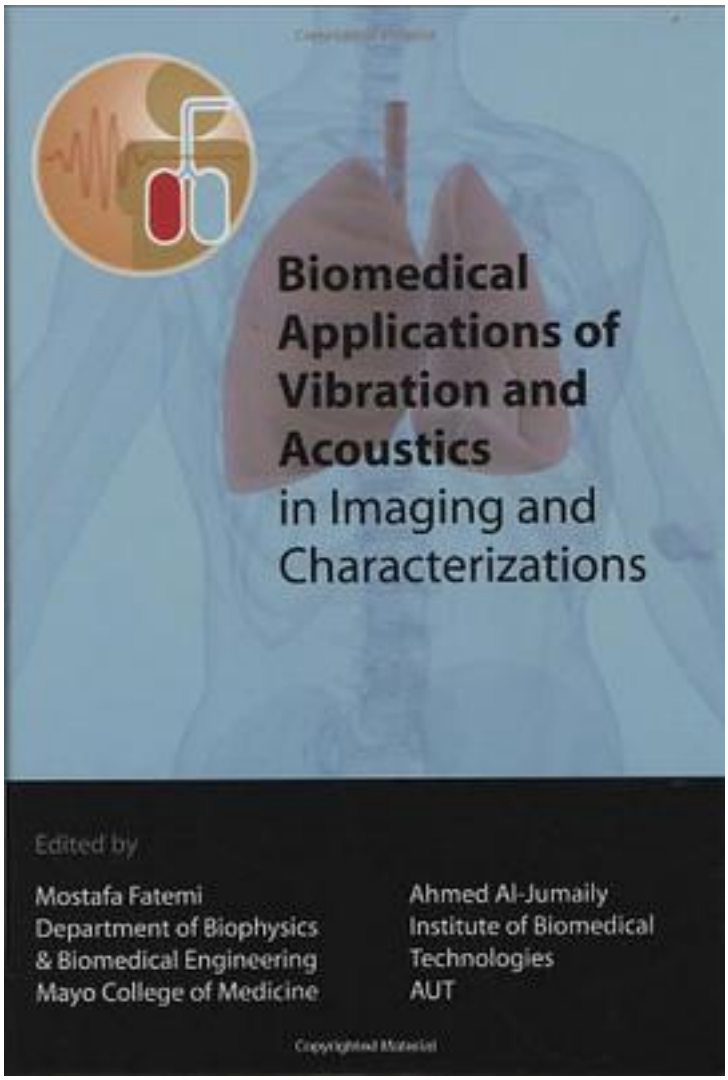
Biomedical Applications of Vibration and Acoustics in Imaging and Characterizations



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出版者:

出版时间:2008-1

装帧:

isbn:9780791802731

This collection of 13 articles describes methods that use acoustic radiation force of acoustic waves, describing their dynamics and use in numerical modeling for the assessment and design of ultrasound vibroacoustography systems, strain induced by dual acoustic radiation force and its ultrasonic measurement, computational inverse problem techniques, and fundamental concepts and image formation in acoustic radiation force impulse imaging. Applications include cardiovascular elasticity imaging, harmonic motion imaging in high intensity focused ultrasound (as used in breast cancer detection, and characterization of skeletal muscle elasticity using magnetic resonance elastography. Articles also cover the vibration and acoustics of tissue characterization, including acoustic response of the human arteries, a non-invasive methods for measuring local viscoelasticity of arterial vessels, tissue harmonic motion estimation for tissue characteristics using ultrasound and the Kalman filter, characterization of tissue viscoelasticity from shear wave speed dispersion, and bone characterization. Includes appendices on bioeffects, safety standards, and guidelines for practice.

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