**Abstract**

In this paper, we discussed image segmentation algorithms and introduce it with threshold based approach and region based segmentation approach, “region growing based segmentation” and “region splitting and merge based segmentation.”

Image segmentation is known as the first step and fundamental part of image processing.

1. **Introduction**

In image processing, image segmentation is important and fundamental. Generally, it is a process of division of an image into regions or categories. In the other word, we did the process of separating or grouping an image into different parts, it could be considered as set of objects. Basically, there are many approaches can achieve the purpose of segmentation. In this work, we processed image segmentation with region growing based segmentation. Which is one of region based segmentation approaches. As all image segmentation processing, the main purpose is to partition an image into regions, to get more information in the region of interest in an image which helps in annotation of the object scene.[10]It is process of assigning a label to every pixel in an image such that pixels with the same label share certain visual characteristics.[2] Region based method rely on common patterns in intensity values within a cluster of neighboring pixels.[1]

1. **Thresholding segmentation**

Thresholding is a basic and simple method for image segmentation.

By selecting an adequate threshold value T, it creates binary images.[3]

The most common way to convert a gray-level image to a binary image is to select a single threshold value (T). Then all the gray level values below this T will be

classified as black (0), and those equal or above T will be white (1). [4] It means those are not satisfied with the value the same or greater than threshold should be zero.

Threshold image g(x,y) can be define where T is the threshold value:

|  |  |
| --- | --- |
| ﹛ | 1 if f(x, y) ≥ T |
| 0 otherwise |

g(x, y)=

1. **Region growing based segmentation**

Region growing method gives reliable output compared to its other counterparts. It is basically extracting a region from the image using some pre-defined criteria.[22]. The basic idea is finding a seed pixel as a starting point, and merging the same or similar property of pixel to be a region. All pixels must be included in a region.

1. **Region splitting and merge based segmentation**

The basic idea of region splitting is to break the image into a set of disjoint regions which are coherent within themselves. [12]

**5. Conclusion**

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