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KEY=ANALYSIS - ZAYDEN WILLIAMSON

Quantitative Analysis in Nuclear Medicine Imaging

Springer Science & Business Media This book provides a review of image analysis techniques as they are applied in the field of diagnostic and therapeutic nuclear medicine. Driven in part by the remarkable sophistication of nuclear medicine instrumentation and - crease in computing power and its ready and inexpensive availability, this is a relatively new yet rapidly expanding field. Likewise, although the use of nuclear imaging for diagnosis and therapy has origins dating back almost to the pioneering work of Dr G. de Hevesy, quantitative imaging has only recently emerged as a promising approach for diagnosis and therapy of many diseases. An effort has, therefore, been made to place the reviews provided in this book in a broader context. The effort to do this is reflected by the inclusion of introductory chapters that address basic principles of nuclear medicine instrumentation and dual-modality imaging, followed by overview of issues that are closely related to quantitative nuclear imaging and its potential role in diagnostic and therapeutic applications. A brief overview of each chapter is provided below. Chapter 1 presents a general overview of nuclear medicine imaging physics and instrumentation including planar scintigraphy, single-photon emission computed tomography (SPECT) and positron emission tomography (PET). Nowadays, patients' diagnosis and therapy is rarely done without the use of imaging technology. As such, imaging considerations are incorporated in almost every chapter of the book. The development of dual-modality - aging systems is an emerging research field, which is addressed in chapter 2.

Nuclear Medicine

Quantitative Analysis in Imaging and Function

Nuclear Medicine

Quantitative Analysis in Imaging and Function

Wiley-Liss

Perspectives on Nuclear Medicine for Molecular Diagnosis and Integrated Therapy

Springer This work is devoted to understanding the recent advances in nuclear medicine and molecular imaging technologies along with their application to integrated medical therapy and future drug development. This anthology is based on the international symposium in 2015 entitled "Perspective on Nuclear Medicine for Molecular Diagnosis and Integrated Therapy." The symposium provided an opportunity to exchange ideas on how to promote nuclear medicine technology and how to extend the technology to medical therapy and drug development, and was also a good opportunity to discuss the future perspective of nuclear medicine and molecular imaging by worldwide leaders in the field. Molecular imaging technologies have been rapidly developed worldwide in recent years. Among those developments, nuclear medicine has come to play an important role in quantitative analysis of biological process in vivo as well as in wide clinical use. With the current progress of nuclear medicine and molecular imaging, this modality has been applied for treatment monitoring and predicting its outcome with the use of optimal imaging biomarkers and suitable quantitative analysis. Truly, a new era has arrived with clinical use of nuclear medicine and molecular imaging for personalized medicine. This volume will benefit a wide variety of researchers in life science including those working in drug development, molecular imaging, and medical therapy as well as physicians who utilize diagnostic imaging.

Nuclear Medicine

Quantitative Analysis in Imaging and Function : European Nuclear Medicine Congress 1989, Strassbourg [i.e. Strasbourg], August 28-September 1, 1989

Perspectives on Nuclear Medicine for Molecular Diagnosis and Integrated Therapy

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Artificial Intelligence/Machine Learning in Nuclear Medicine and Hybrid Imaging

Springer Nature This book includes detailed explanations of the underlying technologies and concepts used in Artificial Intelligence (AI) and Machine Learning (ML) in the context of nuclear medicine and hybrid imaging. A diverse team of authors, including pioneers in the field and respected experts from leading international institutions, share their insights, opinions and outlooks on this exciting topic. A wide range of clinical applications are discussed, from brain applications to body indications, as well as the applicability of AI and ML for cardio-vascular conditions. The book also considers the potential impact of theranostics. To balance the technology-heavy and disease-specific applications, it also discusses ethical / legal issues, economic realities and the human factor, the physician. Though this discussion is not based on research and outcomes, it provides important insights into the ramifications of how AI and ML could transform Nuclear Medicine and Hybrid Imaging practice. As the first work highlighting the role of these concepts specifically in this field, rather than for medical imaging in general, this book offers a valuable resource for Nuclear Medicine Physicians, Radiologists, Physicists, Medical Imaging Administrators and Nuclear Medicine Technologists alike.

Physical Analysis and Optimization of Imaging Systems in Nuclear Medicine with Application to Quantitative Radiocardiography

World Congress of Medical Physics and Biomedical Engineering 2006

August 27 - September 1, 2006 COEX Seoul, Korea

Springer Science & Business Media These proceedings of the World Congress 2006, the fourteenth conference in this series, offer a strong scientific program covering a wide range of issues and challenges which are currently present in Medical physics and Biomedical Engineering. About 2,500 peer reviewed contributions are presented in a six volume book, comprising 25 tracks, joint conferences and symposia, and including invited contributions from well known researchers in this field.

Basic Sciences of Nuclear Medicine

Springer Science & Business Media Nuclear medicine has become an ever-changing and expanding diagnostic and therapeutic medical profession. The day-to-day innovations seen in the field are, in great part, due to the integration of many scientific bases with complex technologic advances. The aim of this reference book, Basic Sciences of Nuclear Medicine, is to provide the reader with a comprehensive and detailed discussion of the scientific bases of nuclear medicine, covering the different topics and concepts that underlie many of the investigations and procedures performed in the field. Topics include radiation and nuclear physics, Tc-99m chemistry, single-photon radiopharmaceuticals and PET chemistry, radiobiology and radiation dosimetry, image processing, image reconstruction, quantitative SPECT imaging, quantitative cardiac SPECT, small animal imaging (including multimodality hybrid imaging, e.g., PET/CT, SPECT/CT, and PET/MRI), compartmental modeling, and tracer kinetics.

Clinical Nuclear Medicine Physics with MATLAB®

A Problem-Solving Approach

CRC Press The use of MATLAB® in clinical Medical Physics is continuously increasing, thanks to new technologies and developments in the field. However, there is a lack of practical guidance for students, researchers, and medical professionals on how to incorporate it into their work. Focusing on the areas of diagnostic Nuclear Medicine and Radiation Oncology Imaging, this book provides a comprehensive treatment of the use of MATLAB in clinical Medical Physics, in Nuclear Medicine. It is an invaluable guide for medical physicists and researchers, in addition to postgraduates in medical physics or biomedical engineering, preparing for a career in the field. In the field of Nuclear Medicine, MATLAB enables quantitative analysis and the visualization of nuclear medical images of several modalities, such as Single Photon Emission Computed Tomography (SPECT), Positron Emission Tomography (PET), or a hybrid system where a Computed Tomography system is incorporated into a SPECT or PET system or similarly, a Magnetic Resonance Imaging system (MRI) into a SPECT or PET system. Through a high-performance interactive software, MATLAB also allows matrix computation, simulation, quantitative analysis, image processing, and algorithm implementation. MATLAB can provide medical physicists with the necessary tools for analyzing and visualizing medical images. It is useful in creating imaging algorithms for diagnostic and therapeutic purposes, solving problems of image reconstruction, processing, and calculating absorbed doses with accuracy. An important feature of this application of MATLAB is that the results are completely reliable and are not dependent on any specific γ -cameras and workstations. The use of MATLAB algorithms can greatly assist in the exploration of the anatomy and functions of the human body, offering accurate and precise results in Nuclear Medicine studies. KEY FEATURES Presents a practical, case-based approach whilst remaining accessible to students Contains chapter contributions from subject area specialists across the field Includes real clinical problems and examples, with worked through solutions Maria Lyra Georgosopoulou, PhD, is a Medical Physicist and Associate Professor at the National and Kapodistrian University of Athens, Greece. Photo credit: The Antikythera Mechanism is the world's oldest known analog computer. It consisted of many wheels and discs that could be placed onto the mechanism for calculations. It is possible that the first algorithms and analog calculations in mathematics were implemented with this mechanism, invented in the early first centuries BC. It has been selected for the cover to demonstrate the importance of calculations in science.

Quantitative MRI of the Brain

Principles of Physical Measurement, Second edition

CRC Press Building on the success of the first edition of this book, the winner of the 2004 British Medical Association Radiology Medical Book Competition, Quantitative MRI of the Brain: Principles of Physical Measurement gives a unique view on how to use an MRI machine in a new way. Used as a scientific instrument it can make measurements of a myriad of physical and biological quantities in the human brain and body. For each small tissue voxel, non-invasive information monitors how tissue changes with disease and responds to treatment. The book opens with a detailed exposition of the principles of good practice in quantification, including fundamental concepts, quality assurance, MR data collection and analysis and improved study statistical power through minimised instrumental variation. There follow chapters on 14 specific groups of quantities: proton density, T1, T2, T2*, diffusion, advanced diffusion, magnetisation transfer, CEST, 1H and multi-nuclear spectroscopy, DCE-MRI, quantitative fMRI, arterial spin-labelling and image analysis, and finally a chapter on the future of quantification. The physical principles behind each quantity are stated, followed by its biological significance. Practical techniques for measurement are given, along with pitfalls and examples of clinical applications. This second edition of this indispensable 'how to' manual of quantitative MR shows the MRI physicist and research clinician how to implement these techniques on an MRI scanner to understand more about the biological processes in the patient and physiological changes in healthy controls. Although focussed on the brain, most techniques are applicable to characterising tissue in the whole body. This book is essential reading for anyone who wants to use the gamut of modern quantitative MRI methods to measure the effects of disease, its progression, and its response to treatment. Features: The first edition was awarded the book prize for Radiology by the British Medical Association in 2004 Written by an authority in the field: Professor Tofts has an international reputation for quantification in MRI Gives specific 'how to' information for implementation of MRI measurement sequence techniques

Quantitative Nuclear Medicine Imaging Concepts, Requirements and Methods

This publication reviews the current state of the art of image quantification and provides a solid background of tools and methods to medical physicists and other related professionals who are faced with quantification of radionuclide distribution in clinical practice. It describes and analyses the physical effects that degrade image quality and affect the accuracy of quantification, and describes methods to compensate for them in planar, single-photon emission computed tomography (SPECT) and positron emission tomography (PET) images.

Nuclear Cardiac Imaging

Principles and Applications

Oxford University Press, USA The definitive resource for nuclear cardiologists and nuclear clinicians on the technical, physiological, diagnostic and prognostic considerations of cardiac diagnostic techniques performed with the aid of radiopharmaceuticals.

Research for Medical Imaging and Radiation Sciences

Springer Nature This book addresses essential principles of research according to the scientific method for medical imaging technology research. The scope of this book covers the nature of scientific research; quantitative and qualitative approaches essentials; research planning; literature review fundamentals; research methods; data collection, analysis, and interpretation; and communicating research findings. The book meets the educational requirements on Research Principles and Concepts (for entry to practice) of the following professional radiologic technology associations: the American Society of Radiologic Technologists (ASRT), the Canadian Association of Medical Radiation Technologists (CAMRT), the College of Radiographers in the United Kingdom, and radiography societies and associations in Asia, Australia, Europe, and Africa. This is an ideal book for radiologic technologists, nuclear medicine technologists, and radiation therapists seeking to get started in research in their profession. Additionally, biomedical imaging engineering technologists, radiologists, and medical imaging physicists may use this as a "guiding principles" textbook.

The Essential Physics of Medical Imaging

Lippincott Williams & Wilkins This renowned work is derived from the authors' acclaimed national review course ("Physics of Medical Imaging") at the University of California-Davis for radiology residents. The text is a guide to the fundamental principles of medical imaging physics, radiation protection and radiation biology, with complex topics presented in the clear and concise manner and style for which these authors are known. Coverage includes the production, characteristics and interactions of ionizing radiation used in medical imaging and the imaging modalities in which they are used, including radiography, mammography, fluoroscopy, computed tomography and nuclear medicine. Special attention is paid to optimizing patient dose in each of these modalities. Sections of the book address topics common to all forms of diagnostic imaging, including image quality and medical informatics as well as the non-ionizing medical imaging modalities of MRI and ultrasound. The basic science important to nuclear imaging, including the nature and production of radioactivity, internal dosimetry and radiation detection and measurement, are presented clearly and concisely. Current concepts in the fields of radiation biology and radiation protection relevant to medical imaging, and a number of helpful appendices complete this comprehensive textbook. The text is enhanced by numerous full color charts, tables, images and superb illustrations that reinforce central concepts. The book is ideal for medical imaging professionals, and teachers and students in medical physics and biomedical engineering. Radiology residents will find this text especially useful in bolstering their understanding of imaging physics and related topics prior to board exams.

Technologies for Medical Sciences

Springer Science & Business Media This book presents novel and advanced technologies for medical sciences in order to solidify knowledge in the related fields and define their key stakeholders. The fifteen papers included in this book were written by invited experts of international stature and address important technologies for medical sciences, including: computational modeling and simulation, image processing and analysis, medical imaging, human motion and posture, tissue engineering, design and development medical devices, and mechanic biology. Different applications are treated in such diverse fields as biomechanical studies, prosthesis and orthosis, medical diagnosis, sport, and virtual reality. This book is of interest to researchers, students and manufacturers from a wide range of disciplines related to bioengineering, biomechanics, computational mechanics, computational vision, human motion, mathematics, medical devices, medical image, medicine and physics.

6th European Conference of the International Federation for Medical and Biological Engineering

MBEC 2014, 7-11 September 2014, Dubrovnik, Croatia

Springer This volume presents the Proceedings of the 6th European Conference of the International Federation for Medical and Biological Engineering (MBEC2014), held in Dubrovnik September 7 - 11, 2014. The general theme of MBEC 2014 is "Towards new horizons in biomedical engineering" The scientific discussions in these conference proceedings include the following themes: - Biomedical Signal Processing - Biomedical Imaging and Image Processing - Biosensors and Bioinstrumentation - Bio-Micro/Nano Technologies - Biomaterials - Biomechanics, Robotics and Minimally Invasive Surgery - Cardiovascular, Respiratory and Endocrine Systems Engineering - Neural and Rehabilitation Engineering - Molecular, Cellular and Tissue Engineering - Bioinformatics and Computational Biology - Clinical Engineering and Health Technology Assessment - Health Informatics, E-Health and Telemedicine - Biomedical Engineering Education

Energy Research Abstracts

Semiannual, with semiannual and annual indexes. References to all scientific and technical literature coming from DOE, its laboratories, energy centers, and contractors. Includes all works deriving from DOE, other related government-sponsored information, and foreign nonnuclear information. Arranged under 39 categories, e.g., Biomedical sciences, basic studies; Biomedical sciences, applied studies; Health and safety; and Fusion energy. Entry gives bibliographical information and abstract. Corporate, author, subject, report number indexes.

Nuclear Science Abstracts

Frontiers Of Medical Imaging

World Scientific There has been great progress and increase in demand for medical imaging. The aim of this book is to capture all major developments in all aspects of medical imaging. As such, this book consists of three major parts: medical physics which includes 3D reconstructions, image processing and segmentation in medical imaging, and medical imaging instruments and systems. As the field is very broad and growing exponentially, this book will cover major activities with chapters prepared by leaders in the field. This book takes a balanced approach in providing coverage of all major work done in the field, and thus provides readers a clear view of the frontier activities in the field. Other books may only focus on instrumentation, physics or computer algorithms. In contrast, this book contains all components so that the readers will obtain a full picture of the field. At the same time, readers can gain some deep insights into certain special topics such as 3D reconstruction and image enhancement software systems involving MRI, ultrasound, X-ray and other medical imaging modalities.

Handbook of Statistics in Clinical Oncology

CRC Press Many new challenges have arisen in the area of oncology clinical trials. New cancer therapies are often based on cytostatic or targeted agents, which pose new challenges in the design and analysis of all phases of trials. The literature on adaptive trial designs and early stopping has been exploding. Inclusion of high-dimensional data and imaging techniques have become common practice, and statistical methods on how to analyse such data have been refined in this area. A compilation of statistical topics relevant to these new advances in cancer research, this third edition of Handbook of Statistics in Clinical Oncology focuses on the design and analysis of oncology clinical trials and translational research. Addressing the many challenges that have arisen since the publication of its predecessor, this third edition covers the newest developments involved in the design and analysis of cancer clinical trials, incorporating updates to all four parts: Phase I trials: Updated recommendations regarding the standard 3 + 3 and continual reassessment approaches, along with new chapters on phase 0 trials and phase I trial design for targeted agents. Phase II trials: Updates to current experience in single-arm and randomized phase II trial designs. New chapters include phase II designs with multiple strata and phase II/III designs. Phase III trials: Many new chapters include interim analyses and early stopping considerations, phase III trial designs for targeted agents and for testing the ability of markers, adaptive trial designs, cure rate survival models, statistical methods of imaging, as well as a thorough review of software for the design and analysis of clinical trials. Exploratory and high-dimensional data analyses: All chapters in this part have been thoroughly updated since the last edition. New chapters address methods for analyzing SNP data and for developing a score based on gene expression data. In addition, chapters on risk calculators and forensic bioinformatics have been added. Accessible to statisticians and oncologists interested in clinical trial methodology, the book is a single-source collection of up-to-date statistical approaches to research in clinical oncology.

Quantification in Nuclear Medicine Imaging

Frontiers Media SA

Neuroimaging in Forensic Psychiatry

From the Clinic to the Courtroom

John Wiley & Sons This important volume is the first to address the use of neuroimaging in civil and criminal forensic contexts and to include discussion of prior precedents and court decisions. Equally useful for practicing psychiatrists and psychologists, it reviews both the legal and ethical considerations of neuroimaging.

Information Processing in Medical Imaging

15th International Conference, IPMI'97, Poultney, Vermont, USA, June 9-13, 1997, Proceedings

Springer Science & Business Media This book constitutes the refereed proceedings of the 15th International Conference on Information Processing in Medical Imaging, IPMI'97, held in Poultney, Vermont, USA, in June 1997. The 27 revised full papers presented were selected from a total of 96 submissions; also included are 31 poster presentations. The book is divided into topical sections on shape models and matching, novel imaging methods, segmentation, image quality and statistical character of measured data, registration/mapping, statistical models in functional neuroimaging, and MR analysis and processing.

Issues in Medical Lasers, Imaging, and Devices Research and Application: 2011 Edition

ScholarlyEditions Issues in Medical Lasers, Imaging, and Devices Research and Application: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Medical Lasers, Imaging, and Devices Research and Application. The editors have built Issues in Medical Lasers, Imaging, and Devices Research and Application: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Medical Lasers, Imaging, and Devices Research and Application in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Medical Lasers, Imaging, and Devices Research and Application: 2011 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Medical Imaging

Principles and Practices

CRC Press The discovery of x-ray, as a landmark event, enabled us to see the "invisible," opening a new era in medical diagnostics. More importantly, it offered a unique understanding around the interaction of electromagnetic signal with human tissue and the utility of its selective absorption, scattering, diffusion, and reflection as a tool for understanding the physiology, evolution of disease, and therapy. With contributions from world-class experts, Medical Imaging: Principles and Practices offers a review of key imaging modalities with established clinical utilization and examples of quantitative tools for image analysis, modeling, and interpretation. The book provides a detailed overview of x-ray imaging and computed tomography, fundamental concepts in signal acquisition and processes, followed by an overview of functional MRI (fMRI) and chemical shift imaging. It also covers topics in Magnetic Resonance Microscopy, the physics of instrumentation and signal collection, and their application in clinical practice. Highlights include a chapter offering a unique perspective on the use of quantitative PET for its applications in drug discovery and development, which is rapidly becoming an indispensable tool for clinical and research applications, and a chapter addressing the key issues around organizing and searching multimodality data sets, an increasingly important yet challenging issue in clinical imaging. Topics include: X-ray imaging and computed tomography MRI and magnetic resonance microscopy Nuclear imaging Ultrasound imaging Electrical Impedance Tomography (EIT) Emerging technologies for in vivo imaging Contrast-enhanced MRI MR approaches for osteoarthritis and cardiovascular imaging PET quantitative imaging for drug development Medical imaging data mining and search The selection of topics provides readers with an appreciation of the depth and breadth of the field and the challenges ahead of the technical and clinical community of researchers and practitioners.

CARS 2002 Computer Assisted Radiology and Surgery

Proceedings of the 16th International Congress and Exhibition Paris, June 26–29,2002

Springer Science & Business Media Progress in specific computer-assisted techniques (digital imaging , computer-aided diagnosis, image-guided surgery, MEMS, etc.) combined with computer-assisted integration tools offers a valuable complement to or replacement for existing procedures in healthcare. Physicians are now employing PACS and telemedicine systems as enabling infrastructures to improve quality of and access to healthcare. Tools based on CAD and CAS facilitate completely new paths in patient care. To ensure that CARS tools benefit the patient, collaboration between various disciplines, specifically radiology, surgery, engineering, informatics, and healthcare management, is a critical factor. A multidisciplinary congress like CARS is a step in the desired direction of knowledge sharing and crossover education. It provides the necessary cooperative framework for advancing the development and application of modern computer-assisted technologies in healthcare.

Handbook of Medical Image Processing and Analysis

Elsevier The Handbook of Medical Image Processing and Analysis is a comprehensive compilation of concepts and techniques used for processing and analyzing medical images after they have been generated or digitized. The Handbook is organized into six sections that relate to the main functions: enhancement, segmentation, quantification, registration, visualization, and compression, storage and communication. The second edition is extensively revised and updated throughout, reflecting new technology and research, and includes new chapters on: higher order statistics for tissue segmentation; tumor growth modeling in oncological image analysis; analysis of cell nuclear features in fluorescence microscopy images; imaging and communication in medical and public health informatics; and dynamic mammogram retrieval from web-based image libraries. For those looking to explore advanced concepts and access essential information, this second edition of Handbook of Medical Image Processing and Analysis is an invaluable resource. It remains the most complete single volume reference for biomedical engineers, researchers, professionals and those working in medical imaging and medical image processing. Dr. Isaac N. Bankman is the supervisor of a group that specializes on imaging, laser and sensor systems, modeling, algorithms and testing at the Johns Hopkins University Applied Physics Laboratory. He received his BSc degree in Electrical Engineering from Bogazici University, Turkey, in 1977, the MSc degree in Electronics from University of Wales, Britain, in 1979, and a PhD in Biomedical Engineering from the Israel Institute of Technology, Israel, in 1985. He is a member of SPIE. Includes contributions from internationally renowned authors from leading institutions NEW! 35 of 56 chapters have been revised and updated. Additionally, five new chapters have been added on important topics including Nonlinear 3D Boundary Detection, Adaptive Algorithms for Cancer Cytological Diagnosis, Dynamic Mammogram Retrieval from Web-Based Image Libraries, Imaging and Communication in Health Informatics and Tumor Growth Modeling in Oncological Image Analysis. Provides a complete collection of algorithms in computer processing of medical images Contains over 60 pages of stunning, four-color images

Integration of Health Telematics Into Medical Practice

IOS Press Title page -- Preface -- Acknowledgements -- Contents -- A Telemedicine Guideline for the Practice of Teleconsultation -- Medical Telematics in Disaster Response -- Architecture and Tools for Open, Interoperable and Portable EHRs -- Telemedicine in Extreme Environments: Analogs for Space Flight -- Development of a Robotic Navigation and Fracture Fixation System -- A Readiness Model for Telehealth Is it possible to Pre-Determine How Prepared Communities are to Implement Telehealth? -- An Automated Diagnostic System for Tubular Carcinoma of the Breast - An Overview of Approach and Considerations -- Data Analysis Now and Then: Significant Changes in Approaches and Results -- Software Agents in Surgery: An Update -- Technologies for Haptic Systems in Telemedicine -- Cybercare NDMS: An Improved Strategy for Biodefense Using Information Technologies -- A Communication-Theory Based View on Telemedical Communication -- Implementation of TeleCare Services: Benefit Assessment and Organisational Models -- LifeGuard - Recording, Evaluation and Wireless Transmission of Medical Data -- NOAH - A Mobile Emergency Care System -- Author Index

Hybrid Imaging in Cardiovascular Medicine

CRC Press This comprehensive book focuses on multimodality imaging technology, including overviews of the instruments and methods followed by practical case studies that highlight use in the detection and treatment of cardiovascular diseases. Chapters cover PET-CT, SPECT-CT, SPECT-MRI, PET-MRI, PET-optical imaging, SPECT-optical imaging, photoacoustic Imaging, and hybrid intravascular imaging. It also addresses the important issues of multimodality imaging probes and image quantification. Readers from radiology and cardiology as well as medical imaging and biomedical engineering will learn essentials of the field. They will be shown how the field has advanced quantitative analysis of molecularly targeted imaging through improvements in the reliability and reproducibility of imaging data. Moreover, they will be presented with quantification algorithms and case illustrations, including coverage of such topics such as multimodality image fusion and kinetic modeling. Yi-Hwa Liu, PhD is Senior Research Scientist in Cardiovascular Medicine at Yale University School of Medicine and Technical Director of Nuclear Cardiology at Yale New Haven Hospital. He is also an Associate Professor (Adjunct) of Biomedical Imaging and Radiological Sciences at National Yang-Ming University, Taipei, Taiwan, and Professor (Adjunct) of Biomedical Engineering at Chung Yuan Christian University, Taoyuan, Taiwan. He is an elected senior member of Institute of Electrical and Electronic Engineers (IEEE) and a full member of Sigma Xi of The Scientific Research Society of North America. Albert J. Sinusas, M.D., FACC, FAHA is Professor of Medicine (Section of Cardiovascular Medicine) and Radiology and Biomedical Imaging, at Yale University School of Medicine, and Director of the Yale Translational Research Imaging Center (Y-TRIC), and Director of Advanced Cardiovascular Imaging at Yale New Haven Hospital. He is a recipient of the Society of Nuclear Medicine's Hermann Blumgart Award.

An Introduction to Medical Physics

Springer This book begins with the basic terms and definitions and takes a student, step by step, through all areas of medical physics. The book covers radiation therapy, diagnostic radiology, dosimetry, radiation shielding, and nuclear medicine, all at a level suitable for undergraduates. This title not only describes the basics concepts of the field, but also emphasizes numerical and mathematical problems and examples. Students will find An Introduction to Medical Physics to be an indispensable resource in preparations for further graduate studies in the field.

Artificial Intelligence and PET Imaging, Part 1, An Issue of PET Clinics

Elsevier Health Sciences Artificial Intelligence and PET Imaging, Part 1, An Issue of PET Clinics, E-Book

Medical Radionuclide Imaging

Proceedings of an International Symposium ...

Clinical Nuclear Medicine Physics with MATLAB®

A Problem-Solving Approach

CRC Press The use of MATLAB® in clinical Medical Physics is continuously increasing, thanks to new technologies and developments in the field. However, there is a lack of practical guidance for students, researchers, and medical professionals on how to incorporate it into their work. Focusing on the areas of diagnostic Nuclear Medicine and Radiation Oncology Imaging, this book provides a comprehensive treatment of the use of MATLAB in clinical Medical Physics, in Nuclear Medicine. It is an invaluable guide for medical physicists and researchers, in addition to postgraduates in medical physics or biomedical engineering, preparing for a career in the field. In the field of Nuclear Medicine, MATLAB enables quantitative analysis and the visualization of nuclear medical images of several modalities, such as Single Photon Emission Computed Tomography (SPECT), Positron Emission Tomography (PET), or a hybrid system where a Computed Tomography system is incorporated into a SPECT or PET system or similarly, a Magnetic Resonance Imaging system (MRI) into a SPECT or PET system. Through a high-performance interactive software, MATLAB also allows matrix computation, simulation, quantitative analysis, image processing, and algorithm implementation. MATLAB can provide medical physicists with the necessary tools for analyzing and visualizing medical images. It is useful in creating imaging algorithms for diagnostic and therapeutic purposes, solving problems of image reconstruction, processing, and calculating absorbed doses with accuracy. An important feature of this application of MATLAB is that the results are completely reliable and are not dependent on any specific γ -cameras and workstations. The use of MATLAB algorithms can greatly assist in the exploration of the anatomy and functions of the human body, offering accurate and precise results in Nuclear Medicine studies. KEY FEATURES Presents a practical, case-based approach whilst remaining accessible to students Contains chapter contributions from subject area specialists across the field Includes real clinical problems and examples, with worked through solutions Maria Lyra Georgosopoulou, PhD, is a Medical Physicist and Associate Professor at the National and Kapodistrian University of Athens, Greece. Photo credit: The Antikythera Mechanism is the world's oldest known analog computer. It consisted of many wheels and discs that could be placed onto the mechanism for calculations. It is possible that the first algorithms and analog calculations in mathematics were implemented with this mechanism, invented in the early first centuries BC. It has been selected for the cover to demonstrate the importance of calculations in science.

Issues in Medical Microbiology, Mycology, Virology, and Molecular Medicine: 2013 Edition

ScholarlyEditions Issues in Medical Microbiology, Mycology, Virology, and Molecular Medicine: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Medical Microbiology. The editors have built Issues in Medical Microbiology, Mycology, Virology, and Molecular Medicine: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Medical Microbiology in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Medical Microbiology, Mycology, Virology, and Molecular Medicine: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Quantitative Functional Brain Imaging with Positron Emission Tomography

Elsevier This book presents the latest scientific developments in the field of positron emission tomography (PET) dealing with data acquisition, image processing, applications, statistical analysis, tracer development, parameter estimation, and kinetic modeling. It covers improved methodology and the application of existing techniques to new areas. The text also describes new approaches in scanner design and image processing, and the latest techniques for modeling and statistical analyses. This volume will be a useful reference for the active brain PET scientist, as well as a valuable introduction for students and researchers who wish to take advantage of the capabilities of PET to study the normal and diseased brain. Authored by international authorities in PET Provides the latest up-to-date techniques and applications Covers all fundamental disciplines of PET in one volume A comprehensive resource for students, clinicians, and new PET researchers

Measurements for the Safe Use of Radiation

Proceedings of an NBS 75th Anniversary Symposium Held at the National Bureau of Standards, Gaithersburg, Maryland, March 1-4, 1976

Medical Radionuclide Imaging 1980

Proceedings of an International Symposium on Medical Radionuclide Imaging

Scientific and Technical Aerospace Reports