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ROWAN ARIANA

Physical Principles, Clinical Applications, and Quality Control
Publicis

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.

Molecular Imaging I Springer

This book describes fundamental computational methods for image reconstruction in computed tomography (CT) with a focus on a pedagogical presentation of these methods and their underlying concepts. Insights into the advantages, limitations, and theoretical and computational aspects of the methods are included, giving a balanced presentation that allows readers to understand and implement CT reconstruction algorithms. Unique in its emphasis on the interplay between modeling, computing, and algorithm development, *Computed Tomography: Algorithms, Insight, and Just Enough Theory* develops the mathematical and computational aspects of three main classes of reconstruction methods: classical filtered back-projection, algebraic iterative methods, and variational methods based on nonlinear numerical optimization algorithms. It spotlights the link between CT and numerical methods, which is rarely discussed in current literature, and describes the effects of incomplete data using both microlocal analysis and singular value decomposition (SVD). This book sets the stage for further exploration of CT algorithms.

Readers will be able to grasp the underlying mathematical models to motivate and derive the basic principles of CT reconstruction and will gain basic understanding of fundamental computational challenges of CT, such as the influence of noisy and incomplete data, as well as the reconstruction capabilities and the convergence of the iterative algorithms. Exercises using MATLAB are included, allowing readers to experiment with the algorithms and making the book suitable for teaching and self-study. *Computed Tomography: Algorithms, Insight, and Just Enough Theory* is primarily aimed at students, researchers, and practitioners interested in the computational aspects of X-ray CT and is also relevant for anyone working with other forms of tomography, such as neutron and electron tomography, that share the same mathematical formulation. With its basis in lecture notes developed for a PhD course, it is appropriate as a textbook for courses on computational methods for X-ray CT and computational methods for inverse problems.

Algorithms, Insight, and Just Enough Theory SPIE Press
Updated to reflect the notable advances in cardiac computed tomography (CT) imaging, the Second Edition of the best-selling *Computed Tomography of the Coronary Arteries* provides cardiologists and radiologists with a practical text that explains the basic principles and applications of CT. Written by renowned international experts in the field, this accessible resource clearly presents the fundamentals of the new technology of 64-slice imaging through the use of high quality illustrations, references, and tables. Contents include: image post-processing coronary imaging for normal coronary arteries coronary pathology and coronary imaging coronary stenosis coronary plaque imaging and calcification chronic total occlusion an assessment of coronary stents coronary artery anomalies in adults coronary collaterals and bypass grafts cardiac masses, intracardiac thrombi, and pericardial abnormalities great thoracic vessels noncardiac findings on CT calcium screening left ventricular function artefacts the future of cardiac CT imaging contrast-enhancement for coronary angiography

Fundamentals, System Technology, Image Quality, Applications BoD - Books on Demand

Takes technical process of CT scanning and breaks it down to

digestible components. Provides technical detail essential to understanding the modality.

Principles, Design, Artifacts, and Recent Advances *Computed Tomography Fundamentals, System Technology, Image Quality, Applications*

Due to the availability of commercial laboratory systems and the emergence of user facilities at synchrotron radiation sources, studies of microcomputed tomography or microCT have increased exponentially. *MicroComputed Technology* provides a complete introduction to the technology, describing how to use it effectively and understand its results. The first part of the book focuses on methodology, covering experimental methods, data analysis, and visualization approaches. The second part addresses various microCT applications, including porous solids, microstructural evolution, soft tissue studies, multimode studies, and indirect analyses. The author presents a sufficient amount of fundamental material so that those new to the field can develop a relative understanding of how to design their own microCT studies. One of the first full-length references dedicated to microCT, this book provides an accessible introduction to field, supplemented with application examples and color images.

Image Reconstruction from Projections SIAM

Radiology Fundamentals is a concise introduction to the dynamic field of radiology for medical students, non-radiology house staff, physician assistants, nurse practitioners, radiology assistants, and other allied health professionals. The goal of the book is to provide readers with general examples and brief discussions of basic radiographic principles and to serve as a curriculum guide, supplementing a radiology education and providing a solid foundation for further learning. Introductory chapters provide readers with the fundamental scientific concepts underlying the medical use of imaging modalities and technology, including ultrasound, computed tomography, magnetic resonance imaging, and nuclear medicine. The main scope of the book is to present concise chapters organized by anatomic region and radiology subspecialty that highlight the radiologist's role in diagnosing and treating common diseases, disorders, and conditions. Highly illustrated with images and diagrams, each chapter in *Radiology Fundamentals* begins with learning objectives to aid readers in

recognizing important points and connecting the basic radiology concepts that run throughout the text. It is the editors' hope that this valuable, up-to-date resource will foster and further stimulate self-directed radiology learning—the process at the heart of medical education.

Infrared Technology Fundamentals CRC Press

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.

Introduction to Imaging & Technology Cambridge University Press

This open access book gives a complete and comprehensive introduction to the fields of medical imaging systems, as designed for a broad range of applications. The authors of the book first explain the foundations of system theory and image processing, before highlighting several modalities in a dedicated chapter. The initial focus is on modalities that are closely related to traditional camera systems such as endoscopy and microscopy. This is followed by more complex image formation processes: magnetic resonance imaging, X-ray projection imaging, computed tomography, X-ray phase-contrast imaging, nuclear imaging, ultrasound, and optical coherence tomography.

Computed Tomography Elsevier Health Sciences

Computed tomography of the heart has become a highly accurate diagnostic modality that is attracting increasing attention. This extensively illustrated book aims to assist the reader in integrating cardiac CT into daily clinical practice, while also reviewing its current technical status and applications. Clear guidance is provided on the performance and interpretation of imaging using the latest technology, which offers greater coverage, better spatial resolution, and faster imaging. The specific features of scanners from all four main vendors, including those that have only recently become available, are presented. Among the wide range of applications and issues to be discussed are coronary artery bypass grafts, stents, plaques, and anomalies, cardiac valves, congenital and acquired heart disease, and radiation exposure. Upcoming clinical uses of cardiac CT, such as

plaque imaging and functional assessment, are also explored. *Integrated Imaging in Oncology* Lippincott Williams & Wilkins 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 Springer

"This book provides a comprehensive and user-friendly description of the theoretical and technical essentials of computed tomography (CT), an imaging technique used extensively by the medical community." --Book Jacket.

Principles, Design, Artifacts, and Recent Advances Taylor & Francis

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.

Maxillofacial Cone Beam Computed Tomography Springer Science & Business Media

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.

Kalender - Computed Tomography - Fundamentals, System Technology, Image Quality, Applications 4e National Academies Press

Conventional computed tomography (CT) techniques employ a narrow array of x-ray detectors and a fan-shaped x-ray beam to rotate around the patient to produce images of thin sections of the patient. Large sections of the body are covered by moving the patient into the rotating x-ray detector and x-ray source gantry. Cone beam CT is an alternative technique using a large area detector and cone-shaped x-ray beam to produce 3D images of a thick section of the body with one full angle (360 degree or 180 degree plus detector coverage) rotation. It finds applications in situations where bulky, conventional CT systems would interfere with clinical procedures or cannot be integrated with the primary treatments or imaging systems. Cone Beam Computed Tomography explores the past, present, and future state of medical x-ray imaging while explaining how cone beam CT, with its superior spatial resolution and compact configuration, is used in clinical applications and animal research. The book: Supplies a detailed introduction to cone beam CT, covering basic principles

and applications as well as advanced techniques Explores state-of-the-art research and future developments while examining the fundamental limitations of the technology Addresses issues related to implementation and system characteristics, including image quality, artifacts, radiation dose, and perception Reviews the historical development of medical x-ray imaging, from conventional CT techniques to volumetric 3D imaging Discusses the major components of cone beam CT: image acquisition, reconstruction, processing, and display A reference work for scientists, engineers, students, and imaging professionals, Cone Beam Computed Tomography provides a solid understanding of the theory and implementation of this revolutionary technology.

Fundamentals, System Technology, Image Quality, Applications Elsevier

Covers the most recent advances in CT technique, including the use of multislice CT to diagnose chest, abdominal, and musculoskeletal abnormalities, as well as the expanded role of 3D CT and CT angiography in clinical practice. Highlights the information essential for interpreting CTs and the salient points needed to make diagnoses, and reviews how the anatomy of every body area appears on a CT scan. Offers step-by-step instructions on how to perform all current CT techniques. Provides a survey of major CT findings for a variety of common diseases, with an emphasis on those findings that help to differentiate one condition from another.

Computed Tomography VCH

Spectral, Photon Counting Computed Tomography is a comprehensive cover of the latest developments in the most prevalent imaging modality (x-ray computed tomography (CT)) in its latest incarnation: Spectral, Dual-Energy, and Photon Counting CT. Disadvantages of the conventional single-energy technique used by CT technology are that different materials cannot be distinguished and that the noise is larger. To address these problems, a novel spectral CT concept has been proposed. Spectral Dual-Energy CT (DE-CT) acquires two sets of spectral data, and Spectral Photon Counting CT (PC-CT) detects energy of x-ray photons to reveal additional material information of objects by using novel energy-sensitive, photon-counting detectors. The K-edge imaging may be a gateway for functional or molecular CT. The book covers detectors and electronics, image reconstruction methods, image quality assessments, a simulation tool,

nanoparticle contrast agents, and clinical applications for spectral CT.

Clinical PET-CT in Radiology John Wiley & Sons

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.

Computed Tomography Springer Nature

Publisher's Note: Products purchased from 3rd Party sellers are not guaranteed by the Publisher for quality, authenticity, or access to any online entitlements included with the product. Computed Tomography for Technologists: Exam Review, Second Edition, is intended to be used as a companion to Computed Tomography for Technologists: A Comprehensive Text, Second Edition, and as a review of computed tomography on its own. This is an excellent resource for students preparing to take the

advanced level certification exam offered by The American Registry of Radiologic Technologists (ARRT).

Radiology Fundamentals BoD – Books on Demand

Despite the expected decline in the mid-1970s in the use of computed tomography (CT) following the excitement of magnetic resonance imaging (MRI), CT has confounded its detractors and remains the imaging modality of choice, particularly for the chest and abdomen. Spiral/helical CT with the development of 64-multislice variant has revolutionized diagnostic imaging: image acquisition of large body volumes are obtained in short times during a single-breath hold. Scanning protocols without contrast enhancement are not a challenge; however, with intravenous contrast agents, critical choices are made and bad choices inevitably produce bad scans. This handy guide provides the reader with a simple introduction to the essential ideas involved and a practical guide to the implementation of rational scanning protocols for multislice spiral instruments. Written by Peter Dawson, a well-respected figure in computed tomography and radiology, and a world expert on contrast agents, Scanning Protocols for Multislice Helical Computed Tomography is an essential guide for all those working with CT, as well as those in training.

Springer Science & Business Media

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 tomography will be an essential part of Industry 4.0. there is still work to do, in the perspective that X-ray computed

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