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A two-pointer filtering method on breast ultrasound images (BUS) to improve segmentation with traditional algorithms

Rasheed Abid
Uttara University, Bangladesh

Segmentation is a challenge when applied on ultrasound images. Noise, speckle and artifacts make it relatively harder for any segmentation algorithm to successfully segment the region of interest (ROI) with high accuracy. As a first step towards segmentation, most algorithms take the edge-map of the image to get an approximate idea about the gradient change. For ultrasound breast image, the edge image provides almost no clear information at all. The purpose of this study is to filter the edge image so that the traditional segmentation algorithm improves. **Methodology:** We propose a semi-automatic technique that improves the edge-map around the lesion area of a BUS image. Improving the edge images require manually initializing two points on the original image, which will cover a major region of the ROI and from there the method

will initialize a simple shape automatically. This shape is used to determine estimated pixel information of the ROI and then two separating pointers are used on its histogram to filter the main image. This filtered image, which we call intermediate image, has a better edge-map with respect to the original edge-map. **Findings:** General segmentation has yielded better results on these filtered images. Dice Similarity Co-efficient values proved that the segmentation on the filtered images increase by a few percentages depending on the type of algorithms used. **Conclusion & Significance:** Further investigation into the algorithm can improve the efficiency for general BUS images. Improving the edge-map will give a better result for CAD systems that will find cancer cells and their segmentation.

Biography

Rasheed Abid is a graduate in Electrical and Electronic Engineering from Islamic University of Technology. Being a programming enthusiast, he completed his major in Biomedical imaging. Currently he is working on a filtering method that will develop the edge image of Breast Ultrasound Images.

r.abid94.bogra@gmail.com

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