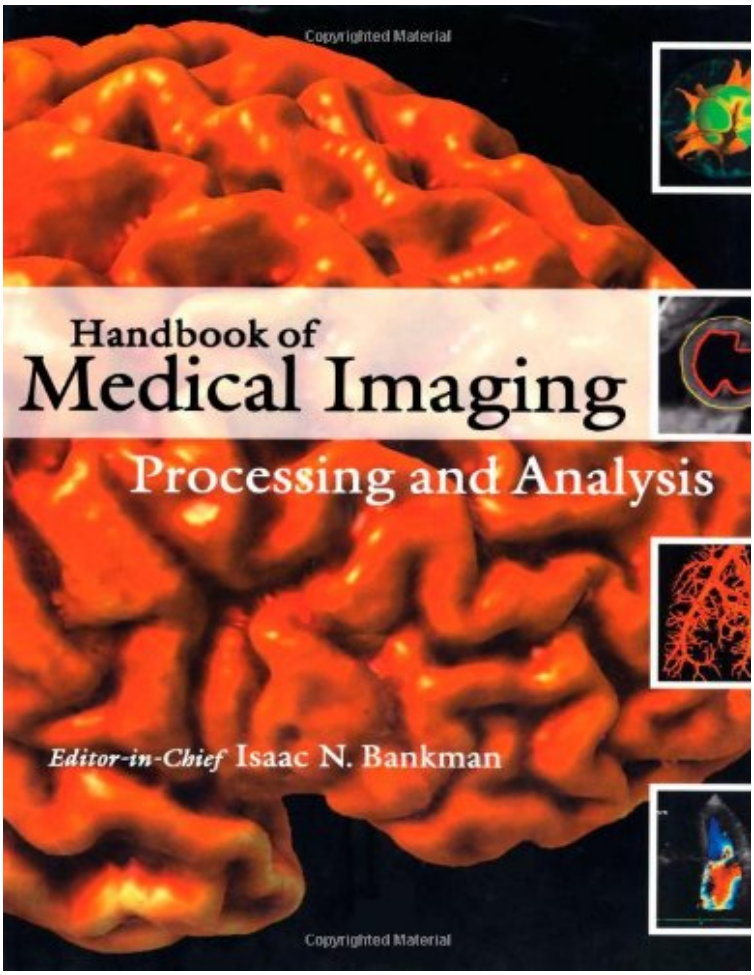
Handbook of Medical Imaging: Processing and Analysis Management (Biomedical Engineering)

From Academic Press
*ebooks | Download PDF | *ePub | DOC | audiobook*



#4052845 in Books 2000-10-13Original language:EnglishPDF # 1 2.02 x 8.85 x 11.39l, #File Name: 0120777908901 pages | File size: 61.Mb

From Academic Press : Handbook of Medical Imaging: Processing and Analysis Management (Biomedical Engineering) before purchasing it in order to gage whether or not it would be worth my time, and all praised Handbook of Medical Imaging: Processing and Analysis Management (Biomedical Engineering):

3 of 3 people found the following review helpful. Not for the noviceBy wiredweirdThis book presents more than fifty detailed expositions in a half-dozen major areas:- Enhancement of indistinct images,- Segmentation into regions with different physiological meaning,- Quantification of textures, structural features, and diagnostic markers,- Registration of images from multiple modalities, times, or patients,- Visualization of complex data in intuitively meaningful displays, and- Compression and storage of the vast volumes of data in even a single image.Many chapters apply well-known image processing and image understanding techniques, sometimes with extensions for volumetric data. For

example, there's diagnostic information in the angle between two parts of a bony structure, but X-ray images generally foreshorten structures tilted away from the image plane; 3D reconstruction techniques help out here. Segmentation problems take on special urgency when used to isolate lesions or other abnormalities. Techniques often merge in solving any one problem. For example, identifying a brain lesion might first require segmenting the different kinds of tissue using volumetric adaptation of common imaging techniques, warping the standard physiological model to match the patient's unique anatomy, then applying neural networks or other mechanisms to identify the differences of clinical interest. Then, as any mammogram patient knows, non-rigid tissues can shift during imaging so that the picture taken corresponds only roughly to the body structures as they appear normally.The target reader has rich mathematical background, and some working understanding of image-capture technologies and of diagnosticians' needs. This book aims squarely at the engineer translating the image data into medically useful forms, without losing data of diagnostic importance (and this means you, all you image-compressors out there). By design, this addresses the higher levels of image computation. It deals only occasionally with instrumentation issues, such as image reconstruction. I was interested to learn, however, that the strength of MRI as a tool for chemical analysis is a problem in imaging - the same chemical shifts that represent molecular structure actually mis-represent physiological structure.This massive book offers a lot to many practitioners in the computations behind contemporary medical imaging. For others, however, the 900-page thickness will be most helpful when a small child sits at a tall table, once she's too big for a booster seat. My immediate needs have to do with image reconstruction from raw data, a topic addressed only tangentially here, so I'm in the second category.-- wiredweird12 of 13 people found the following review helpful. Almost complete collection of algorithmsBy C. V. JensenThis book is an almost complete collection of algorithms in computer processing of medical images. As an addition to computer processing litterature, this book fills a gap much in need of being closed. The text contains three levels of informating, a scholarly review of each topic, a professional review of methods and their application, and, finally, several chapters for each subject of thorough mathematical descriptions of individual methods and approaches, with useful examples from "real life". The book is divided into six sections: I Enhancement, describing the methods available for enhancing, e.g., noise reduction, window/level processing and grayscale manipulations. II Segmentation, dividing images into usefull subsets for further processing, III Quantification, measuring on images. IV Registration, making different images, both from between different subjects and between different modalities as well as between individuals having imaging studies done on separate occasions. V Visualization, rendering images for views in several different formats, including virtual endoscopies and volume rendering techniques. VI Compression, Storage and Communication, describing methods related to DICOM storage facilities and files, compressing, normalizing grayscale for optimal storage and removing nuisances from images. This book is contains a wealth of information in a handy format, making it an invaluable companion for anyone working in the field of medical image processing. It is also a source of vast information for the interested radiologist, although some may find the extend of mathematical understanding required somewhat overwhelming. Even if the DICOM part of this book does not comprise a large part, the book may be worth its price for this section alone.8 of 8 people found the following review helpful. Up-to-date information for medical imaging researchersBy OlehThe editors of this book have done a terrific job. Even though the price is quite high, with 900 pages of state-of-the art and well-illustrated timely and high quality text this volume is a bargain! It is important to focus on the title: this book deals with computer processing and computer analysis of images encountered in medicine and biology. It contains about 50 papers distributed over six sections. The book does not deal with imaging physics nor with reconstruction algorithms. The level is suitable for biomedical engineers, computer scientists, and biomedical researchers. Both the organization and the selection of topics are excellent. Though there are idiosyncrasies in the coverage, the relevance and quality of the papers is very high. This is an ideal book for imaging researchers wishing to learn the state of the art outside their immediate discipline and for students wishing to enter the field. I look forward to seeing other volumes in this series!

In recent years, the remarkable advances in medical imaging instruments have increased their use considerably for diagnostics as well as planning and follow-up of treatment. Emerging from the fields of radiology, medical physics and engineering, medical imaging no longer simply deals with the technology and interpretation of radiographic images. The limitless possibilities presented by computer science and technology, coupled with engineering advances in signal processing, optics and nuclear medicine have created the vastly expanded field of medical imaging. The Handbook of Medical Imaging is the first comprehensive compilation of the concepts and techniques used to analyze and manipulate medical images after they have been generated or digitized. The Handbook is organized in six sections that relate to the main functions needed for processing: enhancement, segmentation, quantification, registration, visualization as well as compression storage and telemedicine.* Internationally renowned authors(Johns Hopkins, Harvard, UCLA, Yale, Columbia, UCSF)* Includes imaging and visualization* Contains over 60 pages of stunning, four-color images

"Most investigators and students actively involved in the image processing and analysis field or those who would like

to participate in this field will be pleased to have this handbook as a reference. ...I am sure that this handbook will find its place in most academic radiology department libraries and on the shelf of investigators in the field." - ULTRASOUND IN MEDICINE BIOLOGY (May 2001)"This new volume is part of the Academic Press Series in Biomedical Engineering for which Joseph Bronzino is the Series Editor. The Handbook is organized in six sections... enhancements, segmentation, quantification, registration, visualization, and compression/storage/communication."-IEEE SIGNAL PROCESSING MAGAZINE, January 2001HONORABLE MENTION, ANNUAL AWARDS PROGRAM FOR EXCELLENCE IN PROFESSIONAL/SCHOLARLY PUBLISHING (2000)"...an invaluable and exeptionally convenient resource to students of the field and professionals who need to implement image processing techniques."-RADIOLOGY(August 2001)"...a valuable addition to the shelf of anyone interested in the rapidly-developing field of medical image processing."-MEDICAL ENGINEERING PHYSICSAbout the AuthorIsaac Bankman is affiliated with Johns Hopkins UniversityExcerpt. Reprinted by permission. HONORABLE MENTION, ANNUAL AWARDS PROGRAM FOR EXCELLENCE IN PROFESSIONAL/SCHOLARLY PUBLISHING, 2000