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IMAGE BASED SEGMENTATION ANALYSIS THROUGH REGISTRATION

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ABSTRACT

Image based segmentation is the algorithm which require early and accurate segmentation methods. The manual method for segmentation used by image processing, and signal processing have possible errors. The manual method for detection image is also time consuming. We will study the processes and techniques used for detecting image segmentation from registration algorithms. In this paper our main concern is to analyze image using registration segmentation. We will use multi registration-based segmentation. As compare to other methods of segmentation the registration-based segmentation has the capability to segment image with no clear boundaries. At last, we will compare our results with different expert's models.

Keywords: Images, Registration, Segmentation.

I. INTRODUCTION

Segmentation is one of the fundamental problems in biomedical image analysis and refers to the process of tagging image pixels or voxels with biologically meaningful labels, such as anatomical structures and tissue types [1]. Depending on the application, these labels might constitute a handful of, possibly disjoint, regions of interest (ROIs) and a "background", which would refer to the parts of the image one might ignore in subsequent analysis. To detect a moving object especially in static camera condition background subtraction is commonly used. It is quite difficult task to mark out a moving object in a video. Foreground detection can also be called as background subtraction. In this technique first of all the background is modeled and at that point foreground object is sensed by subtracting the foreground scene from the background scene. The main glitches that are come across during background subtraction are Change of brightness of the environment, rippling water and waving trees. This algorithm is founded on contextual deduction method then border alteration method. It removes the shortcoming of the contextual deduction method and the frame dissimilarity method. Finally, it proposes a dynamic updating of background image by border alteration technique and apply the influence of the background subtraction method for perceiving the moving object very efficiently and precisely. The significant challenges to background subtraction techniques are abrupt light changes, shadows, abrupt movement of camera, and several alterations in the background for example shrugging trees flittering shades and shadows. The time-based distinguishing techniques utilize two or more successive frames to draw out moving regions. This method is inclined to invalid spotting and vulnerable, if the temporal variations area unit created by noise or light alteration due to weather conditions [2]. In this paper, first of all, it presents a transitory overview of pre action of the movie pictures. It lessens the blunder inside the image process once. Second the paper pays attention on the analysis and also the difference of frame. This paper chooses reinforced the background subtraction technique to develop it and offer a background subtraction frame difference algorithm mount on the contextual removal and the surround alteration techniques as shown in Figure 1.

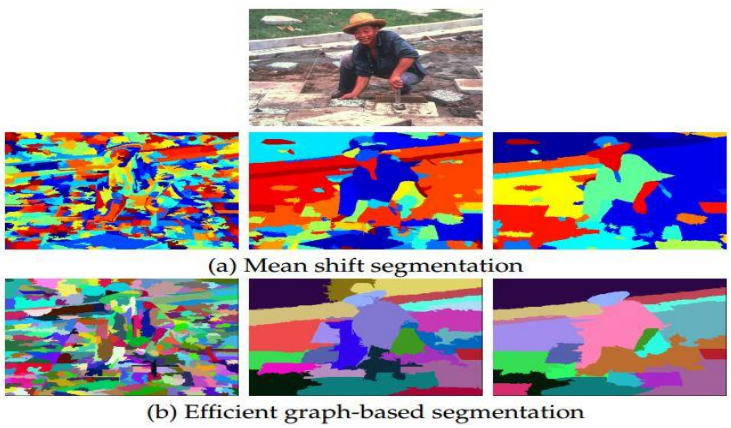

Figure 1: Show the segmentation result of two algorithms

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II. LITERATURE REVIEW

Segmentation is one of the fundamental problems in biomedical image analysis and refers to the process of tagging image pixels or voxels with biologically meaningful labels, such as anatomical structures and tissue types. Depending on the application, these labels might constitute a handful of, possibly disjoint, regions of interest (ROIs) and a "background", which would refer to the parts of the image one might ignore in subsequent analysis.

In the early days of atlas-guided segmentation, atlases were rare commodities. In fact, in many applications, there was only a single atlas1, i.e., a single image that was delineated by an expert [3] [4].

Therefore, the use of several atlases is expected to yield improved segmentation results. Initial methods that utilized several atlases for segmentation took a two-step approach. In the first step, the most relevant atlas was identified, which was then used in a second registration-based segmentation step [5]. As we will see below, this can be viewed as special case of multi-atlas segmentation, since all atlases are consulted for segmentation. However, the approach that dominated early atlas-guided segmentation was probabilistic atlas-based segmentation. In 2003–2004, in a series of papers (Rohlfing et al., 2003b,c,d, 2004), Rohlfing and colleagues proposed an alternative segmentation strategy, Heckerman et al. (2006) and others [6] [7].

Image registration [8] is a method to accomplish mapping between two different images of same scene taken at different times on regular time interval, from different viewpoints of same scene, and/or by different sensors to integrate the information. It's a method to superimpose the pixels from target image by alignment the images into common coordinate system [9]. The possible application areas of registration such as in remote sensing (image mosaicking, landscape planning, fusion of information, registration of aerial and satellite data into maps), in medical (monitoring of tumor evaluation, magnetic resonance image MRI, ultrasound, magnetic resonance spectroscopy, specimen classification, positron emission tomography PET SPECT) etc [10]. Misalignment between the two images may be due to viewpoints, sensor position, viewing characteristics or from the object movement and deformation [11]. A great deal of work has been done on this important topic. More and more attention has been paid on main approaches and point out interesting parts of the registration methods [12].

III. METHODOLOGY

Image Segmentation Algorithms:

Image Segmentation Algorithms is used for registration of image template and target image; the labels of image template are then transferred to target image. Image segmentation has the proficiency to segment image with no defined boundary between regions and pixels.

Dataset:

The quantitative analysis of any images increases day by day. We need a high validate technique. The SBD consists of reasonable MRI images created through MRI simulator. SBD composed of two models one is normal and multiple scleroses (MS). These models comprise of three sequences T1, T2 and proton-density-weighted. These data can be viewed in 3 orthogonal views which are transversal, sagittal, and coronal.

Segmentation Process:

Image Reading Step:

```
filepath=strcat(mri_image. rawb');
fid = fopen(filepath,'r');
dim = [181 217 181];  // brain volume resolution
rima=zeros (dim (1:3));
for z=1:dim(3),
 rima(:,:,z) = fread(fid,dim(1:2),'uchar');
end;
fclose(fid);
imshow(rima(:,:,91),[]); %% Show slice no. 9th
```

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Image Segment Step:

There are multiple techniques used for segmentation. we have used K-mean algorithm which is more accurate as compare to others.

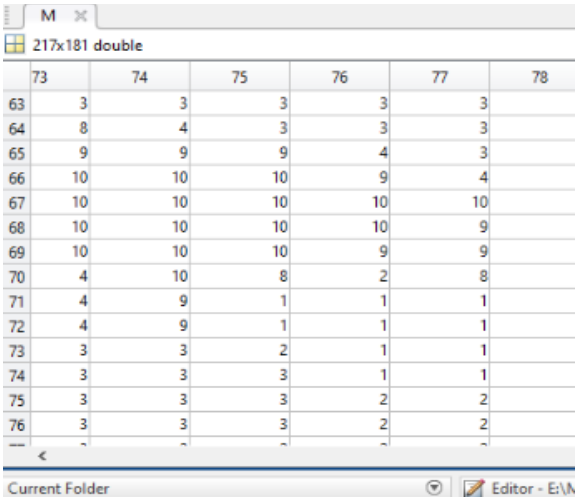
```
F = reshape(I,size(I,1) *size(I,2),1);
Find Cluster center:
CENTS = F(ceil(rand(K,1) *size(F,1)), :);
Distance from cluster to center:
[Distance, CN] = min (DAL (i,1: K));
Display number of segments
disp('number of segments ='); disp(K)
```

IV. RESULTS AND DISCUSSION

As discussed earlier, we used atlas based registration multiple sclerosis datasets from image web for achieving the results. We have two sets of data one is the video images and the other is their ground truth as mentioned earlier that we use image web data. We want to compare our results with the ground truth.

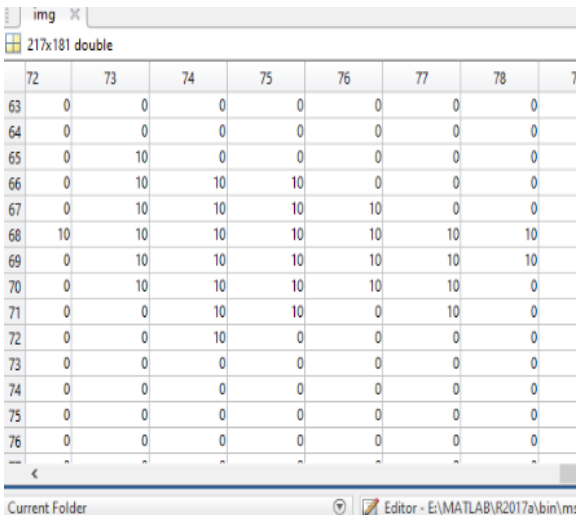
Accuracy:

The accuracy is found by comparing the result and the ground truth data. As both are the images so we compare these by comparing pixel by pixel values and we found it accurate.



	73	74	75	76	77	78
63	3	3	3	3	3	
64	8	4	3	3	3	
65	9	9	9	4	3	
66	10	10	10	9	4	
67	10	10	10	10	10	
68	10	10	10	10	9	
69	10	10	10	9	9	
70	4	10	8	2	8	
71	4	9	1	1	1	
72	4	9	1	1	1	
73	3	3	2	1	1	
74	3	3	3	1	1	
75	3	3	3	2	2	
76	3	3	3	2	2	

Figure 2: Pixel by pixel segmentation and registration.



	72	73	74	75	76	77	78
63	0	0	0	0	0	0	0
64	0	0	0	0	0	0	0
65	0	10	0	0	0	0	0
66	0	10	10	10	0	0	0
67	0	10	10	10	10	0	0
68	10	10	10	10	10	10	10
69	0	10	10	10	10	10	10
70	0	10	10	10	10	10	0
71	0	0	10	10	0	10	0
72	0	0	10	0	0	0	0
73	0	0	0	0	0	0	0
74	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
76	0	0	0	0	0	0	0

Figure 3: Pixel by pixel segmentation and registration for ground table.

Sensitivity:

This is done by comparing the result and ground truth data and that has been done by comparing corresponding pixels' values. We found it sensitive by comparing like that.

Specificity:

This can also be done by comparing corresponding pixel values. We did that and found it not specific.

Efficiency of the Results:

The efficiency can be evaluated by comparison of results of our code and the ground truth data. We got 89 and 90 numbered slices in which the 89 was static and 90 was moving and then we compared the result generated by this with the ground data slice number 89. And then we used 90 and 91 numbered slices in which 90 was moving and the other was static and then compared the generated result with the ground data slice number 91. Just like that we took 91 and 92 numbered slices and compared as before. We found all the result more efficient and correct. And these results were liable.

Discussions:

We used different slices in our experiment and then compare those results with ground truth data slices. We have done that like discussed in efficiency part before. It was found very efficient and sensitive. As the comparison has not been done mathematically, but that is our future work plan. We will do comparison by dice method so that we could able to compare our result to other experiments.

V. CONCLUSION

This paper presented the atlas based registration segmentation. This problem, as explained earlier, is challenging one and no perfect methods exits to solve this problem completely. However, using different models of segmentation we reached to our goal by selecting the more proper and accurate way of segmentation which is atlas based registration segmentation. As demonstrated by the results our method achieved very high accuracy. We wish if future work is performed on this algorithm this can shows us best results almost beating any other method.

VI. REFERENCES

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