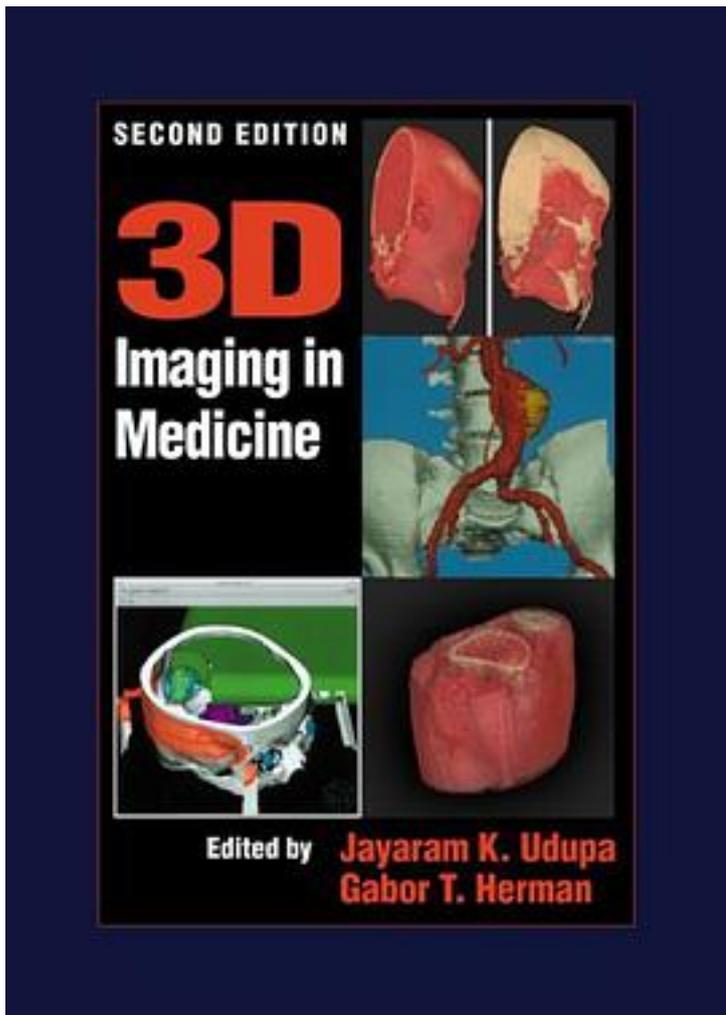


3D Imaging in Medicine, Second Edition



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The ability to visualize, non-invasively, human internal organs in their true form and

shape has intrigued mankind for centuries. While the recent inventions of medical imaging modalities such as computerized tomography and magnetic resonance imaging have revolutionized radiology, the development of three-dimensional (3D) imaging has brought us closer to the age-old quest of non-invasive visualization. The ability to not only visualize but to manipulate and analyze 3D structures from captured multidimensional image data, is vital to a number of diagnostic and therapeutic applications. "3D Imaging in Medicine, Second Edition", unique in its contents, covers both the technical aspects and the actual medical applications of the process in a single source. The value of this technology is obvious. For example, three dimensional imaging allows a radiologist to accurately target the positioning and dosage of chemotherapy as well as to make more accurate diagnoses by showing more pathology; it allows the vascular surgeon to study the flow of blood through clogged arteries; it allows the orthopedist to find all the pieces of a compound fracture; and, it allows oncologists to perform less invasive biopsies. In fact, one of the most important uses of 3D Imaging is in computer-assisted surgery. For example, in cancer surgery, computer images show the surgeon the extent of the tumor so that only the diseased tissue is removed. In short, 3D imaging provides clinicians with information that saves time and money. "3D Imaging in Medicine, Second Edition" provides a ready reference on the fundamental science of 3D imaging and its medical applications. The chapters have been written by experts in the field, and the technical aspects are covered in a tutorial fashion, describing the basic principles and algorithms in an easily understandable way. The application areas covered include: surgical planning, neuro-surgery, orthopedics, prosthesis design, brain imaging, analysis of cardio-pulmonary structures, and the assessment of clinical efficacy. The book is designed to provide a quick and systematic understanding of the principles of biomedical visualization to students, scientists and researchers, and to act as a source of information to medical practitioners on a wide variety of clinical applications of 3D imaging.

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