Ultrasound Imaging Advances and Applications

Ultrasound Imaging and Therapy
Diagnostic Ultrasound
Photoacoustic Imaging
Ultrafast Ultrasound Imaging
Ultrasound Imaging
Cognitive Informatics, Computer Modelling, and Cognitive Science
Ultrasound: Advances in Food Processing and Preservation
Photoacoustic Imaging - Principles, Advances and Applications
Advances in Diagnostic and Therapeutic Ultrasound
Imaging Advances in Computational Techniques for Biomedical Image Analysis
Diagnostic Ultrasound
Imaging in Ultrasound Imaging
Diagnostic Ultrasound Imaging: Inside Out
Ultrasound in Food Processing
Advances in Molecular Nanotechnology Research and Application
2011 Edition Medical Image Processing
Molecular Imaging
Tissue Elasticity Imaging
Therapeutic Ultrasound
Medical Imaging
Medical Imaging Concepts, Methodologies, Tools, and Applications
Obstetric Imaging: Fetal Diagnosis and Care
E-Book Pattern Recognition and Image Analysis
Advances and Applications of Sonography
Clinical Technologies: Concepts, Methodologies, Tools, and Applications
Learning Ultrasound Imaging
Medical and Biological Image Analysis
Diagnostic Ultrasound
Advancements and Breakthroughs in Ultrasound Imaging
Ultrasound Imaging Innovations in Abdominal Ultrasound
Biomedical Imaging
Design and Applications of Nanoparticles in Biomedical Imaging
Advances in Diagnostic and Therapeutic Ultrasound Imaging
Computational Intelligence in Medical Imaging
Clinical Ultrasound
Ultrasound Imaging in Reproductive Medicine
Status Go for Preclinical Imaging
The detection and measurement of the dynamic regulation and interactions of cells and proteins within the living cell are critical to the understanding of cellular biology and pathophysiology. The multidisciplinary field of molecular imaging of living subjects continues to expand with dramatic advances in chemistry, molecular biology, therapeutics, engineering, medical physics and biomedical applications. Molecular Imaging: Principles and Practice, Volumes 1 and 2, Second Edition provides the first point of entry for physicians, scientists, and practitioners. This authoritative reference book provides a comprehensive overview along with in-depth presentation of molecular imaging concepts, technologies and applications making it the foremost source for both established and new investigators, collaborators, students and anyone interested in this exciting and important field. The most authoritative and comprehensive resource available in the molecular imaging field, written by over 170 of the leading scientists from around the world who have evaluated and summarized the most important methods, principles, technologies and data Concepts illustrated with over 600 color figures and molecular-imaging examples Chapters/topics include, artificial intelligence and machine learning, use of online social media, virtual and augmented reality, optogenetics, FDA regulatory process of imaging agents and devices, emerging instrumentation, MR elastography, MR fingerprinting, operational radiation safety, multiscale imaging and uses in drug development This edition is packed with innovative science, including theranostics, light sheet fluorescence microscopy, (LSFM), mass spectrometry imaging, combining in vitro and in vivo diagnostics, Raman imaging, along with molecular and functional imaging applications. Valuable applications of molecular imaging in pediatrics, oncology, autoimmune, cardiovascular and CNS diseases are also presented This resource helps integrate diverse multidisciplinary concepts associated with molecular imaging to provide readers with an improved understanding of current and future applications. This book presents and describes imaging technologies that can be used to study chemical processes and structural interactions in dynamic systems, principally in biomedical systems. The imaging technologies, largely biomedical imaging technologies such as MRT, Fluorescence mapping, Raman mapping, nanoESCA, and CARS microscopy, have been selected according to their application range and to the chemical information content of their data. These technologies allow for the analysis and evaluation of delicate biological samples, which must not be disturbed during the process. Ultimately, this may mean fewer animal lab tests and clinical trials. Medical imaging has transformed the ways in which various conditions, injuries, and diseases are identified, monitored, and treated. As various types of digital visual representations continue to advance and improve, new opportunities for their use in medical practice will likewise evolve. Medical Imaging: Concepts, Methodologies, Tools, and Applications presents a compendium of research on digital imaging technologies in a variety of healthcare settings. This multi-volume work contains practical examples of implementation, emerging trends, case studies, and technological innovations essential for using imaging technologies for making medical decisions. This comprehensive publication is an essential resource for medical practitioners, digital imaging technologists, researchers, and medical students. This book offers a practical approach to the world of diagnostic ultrasound. It has been structured in a reader-friendly, case-based format that makes it easy and enjoyable to learn the basics of the applications and interpretation of ultrasound. Each case includes illustrations, descriptions of the imaging findings, and technical details and serves to identify the essential imaging features of the pathology under consideration, thus assisting the reader in the diagnosis of similar cases. The book is divided into 17 short chapters that review the most important areas of ultrasound application.
and also document the latest advances in the use of contrast and interventional ultrasound. The authors treat every
topic from a “how to do it” perspective with the aim of imparting their wide experience in use of the technique. This
book forms part of the Learning Imaging series for medical students, residents, less experienced radiologists, and other
medical staff. This book addresses the future development of ultrasound in food processing, covering both High Power
(material altering) and Low Power (non-destructive testing) applications. Leading work is presented for a non-expert
audience, so that people in industry and academia can make informed decisions about future research and the
adoption of ultrasound techniques. It will be of particular interest to food manufacturing personnel responsible for
process development, engineering and research. It will be invaluable for scientists and technologists involved in active
ultrasound research and instrument manufacture. Diagnostic Ultrasound Imaging provides a unified description of the
physical principles of ultrasound imaging, signal processing, systems and measurements. This comprehensive reference
is a core resource for both graduate students and engineers in medical ultrasound research and design. With continuing
rapid technological development of ultrasound in medical diagnosis, it is a critical subject for biomedical engineers,
clinical and healthcare engineers and practitioners, medical physicists, and related professionals in the fields of signal
and image processing. The book contains 17 new and updated chapters covering the fundamentals and latest advances
in the area, and includes four appendices, 450 figures (60 available in color on the companion website), and almost
1,500 references. In addition to the continual influx of readers entering the field of ultrasound worldwide who need the
broad grounding in the core technologies of ultrasound, this book provides those already working in these areas with
clear and comprehensive expositions of these key new topics as well as introductions to state-of-the-art innovations in
this field. Enables practicing engineers, students and clinical professionals to understand the essential physics and signal
processing techniques behind modern imaging systems as well as introducing the latest developments that will shape
medical ultrasound in the future. Suitable for both newcomers and experienced readers, the practical, progressively
organized approach is supported by hands-on MATLAB® code and worked examples that enable readers to
understand the principles underlying diagnostic and therapeutic ultrasound. Covers the new important developments in
the use of medical ultrasound: elastography and high-intensity therapeutic ultrasound. Many new developments are
comprehensively reviewed and explained, including aberration correction, acoustic measurements, acoustic radiation
force imaging, alternate imaging architectures, bioeffects: diagnostic to therapeutic, Fourier transform imaging,
multimodal imaging, plane wave compounding, research platforms, synthetic aperture, vector Doppler, transient shear
wave elastography, ultrafast imaging and Doppler, functional ultrasound and viscoelastic models. Covering all of the
core knowledge, skills and experience as recommended by the Royal College of Radiologists, it provides the Fellow
with a knowledge base sufficient to pass professional certification examinations and provides the practitioner with a
quick reference on all currently available diagnostic and therapeutic ultrasound imaging procedures. Contains over
4,000 high quality images (over 1,000 of which are in colour) to provide a comprehensive visual guide to help the
practitioner identify and interpret diagnostic problems. Practical considerations such as image interpretation, image
optimization techniques, pitfalls in technical acquisition and interpretation stressed throughout provide the trainee and
practitioner with a new and improved knowledge in order to optimize clinical decision-making. Highlights the
selection of other modalities (such as CT/MRI) whenever appropriate. Offers an Extensive Discussion on High
Frequency Ultrasound. Based on a course taught and developed by a foremost expert in diagnostic ultrasound
technology, Diagnostic Ultrasound: Imaging and Blood Flow Measurements, Second Edition covers cutting-edge
developments, along with the fundamental physics, instrumentation, system architecture, clinical applications, and
improved 3-D and 4-D imaging of reproductive structures are discussed. MRI-guided ultrasound procedures are
covered, and comparisons of 3-D imaging with MRI imaging for uterine anomalies is reviewed with an emphasis on
the advantages of 3-D performed in the gynecologist’s office, and as a less expensive modality. The overall approach
of the original edition is maintained, starting with ultrasound safety and technique and diagnosis of the ovary, uterus
and fallopian tubes (both normal and pathologic), followed by both male and female infertility and ART treatments
and procedures. Ultrasound monitoring of follicular development, the endometrium, and as an aid in embryo transfer
to maximize IVF success rates are reviewed. Topics new to this edition include updated information on the diagnosis of
benign and malignant: adrenal masses, 3-D follicle monitoring, and the diagnosis of adenomyosis and endometriosis,
including deep implanted endometriosis. Additionally, the evaluation of endometrial receptivity, the use of contrasts
for fallopian tube patency, controversies regarding septate uterus versus arcuate uterus with the use of 3-D ultrasound,
and 3-D ultrasound with saline infusion sonogram and early pregnancy ultrasound are all discussed. An excellent
resource for reproductive medicine and ART specialists, gynecologists and ultrasoundographers alike, Ultrasound
Imaging in Reproductive Medicine, Second Edition covers all that clinicians need to know about the role of
ultrasound, from the first time a woman comes into the clinic for treatment, including ART, to early pregnancy monitoring. See better, do ART better. Offering exclusive coverage of the latest techniques in both diagnostic and therapeutic 3-D ultrasound imaging instrumentation and techniques, this groundbreaking resource offers a solid overview of potential applications in clinical practice. This book covers the most recent advances in using nanoparticles for biomedical imaging, including magnetic resonance imaging (MRI), magnetic particle imaging (MPI), nuclear medicine, ultrasound (US) imaging, computed tomography (CT), and optical imaging. Topics include nanoparticles for MRI and MPI, siRNA delivery, theranostic nanoparticles for PET imaging of drug delivery, US nanoparticles for imaging drug delivery, inorganic nanoparticles for targeted CT imaging, and quantum dots for optical imaging. This book serves as a valuable resource for the fundamental science of diagnostic nanoparticles and their interactions with biological targets, providing a practical handbook for improved detection of disease and its clinical implementation. Cognitive Informatics, Computer Modelling, and Cognitive Science: Theory, Case Studies, and Applications presents the theoretical background and history of cognitive science to help readers understand its foundations, philosophical and psychological aspects, and applications in a wide range of engineering and computer science case studies. Cognitive science, a cognitive model of the brain, knowledge representation, and information processing in the human brain are discussed, as is the theory of consciousness, neuroscience, intelligence, decision-making, mind and behavior analysis, and the various ways cognitive computing is used for information manipulation, processing and decision-making. Mathematical and computational models, structures and processes of the human brain are also covered, along with advances in machine learning, artificial intelligence, cognitive knowledge base, deep learning, cognitive image processing and suitable data analytics. Identifies how foundational theories and concepts in cognitive science are applicable in other fields. Includes a comprehensive review of cognitive science applications in multiple domains, applying it to neural engineering, robotics, computer science and STEM. Includes models of brain processing, consciousness, decision-making and more. Provides in-depth technical coverage of cognitive informatics and computing, along with coverage of cognitive knowledge base, information theory, cognitive machine learning and intelligence. Medical sonography is a medical imaging technique employed across a number of medical disciplines. The technique is rapidly growing due to its easy accessibility and relatively low cost. A number of high quality ultrasound imaging systems are offered. An extensive discussion on high frequency ultrasound. Based on a course taught and developed by a foremost expert in diagnostic ultrasound technology, Diagnostic Ultrasound: Imaging and Blood Flow Measurements, Second Edition covers cutting-edge developments, along with the fundamental physics, instrumentation, system architecture, clinical applications, and biological effects of ultrasound. This text addresses the technical side of diagnostic ultrasound and begins with an overview of the field of ultrasonic imaging and its role in diagnostic medicine relative to other imaging modalities. The author describes the fundamental physics involved in ultrasonic transducers, as well as in conventional imaging approaches and Doppler measurements, including contrast imaging and 4D imaging. He reviews the current status and standards on ultrasound bioeffects and discusses methods that have been used to measure ultrasonic properties of tissues. He also provides a list of relevant references and further reading materials at the end of each chapter. New in the Second Edition: Details the latest advances in ultrasound technology related to biomedical applications, including elastography, portable scanners, ultrasound molecular imaging, preclinical high frequency imaging, 2D array, and 4D imaging techniques. Updates and expands each chapter. Adds a new chapter on new developments such as elastography and miniature scanners. Includes new case studies and examples throughout the book. Diagnostic Ultrasound: Imaging and Blood Flow Measurements, Second Edition covers recent advances in ultrasound technology related to biomedical applications. Intended for senior- to graduate-level coursework in ultrasonic imaging, this text also serves practicing physicists, engineers, clinicians, and sonographers. This book constitutes the proceedings of the 7th Iberian Conference on Pattern Recognition and Image Analysis, IBPRIA 2015, held in Santiago de Compostela, Spain, in June 2015. The 83 papers presented in this volume were carefully reviewed and selected from 141 submissions. They were organized in topical sections named: Pattern Recognition and Machine Learning; Computer Vision; Image and Signal Processing; Applications; Medical Image; Pattern Recognition and Machine Learning; Computer Vision; Image and Signal Processing; and Applications. 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. Advanced techniques in image processing have led to many innovations supporting the medical field, especially in the area of disease diagnosis. Biomedical imaging is an essential part of early disease detection and often considered a first step in the proper management of medical pathological conditions. Classification and Clustering in Biomedical Signal Processing focuses on existing and proposed methods for medical imaging, signal processing, and analysis for the purposes of diagnosing and monitoring.
patient conditions. Featuring the most recent empirical research findings in the areas of signal processing for biomedical applications with an emphasis on classification and clustering techniques, this essential publication is designed for use by medical professionals, IT developers, and advanced-level graduate students. This book deals with medical image analysis methods. In particular, it contains two significant chapters on image segmentation as well as some selected examples of the application of image analysis and processing methods. Despite the significant development of information technology methods used in modern image analysis and processing algorithms, the segmentation process remains open. This is mainly due to intra-patient variability and/or scene diversity. Segmentation is equally difficult in the case of ultrasound imaging and depends on the location of the probe or the contact force. Regardless of the imaging method, segmentation must be tailored for a specific application in almost every case. These types of application areas for various imaging methods are included in this book. Ultrasound is an emerging technology that has been widely explored in food science and technology since the late 1990s. The book is divided into three main areas: Chapters 1 to 5 focus on the basic principles of ultrasound and how the technology works on microbial cells, enzymes, and the chemistry behind the process. Chapters 6 to 15 cover the application of ultrasound in specific food products and processes, discussing changes on food quality and presenting some innovations in food ingredients and enhancement of unit operations. Finally, Chapters 16 to 20 present some topics about manufacture of ultrasound equipment and simulation of the process, the use of the technology to treat food industry wastewater, and an industry perspective. The laws and regulations concerning emerging technologies, such as ultrasound, are also discussed, including the new Food Safety Modernization Act. Provides a clear and comprehensive panorama of ultrasound technology. Contains updated research behind this technology. Brings the current tested product and future uses. Explores potential future use within the food industry. Tissue Elasticity Imaging: Volume One: Theory and Methods offers an extensive treatment of the fundamentals and applications of this groundbreaking diagnostic modality. The book introduces elasticity imaging, its history, the fundamental physics, and the different elasticity imaging methods, along with their implementation details, problems and artefacts. It is an essential resource for all researchers and practitioners interested in any elasticity imaging modality. As many diseases, including cancers, alter tissue mechanical properties, it is not always possible for conventional methods to detect changes, but with elasticity images that are produced by slow tissue deformation or low-frequency vibration, these changes can be displayed. Offers the first comprehensive reference on elasticity imaging. Discusses the fundamentals of technology and their limitations and solutions, along with advanced methods and future directions. Addresses the technologies and applications useful to both researchers and clinical practitioners. Includes an online reference section regularly updated with advances in technology and applications. CI Techniques & Algorithms for a Variety of Medical Imaging Situations Documents both researchers and clinical practitioners. Includes an online reference section regularly updated with advances in technology and applications. CI Techniques & Algorithms for a Variety of Medical Imaging Situations Documents both researchers and clinical practitioners. Includes an online reference section regularly updated with advances in technology and applications.
medical imaging together with medical imaging security and forensics. Photoacoustic imaging (PAI) is an emerging non-invasive imaging modality that integrates the advantages of deep ultrasound penetration and high optical contrast. It provides better resolution than pure ultrasonic imaging and deeper penetration than pure optical imaging. Hence, it is opening new frontiers in diagnostic imaging. Photoacoustic Imaging - Principles, Advances and Applications, provides interested readers with the principle knowledge, advanced methodologies, and new applications associated with PAI technology. Written by expert researchers, chapters cover such topics as the generation and detection of photoacoustic signals, sound source localization, image reconstruction and formation, and application of PAI in gastroenterology and ophthalmology. Richly illustrated and comprehensive in scope, Obstetric Imaging, 2nd Edition, provides up-to-date authoritative guidelines for more than 200 obstetric conditions and procedures, keeping you at the forefront of this fast-changing field. This highly regarded reference covers the extensive and ongoing advances in maternal and fetal imaging in a concise, newly streamlined format for quicker access to common and uncommon findings. Detailed, expert guidance, accompanied by superb, high-quality images, helps you make the most of new technologies and advances in obstetric imaging. Features more than 1,350 high-quality images, including 400 in color. Helps you select the best imaging approaches and effectively interpret your findings with a highly templated, bulleted, at-a-glance organization. Reflects all the latest developments in the field, including genetics, open fetal surgery, fetal echocardiography, Zika virus, and 3D imaging, so you can provide the safest and most responsive care to both mother and fetus. Includes new chapters on Limbs and Bones Overview; Open Fetal Surgery; Biophysical Profile; Ultrasound Physics; Elastography; Doppler; MRI; Echogenic Bowel; Pregnancy of Unknown Location (PUL), Failed Pregnancy and Ectopic Pregnancy, Cesarean Scar Pregnancy; Cytomegalovirus (CMG), Rubella, Toxoplasmosis, Herpes, Varicella; and Congenital Syphilis; plus a new chapter on Zika Virus written by imaging experts from the "hot zone." Keeps you up to date with the latest developments in multimodality imaging and optimizing diagnostic accuracy from ultrasound, 3D ultrasound, Doppler, MRI, elastography, image-guided interventions, and much more. Up-to-Date Details on Using Ultrasound Imaging to Help Diagnose Various Diseases. Due to improvements in image quality and the reduced cost of advanced features, ultrasound imaging is playing a greater role in the diagnosis and image-guided intervention of a wide range of diseases. Ultrasonic Imaging and Therapy highlights the latest advances in using ultrasound in all fields of medicine: medicine, surgery, interventional radiology, cardiology, oncology, neurology, nephrology. This groundbreaking resource offers you exclusive coverage of the latest techniques in diagnostic and therapeutic ultrasound imaging instrumentation and techniques. Providing a solid overview of potential applications in clinical practice, you find need-to-know details on major diseases, including vascular diseases, breast cancer, cardiac abnormalities and prostate cancer. Ultrasound imaging is one of the most important and widely used diagnostic tools in modern medicine, second only to the conventional x-ray. Although considered a mature field, research continues for improving the capabilities and finding new uses for ultrasound technology while driving down the cost of newer, more complicated procedures such as imaging. Since the beginnings of diagnostic ultrasound in the 1950s, each decade has seen significant advances in this technology. Commercialization of ultrasound occurred during the 1960s with the introduction of many of the clinical uses that are in existence today. The 1970s showed the most dramatic changes with the commercial introduction of gray-scale and real-time ultrasound. In the 1980s, many new advances were introduced, including color Doppler, as well as a wide variety of endoluminal approaches, including endorectal, endovaginal and transesophageal. The decade of the 1990s promises even more significant advances with further transducer miniaturization, three-dimensional ultrasound, and the introduction of a variety of ultrasound contrast agents. With such rapid changes occurring, it becomes important to disseminate knowledge in a timely manner as possible. Thus, it was quite appropriate that a meeting such as this be held to provide an in-depth review of the many new areas of ultrasound imaging that show promise for the future. Emphasis was on the new uses of ultrasound in gastrointestinal diseases. Many of these advances will, of course, also have applications in many other areas of the body. It is hoped that those in attendance will acquire a much broader understanding of the use of ultrasound is now and where it is headed in the near future. Ultrasound imaging is a powerful diagnostic tool available to medical practitioners, engineers and researchers today. Due to the relative safety and the non-invasive nature, ultrasound imaging has become one of the most rapidly advancing technologies. These rapid advances are directed at the parallel advancements in electronics, computing, and transducer technology together with sophisticated signal processing techniques. This book focuses on state-of-the-art developments in ultrasonic imaging applications and
underlying technologies presented by leading practitioners and researchers from many parts of the world. Advances in Molecular Nanotechnology Research and Application: 2011 Edition is a ScholarlyEditions® eBook that delivers timely, authoritative, and comprehensive information about Molecular Nanotechnology. The editors have built Advances in Molecular Nanotechnology Research and Application: 2011 Edition on the vast information databases of ScholarlyNews®. You can expect the information about Molecular Nanotechnology 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 Advances in Molecular Nanotechnology 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/. Up-to-Date Details on Using Ultrasound Imaging to Help Diagnose Various Diseases Due to improvements in image quality and the reduced cost of advanced features, ultrasound imaging is playing a greater role in the diagnosis and image-guided intervention of a wide range of diseases. Ultrasound Imaging and Therapy highlights the latest advances in using ultrasound imaging in image-guided interventions and ultrasound-based therapy. The book presents current and emerging techniques, identifies trends in the use of ultrasound imaging, and addresses technical and computational problems that need to be solved. The book is organized into three sections. The first section covers advances in technology, including transducers (2-D, 3-D, and 4-D), beamformers, 3-D imaging systems, and blood velocity estimation systems. The second section focuses on diagnostic applications, such as elastography, quantitative techniques for therapy monitoring and diagnostic imaging, and ultrasound tomography. The final section explains the use of ultrasound in image-guided interventions for image-guided biopsy and brain imaging. The book is designed for end users in the field of digital imaging, who wish to update their skills and understanding with the latest techniques in image analysis. The book emphasizes the conceptual framework of image analysis and the effective use of image processing tools. It uses applications in a variety of fields to demonstrate and consolidate both specific and general concepts, and to build intuition, insight and understanding. Although the chapters are essentially self-contained they reference other chapters to form an integrated whole. Each chapter employs a pedagogical approach to ensure conceptual learning before introducing specific techniques and “tricks of the trade”. The book concentrates on a number of current research applications, and will present a detailed approach to each while emphasizing the applicability of techniques to other problems. The field of topics is wide, ranging from compressive (non-uniform) sampling in MRI, through automated retinal vessel analysis to 3-D ultrasound imaging and more. The book is amply illustrated with figures and applicable medical images. The reader will learn the techniques which experts in the field are currently employing and testing to solve particular research problems, and how they may be applied to other problems. Diagnostic and Therapeutic Ultrasound has recently taken an explosive growth for better safer, economic, mobile and high quality healthcare. This technology is very appealing for medical applications because it is non-ionizing, non-invasive and it is available in most of the medical and clinical facilities. Its low cost, when compared with other medical image modalities, makes it one of the preferred tools for medical monitoring, follow-up and diagnosis. Besides the traditional fields of Cardiology and Obstetrics, where it is extensively used for long time, it has become also very useful in the diagnosis of diseases of the prostate, liver and coronaries and carotids atherosclerosis. However, Ultrasound images present poor quality, very low signal to noise ratio and a lot of artifacts. The extraction of useful information from Ultrasound data for diagnosis is a challenge task that makes this medical image modality a very active field of research. The difficulties are being overcome and novel and advanced methods are being proposed for detection, characterization and segmentation of abnormalities in several organs. In fact, Ultrasound application range is vast, covering almost all organs of the human body, including the brain where Tran-cranial Doppler Ultrasound is very important to assess the brain vasculature. This book presents some of the recent advances in Ultrasound imaging technology covering several organs and techniques in a Biomedical Engineering (BME) perspective. The focus of the book is in the algorithms, methodologies and systems developed by multidisciplinary research teams of engineers and physicians for Computer-Aided Diagnosis (CAD) purposes, Cardiovascular and Cancer, the most common life-threatening diseases in western countries, are two of the most important topics focused in the book. However, other advanced issues are also presented such as Intravascular Ultrasound, 3D US and Ultrasound in Computer-Aided Surgery (CAS). Some chapters are direct contributions from medical research groups where Ultrasound has also received great attention in the last decade. By this, new techniques based on Ultrasound were introduced in the clinical practice for diagnosis and therapeutics, mainly in hospital facilities."This multi-volume book delves into the many applications of information technology ranging from digitizing patient records to high-performance computing, to medical imaging and diagnostic technologies, and much more*"--- Copyright code: e5be348fd17efc7fc4def3e816f7fe66