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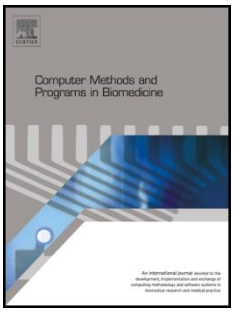

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Fractional Order Integration and Fuzzy Logic Based Filter for Denoising of Echocardiographic Image

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Highlights

- A simple yet efficient method for denoising of echocardiography images which are inherently corrupted with speckle noise.
- Our algorithm performs denoising and edge/structure preservation simultaneously.
- The results showed that our proposed method outperform existing state-of-the-art techniques.

Abstract

Background

Ultrasound is widely used for imaging due to its cost effectiveness and safety feature. However, ultrasound images are inherently corrupted with speckle noise which severely affects the quality of these images and create difficulty for physicians in diagnosis. To get maximum benefit from ultrasound imaging, denoising is an essential requirement.

Method

To perform image denoising, a two stage methodology using fuzzy weighted mean and fractional integration filter has been proposed in this research work. In stage-1, image pixels are processed by applying a 3 × 3 window around each pixel and fuzzy logic is used to assign weights to the pixels in each window, replacing central pixel of the window with weighted mean