

UNIVERSITAT DE GIRONA

MEDICAL IMAGING ANALYSIS

LABORATORY REPORT

MevisLab

Author

Mohit VAISHNAV

Supervisor

Dr. Robert MARTI

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1 Introduction

MeVisLab represent image processing research and development, powerful modular framework. Using this, fast integration and testing of algorithms can be done along with development of various prototypes related to clinical application prototypes.

2 Aim

We were supposed to learn the basic structure of the MeVisLab and get accustomed with the framework for prototyping medical imaging application fast and efficiently.

3 Implementation

To get the basic understanding of the software we learned to use many commands namely, *Image Load/Image save, itkImageFileReader/itkImageFileWriter, info, OrthoView2D, View2D, GVROrthoOverlay, ImageStatistics, Arithmetic, SubImage, AnonymizeMacro, Threshold, Connected Components* and *Morphology*.

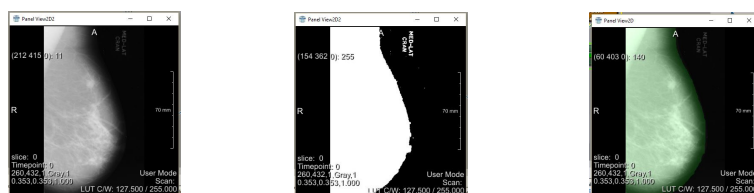
In the next section, we have to segment the breast boundary using MeVisLab platform. Algorithm to segment the boundary is: First I converted the image to a binary format so that other morphological operations could be applied using a threshold value (50 in my case). This value is chosen in such a way that I do not loose any information from the main segment while removing outside boundary ones.

After I have the binary image, to remove the segment other than that of breast I used *erosion* technique of size 10×10 . This *erosion* filter has been applied *thrice*. After this Connected Components function with the option of volume in mm was successful in removing the rest small patches of outliers. Once all this is done, we have to get back the original shape of the mask which got reduced because of erosion operation applied earlier. Hence dilation is again done *thrice* to revert back the earlier effect.

4 Output

For displaying the robustness of the structure, I will show two types of images. Difference between these images are the size of information other than that of required ones i.e. on the top right corner label which is required

to be segmented. All but one could not pass through the erosion filter even after applying thrice where the outlier information is removed using the *Connected Component Block*.



(a) Gray Image 1 (b) Thresholded Image (c) Overlay wrt i/p

Figure 1: Input Image and Output for Image 1

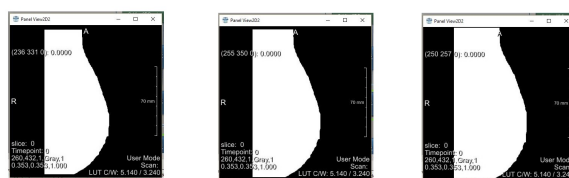


Figure 2: Morphological Operation: Erosion three times

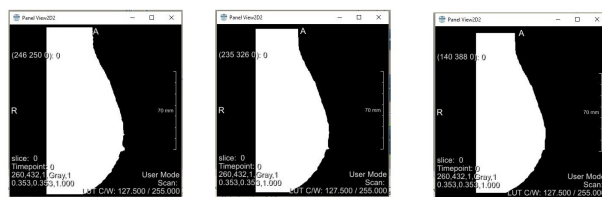
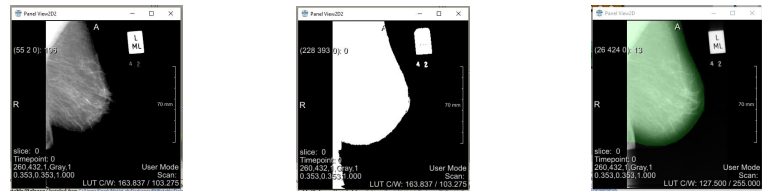


Figure 3: Morphological Operation: Dilation three times



(a) Gray Image 2 (b) Thresholded Image (c) Overlay wrt i/p

Figure 4: Input and Output Image 2

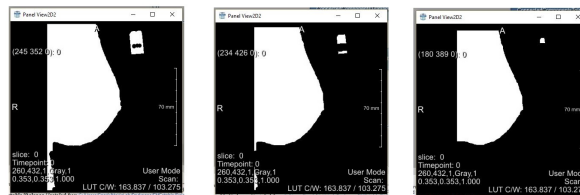


Figure 5: Applying Morphological Operation: Erosion three times

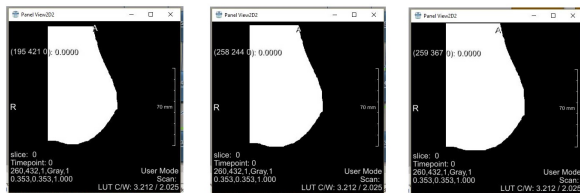


Figure 6: Applying Morphological Operation: Dialation three times

5 Limitations and Problems:

For the first time getting accustomed with the *MeVisLab* was bit difficult. While the other commands given in the lab sheet were easy to implement but *Connected Components* usage to remove the outlier was time taking.