# Automated Ultrasound Carotid Artery Image Segmentation Using Curvelet Threshold Decomposition

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**Abstract :** In this paper, we propose denoising Common Carotid Artery (CCA) B mode ultrasound images by a decomposition approach to curvelet thresholding and automatic segmentation of the intima media thickness and adventitia boundary. By decomposition, the local geometry of the image, its direction of gradients are well preserved. The components are combined into a single vector valued function, thus removes noise patches. Double threshold is applied to inherently remove speckle noise in the image. The denoised image is segmented by active contour without specifying seed points. Combined with level set theory, they provide sub regions with continuous boundaries. The deformable contours match to the shapes and motion of objects in the images. A curve or a surface under constraints is developed from the image with the goal that it is pulled into the necessary features of the image. Region based and boundary based information are integrated to achieve the contour. The method treats the multiplicative speckle noise in objective and subjective quality measurements and thus leads to better-segmented results. The proposed denoising method gives better performance metrics compared with other state of art denoising algorithms.

**Keywords :** curvelet, decomposition, levelset, ultrasound
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