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Medical Radiology · Diagnostic Imaging and Radiation Oncology
Series Editors:
A. L. Baert · L. W. Brady · H.-P. Heilmann · M. Knauth · M. Molls · C. Nieder · K. Sartor
Continuation of Handbuch der medizinischen Radiologie
Encyclopedia of Medical Radiology

Library of Congress Control Number: 2006936011
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Medical Editor: Dr. Ute Heilmann, Heidelberg
Desk Editor: Ursula N. Davis, Heidelberg
Production Editor: Kurt Teichmann, Mauer
Cover-Design and Typesetting: Verlagsservice Teichmann, Mauer
Printed on acid-free paper – 21/3180xq – 5 4 3 2 1 0
Computer applications for image processing in radiological imaging have matured over the past decade and are now considered an indispensable tool for extracting maximal information from the enormous amount of data obtained with the new cross-sectional techniques such as ultrasound, computed tomography and magnetic resonance imaging. Indeed, the exquisite display of anatomy and pathology in all possible planes provided by these methods offers new and specific diagnostic information which will contribute to a better therapeutic management of the patient.

This volume not only covers very comprehensively the fundamental technical aspects of modern imaging processing, including the latest advances in this rapidly evolving field, but it also deals systematically and in depth with the numerous clinical applications in those specific body areas where these methods can be successfully applied. Special chapters are devoted to 3D image fusion and to image-guided robotic surgery. The well readable text is completed by numerous superb illustrations.

The editors, all from the department of diagnostic and interventional radiology of the University of Pisa, are internationally well known experts in the field and all share longstanding dedication and interest in radiological image processing, as demonstrated by their innovative research and publications. Other leading international experts have contributed outstanding individual chapters based on their specific expertise.

I would like to thank and congratulate most sincerely the editors and authors for their superb efforts which have resulted in this much needed and excellent book which will be of great assistance to all radiologists in their daily clinical work, as well as to surgeons and other medical specialists interested in enlarging their knowledge in this wonderful world of radiological computer processing.

I am confident that it will meet with the same success among readers as the previous volumes published in this series.

Leuven

Albert L. Baert
Preface

Two and three-dimensional image processing is an essential and integral part of the diagnostic workflow in the Radiology Department nowadays, significantly improving the quality of diagnosis and at the same time increasing reporting times. Thus, a precise knowledge of the technical aspects and clinical impact of image processing is mandatory for radiologists.

In this book, a group of well recognized experts in the field have sought to provide the radiologist with the information essential to optimizing the use of image processing tools in clinical workflow.

The initial section of the book is dedicated to the technical aspects of image processing, from image acquisition to image processing in the 2D and 3D domain. A larger part of the book is dedicated to clinical applications, where specific topics of Radiology subspecialties are comprehensively covered. A special topic section completes the book, highlighting new and advanced fields of research, such as computer-aided diagnosis and robotics.

We hope to have achieved our aim of providing our colleagues with a useful reference tool in their daily practice.

We would like to express our thanks to all the authors for their outstanding contribute. We are also very grateful to Prof. Albert Baert for his valuable support in this project.

Emanuele Neri
Davide Caramella
Carlo Bartolozzi
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