Text Extraction in Different Orientation From Natural Images

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Abstract: ***The detection and extraction of text area in a picture is a renowned problem in the field of image processing. There are many techniques are available for linear text detection but the text detection in multi-orientation is a challenging task now a days. The aim of the project is to contrast the two methodologies of multi-oriented text extraction: Edge-based and connected components algorithms. The factors that are considered to contrast the two algorithms are lighting, Scale and orientation, precision rate and recall rate.***

Keywords: Image processing, Edge-based, connected components, recall rate, precision rate.

I. INTRODUCTION

Ongoing research work in the field of pc vision and image processing demonstrate a lot of enthusiasm for the substance retrieval from a image or recordings. Text detection in linear orientation is quite easy and there are many techniques to detect like optical character recognition but current Optical Character Recognition (OCR) procedures can just deal with content against a plain monochrome foundation and can't separate content from a mind boggling or finished foundation [7].Distinctive methodologies for extracting text in multi orientations are Edge based and connected components algorithms are used to solve the issue in this project

II. OBJECTIVES

- The goal of our task is to detect and extract text in multi oriented form using two connected components and edge based algorithm.
- To determine which algorithm is efficient in detecting and extraction of text in different orientations.
- The factors for comparison are precision rate and recall rate and scale, variance, lighting conditions.

III. LITERATURE SURVEY

The reason for this undertaking is to actualize, analyze, and differentiate the edge-based and the associated segment strategies. Different strategies referenced that are instances of content extraction procedures that can be utilized for further undertakings. Different techniques have been suggested in the past discovery and limitation of content in pictures and recordings. Those methodologies think about various properties identified with content in a picture, for example, shading, power, associated segments, edges and so forth. These properties are utilized to recognize content areas from their experience as well as different districts inside the picture. The calculation proposed by Wang and Kangas in [5] depends on shading bunching. The info picture is first pre-prepared to evacuate any clamor if present. At that point the picture is gathered into various shading layers and a dim part. This methodology uses the way that normally the shading information in content characters is not the same as the shading information out of sight. The potential content areas are restricted utilizing connected components based heuristics from these layers. Additionally, an adjusting and consolidating investigation (AMA) strategy is utilized in which each line and segment esteem is examined [5]. The examinations led demonstrate that the calculation is powerful in finding for the most part Chinese and English characters in pictures; some bogus alerts happened because of uneven lighting or reflection conditions in the sample pictures.

IV. PROPOSED METHODOLOGY

The objective of the task is to actualize, examine, and thoroughly analyze two methodologies for content district withdrawing in common pictures, and to find how the calculations process under varieties of lighting, introduction, and scale changes of the content. The calculations are from Liu and Samarabandu in [1,2] and

Gllavata, Ewerth and Freisleben in [3]. The correlation depends on the exactness of the outcomes got, and accuracy and review rates. The procedure utilized in [1,2] is an edge-based content extraction approach, and the method utilized in [3] is an associated segment-based methodology.

So as to examine the heartiness and execution of the methodologies utilized, every calculation was first actualized in the first proposed arrangement. The calculations were tried on the picture informational index given by Xiaoqing Liu (xliu65@uwo.ca) and Jagath Samarabandu (jagath@uwo.ca), just as another informational collection which comprises of a blend of indoor and outside pictures taken from an advanced camera. The outcomes got were recorded dependent on criteria, for example, invariance as for lighting conditions, shading, revolution, and separation from the camera (scale) just as level or potentially vertical arrangement of content in a picture. The trials have likewise been directed for pictures containing distinctive textual style styles and content characters having a place with language types other than English. Additionally, the accuracy and review rates (Equations (1) and (2)), have been figured dependent on the quantity of accurately identified words in a picture so as to additionally assess the proficiency and vigor of every calculation.

The Precision rate is characterized as the proportion of effectively identified words to the entirety of accurately distinguished words in addition to false positives. False positives are those districts in the picture which are really not characters of content, yet have been recognized by the calculation as content areas.

$$\text{Pr escision Rate} = \frac{\text{Correctly Detected Words}}{\text{Correctly Detected Words} + \text{False Positives}} \text{X} 100$$

The Recall rate is characterized as the proportion of effectively distinguished words to the whole of accurately recognized words in addition to false negatives. False Negatives are those areas in the picture which are really message characters, yet have not been distinguished by the calculation.

A. System Architecture and Algorithm for Edge Based Text Region Extraction:

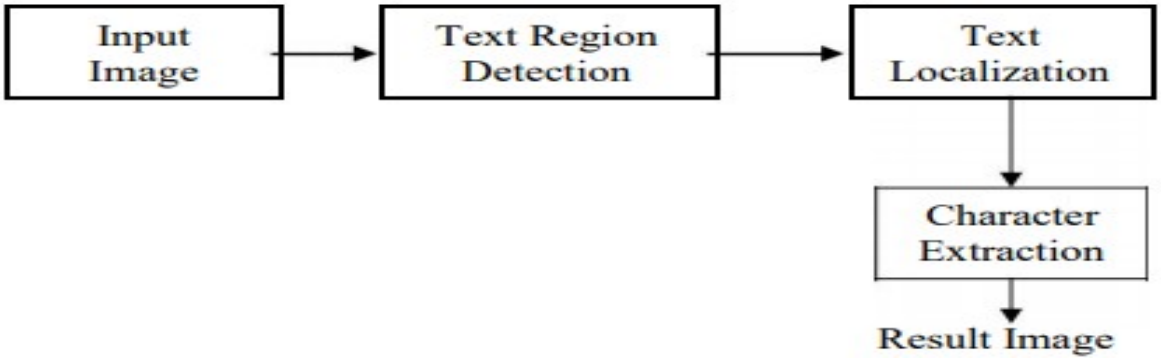

Fig 1 Block Diagram for Edge Based Algorithm

Step 1: Create a Gaussian pyramid by convolving the information picture with a Gaussian piece and progressively down-example every course considerably. (Levels: 4)
Step 2: Create directional pieces to distinguish edges at 0, 45, 90 and 135 introductions.
Step 3: Convolve each picture in the Gaussian pyramid with every introduction channel.
Step 4: Combine the after effects of stage 3 to make the Feature Map.
Step 5: Dilate the resultant picture utilizing an adequately extensive organizing component (7x7) to group hopeful content areas together.
Step 6: Create last yield picture with content in white pixels against a plain dark foundation.

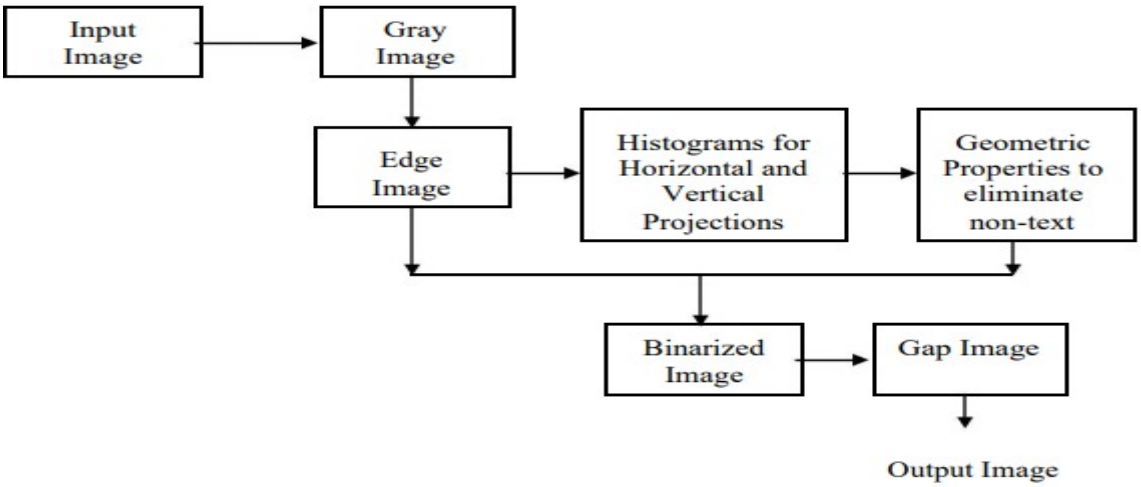

Fig 2 Block Diagram for Connected Component Based Text Extraction

B. System Architecture and Algorithm for Connected Component Based Text Region Extraction:

Step 1: Convert the information picture to YUV shading space. The luminance(Y) esteem is utilized for further handling. The yield is a dark picture.
Step 2: Convert the dim picture to an edge picture.
Step 3: Compute the level and vertical projection profiles of hopeful content locales utilizing a histogram with suitable edge esteem.
Step 4: Use geometric properties of content, for example, width to tallness proportion of characters to take out conceivable non-content districts.
Step 5: Binarize the edge picture upgrading just the content areas against a plain dark foundation.
Step 6: Create the Gap Image (as clarified in the following area) utilizing the hole filling procedure and utilize this as a kind of perspective to additionally wipe out non-content areas from the yield.

V. RESULTS

To have a more intensive take a gander at the outcomes and break results of this work for an assortment of sources of info are

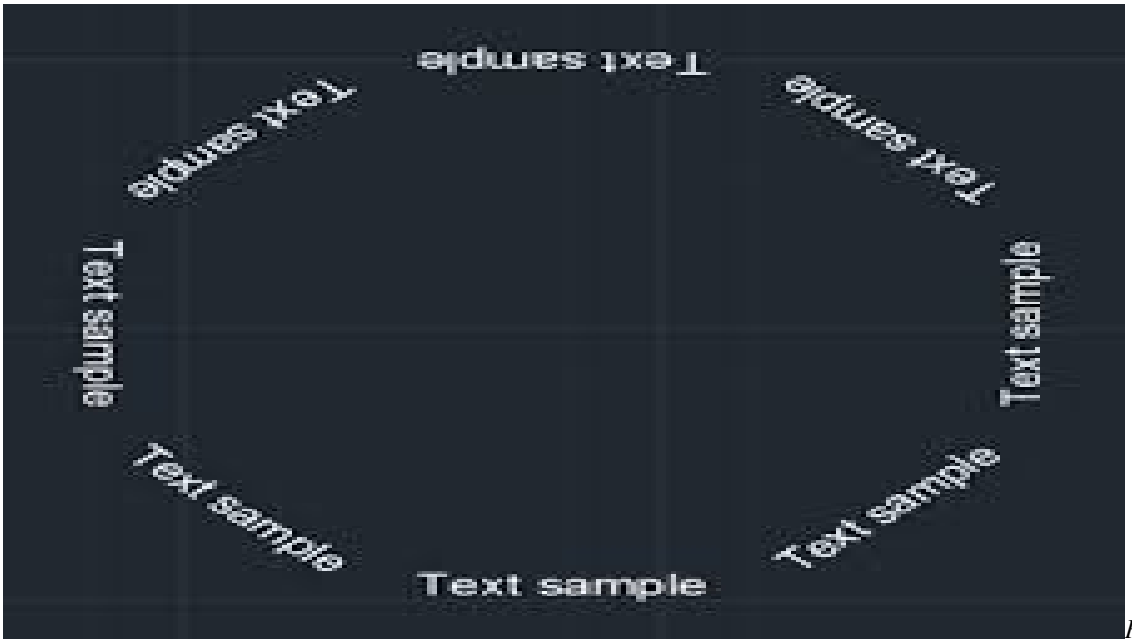

Fig 5.3 original image of text in circular alignment

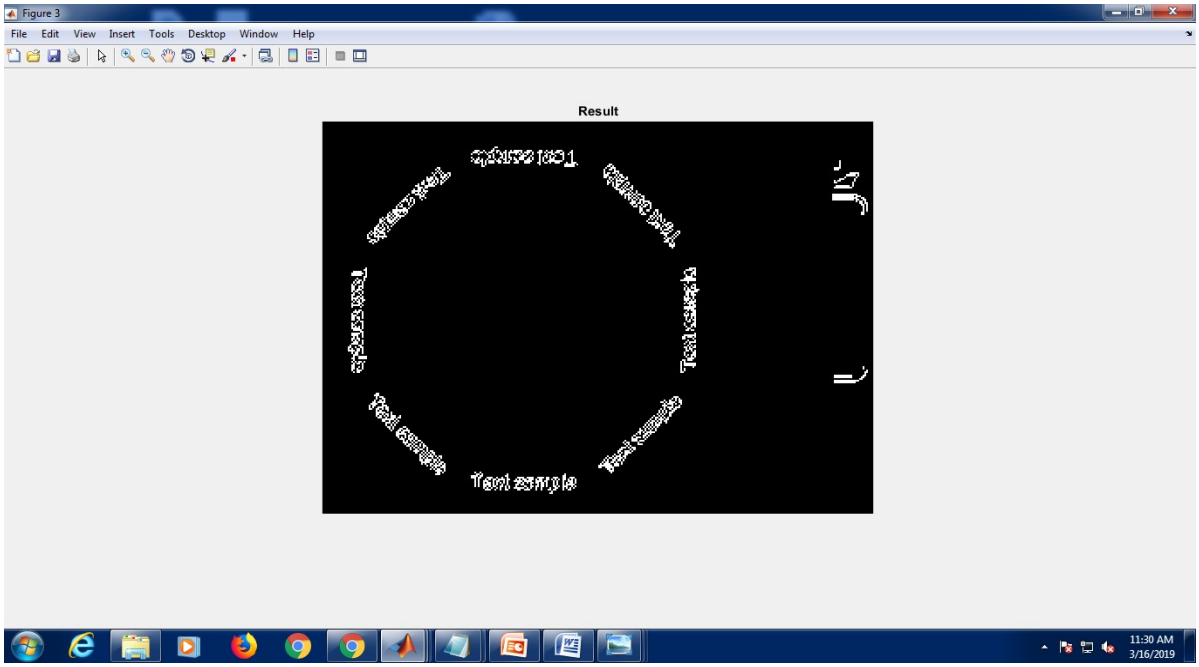

Figure 5.4 Output of the connected components

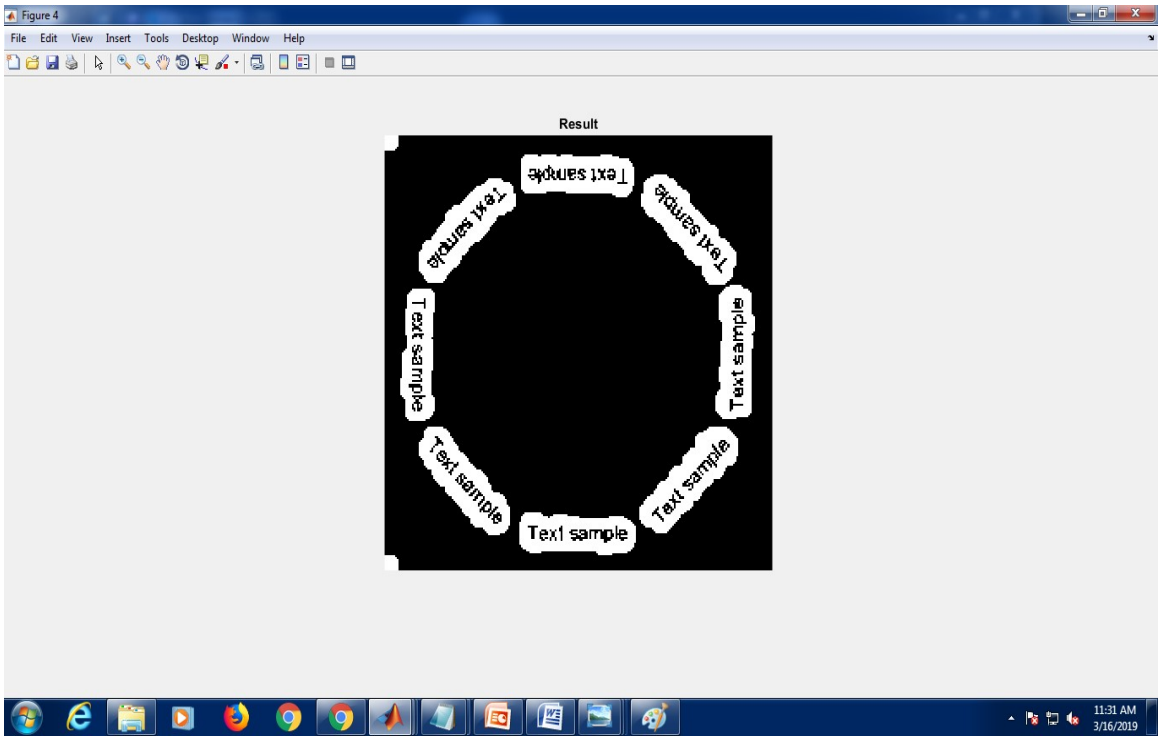

Figure 5.5 output of the Edge based algorithm

VI. CONCLUSION:

The outcomes gotten by every calculation on a shifted set of pictures were contrasted with deference with exactness and review rates. As far as scale change, the connected components part calculation is increasingly hearty when contrasted with the edge-based calculation for content area extraction. Regarding lighting change additionally, the connected components segment-based calculation is less powerful than the edge-based calculation. As far as revolution or introduction fluctuation, the accuracy rate acquired by the connected components part based calculation is less than the edge based, and the review rate gotten by the edge

based is higher than the connected components based The normal exactness rates gotten by every calculation for the rest of the test pictures are comparable, while the normal review rate acquired by the connected components calculation is a little lower than the edge based calculations and outcomes from the tests show that in the vast majority of the cases, the connected components based calculation is progressively powerful and invariant to scale, lighting and introduction when contrasted with the edge-based calculation for content district extraction. For the connected components calculation, the general exactness rate is 47.43% and review rate is 76.09%. For the Edge-based calculation, the general exactness rate is 51.10% and review rate is 74.42%.

REFERENCES:

[1] Xiaoqing Liu and Jagath Samarabandu, *An Edge-based text region extractionalgorithm for Indoor mobile robot navigation*, Proceedings of the IEEE, July 2005.

[2] Xiaoqing Liu and Jagath Samarabandu, *Multiscale edge-based Text extraction fromComplex images*, IEEE, 2006.

[3] Julinda Gllavata, Ralph Ewerth and Bernd Freisleben, *A Robust algorithm for Textdetection in images*, Proceedings of the 3rdinternational symposium on Image andSignal Processing and Analysis, 2003.

[4] Keechul Jung, Kwang In Kim and Anil K. Jain, *Text information extraction in imagesand video: a survey*, The journal of the Pattern Recognition society, 2004.

[5] Kongqiao Wang and Jari A. Kangas, *Character location in scene images from digitalcamera*, The journal of the Pattern Recognition society, March 2003.

[6] K.C. Kim, H.R. Byun, Y.J. Song, Y.W. Choi, S.Y. Chi, K.K. Kim and Y.K Chung, *Scene Text Extraction in Natural Scene Images using Hierarchical Feature Combining and verification*, Proceedings of the 17thInternational Conference onPattern Recognition (ICPR '04), IEEE.

[7] Victor Wu, Raghavan Manmatha, and Edward M. Riseman, *Text Finder: AnAutomatic System to Detect and Recognize Text in Images*, IEEE Transactions onPattern Analysis and Machine Intelligence, Vol. 21, No. 11, November 1999.

[8] Xiaoqing Liu and Jagath Samarabandu, *A Simple and Fast Text LocalizationAlgorithm for Indoor Mobile Robot Navigation*, Proceedings of SPIE-IS&TElectronic Imaging, SPIE Vol. 5672, 2005.

[9] Qixiang Ye, Qingming Huang, Wen Gao and Debin Zhao, *Fast and Robust textdetection in images and video frames*, Image and Vision Computing 23, 2005.

[10] Rainer Lienhart and Axel Wernicke, *Localizing and Segmenting Text in Images andVideos*, IEEE Transactions on Circuits and Systems for Video Technology, Vol.12,No.4, April 2002.

[11] Qixiang Ye, Wen Gao, Weiqiang Wang and Wei Zeng, *A Robust Text DetectionAlgorithm in Images and Video Frames*, IEEE, 2003.