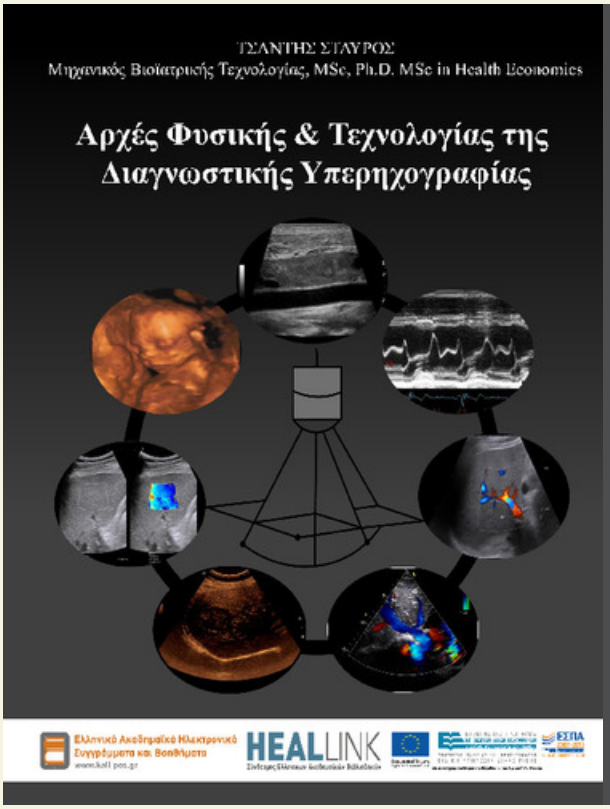

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Abstract

The rapid changes taking place in modern ultrasound systems are primarily technology-driven, leading to the transition from static to dynamic real-time ultrasound, color Doppler, three-dimensional imaging, and, more recently, elastography. A basic prerequisite for these technological achievements to be useful is a good knowledge of the physics and technology of ultrasound. This book can serve as a reference tool in this effort to promote knowledge and communication between the various specialties involved in ultrasound (biomedical engineers, medical physicists, and physicians). In order to ensure the correct, reliable, and safe operation of an ultrasound machine, an engineer and a medical physicist must understand the physical principles governing this system and the technology that accompanies it. Similarly, in order to understand all the information contained in an ultrasound image, a physician must have a thorough knowledge of all the mechanisms involved in the production and propagation of sound waves inside the human body. This effort fills a gap in Greek literature and is primarily aimed at undergraduate and graduate students of biomedical technology and medical physics, as well as physicians of various specialties who use ultrasound as a diagnostic tool. The book's topics include the properties of sound waves and the phenomena encountered during their propagation inside the human body, as well as the technology used to produce and detect them for the creation of ultrasonic images. This is followed by all the imaging techniques offered by ultrasound systems, the basic principles of their technology, all the false indications that appear in ultrasound images, and detailed quality control protocols for an ultrasound system.

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