Virtual Endoscopy

Didier Butiau 2013-12-01
Virtual endoscopy progressively enters the real world. The development of virtual reality is one of the most striking features of our Western societies. Besides chess games and movies, its scope has expanded to medical imaging through 3D CT scan surface or volume reconstructions. Whatever the site clinicians are able to perform real endoscopy (RE), radiologists can now also provide virtual endoscopy (VE) images. VE enters our medical practice. The next question is to weigh the pros and cons. VE has the unique advantage to offer high-quality images obtained through a noninvasive and well-tolerated procedure performed in outpatients. Compared to RE, it carries no risk of bleeding, perforation or trans mission of viruses. Importantly, VE can pass high-grade stenoses affecting large bowel, urinary tract or tracheobronchial tree, and visualize areas hard to visit by optic fibers such as intracranial regions. 3D VE images can be commented with patients, and this might reduce potential misunderstanding and its medico-legal consequences. Last but not least, VE is the sole alternative offered both to those who refuse RE, and to severely ill elderly patients. Then, should we consider VE as the Deus ex machina of modern medical imaging - with CT scan as rna china - ? Clearly, the answer is no, given VE knows several limits and pitfalls. One of the most important me rits of this book is to discuss honestly these aspects. First, VE will never allow to perform biopsies or resections.

Virtual Endoscopy and Related 3D Techniques-
P. Rogalla 2000-10-13
Virtual endoscopy is a valuable independent diagnostic tool of increasing importance. This book provides an in-depth evaluation of the technical aspects of virtual endoscopy, and details information on indications, implementation, and interpretation in a clinical setting. It is designed to support radiologists and educators in approaching this rapidly developing field. It will also assist consumers in judging the applicability of software and hardware packages for virtual endoscopy, and will benefit producers by highlighting current limitations and potential improvements from a clinical viewpoint.

Virtual Endoscopy and 3D Reconstruction in the Airways-
Nabil A. Shallik 2019-11-20
This book is unique in its approach, covering the impact of virtual endoscopy and 3D reconstruction on surgical modalities and perioperative airway options. Airway management is an essential skill that is practiced daily by almost all anesthetists across the world. Most of the anesthesia-related morbidities and mortalities in the perioperative period are associated with respiratory complications, either of airway or pulmonary problems. Thus, the prediction of airway complications in perioperative period has been an active research field for many decades and is a cornerstone of perioperative anesthesia assessment and management. Virtual endoscopy & 3D reconstruction is a novel, reliable and non-invasive airway assessment tool that is able to reconstruct simple CT images to provide a clear view of the airway down to the bronchial trees, and offers the highest possible sensitivity, comparable with fiberoptic endoscopic pictures. This revolutionary tool avoids the hazards of invasive airway assessment by fiber-optic bronchoscopy, like bleeding from airway masses, sedation induced airway collapse and other complications. This book is a valuable resource for anesthesiologists, intensivists, surgeons, radiologists, otolaryngologists, medical students as well as residents in training.

Special Section on Virtual Endoscopy-Jerome Zhengrong Liang 2004

Cinematic Virtual Endoscopy-2016

Virtual Endoscopy

Didier Butiau 2014-10-02
Virtual endoscopy progressively enters the real world. The development of virtual reality is one of the most striking features of our Western societies. Besides chess games and movies, its scope has expanded to medical imaging through 3D CT scan surface or volume reconstructions. Whatever the site clinicians are able to perform real endoscopy (RE), radiologists can now also provide virtual endoscopy (VE) images. VE enters our medical practice. The next question is to weigh the pros and cons. VE has the unique advantage to offer high-quality images obtained through a noninvasive and well-tolerated procedure performed in outpatients. Compared to RE, it carries no risk of bleeding, perforation or trans mission of viruses. Importantly, VE can pass high-grade stenoses affecting large bowel, urinary tract or tracheobronchial tree, and visualize areas hard to visit by optic fibers such as intracranial regions. 3D VE images can be commented with patients, and this might reduce potential misunderstanding and its medico-legal consequences. Last but not least, VE is the sole alternative offered both to those who refuse RE, and to severely ill elderly patients. Then, should we consider VE as the Deus ex machina of modern medical imaging - with CT scan as rna china - ? Clearly, the answer is no, given VE knows several limits and pitfalls. One of the most important me rits of this book is to discuss honestly these aspects. First, VE will never allow to perform biopsies or resections.

Visualizazion Techniques for Virtual Endoscopy-Anna Vilanova i Bartrolí 2001

Handbook of Medical Image Processing and Analysis-Issac Bankman 2008-12-24
The Handbook of Medical Image Processing and Analysis is a comprehensive compilation of concepts and techniques used for processing and analyzing medical images after they have been acquired or digitized. The Handbook is organized into six sections that relate to the main functions: enhancement, segmentation, quantification, registration, visualization, and compression, storage and communication. The second edition is extensively revised and updated throughout, reflecting new technology and research, and includes new chapters on: higher order statistics for tissue segmentation; tumor growth modeling in oncological image analysis; analysis of cell nuclear features in fluoresce microscopy images; imaging and communication in medical and public health informatics; and dynamic mammogram retrieval from web-based image libraries. For those looking to explore advanced concepts and access essential information, this second edition of Handbook of Medical Image Processing and Analysis is an invaluable resource. It remains the most comprehensive single volume reference for biomedical engineers, researchers, professionals and those working in medical imaging and medical image processing. Dr. Isaac N. Bankman is the supervisor of a group that specializes on imaging, laser and sensor systems, modeling, algorithms and testing at the Johns Hopkins University Applied Physics Laboratory. He received his BSc degree in Electrical Engineering from Bogazici University, Turkey, in 1977, the MSc degree in Electronics from University of Wales, Britain, in 1979, and a PhD in Biomedical Engineering from the Israel Institute of Technology, Israel, in 1985. He is a member of SPIE. Includes contributions from internationally renowned authors from leading institutions. Additionally, five new chapters have been added on important topics including Nonlinear 3D Boundary Detection, Adaptive Algorithms for Cancer Cytological Diagnosis, Dynamic Mammogram Retrieval from Web-Based Image Libraries, Imaging and Communication in Health Informatics and Tumor Growth Modeling in Oncological Image Analysis. Provides a complete collection of algorithms in computer processing of medical images. Contains over 60 pages of stunning, four-color images

Advances in Endoscopic Surgery-Cornel Iancu 2011-11-25
Surgeons from various domains have become fascinated by endoscopy with its very low complications rates, high diagnostic yields and the possibility to perform a large variety of therapeutic procedures. Therefore during the last 30 years, the number and diversity of surgical endoscopic procedures has advanced with many new methods for both diagnoses and treatment, and these achievements are presented in this book. Contributing to the development of endoscopic surgery from all over the world, this is a modern, educational, and engaging publication presenting most the recent development in the field. New technologies are described in detail and all aspects of both standard and advanced endoscopic maneuvers applied in gastroenterology, urogynecology, otolaryngology, pediatrics and neurology are presented. The intended audience for this book includes...
surgeons from various specialties, radiologists, internists, and subspecialists.

Coloring voxel-based objects for virtual endoscopy applications-1999

3D Image Processing-D. Caramella 2012-12-06 Few fields have witnessed such impressive advances as the application of computer technology to radiology. The progress achieved has revolutionized diagnosis and greatly facilitated treatment selection and accurate planning of procedures. This book, written by leading experts from many different countries, provides a comprehensive and up-to-date overview of the role of 3D image processing. The first section covers a wide range of technical aspects in an informative way. This is followed by the main section, in which the principal clinical applications are described and discussed in depth. To complete the picture, the final section focuses on recent developments in functional imaging and computer-aided surgery. This book will prove invaluable to all who have an interest in this complex but vitally important field.

Visualization in Medicine-Bernhard Preim 2007-06-21 Visualization in Medicine is the first book on visualization and its application to problems in medical diagnosis, education, and treatment. The book describes the algorithms, the applications and their validation (how reliable are the results?), and the clinical evaluation of the applications (are the techniques useful?). It discusses visualization techniques from research literature as well as the compromises required to solve practical clinical problems. The book covers image acquisition, image analysis, and interaction techniques designed to explore and analyze the data. The final chapter shows how visualization is used for planning liver surgery, one of the most demanding surgical disciplines. The book is based on several years of the authors' teaching and research experience. Both authors have initiated and lead a variety of interdisciplinary projects involving computer scientists and medical doctors, primarily radiologists and surgeons. * A core field of visualization and graphics missing a dedicated book until now * Written by pioneers in the field and illustrated in full color * Covers theory as well as practice

Advances in Endoscopic Surgery-Cornel Iancu 2011-11-25 Surgeons from various domains have become fascinated by endoscopy with its very low complications rates, high diagnostic yields and the possibility to perform a large variety of therapeutic procedures. Therefore during the last 30 years, the number and diversity of surgical endoscopic procedures has advanced with many new methods for both diagnoses and treatment, and these achievements are presented in this book. Contributing to the development of endoscopic surgery from all over the world, this is a modern, educational, and engaging publication precisely presenting the most recent development in the field. New technologies are described in detail and all aspects of both standard and advanced endoscopic maneuvers applied in gastroenterology, urogynecology, otolaryngology, pediatrics and neurology are presented. The intended audience for this book includes surgeons from various specialties, radiologists, internists, and subspecialists.

Visual Computing for Medicine-Bernhard Preim 2013-11-07 Visual Computing for Medicine, Second Edition, offers cutting-edge visualization techniques and their applications in medical diagnosis, education, and treatment. The book includes algorithms, applications, and ideas on achieving reliability of results and clinical evaluation of the techniques covered. Preim and Botha illustrate visualization techniques from research, but also cover the information required to solve practical clinical problems. They base the book on several years of combined teaching and research experience. This new edition includes six new chapters on treatment planning, guidance and training; an updated appendix on software support for visual computing for medicine; and a new global structure that better classifies and explains the major lines of work in the field. Complete guide to visual computing in medicine, fully revamped and updated with new developments in the field illustrated in full color. Includes a companion website offering additional content for professors, source code, algorithms, tutorials, videos, exercises, lessons, and more

Computer Aided Diagnosis for Virtual Endoscopy-Wei Hong (Ph.D.) 2007

Head & Neck Surgery–otolaryngology-Byron J. Bailey 2006 Newly revised and updated, this comprehensive, easy-to-use two-volume otolaryngology text is now in its Fourth Edition. More than 30 new chapters are included that reflect advances in the field, such as outcomes and evidence-based medicine, surgical management of nasal valve collapse and choanal atresia, immunology and allergy, allergic and non-allergic rhinitis, complications of rhinosinusitis, management of dysphagia, radiographic examination of the upper aerodigestive tract, endoscopic evaluation of the upper aerodigestive tract, cosmetic uses of Botox, and more. Coverage includes both adult and pediatric otolaryngology. All chapters are written by distinguished world-renowned authorities and contain summary highlights, boxes, summary tables, and end-of-chapter reviews. More than 2,500 illustrations complement the text.

An Interactive Virtual Endoscopy Tool with Automotive Path Generation- Delphine Nain 2002

Image Processing in Radiology-Amaneule Neri 2007-12-31 This book, written by leading experts from many countries, provides a comprehensive and up-to-date description of how to use 2D and 3D processing tools in clinical radiology. The opening section covers a wide range of technical aspects. In the main section, the principal clinical applications are described and discussed in depth. A third section focuses on a variety of special topics. This book will be invaluable to radiologists of any subspecialty.

Fundamentals of Virtual Colonoscopy-Abraham H. Dachman 2006-01-27 - ‘Big’ book has sold close to 1400 in just over a year and is maintaining high rate of sale. - This practical handbook fully explains the essentials of this state-of-the-art technique to radiologists, gastroenterologists, radiology residents, and technologists. - Makes the key chapters of the big book accessible and affordable to the resident.

Multidetector-Row CT Angiography-Roberto Passariello 2006-03-30 Multidetector-row CT has dramatically improved the results of computed tomography in all clinical applications, but its limitations have also been most striking in vascular imaging. The simplicity of acquisition and the wide availability of equipment make this modality especially suitable for routine clinical application. In this book the basic aspects of multidetector-row CT angiography are comprehensively reviewed. Individual chapters are included on technical principles, image processing techniques and contrast agent administration. All clinical applications are then discussed in depth, with lucid descriptions of the examination technique for particular clinical indications and of the findings that characterize specific diseases. Limitations and advantages in comparison with other imaging modalities are considered. A large number of high-quality black and white and color illustrations help to explain the clinical findings.

Radiology of the Petrous Bone-Marc Lemmerling 2012-12-06 A complete overview of the imaging of the normal and diseased petrous bone. After an introduction describing the anatomy of the area, subsequent chapters address the various diseases and conditions affecting the petrous bone that are encountered in daily practice. At the beginning of each of these chapters an otologist explains what is expected of the radiologist. The various classic imaging methods are described and discussed in detail, and individual chapters are included on newer techniques such as functional imaging and virtual imaging. Imaging findings are documented with the aid of numerous informative high-quality illustrations. This book, with its straightforward structure based essentially on topography, will prove of immense value in daily practice.

Medical Informatics: A Primer-Bansal Mohan 2002-12-01

Coronary Graft Failure-Ion C. Tintoiu 2016-03-24 Coronary artery bypass surgery has been developed since 1960s to overcome proximal coronary artery disease. Worldwide, the number of patients that are undergoing coronary artery bypass surgery is steadily increasing. Depending on diverse risk factors, one fifth of grafts are occluded at 1 year. For the remaining, graft patency last usually 8–15 years. This book brings together the main specialists in the field to review the current evidence on epidemiology, pathophysiology, diagnostic, new imaging techniques and specific therapeutic modalities. This volume aims to update a complex subject represented by coronary graft failure. The authors of this monograph are interventional cardiologists, cardiovascular surgeons and research scientists, who will be creating four parts and 71 chapters that are divided in order to give a uniform interpretation of this condition including all aspects of coronary graft failure. This book not only provides the most up-to-dated scientific evidence in the field but in a two-step manner. Each chapter
is divided into a at a glance part that reflects the basic evidence on the topic, and a “full picture” part that brings all what the advanced reader should be brought with.

World Congress of Medical Physics and Biomedical Engineering 2006-Sun I. Kim 2007-05-07 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.


Abdominal Imaging E-Book-Dushyant V Sahni 2010-10-29 Abdominal Imaging, a title in the Expert Radiology Series, edited by Drs. Dushyant Sahni and Arthi Pillai, is a comprehensive, updated introduction to the imaging of the abdomen in both GI and GU radiology. It is richly illustrated and provides practical, guidance and advice to help you overcome the full range of diagnostic, therapeutic, and interventional challenges in abdominal imaging and combines an image-rich, easy-to-use format with the greater depth that experienced practitioners need. The best imaging approaches and effectively interpret your findings by comparing them to thousands of images that represent every modality and every type of abdominal imaging. Find detailed, expert guidance on all diagnostic, therapeutic, and interventional aspects of abdominal imaging in one authoritative source, including challenging topics such as Oncologic Assessment of Tumor Response and How to Scan a Difficult Patient. Efficiently locate the information you need with a highly templated, well-organized, at-a-glance organization.

Computational Science and Its Applications - ICCSA 2011-Beniamino Murgante 2011-06-17 The five-volume set LNCS 6782 - 6786 constitutes the refereed proceedings of the International Conference on Computational Science and Its Applications, ICCSA 2011, held in Santander, Spain, in June 2011. The five volumes contain papers presenting a wealth of original research results in the field of computational science, from foundational issues in computer science and mathematics to advanced applications in virtually all sciences making use of computational techniques. The topics of the fully refereed papers are structured according to the five major conference themes: geographical analysis, urban modeling, spatial statistics; cities, technologies and planning; computational geometry and applications; computer aided modeling, simulation, and analysis; and mobile communications.

Transactions on Edutainment III-Maiga Chang 2010-01-07 With great pleasure we would like to present the third volume of the journal Transitions on Edutainment. This journal, part of the Springer series Lecture Notes in Computer Science, is devoted to research and development in the field of edutainment. Edutainment, also known as educational entertainment or entertainment-education, denotes all forms of entertainment designed to educate as well as to provide fun. This approach is motivated by the growing demands on individuals for life-long learning and the need to integrate effective learning opportunities throughout life. As such, edutainment has attracted increasing interest in the last few years. The first 12 articles of this issue represent a selection of outstanding contributions from Edutainment 2009, the 4th International Conference on E-Learning and Games held in Canada, in August 2009. The main purpose of the Edutainment conferences is the discussion, presentation, and information exchange of scientific and technological developments in the new community. These 12 papers cover mainly the topic of using games to stimulate learners’ learning motivation, i. e.

Computer Graphics International- 2000 This volume contains the proceedings of Computer Graphics International 2000 (CGI 2000). Topics covered by individual papers include: animation; natural phenomena; meshing and modelling; multimedia and motion capturing; simulation; rendering; and augmented and virtual reality.

3D Multiscale Physiological Human-Nadia Magnenat-Thalmann 2013-12-23 3D Multiscale Physiological Human aims to promote scientific exchange by bringing together overviews and examples of recent scientific and technological advancements across a wide range of disciplines. As a result, the variety in methodologies and knowledge paradigms are contrasted, revealing potential gaps and opportunities for integration. Chapters have been contributed by selected authors in the relevant domains of tissue engineering, medical image acquisition and processing, visualization, modeling, computer aided diagnosis and knowledge management. The multi-scale and multi-disciplinary research aspects of articulations in humans are highlighted, with a particular emphasis on medical diagnosis and treatment of musculoskeletal diseases and related disorders. The need for multi-scale modalities and multi-disciplinary research is an emerging paradigm in the search for a better biological and medical understanding of the human musculoskeletal system. This is particularly motivated by the increasing socio-economic burden of disability and musculoskeletal diseases, especially in the increasing population of elderly people. Human movement is generated through a complex web of interactions between embedded physiological systems on different spatiotemporal scales, ranging from the molecular to the organ level. Much research is dedicated to the understanding of each of these systems, using methods and modalities tailored for each scale. Nevertheless, combining knowledge from different perspectives opens new venues of scientific thinking and stimulates innovation. Integration of this mosaic of multifaceted data across multiple scales and modalities requires further exploration of methods in simulations and visualization to obtain a comprehensive synthesis. However, this integrative approach cannot be achieved without a broad appreciation for the multiple research disciplines involved.

Handbook of Medical Imaging - 2000-10-09 In recent years, the remarkable advances in medical imaging instruments have increased their use considerably for diagnostics as well as planning and follow-up of treatment. Emerging from the fields of radiology, medical physics and engineering, medical imaging no longer simply deals with the technology and interpretation of radiographic images. The limitless possibilities presented by computer science and technology, coupled with engineering advances in signal processing, optics and nuclear medicine have created the vastly expanded field of medical imaging. The Handbook of Medical Imaging is the first comprehensive compilation of the concepts and techniques used to analyze and manipulate medical images after they have been generated or digitized. The Handbook is organized in six sections that relate to the main functions needed for processing, enhancement, segmentation, quantification, registration, visualization as well as compression storage and telemedicine. * Internationally renowned authors (Johns Hopkins, Harvard, UCLA, Yale, Columbia, UCSF) * Includes imaging and visualization * Contains over 60 pages of stunning, four-color images

Urological Oncology-Vinod H. Nargund 2015-01-17 As a professional resource for all doctors, oncologists and urologists involved in the care of uro-oncology patients, this book puts emphasis on developing advanced practice with in-depth discussions to support evidence based, patient focused care. Urological Oncology, Second Edition offers an updated multi-disciplinary and multi professional approach to the assessment, diagnosis, treatment and follow-up care of patients being investigated and treated for urological malignancies. Mainly aimed at oncologists and urologists, it is also useful for general physicians as well as trainee nurses and nurse practitioners in urology / urological oncology.

Successful Training in Gastrointestinal Endoscopy-Jonathan Cohen 2011-04-08 Endoscopy is the primary diagnostic method for GI complaints and is replete with an ever expanding array of therapeutic capabilities. Successful Training in Gastrointestinal Endoscopy will provide all gastroenterologists with the exact set of skills required to perform endoscopy at the highest level. GI trainees will find it a crucial primer for learning endoscopy; teachers will find it a guide to understand how best to develop the expertise of their students; and experienced practicing gastroenterologists will find it a useful refresher tool to brush up on their existing endoscopic skills and to familiarise themselves with new procedures, including the development of new diagnostic tests and treatment procedures. With contributions from internationally recognized leaders in endoscopy education and an endorsement by the World Organisation of Digestive Endoscopy, each chapter will examine the specific skill sets and procedure related tasks which must be mastered when learning a particular
technique, including: Specific descriptions of accessories required Standard training methods for the procedure Optimal utilization of novel learning modalities such as simulators Quality measures and objective parameters for competency Available tools for assessing competency once training has been completed In addition to the 400 high-quality, outstanding colour photos, the book will come with a DVD containing over 130 annotated teaching videos of both actual procedures and ex-vivo animal model simulations. These videos will illustrate, in a step by step fashion the proper techniques to be followed, highlighting clinical pearls from the experts and the most common mistakes to avoid. Successful Training in Gastrointestinal Endoscopy will be a key purchase for all gastroenterologists, whether in training or experienced, to allow them to develop and perfect their endoscopic skills. It will be a particularly useful guide for those interested in mastering the latest new techniques and procedures and an essential reference for teachers of endoscopy and students alike. Note: DVD and other supplementary materials are not included as part of eBook file. These materials are available for download upon purchase.

Intelligent Systems - Cornelius T. Leondes 2018-10-08
Intelligent systems, or artificial intelligence technologies, are playing an increasing role in areas ranging from medicine to the major manufacturing industries to financial markets. The consequences of flawed artificial intelligence systems are equally wide ranging and can be seen, for example, in the programmed trading-driven stock market crash of October 19, 1987. Intelligent Systems: Technology and Applications, Six Volume Set connects theory with proven practical applications to provide broad, multidisciplinary coverage in a single resource. In these volumes, international experts present case-study examples of successful practical techniques and solutions for diverse applications ranging from robotic systems to speech and signal processing, database management, and manufacturing.

The four-volume set LNCS 2657, LNCS 2658, LNCS 2659, and LNCS 2660 constitutes the refereed proceedings of the Third International Conference on Computational Science, ICCS 2003, held concurrently in Melbourne, Australia and in St. Petersburg, Russia in June 2003. The four volumes present more than 460 reviewed contributed and invited papers and span the whole range of computational science, from foundational issues in computer science and algorithmic mathematics to advanced applications in virtually all application fields making use of computational techniques. These proceedings give a unique account of recent results in the field.

Endoscopic Endonasal Transsphenoidal Surgery - Enrico de Divitiis 2012-12-06
Currently, surgical management provides the definitive treatment of choice for most pituitary adenomas, craniopharyngiomas and meningiomas of the sellar region. The elegant minimally invasive transnasal endoscopic approach to the sella turcica and the anterior skull base has added a new dimension of versatility to pituitary surgery and can be adapted to many lesions in the region. In this multi-author book with numerous color illustrations the main aspects of the endonasal endoscopic approach to the skull base are presented, starting with a clear description of the endoscopic anatomy, the panoramic view afforded by the endoscope and the development of effective instruments and adjuncts. After the diagnostic studies, the strictly surgical features are considered in detail. The standard technique is described and particular aspects are treated, including the new extended approaches to the cavernous sinus, spheno-ethmoid planum and clival regions.

Clinical Atlas of CT Virtual Hysterosalpingography - Patricia Carrascosa