Siemens Ct Scanner Somatom Installation Manual

Since its introduction in the 1970's CT has emerged as a modality of choice because of its high sensitivity in producing accurate diagnostic images. A third of all Computed Tomography (CT) examinations are abdominal CTs which deliver one of the highest doses among common examinations. An increase in the number of CT examinations has raised concerns about the negative effects of ionising radiation as the dose is cumulative over the life span of the individual. Image quality in CT is closely related to the radiation dose, so that a certain dose with an associated small, but not negligible, risk is a prerequisite for high image quality. Typically, dose reduction in CT results in higher noise and a decrease in low contrast resolution which can be detrimental to the image quality produced. New technology presents a wide range of dose reduction strategies, the latest being iterative reconstruction (IR).The aim of this thesis was to evaluate two different classes of iterative reconstruction algorithms: statistical (SAFIRE) and model-based (ADMIRE) as well as to explore the diagnostic value of a low-dose abdominal CT for optimisation purposes. This thesis included a total of 140 human subjects in four image quality evaluation studies, three of which were prospective studies (Papers I, II and IV) and one retrospective study (Paper III). Visual grading experiments to determine the potential dose reductions, were performed with pairwise comparison of image quality in the same patient at different tube loads (dose) and reconstructed with Filtered back projection (FBP) and SAFIRE strength 1 in a low-dose abdominal CT (Paper I) and FBP and ADMIRE strengths 3 and 5 in a standard dose abdominal CT (Paper II). Paper IV evaluated the impact of slice thicknesses in CT images reconstructed with ADMIRE strengths 3 and 5 when comparing multiplanar reconstruction (MPR) formatted images in a standard dose abdominal CT. Paper III, on the other hand, was an absolute assessment of image quality and pathology between the three phases of a CT Urography (CTU) protocol to explore the diagnostic value of low-dose abdominal CT. The anonymised images were displayed in random order and image quality was assessed by a group of radiologists using image quality criteria from the "European guidelines of quality criteria for CT". The responses from the reviewer assessment were analysed statistically with ordinal logistic regression i.e. Visual Grading Regression (VGR). Results in Paper I show that a small dose reduction (5-9 %) was possible using SAFIRE strength 1and indicated the need for further research to evaluate the dose reduction potential of higher strengths of the algorithm. In Paper II a 30% dose reduction was possible without change in ADMIRE algorithm strength as no improvement in image quality was observed between tube loads 98- and 140 mAs. When comparing tube loads 42 and 98 mAs, further dose reduction was possible with ADMIRE strength 3 (22-47%). However, for images reconstructed with ADMIRE strength 5, a dose reduction of 34-74% was possible for some, but not all image criteria. Image quality in low-contrast objects such as the liver parenchyma, was affected and a

decline in diagnostic confidence was observed. Paper IV showed potential dose reductions are possible with increasing slice thickness from 1 mm to 2 mm (24-35%) and 1 mm to 3mm (25-41%). ADMIRE strength 3 continued to provide diagnostically acceptable images with possible dose reductions for all image criteria assessed. Despite objective evaluations showing a decrease in noise and an increase in contrast to noise ratio, ADMIRE strength 5 had diverse effects on the five image criteria, depending on slice thickness and further dose reductions were limited to certain image criteria. The findings do not support a general recommendation to replace ADMIRE3 with ADMIRE5 in clinical abdominal CT protocols. Paper III studied another aspect of optimisation and results show that visualisation of renal anatomy was as expected in favour of the post-contrast phases when compared to the native phase. Assessment of pathology showed no significant differences between the three phases. Significantly higher diagnostic certainty for renal anatomy was observed for the post-contrast phases when compared to the native phase. Significantly high certainty scores were also seen for the nephrographic phase for incidental findings. The conclusion is that a low-dose series seems to be sufficient as a first-line modality in certain patient groups. This thesis clinically evaluated the effect of IR in abdominal CT imaging and estimated potential dose reductions. The important conclusion from papers I, II and IV is that IR improves image quality in abdominal CT allowing for some dose reductions. However, the clinical utility of the highest strength of the algorithm is limited to certain criteria. The results can be used to optimise the clinical abdominal CT protocol. The conclusion from paper III may increase clinical awareness of the value of the low-dose abdominal protocol when choosing an imaging method for certain patient groups who are more sensitive to radiation. Datortomografi (DT) används i allt större omfattning vid bilddiagnostik och ger en viss stråldos till patienten. DT är en viktig, snabb och patientvänlig undersökningsteknik. En fördel med denna teknik är att bildmaterialet kan rekonstrueras i olika format för att åskådliggöra anatomin på bästasätt beroende på vilken frågeställning som ska besvaras. Joniserande strålning från dessa undersökningar anses öka risken för negativa effekter även om risken för den enskilde patient är mycket liten. Antalet datortomografiundersökningar ökar från år till år vilket kan leda till ökade stråldoser tillbefolkningen. Optimering av undersökningsteknik och val av undersökning för att minska negativa effekter av röntgenstrålning är därför nödvändig. Det övergripande målet med avhandlingen var att utvärdera bildkvalitetvid en DT-undersökning av buken (då dessa medför en av de högstastråldoserna bland de vanliga röntgenundersökningarna), att kvantifieramöjlig stråldosminskning med hjälp av iterativa rekonstruktionsalgoritmer och att utvärdera diagnostiska värdet av lågdosundersökningsteknik vid DT-buk. Av de fyra delstudierna var delarbeten I, II och IV prospektiva och delarbete III retrospektivt. För de prospektiva studierna, samlades bildmaterial in vid en kliniskberättigad undersökning av lågdos-DT av buken (delarbetet I), eller standarddos-DT av buken (delarbetet II och IV). Bilder

rekonstruerades meden standard bildrekonstruktionsalgoritm, filtrerad återprojektion (FBP), och med styrka 1 av den iterativa algoritmen SAFIRE (delarbetet I). I delarbeten II och IV, gjordes bildrekonstruktioner med FBP och med styrka 3 och 5 av den iterativa algoritmen ADMIRE. Avidentifierade bildmaterialför varje patient visades parvis i slumpmässig ordning för ett antal granskare och bildkvaliteten bedömdes med hjälp av europeiska bildkriterier. I den retrospektiva studien, delarbete III, hämtades bildmaterialet från utförda DT-urografiundersökningar från bildarkivet. För varje undersökning visades bilder från varje fas i DT-urografiundersökningen separat i slumpmässig ordning. För samtliga delarbeten, hämtades bildkriteriernafrån "European Guidelines of Quality Criteria for CT" och modifierades för att passa till varje studie. Granskarnas bedömning analyserades med ordinal logistisk regression så kallad visual grading regression (VGR). Resultat från delarbetet I visade att det fanns en signifikant inverkan av dos (p

Points towards the difficulty encountered in research and development carried out by laboratories to reach the users. This book aims at alerting developers so that they pay attention to the outcome of their work. Inventive research and technologies which have a high potential in the field of Assistive Technology are described in this publication.

This book (vol. 1) presents the proceedings of the IUPESM World Congress on Biomedical Engineering and Medical Physics, a triennially organized joint meeting of medical physicists, biomedical engineers and adjoining health care professionals. Besides the purely scientific and technological topics, the 2018 Congress will also focus on other aspects of professional involvement in health care, such as education and training, accreditation and certification, health technology assessment and patient safety. The IUPESM meeting is an important forum for medical physicists and biomedical engineers in medicine and healthcare learn and share knowledge, and discuss the latest research outcomes and technological advancements as well as new ideas in both medical physics and biomedical engineering field.

The application of computer-aided planning, navigation and robotics in surgery provides significant advantages due to todayOCOs sophisticated techniques of patient-data visualization in combination with the flexibility and precision of novel robots. Robotic surgery is set to revolutionize surgical procedures. Augmented with 3D image-guidance technology these tools give finer control over sensitive movements in diseased areas and therefore allow more surgical procedures to be performed using minimally invasive techniques. This book provides an overview of new image-guided procedures in all areas of medical application. The proceedings have been selected for coverage in: . OCo Index to Scientific & Technical Proceedings- (ISTP- / ISI Proceedings). OCo Index to Scientific & Technical Proceedings (ISTP CDROM version / ISI Proceedings). OCo CC Proceedings OCo Engineering & Physical Sciences. OCo CC Proceedings OCo Biomedical, Biological & Agricultural Sciences."

This book constitutes the refereed proceedings of the 7th International Workshop on Machine Learning in Medical Imaging, MLMI 2016, held in conjunction with MICCAI 2016, in Athens, Greece, in October 2016. The 38 full papers presented in this volume were carefully reviewed and selected from 60 submissions. The main aim of this workshop is to help advance scientific research within the broad field of machine learning in medical imaging. The workshop focuses on major trends and challenges in this area, and presents works aimed to identify new cutting-edge techniques and their use in medical imaging.

This book considers mainly diagnosis, screening, surveillance and treatment of abdominal, thoracoabdominal and thoracic aortic aneurysms. It addresses vascular and cardiothoracic surgeons and interventional radiologists, but also anyone engaged in vascular medicine. The

high mortality of ruptured aneurysms certainly favors the recommendation of prophylactic repair of asymptomatic aortic aneurysms (AA) and therewith a generous screening. However, the comorbidities of these patients and their age have to be kept in mind if the efficacy and cost effectiveness of screening and prophylactic surgery should not be overestimated. The treatment recommendations which will be outlined here, have to regard on the one hand the natural course of the disease, the risk of rupture, and the life expectancy of the patient, and on the other hand the morbidity and mortality of the prophylactic surgical intervention. The book describes perioperative mortality after endovascular and open repair of AA, long-term outcome after repair, and the cost-effectiveness of treatment.

Charred, badly decomposed, or mummified corpses, as well as those restrictions forced upon coroners by certain religious sects, often make autopsies impossible to perform. In addition, lack of manpower among the personnel charged with performing autopsies frequently creates a backlog of cases in the coroner's office. This delay increases the likelihood that causes of death will go undetermined and criminal perpetrators will go unpunished. The solution can be found in what has come to be known as the virtopsy®, a minimally invasive and efficient way to perform an autopsy through state-of-the-art imaging-guided means. A term coined by noted forensic pathologist Richard Dirnhofer, virtopsy refers to "virtual autopsy," a modality that employs a spectrum of technologies including computed tomography, magnetic resonance imaging and spectroscopy, and 3D photogrammetry and surface scanning. In The Virtopsy Approach: 3D Optical and Radiological Scanning and Reconstruction in Forensic Medicine, the authors reveal a comprehensive summary of the virtopsy procedure. Well-organized, detailed enough to serve as a how-to guide for newcomers to the field, and copiously illustrated with many color figures accompanied by appropriate explanatory captions, this volume breaks new ground in the world of autopsy science.

The two-volume set LNCS 3749 and LNCS 3750 constitutes the refereed proceedings of the 8th International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI 2005, held in Palm Springs, CA, USA, in October 2005. Based on rigorous peer reviews the program committee selected 237 carefully revised full papers from 632 submissions for presentation in two volumes. The first volume includes all the contributions related to image analysis and validation, vascular image segmentation, image registration, diffusion tensor image analysis, image segmentation and analysis, clinical applications - validation, imaging systems - visualization, computer assisted diagnosis, cellular and molecular image analysis, physically-based modeling, robotics and intervention, medical image computing for clinical applications, and biological imaging - simulation and modeling. The second volume collects the papers related to robotics, image-guided surgery and interventions, image registration, medical image computing, structural and functional brain analysis, model-based image analysis, image-guided intervention: simulation, modeling and display, and image segmentation and analysis.

Advances in Imaging Technology Research and Application: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Atomic Force Microscopy. The editors have built Advances in Imaging Technology Research and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Atomic Force Microscopy 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 Advances in Imaging Technology Research and Application: 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/.

Image Guided Radiation Therapy (IGRT) is a true revolution in the field of radiation oncology. IGRT provides the unprecedented means of conforming does to the shape of the target tissues in 3-dimensions reducing the risk of complications thereby improving the quality of life of irradiated patients. Moreover, IGRT provides the means to deliver higher than conventional doses thus improving the chance of cure in these patients. Despite its established benefits, several barriers exist to the widespread clinical implementation of IGRT. In the past, great concerns existed regarding the large capital outlay needed for both software and hardware. This barrier is less relevant today given the increased reimbursements possible with IGRT. Today, the most significant barrier is education. IGRT is a fundamentally new approach to both treatment planning and delivery. Adoption of the IGRT approach entails new ways of thinking in regard to patient selection, treatment planning and quality assurance measures. Unfortunately, apart from a few University-based short courses, limited resources are available for the physician and physicist interested in learning IGRT.

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

Respiratory motion causes an important uncertainty in radiotherapy planning of the thorax and upper abdomen. The main objective of radiation therapy is to eradicate or shrink tumor cells without damaging the surrounding tissue by delivering a high radiation dose to the tumor region and a dose as low as possible to healthy organ tissues. Meeting this demand remains a challenge especially in case of lung tumors due to breathing-induced tumor and organ motion where motion amplitudes can measure up to several centimeters. Therefore, modeling of respiratory motion has become increasingly important in radiation therapy. With 4D imaging techniques spatiotemporal image sequences can be acquired to investigate dynamic processes in the patient's body. Furthermore, image registration enables the estimation of the breathing-induced motion and the description of the temporal change in position and shape of the structures of interest by establishing the correspondence between images acquired at different phases of the breathing cycle. In radiation therapy these motion estimations are used to define accurate treatment margins, e.g. to calculate dose distributions and to develop prediction models for gated or robotic radiotherapy. In this book, the increasing role of image registration and motion estimation algorithms for the interpretation of complex 4D medical image sequences is illustrated. Different 4D CT image acquisition techniques and conceptually different motion estimation algorithms are presented. The clinical

relevance is demonstrated by means of example applications which are related to the radiation therapy of thoracic and abdominal tumors. The state of the art and perspectives are shown by an insight into the current field of research. The book is addressed to biomedical engineers, medical physicists, researchers and physicians working in the fields of medical image analysis, radiology and radiation therapy.

This volume contains the proceedings of the international symposium, 'Focal Epilepsy: Clinical Use of Functional Imaging by Means of Emission Tomography', held in Paris on 6 May 1989. The aim of the meeting was to contribute to the integration of PET/SPELT isotope tomography into the spectrum of methods used for localising the origin of seizures. Special emphasis has been placed on the investigation of temporal lobe epilepsy by SPECT/HmPAO, since this is presently the most affordable method, both technically and economically. Although the reader may not find the answers to all his questions, as the assessment of new methods and techniques and the interpretation of results are not yet complete, the contributions will serve to stimulate further studies and to encourage the compilation of data from various centres using a similar approach.

This book is a complete guide to intraoperative imaging in neurosurgery. Divided into eighteen sections, the text begins with an introduction to the history of neuroimaging and an overview of intraoperative imaging in neurosurgery. The following chapters discuss different types of intraoperative imaging techniques (magnetic resource imaging, computed tomography, ultrasound) and the use of each of these techniques during different surgical procedures, including epilepsy surgery, pituitary surgeries, skull base surgeries, cerebrovascular surgeries and more. A complete chapter is dedicated to multimodality imaging and the final chapter considers the future of navigation and intraoperative imaging. Intraoperative photographs and figures further enhance the comprehensive text. Key points Comprehensive guide to intraoperative imaging in neurosurgery Covers different types of imaging techniques (MRI, CT, Ultrasound) Complete chapter dedicated to multimodality imaging Includes intraoperative photographs and figures

This book provides a contemporary reference to the science, technology and clinical applications of PET and PET/CT. The book is designed to be used by residents and fellows training in medical imaging specialties as well as imaging experts in private or academic practice who need to become familiar with this technology and its applications. It is also for use by those whose specialties carry over to PET and PET/CT, referring physicians such as oncologists, cardiologists, neurologists and surgeons. Developed as an offshoot/update of the "clinical practice" portion of the main book, edited by PE Valk et al, published in 2003 (Positron Emission Tomography: basic science and clinical practice), this offshoot covers the second half of the main book only, dealing with mainly the clinical research and practice. Most of the book comprises chapters updated from the "Clinical practice" portion of the main Valk book. It contains 6 brand new

chapters and 22 completely revised and updated chapters from the main Valk book.

PET and SPECT are two of today's most important medical-imaging methods, providing images that reveal subtle information about physiological processes in humans and animals. Emission Tomography: The Fundamentals of PET and SPECT explains the physics and engineering principles of these important functional-imaging methods. The technology of emission tomography is covered in detail, including historical origins, scientific and mathematical foundations, imaging systems and their components, image reconstruction and analysis, simulation techniques, and clinical and laboratory applications. The book describes the state of the art of emission tomography, including all facets of conventional SPECT and PET, as well as contemporary topics such as iterative image reconstruction, small-animal imaging, and PET/CT systems. This book is intended as a textbook and reference resource for graduate students, researchers, medical physicists, biomedical engineers, and professional engineers and physicists in the medical-imaging industry. Thorough tutorials of fundamental and advanced topics are presented by dozens of the leading researchers in PET and SPECT. SPECT has long been a mainstay of clinical imaging, and PET is now one of the world's fastest growing medical imaging techniques, owing to its dramatic contributions to cancer imaging and other applications. Emission Tomography: The Fundamentals of PET and SPECT is an essential resource for understanding the technology of SPECT and PET, the most widely used forms of molecular imaging. *Contains thorough tutorial treatments, coupled with coverage of advanced topics *Three of the four holders of the prestigious Institute of Electrical and Electronics Engineers Medical Imaging Scientist Award are chapter contributors *Include color artwork

The thoroughly updated fifth edition of this landmark work has been extensively revised to better represent the rapidly changing field of radiation oncology and to provide an understanding of the many aspects of radiation oncology. This edition places greater emphasis on use of radiation treatment in palliative and supportive care as well as therapy.

This issue of Neurosurgery Clinics focus on Intraoperative Imaging. Article topics will include historical, current and future intraoperative imaging modality; iMRI suites: history, design, utility and cost-effectiveness; Stereotactic platforms for iMRI; iMRI for tumor: maximizing extent of resection of glioma; IMRI for tumor: combining iMRI with functional MRI; iMRI for tumor: pituitary adenoma; iMRI for tumor: MR thermometry; iMRI for tumor: LITT for spinal tumors; iMRI for functional/epilepsy neurosurgery: DBS placement; iMRI for functional/epilepsy neurosurgery: MR thermometry for mesial temporal epilepsy; iMRI for functional/epilepsy neurosurgery: MR thermometry HIFU; Fluorescence imaging/agents in tumor resection; Intraoperative 3D ultrasound; Intraoperative 3D CT: spine surgery; Intraoperative 3D CT: cranial/functional/trigem; Intraoperative imaging for vascular lesions; Imaging of intraoperative drug

delivery; Intraoperative ultrasound for peripheral nerve; and Intraoperative Raman Spectroscopy.

This book provides structured up-to-date information on all routine protocols used for multislice (multidetector row) CT. The volume contains a detailed technical section and covers the prevailing investigations of the brain, neck, lungs and chest, abdomen with parenchymal organs and gastrointestinal tract, the musculoskeletal system and CTA as well as dedicated protocols for the heart. Separate chapters address the how-to of CT-guided interventions such as punctures, drainages, and therapeutic approaches. Each protocol is displayed en bloc, enabling rapid appreciation of indications and the necessary scanner settings. The second edition includes contributions by renowned experts in the field, who not only provide their clinical experience on each topic, but also give guidelines for indications, workflow, postprocessing and reconstruction algorithms.

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 indispensible resource in preparations for further graduate studies in the field. There have been remarkable achievements in CT technology, workflow management and applications in the last couple of years. The introduction of 4- and 16-row multidetector technology has substantially increased acquisition speed and provides nearly isotropic resolution. These new technical possibilities had significant impact on the clinical use of CT and have yielded a broadening of the spectrum of applications, particularly in vascular, cardiac, abdominal, and trauma imaging. This book presents the practical experience of an international expert group of radiologists and physicists with state-of-the-art multidetector-technology. The chapters in this book will facilitate a thorough understanding of 4- and 16-slice multidetector-row CT and its clinical applications. This will help to fully exploit the diagnostic potential of this technology.

Modern medical imaging and radiation therapy technologies are so complex and computer driven that it is difficult for physicians and technologists to know exactly what is happening at the point-of-care. Medical physicists responsible for filling this gap in knowledge must stay abreast of the latest advances at the intersection of medical imaging and radiation therapy. This book provides medical physicists and radiation oncologists current and relevant information on Adaptive Radiation Therapy (ART), a state-of-the-art approach that uses a feedback process to account for patient-specific anatomic and/or biological changes, thus delivering highly individualized radiation therapy for cancer patients. The book should also benefit medical dosimetrists and radiation therapists. Adaptive Radiation Therapy describes technological and methodological advances in the field of ART, as well

as initial clinical experiences using ART for selected anatomic sites. Divided into three sections (radiobiological basis, current technologies, and clinical applications), the book covers: Morphological and biological biomarkers for patient-specific planning Design and optimization of treatment plans Delivery of IMRT and IGRT intervention methodologies of ART Management of intrafraction variations, particularly with respiratory motion Quality assurance needed to ensure the safe delivery of ART ART applications in several common cancer types / anatomic sites The technology and methodology for ART have advanced significantly in the last few years and accumulated clinical data have demonstrated the need for ART in clinical settings, assisted by the wide application of intensity modulated radiation therapy (IMRT) and image-guided radiation therapy (IGRT). This book shows the real potential for supplying every patient with individualized radiation therapy that is maximally accurate and precise.

The 4th European Congress of the International Federation for Medical and Biological Federation was held in Antwerp, November 2008. The scientific discussion on the conference and in this conference proceedings include the following issues: Signal & Image Processing ICT Clinical Engineering and Applications Biomechanics and Fluid Biomechanics Biomaterials and Tissue Repair Innovations and Nanotechnology Modeling and Simulation Education and Professional

Essential for students, science and medical graduates who want to understand the basic science of Positron Emission Tomography (PET), this book describes the physics, chemistry, technology and overview of the clinical uses behind the science of PET and the imaging techniques it uses. In recent years, PET has moved from high-end research imaging tool used by the highly specialized to an essential component of clinical evaluation in the clinic, especially in cancer management. Previously being the realm of scientists, this book explains PET instrumentation, radiochemistry, PET data acquisition and image formation, integration of structural and functional images, radiation dosimetry and protection, and applications in dedicated areas such as drug development, oncology, and gene expression imaging. The technologist, the science, engineering or chemistry graduate seeking further detailed information about PET, or the medical advanced trainee wishing to gain insight into the basic science of PET will find this book invaluable. This book is primarily repackaged content from the Basic Science section of the 'big' Valk book on PET. It contains new, completely revised and unchanged chapters covering the "basic sciences" section of the main book - total 18 chapters: 2 new (chapters 1, 16) 8 completely revised (chapters 4, 5, 8, 13, 14, 15, 17, 18) 3 minor corrections (chapters 2, 6, 11) 5 unchanged (chapters 3, 7, 9, 10, 12)

This book constitutes the refereed proceedings of the First International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI'98, held in Cambridge, MA, USA, in October 1998. The 134 revised

papers presented were carefully selected from a total of 243 submissions. The book is divided into topical sections on surgical planning, surgical navigation and measurements, cardiac image analysis, medical robotic systems, surgical systems and simulators, segmentation, computational neuroanatomy, biomechanics, detection in medical images, data acquisition and processing, neurosurgery and neuroscience, shape analysis, feature extraction, registration, and ultrasound.

Much work, although often fragmentary, has been published by professionals on PACS (picture archiving and communication systems) related issues. This book, however, is unique in its field, providing medical professionals in particular with a state-of-the-art overview of this system. Covering the USA, Western Europe and Japan, it gives an outline of the history, status and future of (digital) medical image handling in the hospital environment during the final two decades of this century (as perceived and experienced by professionals working in this particular field of medicine). It comprises case studies from around the world and, with most of these studies belonging to highly specialized subtopics of the medical imaging area, they provide a good insight into the complexity and problems of the total field. Hence this volume will be invaluable to those in the medical profession, and specifically those with a clear technical interest in medical imaging for daily use in a hospital environment.

Almost 500 paper and poster contributions from more than 30 countries had to be evaluated for CARS 2004. In addition to the traditional CARS themes and topics, emphasis has been given to developments such as IHE, Surgical Workflow and PACS, Operation Room of the Future, and Strategic Thinking. In special congress sessions, partner societies such as SPIE and SCAR have joined these endeavours to assist in achieving progress in these fields. While the increased reliance on multi-source information is proceeding at a rapid rate, it is interesting to note that the basis for the greater part of medical decision making is still medical imaging. This may change as genomics and proteomics fulfil more of their potential, but it is estimated that more than half of current hospital visits result in imaging studies. In that respect, it is true that "the more things change, the more they stay the same" (Alphonse Karr, 1849) and that medical imaging is the cornerstone of the field. This focus on medical imaging is evident throughout the CARS conference, with sessions dedicated to Medical Imaging (MI) itself, Image Processing and Display (IPD), Image Guided Radiological Therapy (IGRT), Image Guided Therapy (IGT), and separate symposia on Computer Aided Diagnosis (based on imaging) and both Cardiovascular and Maxillofacial Imaging. Still, it is up to you, the engineers, scientists, clinicians, and related personnel participating in CARS, to ensure that innovation in technology and procedures is not developed just for the sake of change, but instead to achieve progress and thereby provide better patient care.

Stereotactic body radiation therapy (SBRT) has emerged as an important innovative treatment for various primary and metastatic cancers. This book provides a comprehensive and up-to-date account of the physical/technological, biological, and clinical aspects of SBRT. It will serve as a detailed resource for this rapidly developing treatment modality. The organ sites covered include lung, liver, spine, pancreas, prostate, adrenal, head and neck, and female reproductive tract. Retrospective studies and prospective clinical trials on SBRT for various organ sites from around the world

are examined, and toxicities and normal tissue constraints are discussed. This book features unique insights from world-renowned experts in SBRT from North America, Asia, and Europe. It will be necessary reading for radiation oncologists, radiation oncology residents and fellows, medical physicists, medical physics residents, medical oncologists, surgical oncologists, and cancer scientists.

The two-volume set LNCS 5761 and LNCS 5762 constitute the refereed proceedings of the 12th International Conference on Medical Image Computing and Computer-Assisted Intervention, MICCAI 2009, held in London, UK, in September 2009. Based on rigorous peer reviews, the program committee carefully selected 259 revised papers from 804 submissions for presentation in two volumes. The first volume includes 125 papers divided in topical sections on cardiovascular image guided intervention and robotics; surgical navigation and tissue interaction; intra-operative imaging and endoscopic navigation; motion modelling and image formation; image registration; modelling and segmentation; image segmentation and classification; segmentation and atlas based techniques; neuroimage analysis; surgical navigation and robotics; image registration; and neuroimage analysis: structure and function.

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