
Microsurgery Advances Simulations And Application

Simulation In Anesthesia E-Book

Practical Simulation in Urology

Engineering Design Applications V

Advances in Artificial Intelligence, Robotics, Augmented and Virtual Reality in
Neurosurgery

Handbook of Virtual Environments

Core Techniques in Flap Reconstructive Microsurgery

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Plastic and Reconstructive Surgery

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Modeling, Synthesis and Fracture of Advanced Materials for Industrial and Medical Applications

Advanced Materials Modelling for Mechanical, Medical and Biological Applications

Microsurgery

Surgical and Medical Management of Male Infertility

Microsurgery

Microsurgery: Global Perspectives, An Update, An Issue of Clinics in Plastic Surgery

Robotic Surgery

Emerging Advancements for Virtual and Augmented Reality in Healthcare

Advanced Robotics

Practice Manual for Microvascular Surgery

Advanced Mobile Robotics
Advances in Oral and Maxillofacial Surgery
Comprehensive Healthcare Simulation: Surgery and Surgical Subspecialties
Handbook of Composites from Renewable Materials, Biodegradable Materials
New Developments in Computer Technology
3D Printing: Application in Medical Surgery Volume 2 E-Book
NASA Tech Briefs
Encyclopedia Of Medical Robotics, The (In 4 Volumes)
Surgical Education and Training in Pakistan

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Simulations And
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FULLER SAIGE

Simulation In Anesthesia E-Book Elsevier
Health Sciences

This book explains, using the example of endovascular intervention, the development of in vitro simulators for biomedical applications based on the

scientific context in the robotics area and the explanation of the medical procedure to be simulated. It presents modeling methods for in vitro representation of human tissue and for representing tissue integrity during endovascular surgery simulation. Additionally, applications of this in vitro vasculature modeling technology are presented: flow control for human blood

pressure simulation, computer fluid dynamics simulations using vasculature morphology, catheter insertion robot control and vasculature imaging based on magnetic trackers, and tailor-made scaffolds for blood vessel regeneration.

Practical Simulation in Urology CRC Press

This book gives an update on recent developments in different engineering disciplines such as mechanical, materials, computer and process engineering, focusing on modern engineering design applications. These disciplines provide the foundation for the design and development of improved structures, materials and processes. The modern design cycle is characterized by an interaction of different disciplines and a strong shift to computer-based

approaches where only a few experiments are performed for verification purposes. A major driver for this development is the increased demand for cost reduction, which is also connected to environmental demands. In the transportation industry (e.g., automotive), this is connected to the demand for higher fuel efficiency, which is related to the operational costs and the lower harm for the environment. One way to fulfill such requirements is lighter structures and/or improved processes for energy conversion. Another emerging area is the interaction of classical engineering with the health, medical and environmental sector. The chapters are selected contributions of the Advanced Computational Engineering and Experimenting conference, held in July

2022 in Florence, Italy.

Engineering Design Applications V

Springer Nature

Following up his best-selling Board Stiff TEE & Too manuals for the oral boards in anesthesiology, Dr. Gallagher has produced a step-by-step how-to guide on conducting an anesthesia simulation. Topics include which equipment to use as well as suggestions for simulation scenarios that will help train your staff with a theoretical basis for handling even the most unexpected complications. This simulation guide with video clips helps to close the gaps that may result when abnormal situations are not recognized quickly enough or the response to them is haphazard and slow. The result is a highly effective, enjoyable, and affordable tool on this

increasingly important way to ensure resources are being managed effectively. Concise and complete guide to all the issues relevant to anesthesia simulation Rich in clinical scenarios and models Experiences from state-of-the-art simulation center Employs latest CPR and other practice guidelines *Advances in Artificial Intelligence, Robotics, Augmented and Virtual Reality in Neurosurgery* CRC Press *Advanced Methods in Biomedical Signal Processing and Analysis* presents state-of-the-art methods in biosignal processing, including recurrence quantification analysis, heart rate variability, analysis of the RRI time-series signals, joint time-frequency analyses, wavelet transforms and wavelet packet decomposition, empirical

mode decomposition, modeling of biosignals, Gabor Transform, empirical mode decomposition. The book also gives an understanding of feature extraction, feature ranking, and feature selection methods, while also demonstrating how to apply artificial intelligence and machine learning to biosignal techniques. Gives advanced methods in signal processing Includes machine and deep learning methods Presents experimental case studies
Handbook of Virtual Environments
 Springer Nature
 New technologies in 3D printing offer innovative capabilities in surgery, from planning complex operations to providing alternatives to traditional training with more cost-effective outcomes. In 3D Printing: Application in

Medical Surgery, Volume 2, Drs. Vasileios N. Papadopoulos, Vassilios Tsioukas, and Jasjit S. Suri bring together up-to-date information on 3D printing and its application in surgical specialties such as hepatobiliary and pancreatic surgery, vascular surgery, orthopedic surgery, obstetrics and gynecology, cardiovascular and thoracic surgery, and more. Discusses challenges and opportunities of 3D printing in the field of surgery. Covers 3D printing and its application in major surgical subspecialties, as well as dentistry, transplantation, global surgery, and diagnostic and interventional radiology. Consolidates today's available information on this burgeoning topic into a single convenient resource.
Core Techniques in Flap Reconstructive

Microsurgery Springer

This book explains, using the example of endovascular intervention, the development of in vitro simulators for biomedical applications based on the scientific context in the robotics area and the explanation of the medical procedure to be simulated. It presents modeling methods for in vitro representation of human tissue and for representing tissue integrity during endovascular surgery simulation. Additionally, applications of this in vitro vasculature modeling technology are presented: flow control for human blood pressure simulation, computer fluid dynamics simulations using vasculature morphology, catheter insertion robot control and vasculature imaging based on magnetic trackers, and tailor-made

scaffolds for blood vessel regeneration.

Technological Advancements in Biomedicine for Healthcare Applications
Elsevier Health Sciences

This book covers the history of starting a new surgical training program in Pakistan, detailing the induction of residents and the attributes and considering how to impart education and surgical skills in a graduated manner. It also details the current evaluation processes used and how to develop professional and ethical attributes in a surgical trainee. In addition to providing insights into career counseling and the rights of trainees, the book offers monologues from renowned practitioners in the field about their own personal journeys.

Brain Anatomy and Neurosurgical

Approaches Springer

This strategic book joins the classical brain anatomy to the challenges of neurosurgery approaches. Its thirty illustrated chapters connect basic concepts to the specialists experience in the operating room. They also provide didactic tips and tricks for accessing the brain into to the surface, cisterns, central core, ventricles and skull base. The Brain Anatomy and Neurosurgical Approaches is focused on neurosurgeons in training and those who need updated information and technical tips on how to deal with neurosurgical patients, as well as with anatomical challenges in real surgeries. Neurosurgeons, residents and students will have a helpful source of study and research.

Principles, Techniques and

Applications in Microsurgery MDPI

Robots able to imitate human beings have been at the core of stories of science-fiction as well as dreams of inventors for a long time. Among the various skills that Mother Nature has provided us with and that often go forgotten, the ability of sight is certainly one of the most important. Perhaps inspired by tales of Isaac Asimov, comics and cartoons, and surely helped by the progress of electronics in recent decades, researchers have progressively made the dream of creating robots able to move and operate by exploiting artificial vision a concrete reality. Technically speaking, we would say that these robots position themselves and their end-effectors by using the view provided by some artificial eyes as feedback

information. Indeed, the artificial eyes are visual sensors such as cameras that have the function to acquire an image of the environment. Such an image describes if and how the robot is moving toward the goal and hence constitutes feedback information. This procedure is known in robotics with the term visual servoing, and it is nothing else than an imitation of the intrinsic mechanism that allows human beings to realize daily tasks such as reaching the door of the house or grasping a cup of coffee.

Advanced Methods in Biomedical Signal Processing and Analysis John Wiley & Sons

The Handbook of Composites From Renewable Materials comprises a set of 8 individual volumes that brings an interdisciplinary perspective to

accomplish a more detailed understanding of the interplay between the synthesis, structure, characterization, processing, applications and performance of these advanced materials. The handbook covers a multitude of natural polymers/ reinforcement/ fillers and biodegradable materials. Together, the 8 volumes total at least 5000 pages and offers a unique publication. This 5th volume Handbook is solely focused on Biodegradable Materials. Some of the important topics include but not limited to: Rice husk and its composites; biodegradable composites based on thermoplastic starch and talc nanoparticles; recent progress in biocomposites of biodegradable polymer; microbial polyesters: production and market;

biodegradable and bio absorbable materials for osteosynthesis applications; biodegradable polymers in tissue engineering; composites based on hydroxyapatite and biodegradable polylactide; biodegradable composites; development of membranes from bio-based materials and their applications; green biodegradable composites based on natural fibers; fully biodegradable all-cellulose composites; natural fiber composites with bio-derivative and/or degradable polymers; synthetic biodegradable polymers for bone tissue engineering; polysaccharides as green biodegradable platforms for building-up electroactive composite materials; biodegradable polymer blends and composites from seaweeds; biocomposites scaffolds derived from

renewable resources for bone tissue repair ; pectin-based composites; recent advances in conductive composites based on biodegradable polymers for regenerative medicine applications; biosynthesis of PHAs and their biomedical applications; biodegradable soy protein isolate/poly (vinyl alcohol) packaging films and biodegradability of bio-based polymeric materials in natural environment.

Control Systems Design of Bio-Robotics and Bio-Mechatronics with Advanced Applications CRC Press

The book is devoted to the 70th birthday of Prof. Sergey M. Aizikovich, which will celebrated on August 2nd 2021. His scientific interests are related to the following topics: Mechanics of contact interactions, Functionally graded

materials, Mechanics of fracture, Integral equations of mathematical physics, Inverse problems of the theory of elasticity, and Applications of elasticity to biological and medical problems of mechanics of materials. The papers, collected in the book, are contributions of authors from 10 countries.

Advanced Infrastructures for Future Healthcare Springer Nature

This book describes the current state of robotics in plastic and reconstructive surgery. It examines existing clinical applications, emerging and future applications and evolving technological platforms. Concise yet comprehensive, this book is organized into four sections. It begins with an introduction to robotic microsurgical training and robotic skills assessment, including crowd-sourced

evaluation in surgery. Section two explores a variety of robotic clinical application, including robotic breast reconstruction, robotic mastectomy, robotic cleft palate surgery and robotic microsurgery in a urologic private practice. Following this, section three addresses the opportunities and challenges an interested surgeon might face when considering incorporating this technology into their practice. To close, the final section discusses new microsurgical robotic platforms and the potential directions this technology may take in the future. Supplemented with high quality videos and images, Robotics in Plastic and Reconstructive Surgery is an invaluable resource for both plastic surgeons and multi-specialty microsurgeons.

Microsurgery Manual for Medical Students and Residents Springer Nature
The Encyclopedia of Medical Robotics combines contributions in four distinct areas of Medical robotics, namely: Minimally Invasive Surgical Robotics, Micro and Nano Robotics in Medicine, Image-guided Surgical Procedures and Interventions, and Rehabilitation Robotics. The volume on Minimally Invasive Surgical Robotics focuses on robotic technologies geared towards challenges and opportunities in minimally invasive surgery and the research, design, implementation and clinical use of minimally invasive robotic systems. The volume on Micro and Nano robotics in Medicine is dedicated to research activities in an area of emerging interdisciplinary technology

that is raising new scientific challenges and promising revolutionary advancement in applications such as medicine and biology. The size and range of these systems are at or below the micrometer scale and comprise assemblies of micro and nanoscale components. The volume on Image-guided Surgical Procedures and Interventions focuses primarily on the use of image guidance during surgical procedures and the challenges posed by various imaging environments and how they related to the design and development of robotic systems as well as their clinical applications. This volume also has significant contributions from the clinical viewpoint on some of the challenges in the domain of image-guided interventions. Finally, the volume

on Rehabilitation Robotics is dedicated to the state-of-the-art of an emerging interdisciplinary field where robotics, sensors, and feedback are used in novel ways to re-learn, improve, or restore functional movements in humans. Volume 1, Minimally Invasive Surgical Robotics, focuses on an area of robotic applications that was established in the late 1990s, after the first robotics-assisted minimally invasive surgical procedure. This area has since received significant attention from industry and researchers. The teleoperated and ergonomic features of these robotic systems for minimally invasive surgery (MIS) have been able to reduce or eliminate most of the drawbacks of conventional (laparoscopic) MIS. Robotics-assisted MIS procedures have

been conducted on over 3 million patients to date — primarily in the areas of urology, gynecology and general surgery using the FDA approved da Vinci® surgical system. The significant commercial and clinical success of the da Vinci® system has resulted in substantial research activity in recent years to reduce invasiveness, increase dexterity, provide additional features such as image guidance and haptic feedback, reduce size and cost, increase portability, and address specific clinical procedures. The area of robotic MIS is therefore in a state of rapid growth fueled by new developments in technologies such as continuum robotics, smart materials, sensing and actuation, and haptics and teleoperation. An important need arising from the

incorporation of robotic technology for surgery is that of training in the appropriate use of the technology, and in the assessment of acquired skills. This volume covers the topics mentioned above in four sections. The first section gives an overview of the evolution and current state the da Vinci® system and clinical perspectives from three groups who use it on a regular basis. The second focuses on the research, and describes a number of new developments in surgical robotics that are likely to be the basis for the next generation of robotic MIS systems. The third deals with two important aspects of surgical robotic systems — teleoperation and haptics (the sense of touch). Technology for implementing the latter in a clinical setting is still very much at

the research stage. The fourth section focuses on surgical training and skills assessment necessitated by the novelty and complexity of the technologies involved and the need to provide reliable and efficient training and objective assessment in the use of robotic MIS systems. In Volume 2, *Micro and Nano Robotics in Medicine*, a brief historical overview of the field of medical nanorobotics as well as the state-of-the-art in the field is presented in the introductory chapter. It covers the various types of nanorobotic systems, their applications and future directions in this field. The volume is divided into three themes related to medical applications. The first theme describes the main challenges of microrobotic design for propulsion in vascular media.

Such nanoscale robotic agents are envisioned to revolutionize medicine by enabling minimally invasive diagnostic and therapeutic procedures. To be useful, nanorobots must be operated in complex biological fluids and tissues, which are often difficult to penetrate. In this section, a collection of four papers review the potential medical applications of motile nanorobots, catalytic-based propelling agents, biologically-inspired microrobots and nanoscale bacteria-enabled autonomous drug delivery systems. The second theme relates to the use of micro and nanorobots inside the body for drug-delivery and surgical applications. A collection of six chapters is presented in this segment. The first chapter reviews the different robot structures for three different types of

surgery, namely laparoscopy, catheterization, and ophthalmic surgery. It highlights the progress of surgical microrobotics toward intracorporeally navigated mechanisms for ultra-minimally invasive interventions. Then, the design of different magnetic actuation platforms used in micro and nanorobotics are described. An overview of magnetic actuation-based control methods for microrobots, with eventually biomedical applications, is also covered in this segment. The third theme discusses the various nanomanipulation strategies that are currently used in biomedicine for cell characterization, injection, fusion and engineering. In-vitro (3D) cell culture has received increasing attention since it has been discovered to provide a better simulation environment

of in-vivo cell growth. Nowadays, the rapid progress of robotic technology paves a new path for the highly controllable and flexible 3D cell assembly. One chapter in this segment discusses the applications of micro-nano robotic techniques for 3D cell culture using engineering approaches. Because cell fusion is important in numerous biological events and applications, such as tissue regeneration and cell reprogramming, a chapter on robotic-tweezers cell manipulation system to achieve precise laser-induced cell fusion using optical trapping has been included in this volume. Finally, the segment ends with a chapter on the use of novel MEMS-based characterization of micro-scale tissues instead of mechanical characterization for cell lines

studies. Volume 3, Image-guided Surgical Procedures and Interventions, focuses on several aspects ranging from understanding the challenges and opportunities in this domain, to imaging technologies, to image-guided robotic systems for clinical applications. The volume includes several contributions in the area of imaging in the areas of X-Ray fluoroscopy, CT, PET, MR Imaging, Ultrasound imaging, and optical coherence tomography. Ultrasound-based diagnostics and therapeutics as well as ultrasound-guided planning and navigation are also included in this volume in addition to multi-modal imaging techniques and its applications to surgery and various interventions. The application of multi-modal imaging and fusion in the area of prostate biopsy is

also covered. Imaging modality compatible robotic systems, sensors and actuator technologies for use in the MRI environment are also included in this work., as is the development of the framework incorporating image-guided modeling for surgery and intervention. Finally, there are several chapters in the clinical applications domain covering cochlear implant surgery, neurosurgery, breast biopsy, prostate cancer treatment, endovascular interventions, neurovascular interventions, robotic capsule endoscopy, and MRI-guided neurosurgical procedures and interventions. Volume 4, Rehabilitation Robotics, is dedicated to the state-of-the-art of an emerging interdisciplinary field where robotics, sensors, and feedback are used in novel ways to

relearn, improve, or restore functional movements in humans. This volume attempts to cover a number of topics relevant to the field. The first section addresses an important activity in our daily lives: walking, where the neuromuscular system orchestrates the gait, posture, and balance. Conditions such as stroke, vestibular deficits, or old age impair this important activity. Three chapters on robotic training, gait rehabilitation, and cooperative orthoses describe the current works in the field to address this issue. The second section covers the significant advances in and novel designs of soft actuators and wearable systems that have emerged in the area of prosthetic lower limbs and ankles in recent years, which offer potential for both rehabilitation and

human augmentation. These are described in two chapters. The next section addresses an important emphasis in the field of medicine today that strives to bring rehabilitation out from the clinic into the home environment, so that these medical aids are more readily available to users. The current state-of-the-art in this field is described in a chapter. The last section focuses on rehab devices for the pediatric population. Their impairments are life-long and rehabilitation robotics can have an even bigger impact during their lifespan. In recent years, a number of new developments have been made to promote mobility, socialization, and rehabilitation among the very young: the infants and toddlers. These aspects are summarized in two chapters of this

volume.

Plastic and Reconstructive Surgery World Scientific

A Complete Toolbox of Theories and Techniques The second edition of a bestseller, Handbook of Virtual Environments: Design, Implementation, and Applications presents systematic and extensive coverage of the primary areas of research and development within VE technology. It brings together a comprehensive set of contributed articles that address the principles required to define system requirements and design, build, evaluate, implement, and manage the effective use of VE applications. The contributors provide critical insights and principles associated with their given areas of expertise to provide extensive scope and detail on VE

technology and its applications. What's New in the Second Edition: Updated glossary of terms to promote common language throughout the community New chapters on olfactory perception, avatar control, motion sickness, and display design, as well as a whole host of new application areas Updated information to reflect the tremendous progress made over the last decade in applying VE technology to a growing number of domains This second edition includes nine new, as well as forty-one updated chapters that reflect the progress made in basic and applied research related to the creation, application, and evaluation of virtual environments. Contributions from leading researchers and practitioners from multidisciplinary domains provide a

wealth of theoretical and practical information, resulting in a complete toolbox of theories and techniques that you can rely on to develop more captivating and effective virtual worlds. The handbook supplies a valuable resource for advancing VE applications as you take them from the laboratory to the real-world lives of people everywhere.

Advanced Technologies in Designing and Progressive Development of Manufacturing Systems Springer Nature

This book gathers papers presented at the international workshop PMSDAM'19. The respective contributions offer valuable insights for researchers working on numerical solutions to advanced materials problems. The problems concerning the remineralization of teeth

are considered. Of particular interest are articles exploring topics at the interface of different disciplines.

Visual Servoing via Advanced Numerical Methods John Wiley & Sons

Plastic and reconstructive surgery continues to evolve as new techniques open up new possibilities for the surgeon. In this groundbreaking textbook, contemporary approaches are explained and demonstrated to allow trainee and experienced surgeons alike to understand and assimilate best practice. Containing over 300 outstanding color figures demonstrating surgical practice, an international cast of leading surgeons show the paths to effective plastic surgery technique and outcomes. They cover all the major bases including: Integument Pediatric

Plastic Surgery Head and Neck Reconstruction The Breast Trunk, Lower Limb and Sarcomas Upper Limb and Hand Surgery Aesthetic Surgery Comprehensive in scope, practical in nature, Plastic and Reconstructive Surgery is your one-stop guide to successful surgical management of your patients. "This textbook is aimed at the trainee and young plastic surgeon, but it is extremely comprehensive and sufficiently detailed for any practitioner. The information is succinct, yet complete and up to date. . . . For a single-volume book, the detailed knowledge presented is impressive. . . . I think this is a great book. It is packed with good and up-to-date information, and I think it will be an invaluable resource for trainees but also for all plastic surgeons. The editors are

to be congratulated on achieving a very difficult task with such success." —from a review by Peter C. Neligan, MB, in *Plastic and Reconstructive Surgery* "This is exactly what the editors of *Plastic and reconstructive surgery: Approaches and Techniques* set out to achieve in producing this excellent textbook. . . . It is truly an international effort at all levels, as the editors, from Australia (Ross D. Farhadieh), the UK (Neil W. Bulstrode) and Canada (Sabrina Cugno), have joined forces to recruit over 130 international contributors and produce a resource of over 1100 pages that provides a well-organized and thorough, yet succinct, text of the essentials of current plastic surgery. . . . Many of the contributors are world-renowned experts; however, there is also a new

generation of young rising stars whose contributions are equally good, providing a new, fresh and contemporary feel." —from the Foreword by Julian J. Pribaz, Professor of Surgery, Harvard Medical School "The authors here have concentrated all this useful information into their chapters in a quite outstanding manner. Any plastic surgeon of whatever maturity will find this an excellent purchase which he/she will have no reason to regret." —from a review by Douglas H. Harrison in *Journal of Plastic, Reconstructive & Aesthetic Surgery*
The Cranial Nerves in Neurology
Frontiers Media SA
Technology continues to play a major role in all aspects of society, particularly healthcare. Advancements such as biomedical image processing,

technology in rehabilitation, and biomedical robotics for healthcare have aided in significant strides in the biomedical engineering research field. Technological Advancements in Biomedicine for Healthcare Applications presents an overview of biomedical technologies and its relationship with healthcare applications. This reference source is essential for researchers and practitioners aiming to learn more about biomedical engineering and its related fields.

Recent advancements in modeling and simulations of ion channels CRC Press
Mobile robotics is a challenging field with great potential. It covers disciplines including electrical engineering, mechanical engineering, computer science, cognitive science, and social

science. It is essential to the design of automated robots, in combination with artificial intelligence, vision, and sensor technologies. Mobile robots are widely used for surveillance, guidance, transportation and entertainment tasks, as well as medical applications. This Special Issue intends to concentrate on recent developments concerning mobile robots and the research surrounding them to enhance studies on the fundamental problems observed in the robots. Various multidisciplinary approaches and integrative contributions including navigation, learning and adaptation, networked system, biologically inspired robots and cognitive methods are welcome contributions to this Special Issue, both from a research and an application perspective.

The Hip Joint Trans Tech Publications Ltd

Written by world-renowned experts, this textbook comprehensively covers the evaluation, treatment and prevention of male infertility.

Robotics in Plastic and Reconstructive Surgery Springer Nature

Within the last few years, devices that are increasingly capable of offering an immersive experience close to reality have emerged. As devices decrease in size, the interest and application possibilities for them increase. In the healthcare sector, there is an enormous potential for virtual reality development, as this technology allows, on the one hand, the execution of operations or processes at a distance, decoupling

realities; and on the other hand, it offers the possibility of simulation for training purposes, whenever there are contexts of risk to the patient or to the health professional. However, virtual reality devices and immersion in virtual environments still requires some improvement as complaints such as headaches and nausea are still common among users, and so continuous research and development is critical to progress the technology. Emerging Advancements for Virtual and Augmented Reality in Healthcare synthesizes the trends, best practices, methodologies, languages, and tools used to implement virtual reality and create a positive user experience while also discussing how to implement virtual reality into day-to-day work with a focus

on healthcare professionals and related areas. The application possibilities and their impact are transversal to all areas of health and fields such as education, training, surgery, pain management, physical rehabilitation, stroke rehabilitation, phobia therapy, and

telemedicine. Covering topics such as mental health treatment and virtual simulations, it is ideal for medical professionals, engineers, computer scientists, researchers, practitioners, managers, academicians, teachers, and students.