International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395 -0056
Volume: 03 Issue: 02 | Feb-2016 www.irjet.net p-ISSN: 2395-0072

Review on Digital Image Segmentation Techniques

K.Vidhya[1], S.Revathi[2], S. Sahaya Selva Ashwini[3], S.Vanitha[4]

[1,2,3,4]*Department of Electronics and Communication Engineering, Vel Tech, Chennai, Tamilnadu, India*

Abstract - *Image segmentation is partitioning the images based on their similarities, similarities which include color, texture, intensity value, shape; size .This survey gives the better technique for image segmentation which is applied on particular images. This survey is source from journals, conference and online database based on the technique advantage and disadvantages.*

Key Words: — Image segmentation, Edge detection, Clustering.

1.INTRODUCTION

Image segmentation generally means dividing an image into multiple regions. Segmentation provides a meaningful information about an image. It is used for the identification of an object. Basically an image is segmented based on the features like color, texture and intensity. The property of the selected pixel and the information of the neighboring pixel are the two basic parameters of image segmentation. Image segmentation plays a major role in detection of cancerous cells, detection ofland,water, forest region, military applications, computer visions and biometrics.

Particular segmentation cannot be applied to all types of image due to its dissimilar features. So many different techniques are followed in image segmentation. Hence it is difficult to develop a universal technique for image segmentation.

2.TECHNIQUES

2.1. *Active Contour Method*

In this method [1] Qiang Chen,used a new edge based interactive image segmentation. Parametric active contour model is adopted for object segmentation. Object contour is obtained by parametric active contour model which is based on feature images. It is generated according to the small number of uses supplied object contour points. By generating the local intensity values of the object contour feature image prevents the evolving curve running into local optimal solution. This method is better than traditional parametric active contour model.

2.1. *Region Growing Method*

The main goal of segmentation is to partition an image into regions. The first step in region growing [8] is selection of seed points. Seed point selection is based on some user criterion (for example, pixels in a certain gray scale range, pixels evenly, spaced on a grid, etc.). The initial region begins at the exact location of these seeds, the regions are then grown from these seed points to adjacent points depending on the region membership criterion pixel intensity, gray scale texture or color. This segmentation provides images with clear edges.

2.2.Markov Random Field Method

In SAR image segmentation [6], the MRF method is popular technology which achieves optimal image segmentation. The SAR image is segmented initially which randomly changes current state to new state. The new state is accepted and judged. If all pixels been inquired global energy is calculated else the state is changed. If the global energy is convergent the image is obtained or else it updates the temperature and changes it state. This approach is better than single SAR image segmentation based on MRF.

2.3.Edge Detection Method

Edge detection is the most common approach used for detecting meaningful transition, discontinuities in the grey level of an image. Edge is a set of connected pixels that lie on boundary between two regions. Thus the edge detection finds the points where there is an abrupt change in intensities. Edge detection is suitable for image that are simple and noise free.

2.4.Threshold Method

Thresholding is very simple to implement, so that it is used in various application of image segmentation. It is used to separate the objects present in an image from its background. Global thresholding is the simplest thresholding technique. It uses a single threshold, to partition an image. Segmentation is implemented by scanning all the pixels in the image one by one. Then each pixel is labeled either object or background. This depends upon threshold. Global

thresholding [2] is used in highly controlled environments like industrial inspection applications.

2.5.Clustering Method

Classifying the images is a major problem in image segmentation. Clustering [5] differentiate and classify the pixels according to the requirements and rules. The prior information is not obtained during the process and hence the pixels are classified according to similarities using math algorithm. Fuzzy algorithms smoothen the image by opening and closing operation and then perform gradient operation on resultant imageThe sample image is considered and distinguished based on RGB components. Each component is defined by membership function. It represents the color distribution and hence it defines the strong and weak point. As uncertainty and fuzziness in the images are accepted by clustering algorithm, it is more effective method.

2.6.Level Set method

In this method [9], local intensity clustering property is derived on the basis of model images with intensity inhomogeneities, and defines a local clustering criterion function in a neighborhood of each point. The image domain and bias field are portioned which results in intensity inhomogeneity of the image. This partition of image domain and bias field is represented as energy. Hence intensity inhomogeneity correction can be performed by minimizing this energy. Numerical computation involving curves and surfaces are difficult to process but in this method contours and surfaces are represented zero level set and it has the property to change the complex topology so numerical computation can be performed easily.

2.7.Random Walk Method

In random walk method [7], the user first labels a small number of pixels with the known label which is called seeds, the other pixels are left unlabeled. A random walker is released by unlabeled pixels with the probability which arrives at seed bearing each label. The pixel with maximum likelihood to the seed points has been labeled. The image is modeled as graph in which each pixels corresponds to a node. The neighboring pixels are connected to this node by the edges. The similarity between the pixels is identified by weighing the edges.

3. CONCLUSIONS

Image segmentation is challenging task .there is no particular techniques accepted for all images. But above techniques gives better accuracy in various applications such as detection of tumor,lands, in military purpose etc.

REFERENCE

[1].Qiang chen,benben xue,quansen sun, deshen xia , "" IEEE 17th International conference in Image processing,pp.3605-3608,2010.

[2] W. X. Kang, Q. Q. Yang, R. R. Liang, "The Comparative Research on Image Segmentation Algorithms", IEEE Conference on ETCS, pp. 703-707, 2009.

[3] V. K. Dehariya, S. K. Shrivastava, R. C. Jain,"Clustering of Image Data Set Using K-Means and Fuzzy K-Means Algorithms", International conference on CICN, pp. 386-391, 2010.

[4] S. Naz, H. Majeed, H. Irshad, "Image Segmentation using Fuzzy Clustering: A Survey", International Conference on ICET, pp.181-186, 2010.

[5] Zhen wang ,Meng Yang, "A Fast clustering algorithm in image segmentation",IEEE International conference on computer engineering and technology,vol.2,pp.592-594,2010.

[6] Huaing Xu,Wei Wang,Xianghua Liu, "A Novel SAR Fusion Image Based On Markov Random Field",PP-1297-1300,2010.

[7] Sundaresh Ram and Jeffrey J.Rodriguez, "Random Walker Watersheds: A New Image Segmentation Approach", IEEE, PP-1473-1477, 2013.

[8] Jun Tang,"a color Image Segmentation Algorithm Based on Region Growing", IEEE, Vol.5, pp-634-637, 2010

[9] Chunming Li,Rui Huang,Zhaohua Ding,J.Chris Gatenby ,Member ,IEEE and John C.Gore. "A Level Set Method For Image Segmentation In The Presence Of Intensity Inhomogeneities with Application To MRI", Vol.20.no.7, Jul 2011.