



A REVIEW: ANALYSIS OF THE METHODOLOGY OF ALGORITHM AND TECHNIQUES IN IMAGE SEGMENTATION

Dr. Thilagamani S

HOD and Dean, Department of Computer science,
M. Kumarasamy College of Engineering, Thalavapalayam,
Karur, India.

Kavya N

PG Student, Department of Computer Science,
M. Kumarasamy College of Engineering, Thalavapalayam,
Karur, India.

Abstract: Image segmentation methodology that has played a vast role in the image processing approach. The segmentation process that will partition the input images into numerous number of parts as needed. The resultant segmented parts applied with certain techniques or algorithms to enhance the required feature works in the process. The general applications of image segmentation encompass object exposure, surgery simulation, tumour location, recognition work etc. The intension of image segmentation is to shorten or alter the image to some form which will effectively results in some other form with more relevant information needed. This will help in the clearer and apparent resolution of the image. This paper presents the focal approach on the analysis of the numerous transformation techniques and algorithm associated with the image segmentation process.

Keywords: Image segmentation, CNN, MR images, Cyst, Clustering, Watershed transform

1. INTRODUCTION

Image segmentation process that has an important play in the image detection and computer visualization. The vital appearance of segmentation of image is partitioning based on some features like pigmentation, concentration, Strength etc. The two major aspects of image segmentation are clustering and partitioning. The RGB image that are categorized into groups having similar features such as regions, color density, similar characteristics etc. defines about the clustering process. The method that maps the resultant cluster and separating them tends to be partitioning process. The fuzzy logic method can handle some unresolved factors. These variable uses only logic values say 0 and 1. Thus they gives about the truth and false result of the process. To clear the uncertainties the collective method known as fuzziness used [4]. The other segmentation process.

Object segmentation also provides some obstacles nature in computer visualization. This method initially clusters the image into multi regions and the next process is over segmentation that determines the uniformity of the multi regions [6]. The image which are being used in the segmentation process deals with the testing and training phase respectively. To quicken the segmentation and to upgrade the flexibility by incorporating the image to be trained the boosting policy is proposed [5].

The MRI images are the most widely used in the segmentation process especially for the abnormality functioning of the brain identification terminology. The low perceptivity along with well dimensional perseverance knowledge is provided by the MR image [2]. The common abnormalities in the brain are the formation of weird liquid substances, injuries of the brain, cyst, brain stroke etc. The accurate identification of the affected area or the shortfall of the brain can be calculated only by depending on the structure and size of the brain [3]. However many segmentation approach used with some algorithm and

transformation techniques incorporated to perform some functionality over the image to obtain some analytic results and conclusion.

2. SCOPE AND METHODOLOGY DISCUSSED

A. 3D Convolution Neural Network

This paper presents about the brain injury detection using some image segmentation process. The deep layers of 3D Convolution Neural Network in a dual pathway has been presented. Hence to overcome the difficulties in the medical image especially of 3D scan image, the compelling and competent has been designed that are useful for condensed training scheme. This includes the adjacent image processing by using the patches of the adjacent image into a whole image that can be passed through the network which will adapt the implicit imbalance available in the data automatically. The dual pathway architecture has been identified to integrate both local and environmental information simultaneously in multiple scales.

A 3D fully joined Conditional Random Field is used that will eliminate the false positive in the post processing network's segmentation. The betterment of the system has been analyzed from the smaller environmental kernels in 3D CNN. The betterment of the system has been analyzed from the smaller environmental kernels in 3D CNN by non-increasing the analysis cost and the various training criterion. The larger images are processed by means of parallel convolutional pathways for multi-scale processing [3].

The MRI image which has been taken as the input segments in two form as normal and lower resolution. The both segments are processed in a variant path with the similar features. This will greatly check out the three tasks in brain injury segmentation such as traumatic injury, brain stroke and brain cyst in the MRI report generated in multi-channel patient.

B. Morphological reconstruction

Morphological reconstruction is the most widely used image segmentation process. Watershed algorithm which is the key note for the morphological image transformation method. The traditional morphological image transformation method of watershed algorithm will not hold well in the final segmentation of the image. Because it uses only the single threshold value which has been generated. The single threshold value will not reduce any noise in the greater sized

image as it can produce any distortion in the segmenting of image in various shapes and size [1].

C. Watershed transform

The advanced watershed algorithm has been proposed where the morphological operation such as erosion operation, dilation operation, catchment basins used in almost for every size of the image that will give the accurate image in the last segmentation step of the watershed transformation [1].

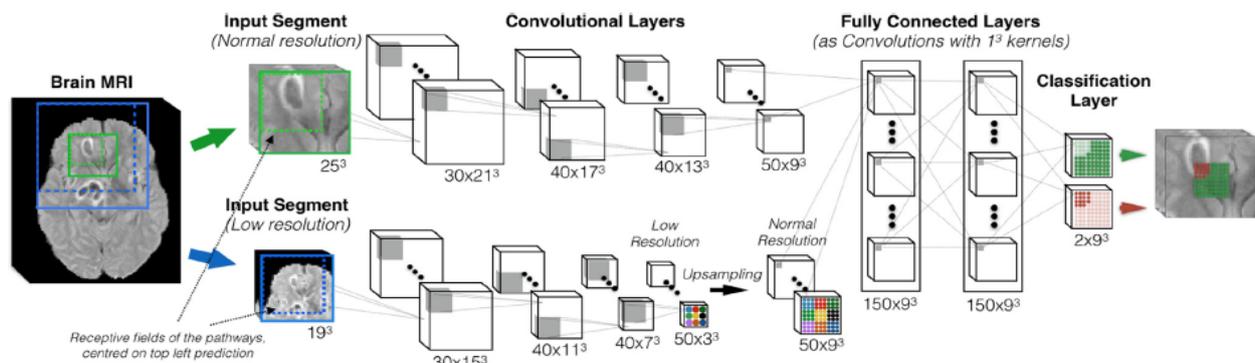


Figure 1. Block diagram of CNN

The forth image is taken as input for analysis purpose. The traditional watershed transform will result in over segmentation while processing the image. The traditional morphological watershed transform is shown in fig.1. Hence to avoid the over segmentation erosion and dilation operation used in the catchment basin region by incorporating a priori method. The erosion operation used for preventing the under segmentation and the dilation operation for preventing the over segmentation. The steps performed in the proposed morphological reconstruction is shown in figure 3.

Thus the above method of morphological transformation holds good for not only greater image but also for the small-scale areas of the bubble in the froth images on applying the segmenting process.

multistage distribution depend on the comprehended identical data incorporated within the image dissemination that eliminates the necessity of the perspective on pixel data.

E. Graph cut algorithm

To remove the etyma from the cyst the Graph cut algorithm used that finds the appropriate position within etyma and cyst. The crystal resolution of the brain edema is achievable by this proposed methodology that helps to clear away the cyst [2].

The proposed method consists of three steps categorized into two groups as preprocess and post process. The preprocess encompass two steps namely skullcap shed, clustering process whereas the post process encompass Graph cut algorithm.

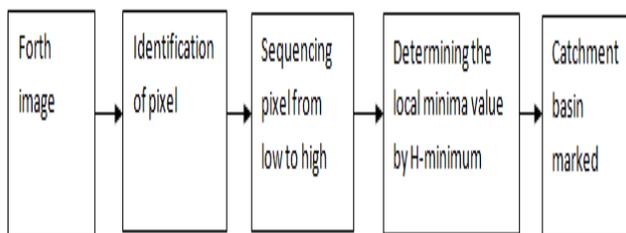


Figure 2. Traditional watershed transform

D. Fuzzy c means algorithm

Several approaches are possible in the tracking down the cyst present in the brain by means of considering many appearances and related task done so far in the scan of brain picture. In case of shape and depth still it becomes complex in determining the consistent data for the cyst in brain while focusing sizeable modification in the image. To overcome it the Fuzzy c means method has been proposed for etyma and cyst partitioning. Improved clustering methodology used by collaborating many dimensional data based on kernel. The

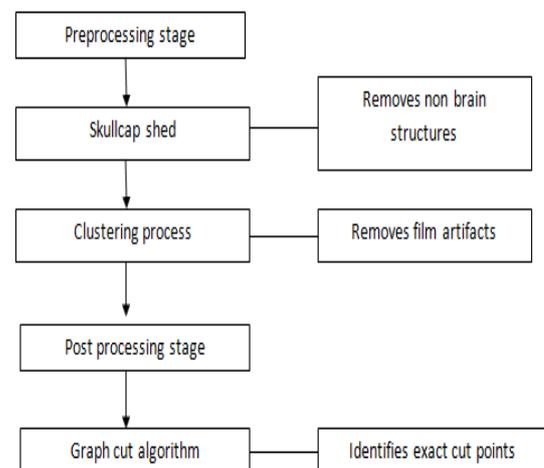


Figure 3. Proposed workflow diagram

The Skullcap shed process performed to extract the unwanted details like film artifacts embedded on the input

image taken for research. Once they are removed the clustering method applied to multiple dimension data to minimize the noise over that data during segmentation process. For this the enhanced Fuzzy c means clustering technique embedded. This will find out the dimensional area and Euclidian measurements. Graph cut algorithm the last step used as co-distribution in segmentation process for evaluating the apt cut point within the cyst and etyma in order to extract the cyst.

This proposed method gives better result than the other methods existed earlier for the detection of thorough etyma and cyst segmentation. But still high spatial informatics data needs to be investigated to increase the exactness and infer about the estimation complication.

3. CONCLUSION

This paper purely presents about the survey on some image segmentation process. This gives the detailed discussion on the review of various algorithmic approach and some transformation operation that made the related research works to work in better condition than mentioned to its prior methodologies. Though there are many approaches with improvements yet there are some detriment in the process. This paper gives the elaborated report on the numerous approaches along with their enumerated description of the techniques and methods discussed. This will help in understanding the basic information of segmentation methods used so far in order to aid the researchers to revise the technology in higher quality for some further standard improvement in the researches oriented to image segmentation mechanism.

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