A 3D Ultrasound System for Medical Diagnosis

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Abstract
This paper presents a system for 3D ultrasound which aims to reconstruct a volume of interest from a set of ultrasound images. A Bayesian reconstruction algorithm has been recently proposed to perform this task. However, it is too slow to be useful in practice. This paper describes several techniques to improve the efficiency of the reconstruction procedure based multi-scale principles and based on the expansion of the likelihood function in a Taylor series. This allows the use of sufficient statistics which avoid processing all the images in each iteration and leads to a space-varying recursive filter designed according to the statistical properties of the data. Experimental results are provided to assess the performance of the proposed algorithms in medical diagnosis.

Keywords
Ultrasound Image, Medical Diagnosis, Speckle Noise, Reconstructed Volume, Pattern Recognition Letter