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Detect and Separate Localization Text in Images

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Abstract: Detect and separate localization text in Images aims towards an approach with respect different sizes, colors and background complexities. Digital image is to use caption text it provide important information about the image. Use preprocessing method for filtering the noise and sharpening the edges in the complex image. Preprocessing also perform RGB to GRAY conversion. Canny edge detector is used to detect a wide range of edges in images. Sobel edge detector is used to measure edges of the overall boundaries of the horizontal and vertical axis present in the grayscale image. Sobel edge detector used to measure overall boundaries of horizontal & vertical axis in gray scale image. Use localization in this method combined the horizontal& vertical projection method to localize text string present in gray scale images. All the pixels are characters like black as well as white. Use optical character reorganization it is a last & final method.

Keywords: Image segmentation, Optical character recognition, connected component analysis, Text Detection, Edge detection.

I. INTRODUCTION

This paper "detect and separate localization Text in Images" uses various digital image capturing device such as high definition cameras, mobile phones &other image capturing device. An approach with respect to different font sizes, font colors, languages and background complexities.

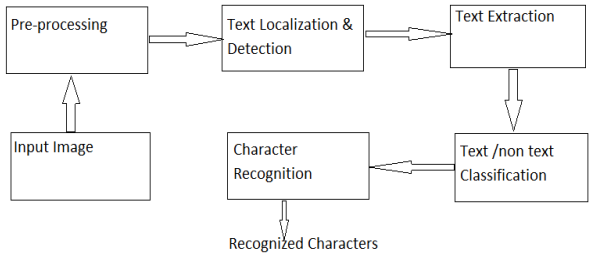

Fig1.Architecture diagram

All the contents in images, text information has build up great interests, since it can be easily understand by human & computer and finds wide applications such as number plate reading, sign indication & translation of images, text recognition web based content like image search & so on. An integrated image text information extraction system with six stages: text detection, image segmentation, text localization and text extraction, text enhancement and optical character recognition (OCR).Text detection & localization are complicated to the overall system performance. Median filter is used to discard the unwanted noise in the gray scale image. Edge detection state that two algorithm like canny edge detector and sobel edge detector.

The purpose of edge detection in general is to significantly reduce the amount of data in an image, while preserving the structural properties to be used for further image processing. Several algorithms exists, and this worksheet focuses on a particular one developed by John F. Canny (JFC) in 1986. Sobel edge detector is used to measure edges of the overall boundaries of the horizontal and vertical axis present in the greyscale image.

II.RELATED WORKS

Several approaches for text detection in images have been proposed in the past.

Victor and Raghavan [1] proposed a system where text is first detected using multi-scale texture segmentation and spatial cohesion constraints, then cleaned up and extracted using a histogram-based binarization algorithm.

Garcia and Apostolidis [2] proposed an algorithm in which potential areas of text are detected by enhancement and clustering processes, considering most of constraints related to the texture of words. Then, classification and binarization of potential text, areas are achieved in a single scheme performing color quantization and characters periodicity analysis. They report a high rate of good detection results with very few false alarms and reliable text binarization.

Julinda, Ralph and Bernd [3] proposed an approach where first, an unsupervised method based on a wavelet transform is used to efficiently detect text regions; second, connected components are generated, and the exact text positions are found via a refinement algorithm and third, an unsupervised learning method for text segmentation and binarization is applied using a color quantizer and a wavelet transform.

Rajeshbaba and Anitha [4] has designed an approach. In this, the image is converted into gray scale image then median filter is used to discard the unwanted noise in the gray scale image. Edge detection is mentioned by using canny edge detection and sobel edge detector. Canny edge detection is used to measure edges of the horizontal and vertical axis present around the text region in gray scale image. Sobel edge detector is used to measure edges of the overall boundaries of the horizontal and vertical axis present in the gray scale image. A mask is a dark and light

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image of the same dimensions as the original image (or the region of interest we are working in). Group of the pixels in the mask can have therefore a value of 0 (black) or 1 (white). When executing operations on the image the mask is used to restrict the result to the pixels that are 1 (selected, active, and white) in the mask. Morphological operations are defined by moving a structuring element over a binary image to be modified in such a way that it is centered over an image pixel at some point. The process of removing certain details in an image which is smaller than certain preference shape is called Morphological image processing and the preference shape is called structuring element. The goal of the connected component analysis is to detect the large sized connected foreground region or object. This is one of the important operations in motion detection. The pixels that are collectively connected can be clustered into changing or moving objects by analyzing their connectivity. The recognition of the text region is referred to the optical Character Recognition which compares the text with databases which consists of different types of character and extracts the text and mentioned in the text notepad document.

III. THE PROPOSED APPROCH

The proposed approach for text extraction and recognition in images can be divided into several elementary tasks:

A: Pre-Processing of Images
In this process making an image in suitable form in next level. It performs filtering the noise & other artifact in the image & sharpening the edges of image. Resharpening & RGB to GRAY scale image conversion also take place. A RBG color image is an image in which each pixel is specified by three values one each for the red component, blue component, and green components of the pixel scalar.

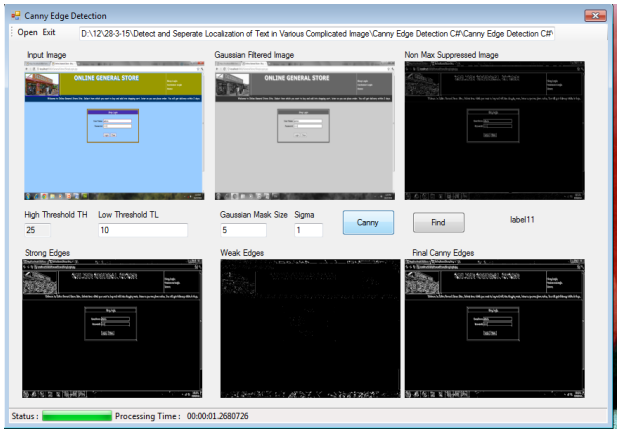

Fig.2:-Edge Detection & Text Localization

B: Text Localization:-
The combined horizontal and vertical projection method is a resourceful way to localize text string along the horizontal orientation assumption. The horizontal and vertical projections cannot separate complex text layouts frequently appeared in the multi-colours image with passing through the exponentionally. The performs the multiple passes of horizontal and vertical projections are engaged the region growing technique with initial bounding boxes to the segmented text regions .Bilinear transformation method is used to rotate image and positioned in rectangular format for the text detection. The localize text may project various shapes. The bilinear transformation method modifies the various horizontal and vertical axes into a rectangular format.

Algorithm for Text Localization:-

1. Convert the color image to a grayscale image.
2. Apply the wavelet transform to the grayscale image.
3. For each pixel blocki of size MxN from the transformed image (e.g. in the HL-subband)
do:
3.1 Create a feature vector fi(x1, x2), where x1 is estimated using formula (1) and x2 is estimated using formula (2).
4. Initialize the three clusters (“text”, “background” and “complex background”) with the pixel block whose feature vectors have the minimal Euclidian distance to the ideal feature vectors.
5. Run the clustering algorithm k-means to classify the image pixel blocks in three clusters.
6. Estimate the connected components (CC) in the “text” cluster to build bounding boxes.
7. Refine the rectangles that surround the text components and analyze them geometrically.

C: Text Segmentation:-
The black and white images are converting into a gray scale image using binarization process. A pixel intensity range between 0 to 255 levels contains in a gray scale image. Gray thresholding is done by using the process of binarization. lt is also defined as the sets of all pixels above defined a value to white and the below rest of pixels to black in the image and threshold value to binaries the image is very important to the global value tor all suitable images. For instance, if threshold value is chosen as X tor an image then the pixels of that image having gray scale intensity range equalling X will be binaries to a value 0 and other pixels will be given a value 1. Thus greyscale image will be converted as black & white image.

Algorithm for Text Segmentation:-

1. Increase the text bounding box (e.g. 4 pixels in each direction).
2. Increase the text image resolution to 300 dpi and rescale the text boxes.
3. Estimate the possible text and background colour.
4. Apply the wavelet transform to the text boxes.
5. For each pixels in a text bounding box do:
5.1 Create the feature vector fi(r, g ,b, x1, x2, x3), where r, g ,b are the values of each of the channels R, G and B, and x1, x2, x3 are the standard deviations of the wavelet (LH, HL, and HH-sub bands) coefficients in the 8-neighbourhood of pixel.
6. Initialize the two clusters “text” and “background” with the feature vectors which have the minimal Euclidian distance to the ideal feature vectors.

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7. Run the k-means clustering algorithm to classify the pixels into the "text" and "background" cluster.
8. Binarize the text image so that pixels which are assigned to the "text" cluster are marked as black.

IV. CONCLUSION

In this paper, we have proposed approaches considered the different attributes related to text in an image such as of size, font, style, orientation, alignment, contrast, color, intensity, connected-components, edges etc. These attributes are used to classify text regions from their background or other regions within the image. This paper provides a broad study of the various text extraction techniques and algorithms proposed earlier. This paper also exposed a performance comparison table of different technique that was proposed earlier for text extraction from an image. Every approach has its own benefits and restrictions. Even though there are many numbers of algorithms, there is no single unified approach that fits for all the applications. The future work mainly concentrates on developing an algorithm for exact and fast text extraction from an image. In the future work the approach will be extended to also work with video sequences instead of still images.

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