IMAGE SEGMENTATION USING THRESHOLDING

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Under Supervision

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TO WHOM AT MAY CONCERN

This is certified that the work entitled as 'Image segmentation by Thresholding' has been satisfactory complete by Raya Dutta (Registration no-161541810017 Roll no-15499016013).It is a bona-fide work carried out under my supervision at DINABANDHU ANDREWS INSTITUTE OF TECHNOLOGY AND MANAGEMENT Kolkata for partial fulfillment of M.sc in computer science during the academic year 2016-2018.

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CERTIFICATE AND APPROVAL

This is certified that the work entitled as 'Image segmentation by Thresholding' has been satisfactory complete by Raya Dutta (Registration no-161541810017 Roll no-15499016013).It is a bona-fide work carried out under my supervision at DINABANDHU ANDREWS INSTITUTE OF TECHNOLOGY AND MANAGEMENT Kolkata for partial fulfillment of Msc in computer science during the academic year 2016-2018.It is understood that by this approval the undersigned do not necessarily endure or approve any statement made, opinion expressed or conclusion drawn there in but approve for which it has been submitted.

Examiners

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Signature of the examiner

Date:

DECLARATION OF ORIGINALITY AND COMPLIANCE OF ACADEMIC ETHICS

I here by declare that this thesis contents original research work done by me, as part of master of computer science studies. All information in this document has been obtained and presented in accordance with the academic rules and ethical conduct.

I also declare that, as required by these rules and conduct I have fully cited and referenced all the materials.

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ABSTRACT

Image segmentation is widely used in image analysis, object detection, medical image processing, face recognition. In our project, we have studied thresholding technique of image segmentation and implemented in R studio. A color image is taken and then converted into gray scale image. Next, a fixed threshold value is taken and compared with the original image to find the segmented image.

INTRODUCTION

An image is a way of transferring information [1], and the image contains lots of useful information. Understanding the image and extracting information from the image to accomplish some works is an important area of application in digital image technology, and the first step in understanding the image is the image segmentation.

IMAGE SEGMENTATION

Image analysis usually refers to processing of images by computer with the goal of finding what objects are presented in the image. Image segmentation is one of the most critical tasks in image analysis. It consists of subdividing an image into its constituent parts and extracting these parts of interest (objects).

Segmentation algorithms can be divided into two categories: the analytical methods and the empirical methods. The analytical methods directly examine the segmentation algorithms by analyzing their principles and properties. The empirical methods indirectly examine the segmentation algorithms to test measuring the quality of segmentation results. Various empirical methods have been provided, most of them can still be classified into two types: goodness methods and discrepancy methods.

Firstly, some desirable properties of segmented images, often established according to human intuition, are measured by "goodness" parameters. The performances of segmentation algorithms are examined by the values of goodness measures. In the second category some references that present the ideal or expected segmentation results are first found. The actual segmentation results obtained by applying a segmentation algorithm, sometimes preceded by preprocessing and/or followed by post processing processes, are compared with the references by counting their differences. The performances of segmentation algorithms under investigation are then assessed according to the

discrepancy measures. Following this discussion, three groups of methods can be distinguished. [3]

APPLICATION OF IMAGE SEGMENTATION

Image segmentation is the process of divided a image into multiple segments. The goal of segmentation is to simplify an image into something that is more meaningful and easier to analyze.

The main goal of segmentation is to divide an image into parts that having correlation with areas of interest in the image.

There are thousands of algorithms, each of the algorithms are slightly different from another, but still there is no specific algorithm that is applicable for all types of digital image and fulfilling every objective of a image.

Medical Image Segmentation:
Medical image segmentation is used in various applications. For example, in medical image processing, it is used to analyze and locate tumour, analyze the anatomical structure etc. It provides comparable resolution and better contrast resolution. One of the most important problems in image processing and analysis is segmentation.[4]

In this paper, it provides a new segmentation method called the Medical Image Segmentation Technique (MIST), it is used to extract an anatomical object from a lack of sequential full colour. An important area of current research is about Human body structure and function. Human body is a complex structure and its segmentation is an important step for further studies for medical purpose.[4]

Thesholding:
Threshold segmentation is the simplest method of image segmentation and also one of the most common parallel segmentation methods. Threshold segmentation can be divided into local threshold method and global threshold method[5].Threshold technique is one of the important techniques in image segmentation.[6]

Thresholding is an important technique for image segmentation. Because the segmented image obtained from thresholding. It has the advantage is storage space is smaller, processing speed is fast and easy in manipulation, compared with a gray level image containing 256 levels, thresholding techniques have drawn a lot of attention during the last few years.

The aim of segmentation is to separate the objects from the background and differentiate pixels that having nearby values for improving the contrast.

In many image processing, image regions are expected to have homogeneous characteristics (e.g. grey level, or color), indicating that they belong to the same objects are facts of an object, implying the possibility of effective segmentation.[7]

LITERATURE SURVEY

In this paper [8], they have discussed about Image segmentation and Current image segmentation techniques. In Current image segmentation techniques, It is based on two categories: Discontinuities based, Similarities based. In similarities based ,it works on Segmentation based on edge detection method and Threshold method.

In this paper [9], they have discussed about Image segmentation Techniques. There are two categories of segmentation techniques: Edge based and Region based. In region based segmentation, it works on some methods: Region Growing, Region Splitting and Merging, Watershed transformation.

In this paper[10]they have discussed about various methods for medical image segmentation. Particularly, analysis of magnetic resonance. Here, segmentation techniques into three classes: Traditional image processing methods, Segmentation techniques based on statistical theory, The partition method considering bias field effect.

In this paper[11]they have discussed about basic segmentation techniques are follows: Thresholding approach, Region growing approach, classifiers, clustering approach, Markov random field approach, Artificial neural network, Deformable models, Atlas guided approach. It represented various methods of segmentation and clustering which can be helpful for medical image segmentation.
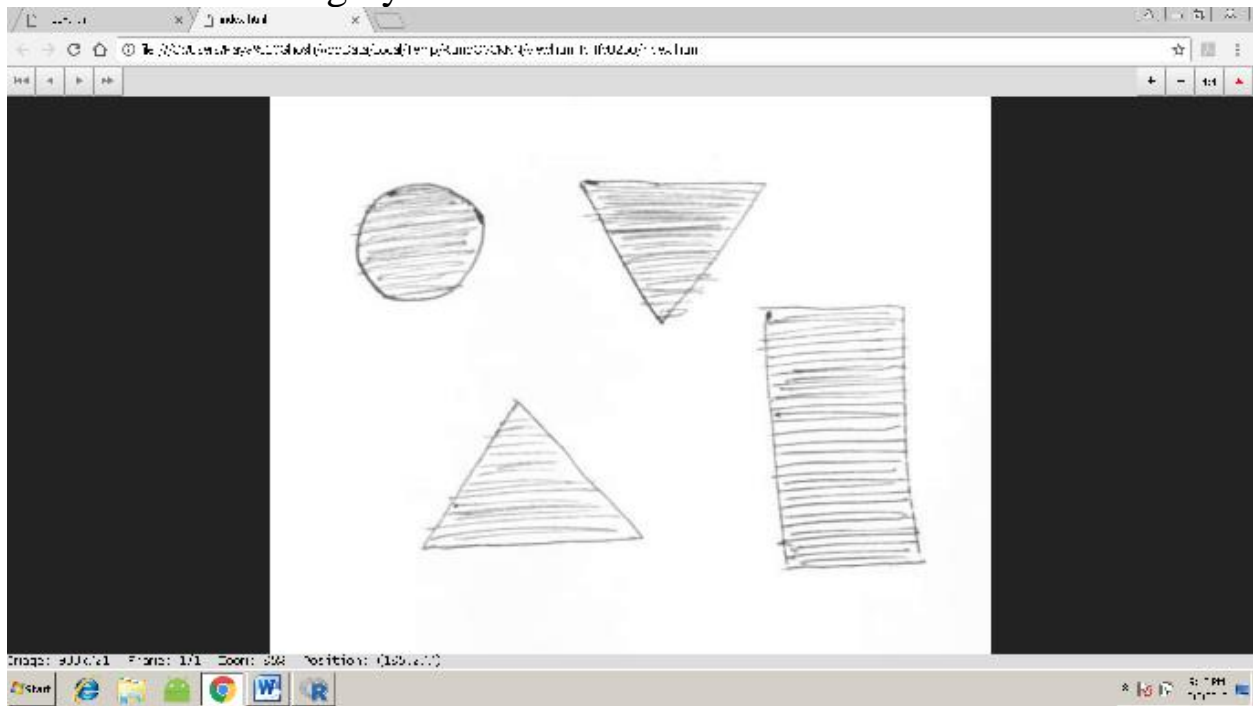
ALGORITHM

step 1. Read the Image.
step 2. Convert into the gray scale.
step 3. Compare with the threshold value.
step 4. Segment the image.
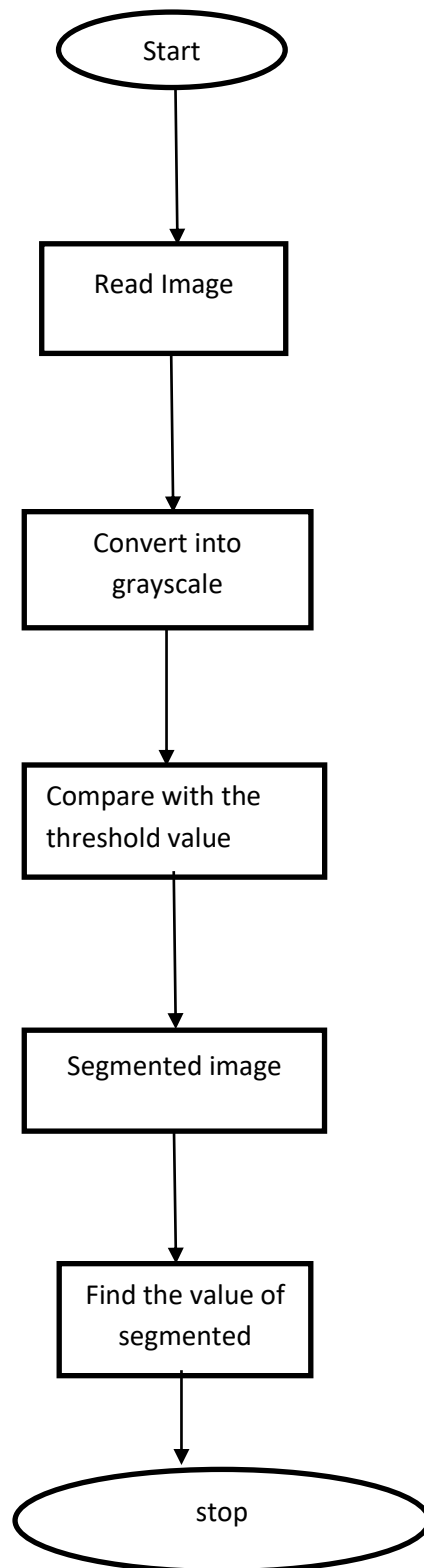step 5. Find the value of segmented Image.

1.Read the image

2.Convert into the gray scale.

3.Segmented image

4.Value of segmented image

BLOCK DIAGRAM

```
        ( Start )
            |
            v
    +----------------+
    |   Read Image   |
    +----------------+
            |
            v
    +----------------+
    |  Convert into  |
    |   grayscale    |
    +----------------+
            |
            v
    +----------------+
    | Compare with the|
    | threshold value |
    +----------------+
            |
            v
    +----------------+
    | Segmented image|
    +----------------+
            |
            v
    +----------------+
    | Find the value of|
    |   segmented    |
    +----------------+
            |
            v
        ( stop )
```
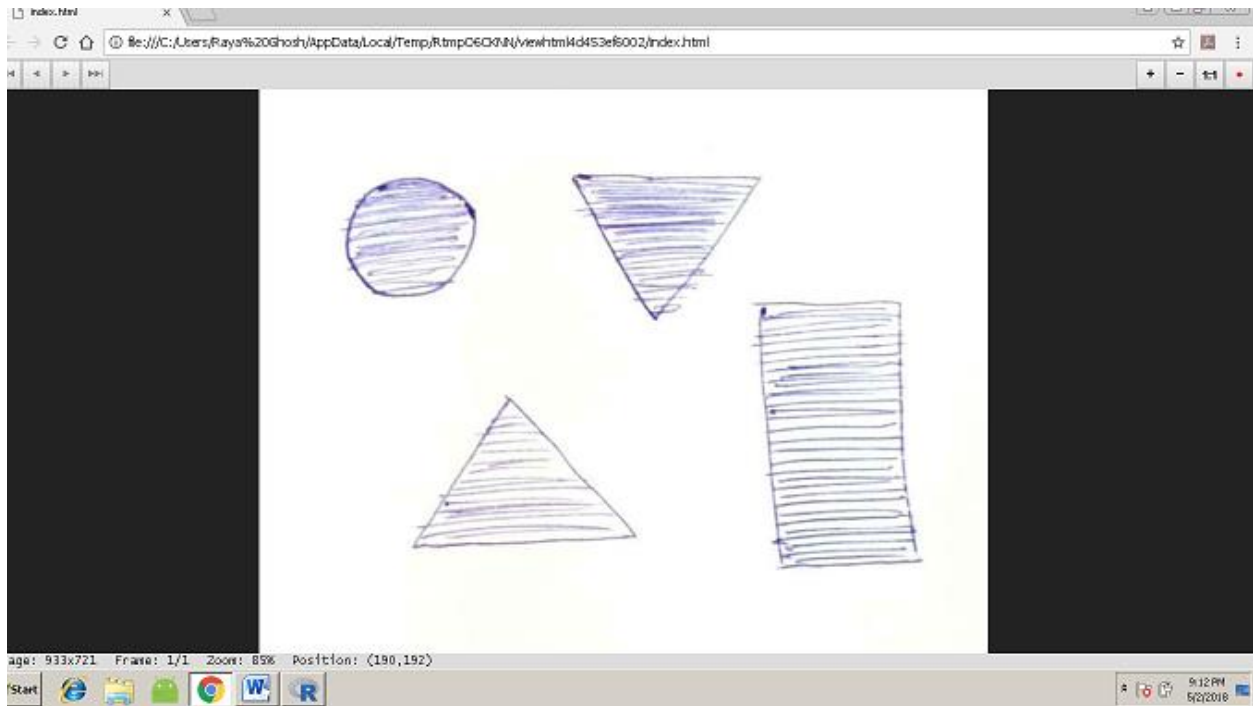
CONCLUSION AND FUTURE SCOPE

In this paper, Image segmentation using Thresholding algorithms are discussed. It is categorized in two parts fixed and adaptive thresholding. Here, fixed thresholding for image segmentation is used. In future, adaptive thresholding may be used because, it will produce more accurate result of image segmentation.

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