

Computed Tomography Principles Design Artifacts And Recent Advances 2nd Edition

Computed Tomography Mathematics and Physics of Emerging Biomedical Imaging Industrial X-Ray Computed Tomography Principles and Practice of Image-Guided Radiation Therapy of Lung Cancer Multislice CT Scientific Basis of the Royal College of Radiologists Fellowship Clinical PET-CT in Radiology Computed Tomography The Stroke Book Tomosynthesis Imaging Computed Tomography Computed Tomography for Technologists Noise Properties of Regularized Image Reconstruction In X-ray Computed Tomography Medical Image Reconstruction 3rd International Conference on Radiation Safety & Security in Healthcare Services Principles of Computerized Tomographic Imaging Computed Tomography Medical Imaging X-Ray Imaging Computational Imaging Machine Learning for Tomographic Imaging Computed Tomography Computed Tomography - E-Book Atlas of Non-Invasive Coronary Angiography by Multidetector Computed Tomography Maxillofacial Cone Beam Computed Tomography Spectral Computed Tomography Abdominal Imaging E-Book Positron Emission Tomography Comprehensive Biomaterials Cardiovascular Imaging E-Book Spiral and Multislice Computed Tomography of the Body Veterinary Computed Tomography Molecular Imaging Medical Imaging Clinical PET Computed Tomography Hendee's Physics of Medical Imaging Developments in X-ray Tomography Principles and Practice of Radiation Therapy - E-Book Micro-computed Tomography (micro-CT) in Medicine and Engineering

Computed Tomography

An essential companion for busy professionals seeking to navigate stroke-related clinical situations successfully and make quick informed treatment decisions.

Mathematics and Physics of Emerging Biomedical Imaging

Whole body computed tomography has developed at a rapid pace in the past decade, spurred on by the introduction of spiral and multislice scanning. These new technologies have not only improved diagnostic accuracy, but also made new applications possible that were previously accessible only through more complex or invasive techniques. This new book expertly fills a gap in the literature by combining the practically relevant technical background with the clinical information required for correctly performing and interpreting CT examinations. The book presents the state-of-the-art capabilities and requirements of CT as a key diagnostic and interventional tool, with special emphasis on the role of spiral and multi-slice CT. You will find a thorough introduction to CT technology from scanner design to 3D image reconstruction, useful practical hints on how to optimize your examination protocols and how to keep the radiation exposure of your patients to a

minimum, as well as an extensive clinical section in which symptoms, pathology and CT morphology are integrated to provide you with the basis for subtle interpretation of CT findings using the most modern CT techniques. Highlights include:- Full coverage of single-slice, 4-slice and 16-slice scanning techniques- Introduction to extended CT applications including cardiac CT, CT fluoroscopy, and 3D image processing- Organ-specific protocols for scanning and contrast administration- Practical guidelines for maximizing image quality and minimizing radiation exposure- Useful suggestions for image interpretation and for avoiding pitfalls and errors- Convenient format by organ system and disease entity- Full discussion of organ-specific pathology and CT morphology- CT indications integrated with other imaging modalities At a time when CT examinations are becoming more technically demanding and complex, with an increasing number of scan parameters and advances in 3D reconstructions, this book is an essential professional tool. Experienced practitioners will find their diagnostic and technical skills improved by reading the book, and beginners will enjoy the clear, systematic approach that will help them use the technique with confidence.

Industrial X-Ray Computed Tomography

An innovative, three-dimensional x-ray imaging technique that enhances projection radiography by adding depth resolution, Tomosynthesis Imaging explores tomosynthesis, an emerging limited-angle tomographic imaging technology that is being considered for use in a range of clinical applications, and is currently being used for breast cancer screening and diagnosis. While conventional mammography has been very successful in reducing breast cancer mortality, it is not perfect. A major limitation of mammography is that the recorded image represents the superposition of complex three-dimensional structures in the breast onto a two-dimensional plane, making detection and diagnosis of breast cancer challenging. Tomosynthesis produces quasi-three-dimensional images that can significantly enhance the visualization of important diagnostic features. This book highlights the flexibility of tomosynthesis systems for new clinical applications, and provides a detailed discussion of the tomosynthesis acquisition process and the impact of physical factors. It explores such topics as acquisition parameters, system components, modeling, image reconstruction algorithms, and system evaluation. Provides in-depth coverage of system design considerations, as well as image reconstruction strategies Describes the current state of clinical applications of tomosynthesis, including imaging of the breast and chest, as well as its use in radiotherapy Illustrates the merits of tomosynthesis imaging and its potential clinical applications in imaging of the breast and chest, as well as for radiation therapy Divided into five sections, this text delves into the history and development of tomosynthesis. It introduces tomosynthesis imaging, discusses imaging system design considerations, and reviews image reconstruction algorithms that have been developed for tomosynthesis. It also describes system evaluation methodologies, emphasizes current clinical applications, and examines the future direction for tomosynthesis.

Principles and Practice of Image-Guided Radiation Therapy of Lung Cancer

Abdominal Imaging, a title in the Expert Radiology Series, edited by Drs. Dushyant Sahani and Anthony Samir, is a comprehensive reference that encompasses both GI and GU radiology. It provides richly illustrated, advanced guidance to help you overcome the full range of diagnostic, therapeutic, and interventional challenges in abdominal imaging and combines an image-rich, easy-to-use format with the greater depth that experienced practitioners need. Select the best imaging approaches and effectively interpret your findings by comparing them to thousands of images that represent every modality and every type of abdominal imaging. Find detailed, expert guidance on all diagnostic, therapeutic, and interventional aspects of abdominal imaging in one authoritative source, including challenging topics such as Oncologic Assessment of Tumor Response and How to Scan a Difficult Patient. Efficiently locate the information you need with a highly templated, well-organized, at-a-glance organization.

Multislice CT

This book offers a comprehensive and topical depiction of advances in CT imaging. CT has become a leading medical imaging modality, thanks to its superb spatial and temporal resolution to depict anatomical details. New advances have further extended the technology to provide physiological information, enabling a wide and expanding range of clinical applications. The text covers the latest advancements in CT technology and clinical applications for a variety of CT types and imaging methods. The content is presented in seven parts to offer a structure across a board coverage of CT: CT Systems, CT Performance, CT Practice, Spectral CT, Quantitative CT, Functional CT, and Special Purpose CT. Each contain chapters written by leading experts in the field, covering CT hardware and software innovations, CT operation, CT performance characterization, functional and quantitative applications, and CT systems devised for specific anatomical applications. This book is an ideal resource for practitioners of CT applications in medicine, including physicians, trainees, engineers, and scientists.

Scientific Basis of the Royal College of Radiologists Fellowship

Provides an overview of the evolution of CT, the mathematical and physical aspects of the technology, and the fundamentals of image reconstruction using algorithms. Image display is examined from traditional methods through the most recent advancements. Key performance indices, theories behind the measurement methodologies, and different measurement phantoms in image quality are discussed. The CT scanner is broken down into components to provide the reader with an understanding of their function, their latest advances, and their impact on the CT system. General descriptions and different categories of artifacts, their causes, and their corrections are considered at length.

Clinical PET-CT in Radiology

Computed Tomography

This book presents the proceedings of the 3rd International Conference on Radiation Safety & Security in Healthcare Services. The conference was held at Universiti Sains Malaysia in Penang on 19th–20th August 2017.

The Stroke Book

This atlas presents over 160 illustrations, with 116 in color, and illustrates the capacity of multidetector CT for the analysis of the anatomy of the coronary arteries. The multidetector CT scanner speeds diagnosis and treatment of patients. One of its many uses is to perform CT coronary angiography. Multidetector CT provides clear pictures and takes less time than other non-invasive techniques. The book is written by cardiologists and radiologists.

Tomosynthesis Imaging

This volume provides an overview of X-ray technology and the historical development of modern CT systems. The main focus of the book is a detailed derivation of reconstruction algorithms in 2D and modern 3D cone-beam systems. A thorough analysis of CT artifacts and a discussion of practical issues such as dose considerations give further insight into current CT systems. Although written mainly for graduate students, practitioners will also benefit from this book.

Computed Tomography

X-ray computed tomography (CT) continues to experience rapid growth, both in basic technology and new clinical applications. Seven years after its first edition, *Computed Tomography: Principles, Design, Artifacts, and Recent Advancements, Second Edition*, provides an overview of the evolution of CT, the mathematical and physical aspects of the technology, and the fundamentals of image reconstruction algorithms. Image display is examined from traditional methods used through the most recent advancements. Key performance indices, theories behind the measurement methodologies, and different measurement phantoms in image quality are discussed. The CT scanner is broken down into components to provide the reader with an understanding of their function, their latest advances, and their impact on the CT system. General descriptions and different categories of artifacts, their causes, and their corrections are considered at length. Given the high visibility and public awareness of the impact of x-ray radiation, the second edition features a new chapter on x-ray dose and presents different dose reduction techniques ranging from patient handling, optimal data acquisition, image reconstruction, and post-process. Based on the advancements over the past five years, the second edition added new

sections on cone beam reconstruction algorithms, nonconventional helical acquisition and reconstruction, new reconstruction approaches, and dual-energy CT. Finally, new to this edition is a set of problems for each chapter, providing opportunities to enhance reader comprehension and practice the application of covered material.

Computed Tomography for Technologists

The book offers a comprehensive and user-oriented description of the theoretical and technical system fundamentals of computed tomography (CT) for a wide readership, from conventional single-slice acquisitions to volume acquisition with multi-slice and cone-beam spiral CT. It covers in detail all characteristic parameters relevant for image quality and all performance features significant for clinical application. Readers will thus be informed how to use a CT system to an optimum depending on the different diagnostic requirements. This includes a detailed discussion about the dose required and about dose measurements as well as how to reduce dose in CT. All considerations pay special attention to spiral CT and to new developments towards advanced multi-slice and cone-beam CT. For the third edition most of the contents have been updated and latest topics like dual source CT, dual energy CT, flat detector CT and interventional CT have been added. The enclosed CD-ROM again offers copies of all figures in the book and attractive case studies, including many examples from the most recent 64-slice acquisitions, and interactive exercises for image viewing and manipulation. This book is intended for all those who work daily, regularly or even only occasionally with CT: physicians, radiographers, engineers, technicians and physicists. A glossary describes all the important technical terms in alphabetical order. The enclosed DVD again offers attractive case studies, including many examples from the most recent 64-slice acquisitions, and interactive exercises for image viewing and manipulation. This book is intended for all those who work daily, regularly or even only occasionally with CT: physicians, radiographers, engineers, technicians and physicists. A glossary describes all the important technical terms in alphabetical order.

Noise Properties of Regularized Image Reconstruction In X-ray Computed Tomography

The present book gives an exceptional overview of molecular imaging. Practical approach represents the red thread through the whole book, covering at the same time detailed background information that goes very deep into molecular as well as cellular level. Ideas how molecular imaging will develop in the near future present a special delicacy. This should be of special interest as the contributors are members of leading research groups from all over the world.

Medical Image Reconstruction

The only radiation therapy text written by radiation therapists, Principles and Practice of Radiation Therapy, 4th Edition

helps you understand cancer management and improve clinical techniques for delivering doses of radiation. A problem-based approach makes it easy to apply principles to treatment planning and delivery. New to this edition are updates on current equipment, procedures, and treatment planning. Written by radiation therapy experts Charles Washington and Dennis Leaver, this comprehensive text will be useful throughout your radiation therapy courses and beyond. Comprehensive coverage of radiation therapy includes a clear introduction and overview plus complete information on physics, simulation, and treatment planning. Spotlights and shaded boxes identify the most important concepts. End-of-chapter questions provide a useful review. Chapter objectives, key terms, outlines, and summaries make it easier to prioritize, understand, and retain key information. Key terms are bolded and defined at first mention in the text, and included in the glossary for easy reference. UPDATED chemotherapy section, expansion of What Causes Cancer, and inclusions of additional cancer biology terms and principles provide the essential information needed for clinical success. UPDATED coverage of post-image manipulation techniques includes new material on Cone beam utilization, MR imaging, image guided therapy, and kV imaging. NEW section on radiation safety and misadministration of treatment beams addresses the most up-to-date practice requirements. Content updates also include new ASRT Practice Standards and AHA Patient Care Partnership Standards, keeping you current with practice requirements. UPDATED full-color insert is expanded to 32 pages, and displays images from newer modalities.

3rd International Conference on Radiation Safety & Security in Healthcare Services

Principles of Computerized Tomographic Imaging

Positron Emission Tomography is a nuclear medicine technique first used to study the brain. Several decades ago, PET scanners design and performance have improved considerably: number of detectors has increased from 20 to 20,000, axial field of view from 2 to 20 cm, spatial resolution has improved from 25 to 5 mm, sensitivity has increased of about 1000 fold. At the same time, clinical applications have grown dramatically. In the first section of this book the authors review some of developments in PET instrumentation, with emphasis on data acquisition, processing and image formation. In the second section authors expose examples of applications in human research. In the last section authors describe applications in assessment and prediction of oncological treatment response.

Computed Tomography

The advent and rapid diffusion of advanced multidetector-row scanner technology offers comprehensive evaluation of different anatomic structures in daily practice. The aim of this book is to introduce the applications of CT imaging in not only

general medicine but also in different fields especially in veterinary medicine, dentistry, and engineering. Recent developments in CT technology have led to a widening of its applications on many areas like material testing in engineering, 3D evaluation of teeth, and the vascular and cardiac evaluations of small animals.

Medical Imaging

Comprehensive Biomaterials brings together the myriad facets of biomaterials into one, major series of six edited volumes that would cover the field of biomaterials in a major, extensive fashion: Volume 1: Metallic, Ceramic and Polymeric Biomaterials Volume 2: Biologically Inspired and Biomolecular Materials Volume 3: Methods of Analysis Volume 4: Biocompatibility, Surface Engineering, and Delivery Of Drugs, Genes and Other Molecules Volume 5: Tissue and Organ Engineering Volume 6: Biomaterials and Clinical Use Experts from around the world in hundreds of related biomaterials areas have contributed to this publication, resulting in a continuum of rich information appropriate for many audiences. The work addresses the current status of nearly all biomaterials in the field, their strengths and weaknesses, their future prospects, appropriate analytical methods and testing, device applications and performance, emerging candidate materials as competitors and disruptive technologies, and strategic insights for those entering and operational in diverse biomaterials applications, research and development, regulatory management, and commercial aspects. From the outset, the goal was to review materials in the context of medical devices and tissue properties, biocompatibility and surface analysis, tissue engineering and controlled release. It was also the intent both, to focus on material properties from the perspectives of therapeutic and diagnostic use, and to address questions relevant to state-of-the-art research endeavors. Reviews the current status of nearly all biomaterials in the field by analyzing their strengths and weaknesses, performance as well as future prospects Presents appropriate analytical methods and testing procedures in addition to potential device applications Provides strategic insights for those working on diverse application areas such as R&D, regulatory management, and commercial development

X-Ray Imaging

The book has two intentions. First, it assembles the latest research in the field of medical imaging technology in one place. Detailed descriptions of current state-of-the-art medical imaging systems (comprised of x-ray CT, MRI, ultrasound, and nuclear medicine) and data processing techniques are discussed. Information is provided that will give interested engineers and scientists a solid foundation from which to build with additional resources. Secondly, it exposes the reader to myriad applications that medical imaging technology has enabled.

Computational Imaging

Machine learning represents a paradigm shift in tomographic imaging, and image reconstruction is a new frontier of machine learning. This book will meet the needs of those who want to catch the wave of smart imaging. The book targets graduate students and researchers in the imaging community. Open network software, working datasets, and multimedia will be included. The first of its kind in the emerging field of deep reconstruction and deep imaging, Machine Learning for Tomographic Imaging presents the most essential elements, latest progresses and an in-depth perspective on this important topic.

Machine Learning for Tomographic Imaging

PET has been a valuable research tool in academic institutions since the '70s, but its move into clinical practice in community hospitals has just begun. PET has undergone spectacular growth in the fields of nuclear medicine, radiology, and oncology. The burgeoning world of PET is reflected in standing room only CME courses at scientific meetings such as the Radiology Society of North America and the Society for Nuclear Medicine. This book will provide nuclear medicine practitioners, radiologists, oncologists, and neurologists with a practical overview of the basic principles and clinical applications of PET. Emphasis is placed on the familiarization of normal distribution, artefacts, and common imaging agents such as FDG in conjunction with CT, MRI, and US to establish the clinical effectiveness of PET. Practical understanding of updated PET scanners, image process and quantification of PET measurements is also discussed. With contributions from leaders in the PET community, the book deals with the basic principles, instrumentation, fusion, radiopharmaceuticals, radiosynthesis, safety and cost analysis of PET. The clinical section of the book will focus on the technique and indications of PET. There is also a unique atlas as well as comprehensive coverage of essential clinical PET studies in neurology, cardiology, and oncology.

Computed Tomography

This book focuses on applications of micro CT, CBCT and CT in medicine and engineering, comprehensively explaining the basic principles of these techniques in detail, and describing their increasing use in the imaging field. It particularly highlights the scanning procedure, which represents the most crucial step in micro CT, and discusses in detail the reconstruction process and the artifacts related to the scanning processes, as well as the imaging software used in analysis. Written by international experts, the book illustrates the application of micro CT in different areas, such as dentistry, medicine, tissue engineering, aerospace engineering, geology, material engineering, civil engineering and additive manufacturing. Covering different areas of application, the book is of interest not only to specialists in the respective fields, but also to broader audience of professionals working in the fields of imaging and analysis, as well as to students of the different disciplines.

Computed Tomography - E-Book

Knowledge of scientific principles is also mandated as a result of a need to understand best and safest practice, especially in the use of ionising radiation where legislation, guidance and risk all form part of a medical specialists' pressures at work. It is no surprise therefore that radiologists are obliged to study and pass physics exams. Such exams can present a considerable challenge and the authors of this work recognise and sympathise with that challenge and have created a volume which that is intended to be an educational resource and not just a pre-exam 'crammer.' Both authors have considerable experience in teaching, supporting and examining in medical science and have developed an awareness of where those sitting professional exams have traditionally struggled. This text is a distillation of that experience.

Atlas of Non-Invasive Coronary Angiography by Multidetector Computed Tomography

This book gives a comprehensive overview on the use of image-guided radiation therapy (IGRT) in the treatment of lung cancer, covering step-by-step guidelines for clinical implementations, fundamental principles and key technical advances. It covers benefits and limitations of techniques as well as quality and safety issues related to IGRT practice. Addresses imaging simulation, treatment planning, verification, and delivery Discusses important quality assurance issues Describes current methods using specialized machines and technologies Jing Cai, PhD, is an Associate Professor of Radiation Oncology at Duke University Medical Center. Joe Y. Chang, MD, PhD, is Professor in the Department of Radiation Oncology at The University of Texas MD Anderson Cancer Center in Houston. Fang-Fang Yin, PhD, is Chief of the Division of Radiation Physics, Professor of Radiation Oncology, and Director of the Medical Physics program at Duke University.

Maxillofacial Cone Beam Computed Tomography

This is the second, revised edition of the very successful volume on multislice CT published only 2 years ago. A second edition became necessary so swiftly due to the rapid technical developments in multi-detector row technology; a huge amount of new experimental and clinical data has recently become available. This book is the most comprehensive up-to-date work on all aspects of the clinical applications of this fascinating imaging technique. It contains information on the very latest developments in the field, as well as numerous superb illustrations. I am very much indebted to the editors of this volume, M. F. Reiser, M. Takahashi, M. Modic and C.R. Becker - all renowned international experts in computer tomography - for the immense dedication and tireless effort involved in preparing and editing this superb volume in a record brief period of time. I would like to congratulate the editors and the contributing authors, all selected for their exceptional expertise, on the outstanding quality of the different chapters and the wide range of topics covered.

Spectral Computed Tomography

Abdominal Imaging E-Book

This practical and highly illustrated guide is an essential resource for veterinarians seeking to improve their understanding and use of computed tomography (CT) in practice. It provides a thorough grounding in CT technology, describing the underlying physical principles as well as the different types of scanners. The book also includes principles of CT examination such as guidance on positioning and how to achieve a good image quality. Written by specialists from twelve countries, this book offers a broad range of expertise in veterinary computed tomography, and is the first book to describe the technology, methodology, interpretation principles and CT features of different diseases for most species treated in veterinary practice. Key features • An essential guide for veterinarians using CT in practice • Includes basic principles of CT as well as guidelines on how to carry out an effective examination • Describes CT features of different diseases for most species treated in practice • Written by a range of international leaders in the field • Illustrated with high quality photographs and diagrams throughout

Positron Emission Tomography

The book provides a comprehensive description of the fundamental operational principles, technical details of acquiring and specific clinical applications of dental and maxillofacial cone beam computed tomography (CBCT). It covers all clinical considerations necessary for optimal performance in a dental setting. In addition overall and region specific correlative imaging anatomy of the maxillofacial region is described in detail with emphasis on relevant disease. Finally imaging interpretation of CBCT images is presented related to specific clinical applications. This book is the definitive resource for all who refer, perform, interpret or use dental and maxillofacial CBCT including dental clinicians and specialists, radiographers, ENT physicians, head and neck, and oral and maxillofacial radiologists.

Comprehensive Biomaterials

A comprehensive, tutorial-style introduction to the algorithms necessary for tomographic imaging.

Cardiovascular Imaging E-Book

While books on the medical applications of x-ray imaging exist, there is not one currently available that focuses on

industrial applications. Full of color images that show clear spectrometry and rich with applications, X-Ray Imaging fills the need for a comprehensive work on modern industrial x-ray imaging. It reviews the fundamental science of x-ray imaging and addresses equipment and system configuration. Useful to a broad range of radiation imaging practitioners, the book looks at the rapid development and deployment of digital x-ray imaging system.

Spiral and Multislice Computed Tomography of the Body

"Medical Image Reconstruction: A Conceptual Tutorial" introduces the classical and modern image reconstruction technologies, such as two-dimensional (2D) parallel-beam and fan-beam imaging, three-dimensional (3D) parallel ray, parallel plane, and cone-beam imaging. This book presents both analytical and iterative methods of these technologies and their applications in X-ray CT (computed tomography), SPECT (single photon emission computed tomography), PET (positron emission tomography), and MRI (magnetic resonance imaging). Contemporary research results in exact region-of-interest (ROI) reconstruction with truncated projections, Katsevich's cone-beam filtered backprojection algorithm, and reconstruction with highly undersampled data with l0-minimization are also included. This book is written for engineers and researchers in the field of biomedical engineering specializing in medical imaging and image processing with image reconstruction. Gengsheng Lawrence Zeng is an expert in the development of medical image reconstruction algorithms and is a professor at the Department of Radiology, University of Utah, Salt Lake City, Utah, USA.

Veterinary Computed Tomography

This cross-disciplinary book documents the key research challenges in the mathematical sciences and physics that could enable the economical development of novel biomedical imaging devices. It is hoped that the infusion of new insights from mathematical scientists and physicists will accelerate progress in imaging. Incorporating input from dozens of biomedical researchers who described what they perceived as key open problems of imaging that are amenable to attack by mathematical scientists and physicists, this book introduces the frontiers of biomedical imaging, especially the imaging of dynamic physiological functions, to the educated nonspecialist. Ten imaging modalities are covered, from the well-established (e.g., CAT scanning, MRI) to the more speculative (e.g., electrical and magnetic source imaging). For each modality, mathematics and physics research challenges are identified and a short list of suggested reading offered. Two additional chapters offer visions of the next generation of surgical and interventional techniques and of image processing. A final chapter provides an overview of mathematical issues that cut across the various modalities.

Molecular Imaging

Build the foundation necessary for the practice of CT scanning with *Computed Tomography: Physical Principles, Clinical Applications, and Quality Control*, 4th Edition. Written to meet the varied requirements of radiography students and practitioners, this two-color text provides comprehensive coverage of the physical principles of CT and its clinical applications. Its clear, straightforward approach is designed to improve your understanding of sectional anatomic images as they relate to CT — and facilitate communication between CT technologists and other medical personnel. Comprehensively covers CT at just the right depth for technologists – going beyond superficial treatment to accommodate all the major advances in CT. One complete CT resource covers what you need to know! The latest information on advances in CT imaging, including: advances in volume CT scanning; CT fluoroscopy; multi-slice applications like 3-D imaging, CT angiography, and virtual reality imaging (endoscopy) – all with excellent coverage of state-of-the-art principles, instrumentation, clinical applications, and quality control. More than 600 photos and line drawings help students understand and visualize concepts. Chapter outlines show you what is most important in every chapter. Strong ancillary package on Evolve facilitates instructor preparation and provides a full complement of support for teaching and learning with the text NEW! Highlights recent technical developments in CT, such as: the iterative reconstruction; detector updates; x-ray tube innovations; radiation dose optimization; hardware and software developments; and the introduction of a new scanner from Toshiba. NEW! Learning Objectives and Key Terms at the beginning of every chapter and a Glossary at the end of the book help you organize and focus on key information. NEW! End-of-Chapter Questions provide opportunity for review and greater challenge. NEW! An added second color aids in helping you read and retain pertinent information

Medical Imaging

Clinical PET

An up-to-date edition of the authoritative text on the physics of medical imaging, written in an accessible format The extensively revised fifth edition of *Hendee's Medical Imaging Physics*, offers a guide to the principles, technologies, and procedures of medical imaging. Comprehensive in scope, the text contains coverage of all aspects of image formation in modern medical imaging modalities including radiography, fluoroscopy, computed tomography, nuclear imaging, magnetic resonance imaging, and ultrasound. Since the publication of the fourth edition, there have been major advances in the techniques and instrumentation used in the ever-changing field of medical imaging. The fifth edition offers a comprehensive reflection of these advances including digital projection imaging techniques, nuclear imaging technologies, new CT and MR imaging methods, and ultrasound applications. The new edition also takes a radical strategy in organization of the content, offering the fundamentals common to most imaging methods in Part I of the book, and application of those fundamentals in specific imaging modalities in Part II. These fundamentals also include notable updates and new content including

radiobiology, anatomy and physiology relevant to medical imaging, imaging science, image processing, image display, and information technologies. The book makes an attempt to make complex content in accessible format with limited mathematical formulation. The book is aimed to be accessible by most professionals with lay readers interested in the subject. The book is also designed to be of utility for imaging physicians and residents, medical physics students, and medical physicists and radiologic technologists perpetrating for certification examinations. The revised fifth edition of Hendee's Medical Imaging Physics continues to offer the essential information and insights needed to understand the principles, the technologies, and procedures used in medical imaging.

Computed Tomography

Computed tomography (CT) is a widely used x-ray scanning technique. In its prominent use as a medical imaging device, CT serves as a workhorse in many clinical settings throughout the world. It provides answers to urgent diagnostic tasks such as oncology tumor staging, acute stroke analysis, or radiation therapy planning. Spectral Computed Tomography provides a concise, practical coverage of this important medical tool. The first chapter considers the main clinical motivations for spectral CT applications. In Chapter 2, the measurement properties of spectral CT systems are described. Chapter 3 provides an overview of the current state of research on spectral CT algorithms. Based on this overview, the technical realization of spectral CT systems is evaluated in Chapter 4. Device approaches such as DSCT, kV switching, and energy-resolving detectors are compared. Finally, Chapter 5 summarizes various algorithms for spectral CT reconstructions and spectral CT image postprocessing, and links these algorithms to clinical use cases

Hendee's Physics of Medical Imaging

This book is specifically designed to meet the needs of practicing radiologists by offering a practical, unified approach to PET-CT. It details how to effectively apply PET-CT in patient management. Written by radiologists who fully appreciate and understand both PET and CT, the book details an integrated understanding of PET-CT as a combined modality. Clinical topics include PET-CT of thoracic malignancies, melanoma, and breast cancer. In addition, the book reinforces fundamental concepts, such as the role of imaging diagnosis in disease management.

Developments in X-ray Tomography

Leveraging the organization and focus on exam preparation found in the comprehensive text, this Exam Review will help any student to successfully complete the ARRT General Radiography and Computed Tomography exams. The book includes a bulleted format review of content, Registry-style questions with answers and rationales, and a mock exam following the

ARRT format. The companion website offers an online testing simulation engine.

Principles and Practice of Radiation Therapy - E-Book

Cardiovascular Imaging, a title in the Expert Radiology Series, edited by Drs. Vincent Ho and Gautham P. Reddy, is a comprehensive 2-volume reference that covers the latest advances in this specialty. It provides richly illustrated, advanced guidance to help you overcome the full range of diagnostic, therapeutic, and interventional challenges in cardiovascular imaging and combines an image-rich, easy-to-use format with the greater depth that experienced practitioners need. Online access at www.expertconsult.com allows you to rapidly search for images and quickly locate the answers to any questions. Access the fully searchable text online at www.expertconsult.com, along with downloadable images. View 5000 full-color digital images of both radiographic images and cutting-edge modalities—MR, multislice CT, ultrasonography, and nuclear medicine. Tap into comprehensive coverage that includes diagnostic and therapeutic options, with an emphasis on cost-effective imaging. Consult the experience of a diverse group of experts on cardiovascular imaging from around the globe. Find information quickly and easily thanks to consistent and tightly focused chapters, a full-color design, and key points boxes.

Micro-computed Tomography (micro-CT) in Medicine and Engineering

X-ray computed tomography has been used for several decades as a tool for measuring the three-dimensional geometry of the internal organs in medicine. However, in recent years, we have seen a move in manufacturing industries for the use of X-ray computed tomography; first to give qualitative information about the internal geometry and defects in a component, and more recently, as a fully-quantitative technique for dimensional and materials analysis. This trend is primarily due to the ability of X-ray computed tomography to give a high-density and multi-scale representation of both the external and internal geometry of a component, in a non-destructive, non-contact and relatively fast way. But, due to the complexity of X-ray computed tomography, there are remaining metrological issues to solve and the specification standards are still under development. This book will act as a one-stop-shop resource for students and users of X-ray computed tomography in both academia and industry. It presents the fundamental principles of the technique, detailed descriptions of the various components (hardware and software), current developments in calibration and performance verification and a wealth of example applications. The book will also highlight where there is still work to do, in the perspective that X-ray computed tomography will be an essential part of Industry 4.0.

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