

# THE COMMON CAROTID ARTERY INTIMAL-MEDIA THICKNESS MEASUREMENT USING AUTOMATED SEGMENTATION IN ULTRASOUND SCAN IMAGE

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**Abstract** - Human artery left, right Common carotid artery (CCA) which supply neck and head with oxygenated blood. Carotid artery disease is a disease in which a waxy substance called plaque builds up inside CA also called stroke intima media thick is a measurement of the thick of tunica intima and tunica media (stroke).It is also called as intimal media thickness is a measurement of the thickness of the tunica intima and tunica media. This is made by ultrasonic scanning. Use 3Dimensional ultrasound and move toward fully automated segmentation and tracking. The initial procedure is to select a ROI in the concerned US image. The segmentation of CA using statically shape drive appears and stroke ellipse algorithm is presented. The proposed systems include analysis for some group of men in and around erode.

**Key Words:** - Common Carotid Artery (CCA), Intimal Media Thickness (IMT), Ultrasound (US), segmentation

## I INTRODUCTION

Stroke and heart attack which could be led by a blind of cerebrovascular and cardiovascular disease named as a atherosclerosis would seriously cause carotid artery of intima-media thickness is key indicator to the disease. The aims of the current study were to compare these markers among young males with cardiovascular disease (CVD) risk factors with health subjects and to determine the associates between these markers with other CVD risk factors. Some group of men 20 to 40 years old were recruited from areas around erode. They measured included peripheral blood pressure(BP), heart beat(Hn),body mass index(BMI), triglyceride(TG), High density lipoprotein(HDL), Low density protein (LDL), Fasting blood sugar

(FBS), Right and Left CMIT were also measured via B mode US.

Three DUS imaging measurement of CA are increasingly being investigated for monitoring the progression and regression of plaque burden in longitudinal studies .We review the recent advancements of 3DUS image in terms of novel car and measure image process techniques and clinical trials.

Evaluate an integrated system for the segmentation of the IMC and the lama diameter in longitudinal US video of the CCA based on normalization, speckle reduction filtering and snakes segmentation(Also statistical parameters such as the max the min or the Avery IMT are measure. The segmentation of CA using statistical stage driven approximate and spokes ellipse algorithm.)

Fully automated algorithm for the segmentation, measurement and tracking of the intima media thick in B- mode us video sequence.

Initial process is to select the image and modified level set method is employed to segment the IMT by adding local intensity in for to the variation level set formulae.

## II LOCAL GAUSSIAN METHOD

In this method system is trained to initiate a point where segmentation want to start.this point is consider as x, from this point distribution of active contour is start based on local intensities value.contour grow based onnearest

neighbourhood. Neighbourhood of  $x$  is partition into three part as  $a_1, a_2, a_3$ . Their common and different region probability are calculated based on the maximum probability value contour segment the region. This process is repeated for various iteration values and intensity value also changes based on application of project for medical image intensity value is 0.0008.

### III. MODULES

This project consist of three main modules

- Feature Extraction
- Segmentation
- Intima Media Thickness measurement

#### FEATURE EXTRACTION

In this module patient details are collected such their age, food habit, nature of work, drug addicter or not, smoker.

Their medical details such as their sugar and pressure test are normal, Gential history, height and weight.

#### SEGMENTATION

In this module ultrasound scanner is used to scan patient body. It collect all detail of common carodit artery such tunica intima and tunica media layer where they differ from their nature of present. Total artery wall breath is normal for their age. If it is smaller or larger to age it should be noted processed at IMT measurement.

The stroke region find out and it is cropped for needed region. Region is allowed for segmentation to separate the stroke and tunic intima, tunica media layer. It also segment any blood clot inside wall region.

Segmentation use local gaussian distribution function of active contour method. This method segment the stroke region based on the intensity value here 0.0008 is used for segment the stroke region.

Some time artery wall joint area also affected by stroke this region may have high risk to segment the region and measure the thickness value.

Fig 1 shows original image of CCA before segmentation and Fig 2 shows after segmentation using active contour of local Gaussian distribution function.

Fig. 1.

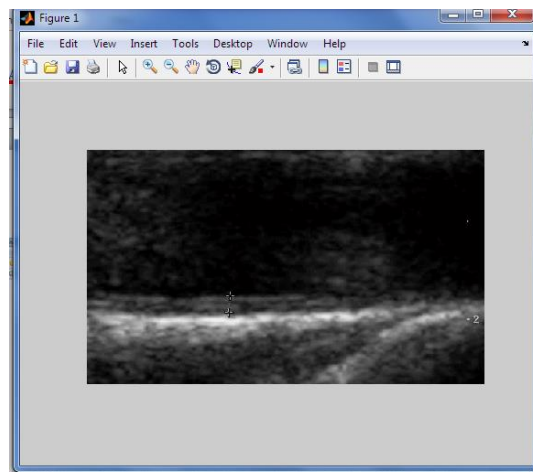


Fig. 1 Before Segmentation

Fig. 2.

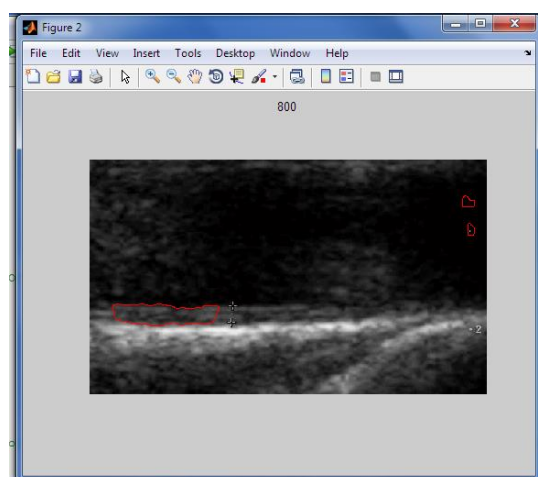


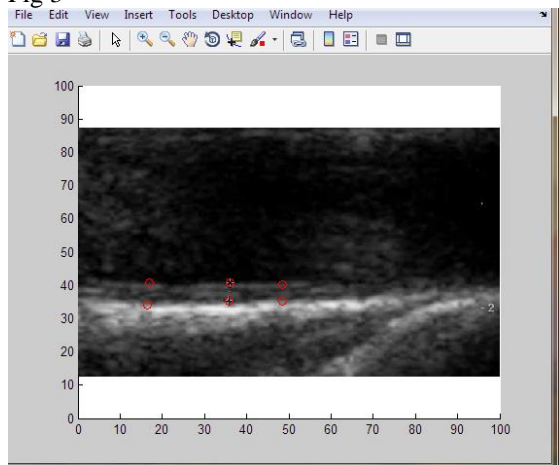
Fig. 1 After Segmentation

#### INTIMA MEDIA THICKNESS MEASUREMENT

After segmentation IMT value need to measure by using distance between two point formula. here three set points are taken. those point are matches with segmented region portion if point place on boundary of segmented region it accepted or new point is plotted. This provide 99% accuracy and automation of process. It will reduce human fault. Their distance is calculated. Mean is taken for three distance to get average IMT value. Value is modified to its original value by divided by it wall breath value. It is used for treatment decisioning.

Fig 3 show point plotting in stroke region and their thickness value.

Fig 3



ans1 =92.7984 201.0565  
 ans2 =90.2869 229.9389  
 ans3 =197.0265 201.0565  
 ans4 =195.7707 224.9159  
 ans5 =264.8376 203.5680  
 ans6 =264.8376 224.9159  
 ans =24.7440/3  
 0.82 mm

#### IV CONCLUSION

Thus the segmentation and tracking method s used to measure the thickness value. Using the proposed automation algorithm it is real time quick examination. Low cost or economic and non-radiation and time reduction. The automation process will reduce the human faults.

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**Tamil selvan.D** is a Master of Engineering Student in the Computer Science and Engineering Department, K.S.Rangasamy College of Technology. He research interests are image processing, medical image analysis.

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