International Journal of Electronics, Electrical and Computational System
IJEECS
ISSN 2348-117X
Volume 6, Issue 8
August 2017

Academic Science

Automatic Detection of Text Labels of Hand-Held Objects for Blind Persons

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ABSTRACT:-
Self-Dependency for disabled persons is of prime importance. Text detection and recognition in natural scene images has applications in computer vision systems. Scene text, however, has complex background, image blur, partially occluded text, variations in font-styles, image noise and varying illumination. Hence scene text recognition is a challenging computer vision problem. The proposed work shows an accurate and effective algorithm for detecting enhanced Maximally Stable Extremely Regions (MSERs) as main character candidates and these character candidates are filtered by stroke width variation for removing regions where the stroke width exhibits too much variation. For the detection of text regions, firstly applied to the natural image and then after detecting MSERs, an intersection of canny edge and MSER region is produced to locate regions that are even more likely to belong to text. Finally, the selected text region is taken as an input of a novel Optical Character Recognition (OCR) technique to make the text editable and usable.

KEYWORDS:-
Object Character Recognition, Stroke Feature Transform, Stroke Width Transform, Data Processing, Classifier.

INTRODUCTION:-

Late reviews in the field of PC vision and pattern recognition demonstrate an incredible measure of enthusiasm for content recovery from pictures and recordings. This content can be as objects, shading, texture, shape and additionally the connections between them. The semantic data given by a picture can be helpful for content based picture recovery, and also to index and classification purposes . As expressed by Jung, Kim and Jain text information is especially fascinating, in light of the fact that text can be utilized to effectively and obviously portray the content of a picture. Since the text information can be embedded in a picture in various textual style styles, sizes, introductions, hues, and against an unpredictablefoundation, the issue of separating the applicant text area turns into a testing one . Likewise, current Optical Character Recognition (OCR) methods can just deal with text against a plain monochrome background and can't extract text from an unpredictable or textured foundation As expressed in text has some basic distinctive characteristics in terms of frequency and introduction data, and furthermore spatial attachment. Spatial cohesion alludes to the way that text characters of a similar string seem near each other and are of comparative tallness, orientation and spacing . Two of the fundamental techniques normally used to decide spatial cohesion depend on edge and associated component components of text characters.

II. RELATED WORK:-

The purpose of this project is to implement, compare, and edge-based contrast methods and related components. The other methods mentioned are examples of text extraction techniques that can be used for future projects. In the past, several methods have been proposed for detecting and locating text in images and videos. These approaches take into account the different properties of the text on an image such as color, intensity, connected components, edges, etc. These properties are used to distinguish text regions from the background and / or other regions within the image. The input image is pre-processed before removing any

noise if present. Then the image is grouped in several layers of color and a gray component. This approach exploits the fact that color data in text characters is usually different from background color data. Possible text areas are found using heuristics based on components linked by these layers.

An alignment and merge analysis method (AMA) in each row and column value is analyzed is also used [5]. The experiments conducted show that the algorithm is robust in the predominantly Chinese and English character localization in images; Some false alarms occurred due to illumination or reflection of irregular conditions in the test images. The text detection algorithm in also relies on the continuity of color [6].

In addition, it also uses multi-resolution wavelet transforms and combines imaging features of low-level and high-level extract text regions. The algorithm proposed [7] in is based on frequency, orientation, and spacing of text in an image. Textured segmentation is used to distinguish text from the background. Additionally, you run an ascending "generation chip" process by using space character property of text characters. The chips are pixels collected in the image formed of text edges and any tracks. The results show that the algorithm is robust in most cases except for very small text characters that are not detected correctly. Even in case of low contrast in the image, classification errors occur in the segmentation proposed a system [5] based on care to locate textual regions system approach. Intensity profiles and spatial variance are used to detect text regions in images. A pyramid is created with the original image at different resolutions or stairs. Text areas are detected in the high resolution image .

III.METHODOLOGY

To overcome the problems identified in problem definitions and also to help blind people read the text of these types of challenging templates and backgrounds found in many commercial everyday handmade products, then they have to elaborate a reference framework for the Assisted reading to monitor the object of interest inside the camera and extract information from the subject of text printing. The proposed algorithm used in this system is capable of effectively managing complex and multiple background patterns, and extracts text information from portable objects and the next signal. To overcome the problem of blind reading systems, the object of interest in the center of the camera view. From now on, there are still acceptable solutions. This problem has come in several phases.

The hand object should appear on the camera, this point of view using a camera .This can often lead to other text objects being displayed in the camera (for example, while shopping in a supermarket). To remove the image of the handheld camera, this system will develop a motion-based ROI of the object method. We proposed an enhanced MSER detection technique to locate the position of text in the image and Optical Character Recognition (OCR) technique is applied to this selected text part of the image. The complete process of our detection and recognition algorithm is demonstrated in the following Fig .The corresponding output of step by step techniques implemented on a natural scene image is displayed.Thus incorporating these several key improvements, the proposed method is also sensitive to small letter, blur image, limited resolution image. The proposed enhanced MSER based method of text detection includes the following steps:

1. MSER region detection: Normally, text characters usually have consistent color. So we start to find the text by selecting the regions of similar intensities by using MSER region detector. Many non-text region is also detected and so further processing is applied.

2. Intersection of canny edge with MSER region: Canny edge detection algorithm plays out a high reaction to edge recognition. And intersection of MSER and canny edge produce the region that is likely be text. By utilizing the district properties, some associated segment can be evacuated. As per the variety of various text style, picture size, or dialects the separating limits are consequently recognized in our proposed algorithm.

3. *Visualization of text candidate's stroke width:* Character in almost all language have a comparable thickness all through or stroke width. After this progression the locale where the stroke width contains excessively variety is killed.

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4. Text candidate after stroke width filtering: Non content locale can be wiped out by deciding an expansive variety in stroke width.

5. Image region under mask created by joining individual characters: Then the individual component is merged to compute a bounding box of text region.

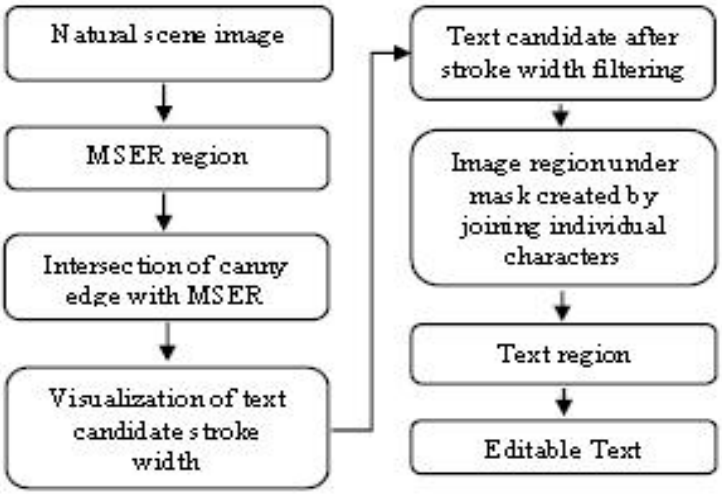

Figure 1: Step by step processing flowchart by our Enhanced MSER detection process.

6. Text regionFinally text region of the image is detected efficiently. Text some portion of the normal scene picture is demonstrated which is found by ours.

7. Optical character recognition technique applied on the text part.

Basic term of machine learning

- Classifier: A machine learning approach/ algorithm that would perform the classification task.
- Training data: Data on which we train the classifier so that it can then be used to classify the new unknown data.
- Testing data: known data with predictable label, but considered as not labeled to verify the accuracy of the built-in classifier.
- Feature vector: Data is represented in the form of the vector function:

Let the feature vector have following information

{ CET score, BE percentile, Elective percentile }

student1= { 230, 89,75}

Student2={123,77,67} And so on.

- Training phase: Present your data from the "gold standard" and its trainers, combining the entrance with the expected results.
- Validation/Test phase: To estimate how well the model has been trained (depending on the size of the data, the value you would like to predict, input, etc.) and estimate the model properties (average error for numeric predictors, incorrect classifications for classifiers , Recall and precision for IR models, etc.

The processing component data is used to display our proposed algorithms, including

1. the detection of objects of interest to selectively extract the image of the retarded object visually detached or otherwise neutral in the view Perspective and text position for image regions containing text

2. text recognition to transform text information into legibles.Utilizamos-based image-based miniphoto-like transformation device objects into our current prototype system.
3. The audio output component is to inform the recognized blind text user code. Results The proposed scene theme text detection is used in the original database prepared by the author.

IV.EXPERIMENTAL RESULTS

The proposed theme of scene text detection is employed on original database. The dataset having 50trainingimage offers several enhancements over the previous scheme.

Figure 2: Original image

After getting MSER detected binary image, it is then intersect with canny edge. Canny edge is the weak edge of local maxima of the gradient of natural image (Fig. 2). As many noisy region of the image we perform a few number

Figure 3: Grey Scale image

It is difficult to train an efficient classifier using unbalanced dataset. So a character classifier is employed to predict the posterior probabilities of text candidates corresponding the region without text.

Figure 4: MSER Region

The stroke width variation, smoothness i.e. average difference of the adjacent pixels, length width, height, aspect ratio etc. features are used to train character classifier.

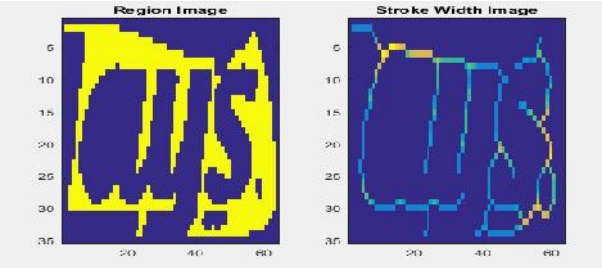

Figure 5: Resulting Region and Stroke width image

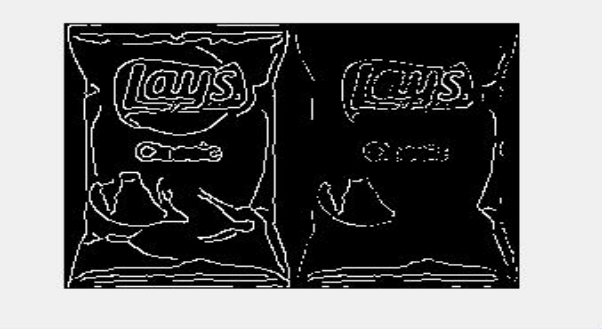

Figure 6:Segmented image

Figure 7:Final image

V.CONCLUSION

We have implemented a prototype system read printed text on hand- held objects for assisting blind persons. In order to solve the common problem for blind users. A stroke width transform system for the text localization algorithm; corresponding maps evaluate the overall textural structural characteristics of each pixel. Adding adjacent characters is done to calculate the candidate text plaque text preparation for text classification. The OCR standard is used for word recognition in localized text regions and converted to audio output for blind users. The recognised text is been made audible using headphones. The OCR standard is used for word recognition in localized text regions and converted to audio output for blind users.

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