

The Phantoms Of Medical And Health Physics Devices For Research And Development Biological And Medical Physics Biomedical Engineering

Over the past few decades, the radiological science community has developed and applied numerous models of the human body for radiation protection, diagnostic imaging, and nuclear medicine therapy. The Handbook of Anatomical Models for Radiation Dosimetry provides a comprehensive review of the development and application of these computational models, known as "phantoms." An ambitious and unparalleled project, this pioneering work is the result of several years of planning and preparation involving 64 authors from across the world. It brings together recommendations and information sanctioned by the International Commission on Radiological Protection (ICRP) and documents 40 years of history and the progress of those involved with cutting-edge work with Monte Carlo Codes and radiation protection dosimetry. This volume was in part spurred on by the ICRP's key decision to adopt voxelized computational phantoms as standards for radiation protection purposes. It is an invaluable reference for those working in that area as well as those employing or developing anatomical models for a number of clinical applications. Assembling the work of nearly all major phantom developers around the world, this volume examines: The history of the research and development in computational phantoms Detailed accounts for each of the well-known phantoms, including the MIRD-5, GSF Voxel Family Phantoms, NCAT, UF Hybrid Pediatric Phantoms, VIP-Man, and the latest ICRP Reference Phantoms Physical phantoms for experimental radiation dosimetry The smallest voxel size (0.2 mm), phantoms developed from the Chinese Visible Human Project Applications for radiation protection dosimetry involving environmental, nuclear power plant, and internal contamination exposures Medical applications, including nuclear medicine therapy, CT examinations, x-ray radiological image optimization, nuclear medicine imaging, external photon and proton treatments, and management of respiration in modern image-guided radiation treatment Patient-specific phantoms used for radiation treatment planning involving two Monte Carlo code systems: GEANT4 and EGS Future needs for research and development Related data sets are available for download on the authors' website. The breadth and depth of this work enables readers to obtain a unique sense of the complete scientific process in computational phantom development, from the conception of an idea, to the identification of original anatomical data, to solutions of various computing problems, and finally, to the ownership and sharing of results in this groundbreaking field that holds so much promise.

This book provides a balanced presentation of the fundamental principles of cardiovascular biomechanics research, as well as its valuable clinical applications. Pursuing an integrated approach at the interface of the life sciences, physics and engineering, it also includes extensive images to explain the concepts discussed. With a focus on explaining the underlying principles, this book examines the physiology and mechanics of circulation, mechanobiology and the biomechanics of different components of the cardiovascular system, in-vivo techniques, in-vitro techniques, and the medical applications of this research. Written for undergraduate and postgraduate students and including sample problems at the end of each chapter, this interdisciplinary text provides an essential introduction to the topic. It is also an ideal reference text for researchers and clinical practitioners, and will benefit a wide range of students and researchers including engineers, physicists, biologists and clinicians who are interested in the area of cardiovascular biomechanics.

The congress's unique structure represents the two dimensions of technology and medicine: 13 themes on science and medical technologies intersect with five challenging main topics of medicine to create a maximum of synergy and integration of aspects on research, development and application. Each of the congress themes was chaired by two leading experts. The themes address specific topics of medicine and technology that provide multiple and excellent opportunities for exchanges.

World Congress on Medical Physics and Biomedical Engineering September 7 - 12, 2009 Munich, Germany

Handbook of Anatomical Models for Radiation Dosimetry

Software Phantoms in Medical Image Analysis

Medical Imaging Systems

The Essential Physics of Medical Imaging

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

This book presents the proceedings of the IUPESM World Biomedical Engineering and Medical Physics, a tri-annual high-level policy meeting dedicated exclusively to furthering the role of biomedical engineering and medical physics in medicine. The book offers papers about emerging issues related to the development and sustainability of the role and impact of medical physicists and biomedical engineers in medicine and healthcare. It provides a unique and important forum to secure a coordinated, multileveled global response to the need, demand and importance of creating and supporting strong academic and clinical teams of biomedical engineers and medical physicists for the benefit of human health.

Issues in Discovery, Experimental, and Laboratory Medicine: 2011 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Discovery, Experimental, and Laboratory Medicine. The editors have built Issues in Discovery, Experimental, and Laboratory Medicine: 2011 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Discovery, Experimental, and Laboratory Medicine 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 Discovery, Experimental, and Laboratory Medicine: 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/>.

Widely regarded as the cornerstone text in the field, the successful series of editions continues to follow the tradition of a clear and comprehensive presentation of the physical principles and operational aspects of medical imaging. The Essential Physics of Medical Imaging, 4th Edition, is a coherent and thorough compendium of the fundamental principles of the physics, radiation protection, and radiation biology that underlie the practice and profession of medical imaging. Distinguished scientists and educators from the University of California, Davis, provide up-to-date, readable information on the production, characteristics, and interactions of non-ionizing and ionizing radiation, magnetic fields and ultrasound used in medical imaging and the imaging modalities in which they are used, including radiography, mammography, fluoroscopy, computed tomography, magnetic resonance, ultrasound, and nuclear medicine. This

vibrant, full-color text is enhanced by more than 1,000 images, charts, and graphs, including hundreds of new illustrations. This text is a must-have resource for medical imaging professionals, radiology residents who are preparing for Core Exams, and teachers and students in medical physics and biomedical engineering.

Exhibiting a Concise View of the Latest and Most Important Discoveries in Medicine, Surgery, and Pharmacy

13th International Conference, Beijing, China, September 20-24, 2010, Proceedings, Part II

Kafka's Monkey and Other Phantoms of Africa

August 27 - September 1, 2006 COEX Seoul, Korea

Development of Polymer-based Gels for Multimodal Medical Imaging Phantoms

Design of Inhomogeneous Phantoms for Medical X-ray Fluorescence Imaging Studies

The 13th International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI 2010, was held in Beijing, China from 20-24

September, 2010. The venue was the China National Convention Center (CNCC), China's largest and newest conference center with excellent facilities and a prime location in the heart of the Olympic Green, adjacent to characteristic constructions like the Bird's Nest (National Stadium) and the Water Cube (National Aquatics Center). MICCAI is the foremost international scientific event in the field of medical image computing and computer-assisted interventions. The annual conference has a high scientific standard by virtue of the threshold for acceptance, and accordingly MICCAI has built up a track record of attracting leading scientists, engineers and clinicians from a wider range of technical and biomedical disciplines. This year, we received 786 submissions, well in line with the previous two conferences in New York and London. Three program chairs and a program committee of 31 scientists, all with a recognized standing in the field of the conference, were responsible for the selection of the papers. The review process was set up such that each paper was considered by the three program chairs, two program committee members, and a minimum of three external reviewers. The review process was double-blind, so the reviewers did not know the identity of the authors of the submission. After a careful evaluation procedure, in which all controversial and gray area papers were discussed individually, we arrived at a total of 251 accepted papers for MICCAI 2010, of which 45 were selected for podium presentation and 206 for poster presentation. The acceptance percentage (32%) was in keeping with that of previous MICCAI conferences. All 251 papers are included in the three MICCAI 2010 LNCS volumes.

Anthropomorphic Phantoms in Image Quality and Patient Dose Optimization: A EUTEMPE network, and the EUTEMPE-NET course, is unique in providing advanced training for medical physicists in the field of diagnostic and interventional radiology. One of the modules in the EUTEMPE-NET course is entitled, 'Anthropomorphic phantoms for optimization of dose and image quality in radiology', making this book invaluable for both medical physicists and biomedical engineers as well as unique in its form and content. It focusses on the practical applications of anthropomorphic phantoms for both research and educational purposes, including both tutorials and self-training examples. Part of IPEM-IOP Series in Physics and Engineering in Medicine and Biology.

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 increase 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 imaging systems is an emerging research field, which is addressed in chapter 2.

Probing the Mysteries of the Human Mind

The Practice of Internal Dosimetry in Nuclear Medicine

Progress in Medical Radiation Physics

The Bulletin of Tokyo Medical and Dental University

Medical Image Computing and Computer-Assisted Intervention -- MICCAI 2010

A Compendium for Medical Physicists and Radiation Oncologists

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

Examines phantom limb pain and its relationship to prosthetic innovation, tracing the major shifts in knowledge of the causes and characteristics of the phenomenon. (Social Science)

Present Your Research to the World! The World Congress 2009 on Medical Physics and Biomedical Engineering – the triennial scientific meeting of the IUPESM - is the world's leading forum for presenting the results of current scientific work in health-related physics and technologies to an international audience. With more than 2,800 presentations it will be the biggest conference in the fields of Medical Physics and Biomedical Engineering in 2009! Medical physics, biomedical engineering and bioengineering have been driving forces of innovation and progress in medicine and healthcare over the past two decades. As new key technologies arise with significant potential to open new options in diagnostics and therapeutics, it is a multidisciplinary task to evaluate their benefit for medicine and healthcare with respect to the quality of performance and therapeutic output. Covering key aspects such as information and communication technologies, micro- and nanosystems, optics and biotechnology, the congress will serve as an inter- and multidisciplinary platform that brings together people from basic research, R&D, industry and medical application to discuss these issues. As a major event for science, medicine and technology the congress provides a comprehensive overview and in-depth, first-hand information on new developments, advanced technologies and current and future applications. With this Final Program we would like to give you an overview of the dimension of the congress and invite you to join us in Munich! Olaf Dössel Congress President Wolfgang C.

Considerations and Recommendations for NMR Imaging Phantoms

Bioassay Phantoms Using Medical Images and Computer Aided Manufacturing

Tissue Substitutes, Phantoms, and Computational Modelling in Medical Ultrasound

Quantitative Analysis in Nuclear Medicine Imaging

Proceedings of MEDICON 2019, September 26-28, 2019, Coimbra, Portugal

Containing chapter contributions from over 130 experts, this unique publication is the first handbook dedicated to the physics and technology of X-ray imaging, offering extensive coverage of the field. This highly comprehensive work is edited by one of the world's leading experts in X-ray imaging physics and technology and has been created with guidance from a Scientific Board containing respected and renowned scientists from around the world. The book's scope includes 2D and 3D X-ray imaging techniques from soft-X-ray to megavoltage energies, including computed tomography, fluoroscopy, dental imaging and small animal imaging, with several chapters dedicated to breast imaging techniques. 2D and 3D industrial imaging is incorporated, including imaging of artworks. Specific attention is dedicated to techniques of phase contrast X-ray imaging. The approach undertaken is one that illustrates the theory as well as the techniques and the devices routinely used in the various fields. Computational aspects are fully covered, including 3D reconstruction algorithms, hard/software phantoms, and computer-aided diagnosis. Theories of image quality are fully illustrated. Historical, radioprotection, radiation dosimetry, quality assurance and educational aspects are also covered. This handbook will be suitable for a very broad audience, including graduate students in medical physics and biomedical engineering; medical physics residents; radiographers; physicists and engineers in the field of imaging and non-destructive industrial testing using X-rays; and scientists interested in understanding and using X-ray imaging techniques. The handbook's editor, Dr. Paolo Russo, has over 30 years' experience in the academic teaching of medical physics and X-ray imaging research. He has authored several book chapters in the field of X-ray imaging, is Editor-in-Chief of an international scientific journal in medical physics, and has responsibilities in the publication committees of international scientific organizations in medical physics.

New developments in the application of radiation to medicine are occurring so rapidly that this is possibly the fastest growing branch of medicine today. In the past decade alone, we have seen enormous progress made in techniques used both for the diagnosis of disease, such as computerized tomography, digital radiography, ultrasonography, computerized nuclear medicine scanning, and nuclear magnetic resonance imaging, and for its treatment, such as the radiotherapeutic utilization of high-LET radiations, and the widespread application of computers to perform elegant dosimetry calculations for 3-D treatment planning and imaging. This series will provide in-depth reviews of the many spectacular technical advances and sophisticated concepts, which are developing in medical radiation physics at such an alarming rate that it has become increasingly difficult to keep one's knowledge up-to-date. These comprehensive review articles will help to bridge the communications gap between the international research community, and the medical physicists and physicians whose responsibility it is to put these advances into clinical use. These articles should also be of value to the increasing number of physical scientists and engineers who are interested in the application of their knowledge and talents to the field of medicine.

Author Esuabom Dijemeni takes readers on an easy, simple and interesting scientific literary journey through his new book, Human Forearm into 3 Dimensional Dielectric Phantoms project conducted at the University of Bristol to understand and model the differences in the dielectric properties between an osteoporotic bone and a healthy bone. The International Osteoporosis Foundation reveals that at least one in three women and one in five men over the age of 50 will suffer a fracture caused by weak bones. As osteoporosis threatens the health of aging individuals, studies related to the subject have become a continuous endeavor. The research presented in this book by the author was a foundational step to model dielectric properties of the forearm. The global aim of the research was to understand and model the differences in the dielectric properties between an osteoporotic bone and a healthy bone. The research proposed a new computational method of classifying an osteoporotic bone from a healthy bone. Packed with knowledge and in-depth information like image segmentation, boundary detection and Dijemeni algorithm, to name a few MRI Scans of the Human Forearm into 3 Dimensional Dielectric Phantoms read. The knowledge acquired is unbelievably fascinating.

Phantoms in the Brain

Proceedings of a Discussion Workshop Held in Würzburg (FRG), 15 - 17 June 1992

Test Phantoms and Optimisation in Diagnostic Radiology and Nuclear Medicine

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

Phantoms and Computational Models in Therapy, Diagnosis, and Protection

Translating 2 Dimensional Mri Scans of the Human Forearm into 3 Dimensional Dielectric Phantoms

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.

Mathematical modelling is an important part of nuclear medicine. Therefore, several chapters of this book have been dedicated towards describing this topic. In these chapters, an emphasis has been put on describing the mathematical modelling of the radiation transport of photons and electrons, as well as on the transportation of radiopharmaceuticals between different organs and compartments. It also includes computer models of patient dosimetry. Two chapters of this book are devoted towards introducing the concept of biostatistics and radiobiology. These chapters are followed by chapters detailing dosimetry procedures commonly used in the context of diagnostic imaging, as well as patient-specific dosimetry for radiotherapy treatments. For safety reasons, many of the methods used in nuclear medicine and molecular imaging are tightly regulated. Therefore, this volume also highlights the basic principles for radiation protection. It discusses the process of how guidelines and regulations aimed at minimizing radiation exposure are determined and implemented by international organisations. Finally, this book describes how different dosimetry methods may be utilized depending on the intended target, including whole-body or organ-specific imaging, as well as small-scale to cellular dosimetry. This text will be an invaluable resource for libraries, institutions, and clinical and academic medical physicists searching for a complete account of what defines nuclear medicine. The most comprehensive reference available providing a state-of-the-art overview of the field of nuclear medicine Edited by a leader in the field, with contributions from a team of experienced medical physicists, chemists, engineers, scientists, and clinical medical personnel Includes the latest practical research in the field, in addition to explaining fundamental theory and the field's history

Written by one of the world's leading experts in the field of nuclear medicine dosimetry, this text describes in detail the use of internal dose calculations in the practice of nuclear medicine. While radiation therapy with external sources of radiation always employs calculations of dose to optimize therapy for each patient, this is not routinely conducted in nuclear medicine therapy. As the trend towards an increasing role of dosimetry in therapy planning increases, this book reviews the available methods and technologies available to make this a more common practice. The book begins by covering the mathematical fundamentals of internal dose calculations, and uses sample calculations to demonstrate key principles. The book then moves forward to describe anthropomorphic models, dosimetric models, and types and uses of diagnostic and therapeutic radiopharmaceuticals. The depth of coverage makes it useful reference and guide for researchers performing dose calculations and for physicians considering incorporating dose calculations into the treatment of their cancer patients.

Anthropomorphic Phantoms in Image Quality and Patient Dose Optimization

The Phantoms of Medical and Health Physics

Simulation of Multi-material Voxels in Medical Imaging Software Phantoms

Physics and Technology

Vol. 25/2 Diagnostic Imaging

Medical Imaging

This book gathers the proceedings of MEDICON 2019 – the XV Mediterranean Conference on Medical and Biological Engineering and Computing – which was held in September 26-28, 2019, in Coimbra, Portugal. A special emphasis has been given to practical findings, techniques and methods, aimed at fostering an effective patient empowerment, i.e. to position the patient at the heart of the health system and encourages them to be actively involved in managing their own healthcare needs. The book reports on research and development in electrical engineering, computing, data science and instrumentation, and on many topics at the interface between those disciplines. It provides academics and professionals with extensive knowledge on cutting-edge techniques and tools for detection, prevention, treatment and management of diseases. A special emphasis is given to effective advances, as well as new directions and challenges towards improving healthcare through holistic patient empowerment.

Details technology associated with radiation oncology, emphasizing design of all equipment allied with radiation treatment. Describes procedures required to implement equipment in clinical service, covering needs assessment, purchase, acceptance, and commissioning, and explains quality assurance issues. Also addresses less common and evolving technologies. For medical physicists and radiation oncologists, as well as radiation therapists, dosimetrists, and engineering technologists. Includes bandw medical images and photos of equipment. Paper edition (unseen), \$145.95. Annotation copyrighted by Book News, Inc., Portland, OR

The Phantoms of Medical and Health Physics Devices for Research and Development Springer Science & Business Media

XV Mediterranean Conference on Medical and Biological Engineering and Computing – MEDICON 2019

Imaging Phantoms: Catherine Heard

Issues in Discovery, Experimental, and Laboratory Medicine: 2011 Edition

7th Asian-Pacific Conference on Medical and Biological Engineering

World Congress on Medical Physics and Biomedical Engineering, June 7-12, 2015, Toronto, Canada

Translating 2 Dimensional MRI Scans of the Human Forearm Into 3 Dimensional Dielectric Phantoms

This volume presents the proceedings of the 7th Asian-Pacific Conference on Medical and Biological Engineering (APCMBE 2008). Themed "Biomedical Engineering - Promoting Sustainable Development of Modern Medicine" the proceedings address a broad spectrum of topics from Bioengineering and Biomedicine, like Biomaterials, Artificial Organs, Tissue Engineering, Nanobiotechnology and Nanomedicine, Biomedical Imaging, Bio MEMS, Biosignal Processing, Digital Medicine, BME Education. It helps medical and biological engineering professionals to interact and exchange their ideas and experiences.

The purpose and subject of this book is to provide a comprehensive overview of all types of phantoms used in medical imaging, therapy, nuclear medicine and health physics. For ionizing radiation, dosimetry with respect to issues of material composition, shape, and motion/position effects are all highlighted. For medical imaging, each type of technology will need specific materials and designs, and the physics and indications will be explored for each type. Health physics phantoms are concerned with some of the same issues such as material heterogeneity, but also unique issues such as organ-specific radiation dose from sources distributed in other organs. Readers will be able to use this book to select the appropriate phantom from a vendor at a clinic, to learn from as a student, to choose materials for custom phantom design, to design dynamic features, and as a reference for a variety of applications. Some of the information enclosed is found in other sources, divided especially along the three categories of imaging, therapy, and health physics. To our knowledge, even though professionally, many medical physicists need to bridge the three categories described above.

Even though many of France's former colonies became independent over fifty years ago, the concept of "colony" and who was affected by colonialism remain problematic in French culture today. Seloua Luste Boulbina, an Algerian-French philosopher and political theorist, shows how the colony's structures persist in the subjectivity, sexuality, and bodily experience of human beings who were once brought together through force. This text, which combines two works by Luste Boulbina, shows how France and its former colonies are haunted by power relations that are supposedly old history, but whose effects on knowledge, imagination, emotional habits, and public controversies have persisted vividly into the present. Luste Boulbina draws on the work of Michel Foucault, Frantz Fanon, and Édouard Glissant to build a challenging, original, and intercultural philosophy that responds to blind spots of inherited political and social culture. *Kafka's Monkey and Other Phantoms of Africa* offers unique insights into how issues of migration, religious and ethnic identity, and postcolonial history affect contemporary France and beyond.

Handbook of X-ray Imaging

APCMBE 2008, 22-25 April 2008, Beijing, China

International Record of Medicine and General Practice Clinics

Devices for Research and Development

Modelling, Dosimetry and Radiation Protection, Volume II

Cardiovascular Biomechanics

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.

A radiation bioassay program relies on a set of standard human phantoms to calibrate and assess radioactivity levels inside a human body for radiation protection and nuclear medicine imaging purposes. However, the methodologies in the development and application of anthropomorphic phantoms, both physical and computational, had mostly remained the same for the past 40 years. We herein propose a 3-year research project to develop medical image-based physical and computational phantoms specifically for radiation bioassay applications involving internally deposited radionuclides. The broad, long-term objective of this research was to set the foundation for a systematic paradigm shift away from the anatomically crude phantoms in existence today to realistic and ultimately individual-specific bioassay methodologies. This long-term objective is expected to impact all areas of radiation bioassay involving nuclear power plants, U.S. DOE laboratories, and nuclear medicine clinics.

Neuroscientist V.S. Ramachandran is internationally renowned for uncovering answers to the deep and quirky questions of human nature that few scientists have dared to address. His bold insights about the brain are matched only by the stunning simplicity of his experiments -- using such low-tech tools as cotton swabs, glasses of water and dime-store mirrors. In *Phantoms in the Brain*, Dr. Ramachandran recounts how his work with patients who have bizarre neurological disorders has shed new light on the deep architecture of the brain, and what these findings

tell us about who we are, how we construct our body image, why we laugh or become depressed, why we may believe in God, how we make decisions, deceive ourselves and dream, perhaps even why we're so clever at philosophy, music and art. Some of his most notable cases: A woman paralyzed on the left side of her body who believes she is lifting a tray of drinks with both hands offers a unique opportunity to test Freud's theory of denial. A man who insists he is talking with God challenges us to ask: Could we be "wired" for religious experience? A woman who hallucinates cartoon characters illustrates how, in a sense, we are all hallucinating, all the time. Dr. Ramachandran's inspired medical detective work pushes the boundaries of medicine's last great frontier -- the human mind -- yielding new and provocative insights into the "big questions" about consciousness and the self.

Handbook of Nuclear Medicine and Molecular Imaging for Physicists

World Congress of Medical Physics and Biomedical Engineering 2006

An Introductory Guide

Understanding Medical Imaging

Tissue substitutes, phantoms and computational modelling in medical ultrasound

The Modern Technology of Radiation Oncology

Development of Polymer-based Gels for Multimodal Medical Imaging Phantom By Eunji In Doctor of Philosophy Department of Mechanical and Industrial Engineering University of Toronto 2016 Abstract In the field of medical imaging, there have been numerous efforts to combine multiple imaging modalities such as ultrasound (US), Magnetic Resonance Imaging (MRI), x-rays and Computed Tomography (CT), positron emission tomography (PET), ultrasound (US), and single photon emission CT. Multimodal imaging allows the fusion and analysis of various image data to provide morphological and functional information. With the progress in medical imaging technology and increased importance of quality assurance, the research in medical imaging phantom is necessary. Phantom is an anthropomorphic object that mimics the properties of human tissue for calibration, training and surgical planning purposes. This research thesis examines four different types of polymer-based materials for constructing medical phantoms: carrageenan-based polymer gel, polymer cross-linked aerogels, UV-curable silicone and self-healing polymer materials. In the first study, water-based carrageenan gel found to have a good correlation with the imaging properties of human tissue, but its long-term stability issue restricts its applicability as commercial phantoms. Since samples contained high water content, mechanical and imaging properties of carrageenan-based gel fluctuated due to water expulsion and absorption cycles over six-week period. In the second study, silica and cellulose aerogel cross-linked with polymer was also investigated as a phantom material. Contrast agents are cross-linked to fabricate an MRI/CT-compatible material. Results demonstrate that the imaging properties of these aerogels met the values of some human tissue values but due to volume shrinkage and complex fabrication process restricts its production in large scale. Furthermore, in the third study UV-curable silicone material was considered as a 3D printable phantom material. The addition of hydrophilic silicone and water is shown to improve the curing time and imaging properties of silicone. With suitable properties of UV-curable silicone, it will assist to produce real-size liver phantom using 3D printing technique for a patient-specific phantoms. There is an increased demand for phantom application in clinician training and surgical planning with needle-insertion or dissection is necessary. In the final chapter, self-healing silicone with microcapsule healing mechanism was investigated as proof-of-concept for surgical planning tool. Throughout four different studies, different polymer-based materials are examined subsequently with novelty in each study.

World Congress on Medical Physics and Biomedical Engineering May 26-31, 2012, Beijing, China

The Edinburgh Medical and Surgical Journal

Amputation, Embodiment, and Prosthetic Technology

Phantom Limb