



# LETTERS EXTRACTION IN SIGN BOARD USING VARIOUS OPTIMIZATION TECHNIQUES

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**Abstract-**The proper allocation of the randomly deployed sensors is most important part in wireless sensors networks (WSN) which is used for monitor and to track the applications. The problem of allocation has proposed a multi-dimensional global optimization problem in earlier literature. There are many swarm algorithm are proposed for proper localization. The inspiration behind this research is the new BFO algorithms which have vast potential. Also the results of the MATLAB simulation of BFO algorithm, based on multistage localization have also been presented. After performing this the output thus obtain is compare with the output of three other methods by the PSO algorithm. Thus here we present some comparative study on the BFO and PSO algorithm with respect to the number of nodes and the location accuracy and time period of the computation. The results thus obtained shows that the ABC algorithm provide the higher accuracy of the localization than the PSO algorithm does but it also take much longer to coverage. This result present a relation between the speed and accuracy of localization in WSNs.

**Key Words:-**Text extraction, Text Localization, text recognition, PSO,BFO.

## 1. INTRODUCTION

This paper discusses about the text content which is contained in the born digital images and contains some important information about the ads and security content. Thus while extracting the this text data from the born digital images the content thus store may effected. Generally there are three steps in for a information extraction system which are: text localization, text segmentation & text recognition. Text localization is the most crucial method among these and also suffer from some challenges like variations in image background and layout.

There are many method which are proposed for the text localization in image and they have been categorized into two categories: connected component (CC)-based and texture-based. Among these two method the CC based method are getting more attention than other method on various data sets (Kai Chen, 2016). The extraction of user text CCs is the most important step for such methods. Additionally maximum possible numbers of connected component have to be recall. And lesser number of connected components are generated because the lesser number will make the identification and grouping of text CCs more easier into the text lines. For clustering the pixels into connected component the researchers uses color, SWT AND MSERs. The methods which are based on the color clustering (Yuanyuan Feng , 2015 ; Kuntpong Woraratpanya , 2014) uses various strategies like k-means for the segmentation of the image in the belief that the similar text can be segmented to the same sub images. The methods which performed on the basis of observation has an assumption that the texture of the region which have text content is somewhat different from the other region which does not have text. As some textual based methods ( J. Canny,1986 ; H. Chen et.al , 2011) uses a sub-window in multi-scales from all the directions of the images by using a trained classifier to classify that which window contains the text and which doesn't. thus such a search based methods makes the computations more costly. There are also several method which have been proposed that produce the text region proposals and determine whether the region contains the text or not (Clavelli et.al, 2010; T. E. de Campos et.al , 2009 ).

The method proposed in this study is based on the connected components. Beside these method there are also several method which are presented for the scene text detection. there are only some works has been presented for the born-digital images. Because born-digital images represent the various characteristics from the scene images, w can not employ the methods which are developed for the scene images for the born-digital images. To differentiate the text region from the other regions the text strokes present in the born images have some contour and the contour for the text content have some high divergence as compared to the contour present in the non text region thus bus the contour difference we can differentiate the regions. But we can not apply this method for the scene image because in these images the capturing environment is not ideal.

This paper is divided into VI sections: Section II outlines literature survey. Proposed Algorithm to analyzed F- Score is discussed in Section III. The Performance parameter is analyzed in Section IV. Section V is concentrated on the simulated result of Viterbi Decoder. The conclusions are given in Section VI.

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## 2. LITERATURE SURVEY

Kai Chen in his study proposes a novel connected component based method for the text localization in born-digital images. Thus by this method we can easily detect the text content from the born digital images. Firstly we detect the contour regions because different region have different contour and then adjoin all these regions. Thus there are some other steps which are followed in CC method like filtering; line grouping etc then we get the final output. Thus this method can give the best performance for the born digital data set of of ICDAR2013.

Yuanyuan Feng presents a method to detect the text in the external regions (ERs) and Corner-HOG feature. To identify the non-text component in a effective way local Histogram of Oriented Gradient extracted through corners is used. This has been observed from the result that Corner Histogram oriented Gradient based pruning method can extract the average of 73.06% of the entire external region in a image and preserve the recall of 80.51% of the text components.

Kuntpong Woraratpanya present a study to localize the Thai text and the extraction of content in its original form is still and problem. As we know that the efficiency of the recognition rate has been depend upon the text localization, i.e., that basically shows that the higher resemblance of the text background decomposition will prove the better accuracy rate for the effective character recognition.

Khalid Iqbal presents a study about the text localization. The text localization is the most important task to study a digital image. For this we use Bayesian network scores by employing K2 algorithm used along with the feature which are in combination with the feature based localization method by using MESRs.

Lukas Neumann present a end to end and a real time localization and identification method. to obtain the performance of this feature we use we character detection and localization issue as a efficient sequential selection from the external regions.

.Mohammad Shori fUddin, Madeena Sultana, Tanzila Rahman, and UmmeSaym 2012 presents a study whose main aim is to extract the text content from the images. Thus for this the author present the method on the basis of morphological features to detct the localization text from the images. There are various researchers and various techniques have been developed which efficiently removed the text content from the images.

Nirmala Shivananda and Naga bhushan presnt a study in which he present a hybrid method for the separation of text content form the color document images. But we can not use this techniques for the extraction of text from the complex images.

Partha Pratim Roy,JosepLlad'os and Uma padaPal present a method by which we can separate the text from the color map on the bases of CC analysis and the clustering of the characters in a string. Basically in this method we detect the characters which are connected in the graphics and then extract them. But there are some characters which can not be separated from the graphic by the CC method. thus here we use Antaniand R.Kasturiworks which is suitable for the text separation from the mixed and complex images. But in this we make a assumption that the characters are aligned in a straight way which is not practically possible and also they does not touch or overlap the graphics which is also not always possible. Thus to enhance the accuracy level they sue the modified morphological filter and also propose a cluster based method.

## 3. PROPOSED ALGORITHM

For Text localization,Particle Swarm optimization & Bacteria Forging optimization are used. These briefly explained as

### 3.1 PSO Technique

Particle Swarm Optimization modeled on the basis of studying the behavior of the various birds in a group. Basically PSO is a technique in which the individual person in a population is assumed as a particle and in group they act as a swarm. Thus the solution for the every individual for the optimization issue is shows as the swarm particles. In this method every particle contain in the swarm travels in three dimensional co-ordinates and adjust its location in the co-ordinates of the free space. Therefore, the best position encountered by particlemake a particular use & their neighbors to position itself toward an optimizesolution. The effect is that still searching a large area around the best solution while particles “fly” toward a minimum. Using predefined fitness functions, the performance of each particle is measured which condense the characteristics of the optimization problem.

### 3.2 BFO

To get the highest level of energy per unit time the bacteria find nutrients. In this technique the communication between two bacteria takes place by sending the signals to each other. In order get maximum energy obtained per unit time, Bacteria search for nutrients.In this technique, communication between two bacterium takes place by sending the signals. On the basis of the previous decision and the results a bacterium takes is decision. The process by which the bacterium takes the nutrient and then carry it away by moving with it small steps is termed as chemot axis and the main idea behind this BFOA is the repeating movement of the virtual bacteria in the problem search space. As this method is unique and attract the various researchers from the various fields especially from the biological initiative and the elegant structure. There are several researches has been conducted to make this technique hybrid by using this technique along with the other techniques to find its global and local finding properties separately. As this techniques has been used for the several other problems and it prove its strength over the various variants of generic algorithm and PSO. While foraging of the original bacteria, we can perform the shifting by a set of tensile flagella. The two basic functions which are performed by the bacterium are E – coli bacterium to tumble or swim.

#### 4. PERFORMANCE PARAMETER

It can be done on the basis of following parameters.

- 1) False Positives (FP) / False alarms represent those region which originally contains the text but they are detected by the algorithm as text.
- 2) False Negatives (FN)/ these are those region which originally contain the text but can not detected by the algorithm.
- 3) RRC (Recall rate) =  $(\text{No. of extracted characters text in image} / \text{No. of characters text in image}) \times 100$ .

#### 5. RESULT & DISCUSSION

The Final extracted images are as shown in below fig. The comparison result is given as shown in Table 1.

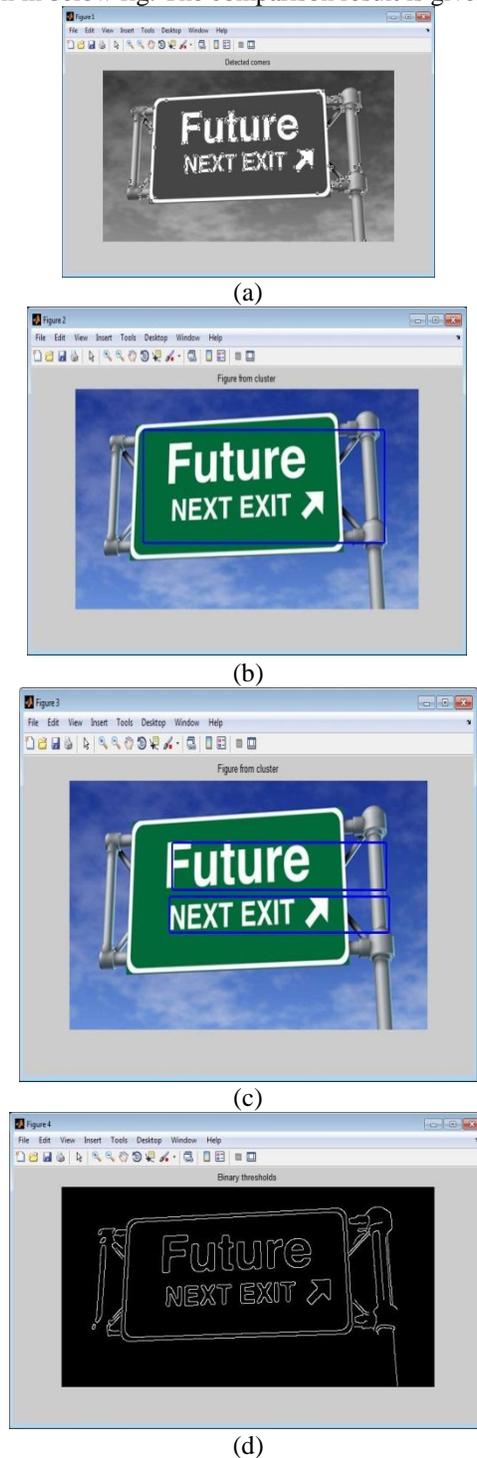


Fig 1 Final Text Extraction from Different Images.

Fig 1 gives final detected text from the image. These texts counts & find the recall rate & precision rate. Hence find F- score. As more is the F –score, algorithm is more efficient.

In our research, we have taken 10 images for text detection. On the basis of PSO & BFO algorithms recall rate and precision rate can be calculated. Table 1 gives Comparison of F- Score of the different images. The 1<sup>st</sup> Image has more F – Score as compare to others.

Table 1. Comparison of F- Score of different Images

Sr. No.	Precision Rate	Recall Rate	F score
1.	86	79	82.35
2.	85	74	79.124
3.	71	59	64.45
4.	65	50	56.89
5.	62	45	52.44
6.	54	29	38.31
7.	48	26	33.63
8.	36	23	25.70
9.	35	21	26.18

## 6. CONCLUSION

A method of character text string extraction from scene image is discussed and implemented. It can't only detect single lead multiple texts and also detect arbitrary oriented text. It is based on mathematical morphology and OCR technique which can deal with various case of scene images. Because in mathematical morphology, top-hats transformation (TT) provides a brilliant tool for extracting bright order objects from complex background. But for many complicated extraction problems, TT alone can't derive better result. For this reason, we discuss this method which uses segmentation of images using mathematical morphology and extraction of text using OCR. The experimental results appear encouraging to demonstrate the efficiency of PSO and BFO for shape analyzing and detecting. We intend to proceed with our study on text extraction from image to improve its accuracy. With this approach F-score of 83.35 is achieved. Finally a character recognition system on scene image using PSO & BFO is suggested to be constructed.

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