Text Extraction from Capture Image with Voice Announcement System for Visually Impaired using Android

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Abstract— In this paper, an android based demo system is developed to show effectiveness of our proposed system. We present an approach to detect text from image and recognize audio. Using this we will improve the quality of life for visually impaired persons and give them the proper care at the right time is one the most important roles that are to be performed by us being a responsible member of the society. We propose a technique to identify products which is hand handled object can be known through audio announcement system. For this, we will extract and recognize the text information associated with the detected objects. We first extract text regions of interested (ROI), then text character layout analysis of text strings are applied to filter for subtraction of background. Optical character recognition (OCR) perform task of binarization that separate the text and information transfer to audio output. That is transfer through wireless module to android mobile, which contain android app through that app it will give audio as output. The label of object can be displayed as speech for blind person through hands free.

Key words: GSM, PIC Controller, Android App, Assistive Devices, Blindness, Distribution Of Edge Pixels, Hand-Held Objects, Optical Character Recognition (OCR), Stroke Orientation, Text Reading, Text Region Localization

I. INTRODUCTION

In this paper, we address the problem of locating the textual data in an image. Further, we have extended text extraction scheme for the segmentation of images. People can get images more easily. Once we get the text in the image, we know the content of the image. So, text detection has great meaning in modern society and it has attracted more and more attentions.

It helps to many impaired person in malls where they can visit to purchase any product by just to shake that product once that video will capture one perfect image and pass on to terminal through Matlab that terminal will extract text from given image of region of interested text. Extracted text will transfer to android app through gsm module to android app. Text will be in audio and it will audible to impaired person through android phone.

A. Motivation

Out of the 314 million visually impaired people worldwide, 45 million are blind[1]. As conclude Reading is essentially so we design system to help blind people to Identify different products through speech.

B. Advantages

Reading is obviously essential in today's life, because Printed text is everywhere in the form of reports, receipts, bank statements, restaurant menus, classroom product packages, instructions on medicine bottles, etc.

The ability of people who are blind or significant visual impairments to read printed labels and product packages will enhance independent living and self-sufficiency. Today, there are already a few systems that have some promise for portable use, but they cannot handle product labeling. 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.

C. Why Android?

In the field of android operating system, the Android 1.0 was the first Android Operating System, which was commercially of released in September 2008.This mobile application development platform was open source. The collaboration of the Google with the Open Handset Alliance was designed this Android Platform. The Android SDK has many tools and different APIS, which can use in designing and developing different mobile apps. Android has growth as a main mobile platform because of its updated and software features. The latest version of the Android was Android L API level 23 which was released on 16 June, 2014 and updated on September 29, 2015 of Android Marshmallow 6.0.

Linux is used as the operating system for Android OS. This android OS is used in mobile, smart phone and tablets. The developers can use the full features the hardware system because it is an open source platform for mobile applications.

II. LITERATURE SURVEY

We have described a prototype system to read printed text on hand-held objects for assisting blind persons. In order to solve the common aiming problem for blind users, in this paper proposed a motion-based method to detect the object of interest, while the blind user simply shakes the object for acouple of second.[1]. An Adaboost learning model is employed to localize text and Off-the-shelf OCR is used to perform word recognition on the localized text regions and transform into audio output for blind users[1][2][3]. The proposed approach embeds multiresolution and multiscale edge detection, adaptive searching, color analysis, and affine rectification in a hierarchical framework for sign detection, with different emphases at each phase to handle the text in different sizes, orientations, color distributions and backgrounds[3][5]][6] for natural scene. There are three main categories of these systems: electronic travel aids (ETAs), electronic orientation aids (EOAs), and position locator devices (PLDs). This paper presents a comparative survey among portable/wearable obstacle detection/ avoidance systems. Survey based on: features, performance and parameters. ETAs performance is best and reliable [4]. MRF formulation-based pixel labeling scheme for

refinement of the segmentation results. Experimental results have established effectiveness of our approach [5]**.** Support Vector Machine (SVM) and Continuously Adaptive Mean Shift Algorithm (CAMSHIFT) SVM: Analyze the textural properties of texts in high dimensional spaces. CAMSHIFT: Text regions are identified to analysis texture.

III. PROPOSED WORK

The aim is to make Android App which can assist visually impaired person to recognize any product which is handled by that person. Used Adaboost learning method algorithm, motion-based method to localize the objects from cluttered background. Background subtraction (BGS) is a conventional and effective approach to detect moving objects for video surveillance systems with stationary cameras.

This Gaussian-mixture-model based method is robust to slow lighting changes, but cannot handle complex foregrounds and quick lighting changes. Than further improved the multiple Gaussian-mixture based BGS method to better define foreground while remove background objects. First, texture information is employed to remove false positive foreground areas. We can extract text by using it. GSM is used to transfer message or text which is extracted via by matlab. Android app that will get text message that text will be converted in audio. So, visually impaired person may be audible that text which was extracted.

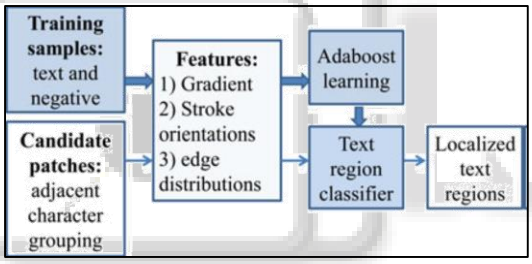

Fig. 1: Diagram of the proposed Adaboost-learning-based text region localization[1]

The proposed system block diagram is shown as below

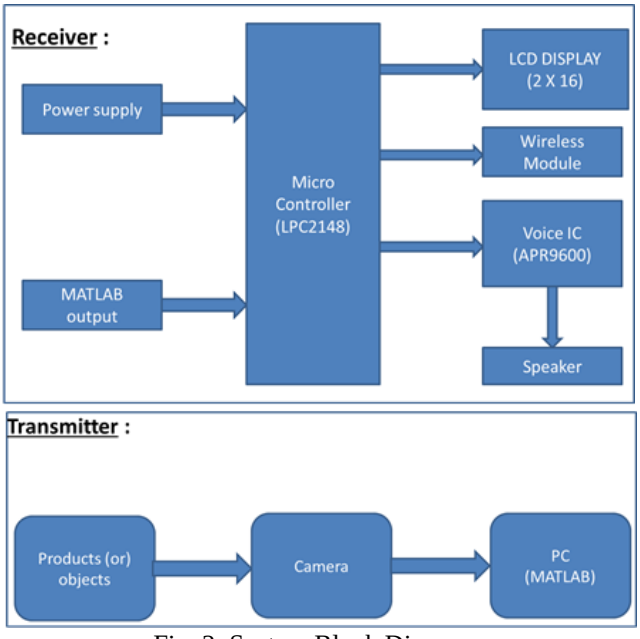

Fig. 2: System Block Diagram

A. *System Overview*

To extract text information from the objects, motion based object detection is first applied to determine the user's object of interest *S* by shaking the object while recording video ground from motion-based object detection, and *R* represents the calculated foreground object at each frame. The object of interest is localized by the average of foreground masks.

Next, our novel proposed text localization algorithm is applied to the object of interest to extract text regions. At first, candidate text regions are generated by layout analysis of color uniformity, horizontal alignment and non-horizontal alignment. After text region localization, off-the-shelf OCR is employed to perform text recognition in the localized text regions. The recognized words are transformed into speech for blind users.

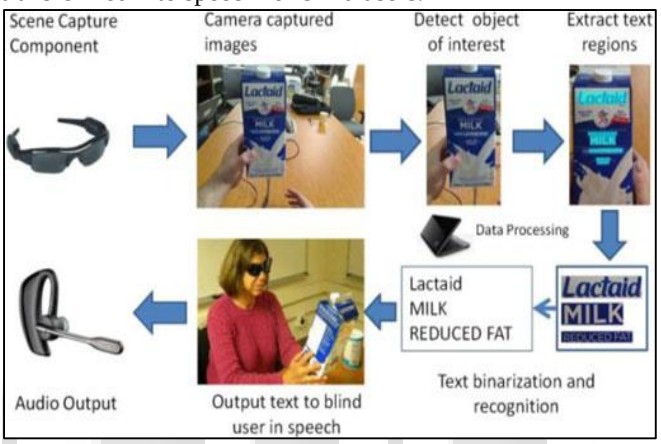

Fig. 3: Flowchart of the proposed framework to read text from hand-held objects for blind users[1]

Our main contribution for this prototype system are a novel motion-based algorithm to solve the aiming problem for blind users by their simply shaking the object of interest for a brief period; 1) a novel algorithm of automatic text localization to extract text regions from complex background and multiple text patterns; and 2) a portable camera-based assistive framework to aid blind persons reading text from hand-held objects. Algorithms of the proposed system are evaluated over images captured by blind persons using the described techniques.

B. *Project Implementation*

The primary function of our project is:
Image Extraction for that steps are as follow:

1) Step 1: Main Image:

Fig. 4.1: Main Image

Product image is captured by good resolution camera. This image contains text of parle that will be extracted by matlab.

2) Step 2: Grayscale Image

Fig. 4.2: Grayscale Image

3) Step 3: Edge Detection

Fig. 4.3: Edge Detection

4) Step 4: Binary Image

Fig. 4.4: Binary Image

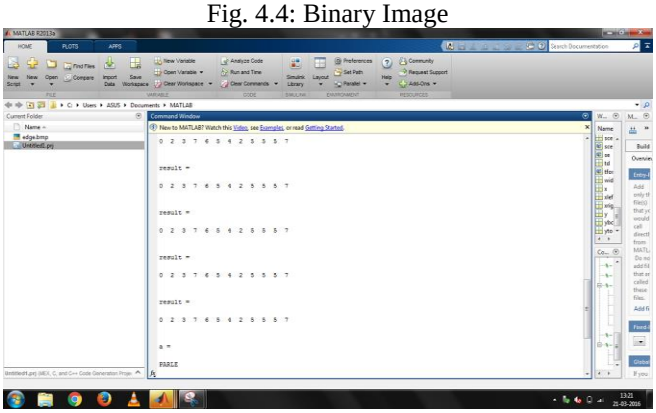

Fig. 4: Result shown as Text Extraction output is parle

IV. CONCLUSION

In this system, we described a prototype system to read printed text on hand-held objects for assisting blind persons .In order to solve the common aiming problem for blind users, we have proposed a motion-based method to detect the object of interest, while the blind user simply shakes the object for a couple of seconds. This method can effectively distinguish the object of interest from background or other objects in the camera view. To extract text regions from complex backgrounds, we have proposed a novel text localization algorithm based on models of stroke orientation and edge distributions. The corresponding feature maps estimate the global structural feature of text at every pixel. Block patterns project the proposed feature maps of an image patch into a feature vector. Adjacent character grouping is performed to calculate candidates of text patches prepared for text classification. An Adboost learning model is employed to localize text in camera-based images. Off-the-shelf OCR is used to perform word recognition on the localized text regions and transform through wireless module to android app mobile that will receive audio output for blind users.

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