Abstract

Ultrasonography is considered to be safest technique in medical imaging and hence is used extensively. Due to the presence of speckle noise and other constraints, establishing the general segmentation scheme for different classes of kidney in ultrasound image is a challenging task. This paper aims at classification of medical ultrasound images of kidney as normal and cystic images. In the proposed method, the acquired images are manually cropped to find the region of interest (ROI) of kidney. The cropped images are pre-processed using three different filters namely Gaussian low-pass filter, median filter and Weiner filter to remove speckle noise. The despeckled images are used for extraction of potential texture features that
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provide tissue characteristics of kidney region in ultrasound images. The Gray Level Co-occurrence Matrix (GLCM) features and run length texture features are extracted. Further, the k-nearest neighbors classifier (k-NN) is used to classify the images as normal and cystic kidney images. The results obtained show that the Gaussian low-pass filter is more suitable for speckle noise removal. The GLCM extracted features are highly significant in classification of kidney images into normal and cystic. The proposed method has the prospect of implementing a computer-aided diagnosis system for ultrasound kidney images. The experimental results demonstrate the efficacy of the method.

References

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Index Terms

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Keywords