For example, portable bar code readers designed to help blind people identify different products in an extensive product database can enable users who are blind to access information about these products through speech and braille. But a big limitation is that it is very hard for blind users to find the position of the bar code and to correctly point the bar code reader at the bar code. Some reading-assistive systems such as pen scanners might be employed in these and similar situations. Such systems integrate OCR software to offer the function of scanning and recognition of text and some have integrated voice output. However, these systems are generally designed for and perform best with document images with simple backgrounds, standard fonts, a small range of font sizes, and well organized characters rather than commercial product boxes with multiple decorative patterns. Most state

of the art OCR software cannot directly handle scene images with complex background.

II. PROPOSED WORK

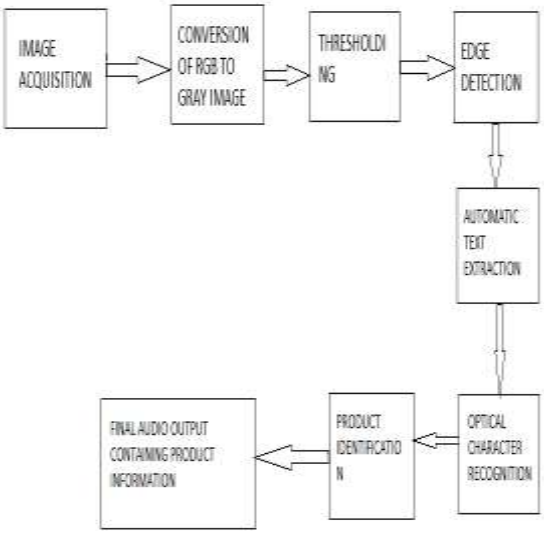

FIGURE : Block Diagram Of Proposed System

III. BLOCK DIAGRAM DESCRIPTION

1.Image Acquisition:

The Image acquisition component collects scenes containing objects of interest in the form of images.Here, a generally available and low cost webcam is used for image acquisition.The image which is captured is shown in figure 1.

2.**Preprocessing and Gray Scale Conversion:**

To make the system more robust i.e. work for noisy conditions, image pre-processing methods like noise filtering are applied. For the purpose of reducing the processing time of the overall process, the input is converted into Gray Scale. Preprocessing of document images is the way of using mature image processing techniques to improve the qualityof images. Its purpose is to enhance and extract useful information of images for later processing purposes. Twopreprocessing tasks, thresholding and noise removal, are performed here.

3.Edge detection:

Edge detection is a set of mathematical method which aim at identifying point in a image at which image brightness changes sharply are typically organized into a setup for the line segment turned are edges.The Canny Edge Detection Algorithm is used in edge detection.
The algorithm runs in 5 separate steps:
1. Smoothing: Blurring of the image to remove noise.

2.Finding gradients: The edges should be marked where the gradients of the image haslarge magnitudes.

3. Non-maximum suppression: Only local maxima should be marked as edges.

4.Double thresholding: Potential edges are determined by thresholding.

5.Edge tracking by hysteresis: Final edges are determined by suppressing all edges thatare not connected to a very certain (strong) edge.

4.Thresholding:

It is a simplest method of image segmentation from a gray scale image. Thresholding can be used to create binary image. The method used in thresholding is ostu's method.Otsu's method selects the threshold by minimizing the within-class

variance of the two groups of pixels separated by the thresholding operator. It does not depend on modeling the probability density functions, however, it assumes a bimodal distribution of gray-level values (i.e., if the image approximately fits this constraint, it will do a good job). (Thresholding image)Binary image shown in Fig2.

5.Automatic Text Extraction:

Then, an automatic text extraction algorithm is implemented to detect the region containing the label text. In order to handle complex backgrounds, two novel feature maps to extracts text features based on stroke orientations andedge distributions, respectively are used. Maximally stable ertremal region is used in automatic text extraction. MSER can be used to define image regions with their outerboundary according to the intensity of a scene street image.The output of MSER detected regions are shown in Figure 3.

6.Optical Character Recognition:

Text recognition is performed by off-the-shelf OCR prior to output of informative words from the localized text

regions. A text region labels the minimum rectangular area for the accommodation of characters inside it, so the border of the text region contacts the edge boundary of the text character. However,OCR generates better performance if text regions are first assigned proper margin areas and binarized to segment text characters from background. We propose to use Template matching algorithm for OCR. The output of the OCR is nothing but a text file containing the product label (its name) in textual form. Audio output component is to inform the blind user of recongnize text code in the form of speech or Audio.

Algorithm for OCR:

1.Start

2.Take input image.

3.Check if RGB image and convert to gray scale image.

4.Create black & white image using "graythresh" & "im2bw".

5.Filter image and remove pixels/objects less than 30 pixel.

6.Load template character.

7.Separate lines using " line" function.

8.Separate letters using "bwlabel".

9.Recongnise letter using read_letter & write into text.

10.Chek if line is finished then move to next line.

11.Check if image is finished.

12.Exit.

7.Product Identification:

The text in output text file from OCR is matched with the saved product names in the Database the matched product is identified.

8.Final Audio Output Containing Product Information:

There are various audio files saved in the database, one for each product. Each audio file contains the complete information of specified product.

Hardware Requirements:

1.USB camera

2.computer with P4 or higher processor

3.Minimum 1 GB RAM

4. Minimum 100 GB Hard Disk

5. Sound Device

Software Requirements:

1.Language:MATLAB 14

IV.RESULTS

1.Original Image:

Fig.1

2.Binary image:

Fig.2

3.MSER regions:

Fig.3

4.Text candidates after region filtering:

Fig.4

Features of an input image i.e.fig1. are detected using MSER for classification of text. MSER has been performing well for detecting text regions. Binary image is shown in Fig2. The detected regions are referred to Maximally Stable Extremal Regions (MSERs) i.e.fig.3 The extracted features of each extremal region include the total number of regions, region centroid, and ranges of regions pixel list.These features are used to extract the pixels for each extremal region of the real image as shown in Figure 3.fig.4 image shows the text candidates after region filtering by text extraction method.

IV.CONCLUSION

In this project, to solve the common aiming problem for blind users, we have proposed a camera-based product information reading framework to help blind persons read product information from hand-held objects in their daily lives.In this project, we get the output in the form of audio.

V.ACKNOWLEDGMENT

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