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Medical Instrument Design and Development - Claudio Becchetti 2013-05-20

This book explains all of the stages involved in developingmedical devices; from concept to medical approval including systemengineering, bioinstrumentation design, signal processing,electronics, software and ICT with Cloud and e-Healthdevelopment. Medical Instrument Design and Development offers a comprehensivetheoretical background with extensive use of diagrams, graphics andtables (around 400 throughout the book). The book explains how thetheory is translated into industrial medical products using amarket-sold Electrocardiograph disclosed in its design by the GammaCardio Soft manufacturer. The sequence of the chapters reflects the product developmentlifecycle. Each chapter is focused on a specific University courseand is divided into two sections: theory and implementation. Thetheory sections explain the main concepts and principles whichremain valid across technological evolutions of medicalinstrumentation. The Implementation sections show how the theory istranslated into a medical product. The Electrocardiograph(ECG or EKG) is used as an example as it is a suitable device toexplore to fully understand medical instrumentation since it issufficiently simple but encompasses all the main areas involved indeveloping medical electronic equipment. Key Features: Introduces a system-level approach to product design Covers topics such as bioinstrumentation, signal processing,information theory, electronics, software, firmware, telemedicine,e-Health and medical device certification Explains how to use theory to implement a market product (usingECG as an example) Examines the design and applications of main medicalinstruments Details the additional know-how required for productimplementation: business context, system design, projectmanagement, intellectual property rights, product life cycle,etc. Includes an accompanying website with the design of thecertified ECG product (ahref="http://www.gammacardiosoft.it/book"www.gammacardiosoft.it/book/a) Discloses the details of a marketed ECG Product (from GammaCardio Soft) compliant with the ANSI standard AAMI EC 11under open licenses (GNU GPL, Creative Common) This book is written for biomedical engineering courses(upper-level undergraduate and graduate students) and for engineersinterested in medical instrumentation/device design with acomprehensive and interdisciplinary system perspective.

ANSI/AAMI St79: Comprehensive Guide to Steam Sterilization and Sterility Assurance in Health Care Facilities - Aami 2013-10-01

The AAMI recommended practice, Comprehensive guide to steam sterilization and sterility assurance in health care facilities, is a breakthrough standard in terms of its scope. AAMI has updated ST79 with the release of ST79:2010/A4:2013. Of particular importance, A4:2013 provides four new figures demonstrating the wrapping of items for steam sterilization and adds an annex focused on Moisture

assessment. As of Oct. 25, 2013, purchasers of ST79 will receive ANSI/AAMI ST79:2010 and A1:2010 and A2:2011 and A3:2012 and A4:2014 as a single consolidated document. Among other changes from the 2006 edition of ST79, this revised and expanded second edition of ST79 includes guidance on the use and application of Class 6 emulating indicators, a chemical monitoring device fairly new to the United States. Because ST79 essentially consolidates five AAMI steam sterilization standards (whose content was reviewed and updated to reflect current good practice prior to being incorporated into ST79), it truly is a comprehensive guideline for all steam sterilization activities in healthcare facilities, regardless of the size of the sterilizer or the size of the facility, and provides a resource for all healthcare personnel who use steam for sterilization.

Advances in Human Factors and Ergonomics in Healthcare - Vincent G. Duffy 2016-07-26

This book discusses the latest advances in human factors and ergonomics, focusing on methods for improving quality, safety, efficiency, and effectiveness in patient care. By emphasizing the physical, cognitive and organizational aspects of human factors and ergonomics applications, it reports on various perspectives, including those of clinicians, patients, health organizations and insurance providers. The book describes cutting-edge applications, highlighting the best practices of staff interactions with patients, as well as interactions with computers and medical devices. It also presents new findings related to improved organizational outcomes in healthcare settings, and approaches to modeling and analysis specifically targeting those work aspects unique to healthcare. Based on the AHFE 2016 International Conference on Human Factors and Ergonomics in Healthcare, held on July 27-31, 2016, in Walt Disney World®, Florida, USA, the book is intended as timely reference guide for both researchers involved in the design of healthcare systems and devices and healthcare professionals aiming at effective and safe health service delivery. Moreover, by providing a useful survey of cutting-edge methods for improving organizational outcomes in healthcare settings, the book also represents an inspiring reading for healthcare counselors and international health organizations.

The Handbook of Cuffless Blood Pressure Monitoring - Josep Solà 2019-08-21

This book is the first comprehensive overview of the emerging field of cuffless blood pressure monitoring. Increasing clinical evidence proves that longitudinal measurements of blood pressure allow for earlier detection and better management of multiple medical conditions and for superior prediction of cardiovascular events. Unfortunately, today’s clinical and industry standards for blood pressure monitoring still require the inflation of a pneumatic cuff around a limb each time a measurement is taken. Over the last decades clinicians, scientists and device manufacturers have explored the feasibility of technologies that reduce or even completely eliminate the need of cuffs, initiating the era of cuffless blood pressure monitoring. Among the existing literature, this book is intended to be a practical guide to navigate across this emerging field. The chapters of the handbook have been elaborated by experts and key opinion leaders in the domain, and will guide the reader along the clinical, scientific, technical, and regulatory aspects of cuffless blood pressure monitoring.

The Medical Device Industry - John Burton 2009-03-26

The Medical Device industry is one of the fastest growing industries in the world. Device manufacturers are producing increasingly sophisticated and complex medical device software to differentiate themselves in the battle for dominance in this sector. The increase in the complexity of medical device software has introduced new challenges with respect to making medical devices and their associated software safe. Risk management has emerged as key in addressing these challenges. Existing literature on risk management for medical devices has been slow to adequately account for the complex nature of software in modern medical devices. Conversely, excellent progress has been made in the broader Software Engineering community with the production of holistic software risk based models such as the Capability Maturity Model Integration (CMMI®) and SPICE™. However, these models do not account for medical device specific requirements. This

book examines the possibility of a unified approach whilst investigating the relevance of the CMMI® SPI model to the medical device regulatory requirements.

Medical Device Use Error - Michael Wiklund 2016-01-06

Medical Device Use Error: Root Cause Analysis offers practical guidance on how to methodically discover and explain the root cause of a use error-a mistake-that occurs when someone uses a medical device. Covering medical devices used in the home and those used in clinical environments, the book presents informative case studies about the use errors

Perspectives on Music, Sound and Musicology - Luísa Correia Castilho 2021-09-30

This book gathers a set of works highlighting significant advances in the areas of music and sound. They report on innovative music technologies, acoustics, findings in musicology, new perspectives and techniques for composition, sound design and sound synthesis, and methods for music education and therapy. Further, they cover interesting topics at the intersection between music and computing, design and social sciences. Chapters are based on extended and revised versions of the best papers presented during the 6th and 7th editions of EIMAD–Meeting of Research in Music, Arts and Design, held in 2020 and 2021, respectively, at the School of Applied Arts in Castelo Branco, Portugal. All in all, this book provides music researchers, educators and professionals with authoritative information about new trends and techniques, and a source of inspiration for future research, practical developments, and for establishing collaboration between experts from different fields.

Audio/video, Information and Communication Technology Equipment - Standards Australia (Organization) 2018

Design Controls for the Medical Device Industry, Third Edition - Marie B. Teixeira 2019-08-02

This third edition provides a substantial comprehensive review of the latest design control requirements, as well as proven tools and techniques to ensure a company's design control program evolves in accordance with current industry practice. It assists in the development of an effective design control program that not only satisfies the US FDA Quality Systems Regulation (QSR) and 13485:2016 standards, but also meets today's Notified Body Auditors' and FDA Investigators' expectations. The book includes a review of the design control elements such as design planning, input, output, review, verification, validation, change, transfer, and history, as well as risk management inclusive of human factors and usability, biocompatibility, the FDA Quality System Inspection Technique (QSIT) for design controls, and medical device regulations and classes in the US, Canada, and Europe. Practical advice, methods and appendixes are provided to assist with implementation of a compliant design control program and extensive references are provided for further study. This third edition: Examines new coverage of ISO 13485-2016 design control requirements Explores proven techniques and methods for compliance Contributes fresh templates for practical implementation Provides updated chapters with additional details for greater understanding and compliance Offers an easy to understand breakdown of design control requirements Reference to MDSAP design control requirements

User Interface Requirements for Medical Devices - Michael Wiklund 2021-11-17

This book is a practical guide for individuals responsible for creating products that are safe, effective, usable, and satisfying in the hands of the intended users. The contents are intended to reduce the number of use errors involving medical devices that have led to injuries and deaths. The book presents the strong connection between user interface requirements and risk management for medical devices and instructs readers how to develop specific requirements that are sufficiently comprehensive and detailed to produce good results – a user-friendly product that is likely to be used correctly. The book’s tutorial content is complemented by many real-world examples of user interface requirements, including ones pertaining to an inhaler, automated external defibrillator, medical robot, and mobile app that a patient might use to manage her diabetes. The book is intended for people

representing a variety of product development disciplines who have responsibility for producing safe, effective, usable, and satisfying medical devices, including those who are studying or working in human factors engineering, psychology, mechanical engineering, biomedical engineering, systems engineering, software programming, technical writing, industrial design, graphic design, and regulatory affairs.

Usability Engineering als Erfolgsfaktor - Thomas Geis 2015-07-14

Die DIN EN 62366:2008-09 und die IEC 62366-1:2015-02 "Medizinprodukte - Anwendung der Gebrauchstauglichkeit auf Medizinprodukte" legen Forderungen an einen vom Hersteller durchzuführenden Prozess zur Analyse, Spezifikation, Entwicklung sowie Verifizierung und Validierung der Gebrauchstauglichkeit fest, soweit sie sich auf die Sicherheit von Medizinprodukten auswirkt. Die Autoren erläutern konkret, welche Informationen im Rahmen der Anforderungen der DIN EN 62366 für ein Medizinprodukt dokumentiert werden müssen und in welcher Form das am besten geschieht (Verzahnung von Regulatory Affairs und Usability-Engineering). So können sowohl die Bereiche Regulatory Affairs als auch das Produktmanagement ihre Effizienz bei der Dokumentation des Usability-Engineering-Prozesses wirksam steigern.

Clinical Neurophysiology: Basis and Technical Aspects - 2019-07-03

Clinical Neurophysiology: Basis and Technical Aspects, the latest release in the Handbook of Clinical Neurology series, is organized into sections on basic physiological concepts, on the function and limitations of modern instrumentation, and on other fundamental or methodologic aspects related to the recording of various bioelectric signals from the nervous system for clinical or investigative purposes. There is discussion of the EEG, nerve conduction studies, needle electromyography, intra-operative clinical neurophysiology, sleep physiology and studies, the autonomic nervous system, various sensory evoked potentials, and cognitive neurophysiology. Provides an up-to-date review on the practice of neurophysiological techniques in the assessment of neurological disease Explores the electrophysiological techniques used to better understand neurological function and dysfunction, first in the area of consciousness and epilepsy, then in the areas of the peripheral nervous system and sleep Focuses on new techniques, including electrocorticography, functional mapping, stereo EEG, motor evoked potentials, magnetoencephalography, laser evoked potentials, and transcranial magnetic stimulation

Mission-Critical and Safety-Critical Systems Handbook - Kim Fowler 2009-11-19

This handbook provides a consolidated, comprehensive information resource for engineers working with mission and safety critical systems. Principles, regulations, and processes common to all critical design projects are introduced in the opening chapters. Expert contributors then offer development models, process templates, and documentation guidelines from their own core critical applications fields: medical, aerospace, and military. Readers will gain in-depth knowledge of how to avoid common pitfalls and meet even the strictest certification standards. Particular emphasis is placed on best practices, design tradeoffs, and testing procedures. *Comprehensive coverage of all key concerns for designers of critical systems including standards compliance, verification and validation, and design tradeoffs *Real-world case studies contained within these pages provide insight from experience

Usability Testing of Medical Devices - Michael E. Wiklund P.E. 2010-12-20

To paraphrase a popular saying, usability testing should be done early and often. However, it doesn't have to be an onerous process. Informative, practical, and engaging, Usability Testing of Medical Devices provides a simple, easy to implement general understanding of usability testing. It offers a general understanding of usability testing and re

Humanizing Healthcare – Human Factors for Medical Device Design - Russell J. Branaghan 2021-02-21

This book introduces human factors engineering (HFE) principles, guidelines, and design methods for medical device design. It starts with an overview of physical, perceptual, and cognitive abilities and limitations, and their implications for design. This analysis produces a set

of human factors principles that can be applied across many design challenges, which are then applied to guidelines for designing input controls, visual displays, auditory displays (alerts, alarms, warnings), and human-computer interaction. Specific challenges and solutions for various medical device domains, such as robotic surgery, laparoscopic surgery, artificial organs, wearables, continuous glucose monitors and insulin pumps, and reprocessing, are discussed. Human factors research and design methods are provided and integrated into a human factors design lifecycle, and a discussion of regulatory requirements and procedures is provided, including guidance on what human factors activities should be conducted when and how they should be documented. This hands-on professional reference is an essential introduction and resource for students and practitioners in HFE, biomedical engineering, industrial design, graphic design, user-experience design, quality engineering, product management, and regulatory affairs. Teaches readers to design medical devices that are safer, more effective, and less error prone; Explains the role and responsibilities of regulatory agencies in medical device design; Introduces analysis and research methods such as UFMEA, task analysis, heuristic evaluation, and usability testing.

Inspection of Medical Devices - Almir Badnjević 2017-10-26

This book offers all countries a guide to implementing verification systems for medical devices to ensure they satisfy their regulations. It describes the processes, procedures and need for integrating medical devices into the legal metrology framework, addresses their independent safety and performance verification, and highlights the associated savings for national healthcare systems, all with the ultimate goal of increasing the efficacy and reliability of patient diagnoses and treatment. The book primarily focuses on diagnostic and therapeutic medical devices, and reflects the latest international directives and regulations. Above all, the book demonstrates that integrating medical devices into the legal metrology system and establishing a fully operational national laboratory for the inspection of medical devices could significantly improve the reliability of medical devices in diagnosis and patient care, while also reducing costs for the healthcare system in the respective country.

Applied Human Factors in Medical Device Design - Mary Beth Privitera 2019-06-15

Applied Human Factors in Medical Device Design describes the contents of a human factors toolbox with in-depth descriptions of both empirical and analytical methodologies. The book begins with an overview of the design control process, integrating human factors as directed by AAMI TIR 59 and experienced practice. It then explains each method, describing why each method is important, its potential impact, when it's ideal to use, and related challenges. Also discussed are other barriers, such as communication breakdowns between users and design teams. This book is an excellent reference for professionals working in human factors, design, engineering, marketing and regulation. Focuses on meeting agency requirements as it pertains to the application of human factors in the medical device development process in both the US and the European Union (EU) Explains technology development and the application of human factors throughout the development process Covers FDA and MHRA regulations Includes case examples with each method

Medical Instruments and Devices - Steven Schreiner 2015-07-24

Medical Instruments and Devices: Principles and Practices originates from the medical instruments and devices section of The Biomedical Engineering Handbook, Fourth Edition. Top experts in the field provide material that spans this wide field. The text examines how biopotential amplifiers help regulate the quality and content of measured signals. I

Federal Register - 2014

Medical Device Technologies - Gail D. Baura 2011-10-07

Medical Device Technologies introduces undergraduate engineering students to commonly manufactured medical devices. It is the first textbook that discusses both electrical and mechanical medical devices. The first 20 chapters are medical device technology chapters; the remaining eight chapters focus on medical device laboratory experiments. Each medical device chapter begins with an exposition of

appropriate physiology, mathematical modeling or biocompatibility issues, and clinical need. A device system description and system diagram provide details on technology function and administration of diagnosis and/or therapy. The systems approach lets students quickly identify the relationships between devices. Device key features are based on five applicable consensus standard requirements from organizations such as ISO and the Association for the Advancement of Medical Instrumentation (AAMI). The medical devices discussed are Nobel Prize or Lasker Clinical Prize winners, vital signs devices, and devices in high industry growth areas Three significant Food and Drug Administration (FDA) recall case studies which have impacted FDA medical device regulation are included in appropriate device chapters Exercises at the end of each chapter include traditional homework problems, analysis exercises, and four questions from assigned primary literature Eight laboratory experiments are detailed that provide hands-on reinforcement of device concepts

Medical Devices and Human Engineering - Joseph D. Bronzino 2018-10-08

Known as the bible of biomedical engineering, The Biomedical Engineering Handbook, Fourth Edition, sets the standard against which all other references of this nature are measured. As such, it has served as a major resource for both skilled professionals and novices to biomedical engineering. Medical Devices and Human Engineering, the second volume of the handbook, presents material from respected scientists with diverse backgrounds in biomedical sensors, medical instrumentation and devices, human performance engineering, rehabilitation engineering, and clinical engineering. More than three dozen specific topics are examined, including optical sensors, implantable cardiac pacemakers, electrosurgical devices, blood glucose monitoring, human–computer interaction design, orthopedic prosthetics, clinical engineering program indicators, and virtual instruments in health care. The material is presented in a systematic manner and has been updated to reflect the latest applications and research findings.

Fast Facts for the Operating Room Nurse - Theresa Criscitelli 2014-12-05

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World Congress on Medical Physics and Biomedical Engineering September 7 - 12, 2009 Munich, Germany - Olaf Dössel 2010-01-06

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

Clinical Engineering - Roberto Miniati 2015-12-23

Clinical Systems Engineering: New Challenges for Future Healthcare covers the critical issues relating to the risk management and design of new technologies in the healthcare sector. It is a comprehensive summary of the advances in clinical engineering over the past 40 years, presenting guidance on compliance and safety for hospitals and engineering teams. This contributed book contains chapters from international experts, who provide their solutions, experiences, and the

successful methodologies they have applied to solve common problems in the area of healthcare technology. Topics include compliance with the European Directive on Medical Devices 93/42/EEC, European Norms EN 60601-1-6, EN 62366, and the American Standards ANSI/AAMI HE75: 2009. Content coverage includes decision support systems, clinical complex systems, and human factor engineering. Examples are fully supported with case studies, and global perspective is maintained throughout. This book is ideal for clinical engineers, biomedical engineers, hospital administrators and medical technology manufacturers. Presents clinical systems engineering in a way that will help users answer many questions relating to clinical systems engineering and its relationship to future healthcare needs Explains how to assess new healthcare technologies and what are the most critical issues in their management Provides information on how to carry out risk analysis for new technological systems or medical software Contains tactics on how to improve the quality and usability of medical devices

Medizintechnik - Rüdiger Kramme 2016-11-21

Multimodale Bildgebung, mikroinvasive und bildgestützte Intervention, Mobile Health, Datenfusionen, Mikroimplantate, Chirurgierobotik u.v.m. waren bis vor kurzem Visionen, die heute in der Diagnostik und Therapie Realität sind. Kurz und prägnant führt die neue Auflage in die faszinierende Technik der Medizin ein und lässt Sie teilhaben an den dynamischen zukunftsorientierten Entwicklungen in der Medizin. Die Übersichtsbeiträge des Buches bieten einen repräsentativen Querschnitt sowie eine praxisnahe Orientierung zum aktuellen Wissensstand und der Wissensentwicklung in der Medizintechnik und medizinischen Informationsverarbeitung. Durch anschauliche Darstellung von Prinzip, Aufbau und Funktion von Geräten und Strukturen werden komplexe Sachverhalte und Zusammenhänge schneller nachvollziehbar und verständlich. Der Wegweiser Praxisrelevantes Know-how für Studium, Kliniken, Arztpraxen Nachschlagewerk, Ratgeber, Arbeitsbuch: mit umfangreichen Abbildungen, Tabellen, Übersichten Ihre Kompetenz für Medizintechnik Allgemeine Themen“/p> Hygiene, Ökonomische Aspekte, Qualitätsmanagement, Technische Sicherheit ... Spezielle Themen Funktionsdiagnostik, Bildgebende Systeme, Therapiegeräte, Laboratorien, Medizinische Informations- und Kommunikationsverarbeitung ... Wichtige Zusatzinformationen Richtungs- und Lagebezeichnung des Körpers, Organprofile, Größen und Einheiten, Abkürzungen, Zeichen und Symbole, Historische Meilensteine der Medizintechnik u.v.m. DAS erfolgreiche und etablierte Standardwerk Ein gebündelter Wissensschatz in kompakter, verständlicher und transparenter Form für alle, die sich mit Medizintechnik beschäftigen: Ärzte; Pflegekräfte; Medizintechniker; Studenten der Medizin, der Informatik, des Gesundheitsingenieurwesens und der Medizintechnik; Krankenhaus-Architekten; Krankenhaus-Manager ...

Anesthesia Equipment E-Book - Jan Ehrenwerth 2013-01-17

Anesthesia Equipment: Principles and Applications, 2nd Edition, by Dr. Jan Ehrenwerth and Dr. James B. Eisenkraft, offers expert, highly visual, practical guidance on the full range of delivery systems and technology used in practice today. It equips you with the objective, informed answers you need to ensure optimal patient safety. Consult this title on your favorite e-reader with intuitive search tools and adjustable font sizes. Elsevier eBooks provide instant portable access to your entire library, no matter what device you're using or where you're located. Make informed decisions by expanding your understanding of the physical principles of equipment, the rationale for its use, delivery systems for inhalational anesthesia, systems monitoring, hazards and safety features, maintenance and quality assurance, special situations/equipment for non-routine adult anesthesia, and future directions for the field. Ensure patient safety with detailed advice on risk management and medicolegal implications of equipment use. Apply the most complete and up-to-date information available on machines, vaporizers, ventilators, breathing systems, vigilance, ergonomics, and simulation. Visualize the safe and effective use of equipment thanks to hundreds of full-color line drawings and photographs.

Software Process Improvement and Capability Determination - Rory O'Connor 2011-05-20

This book constitutes the refereed proceedings of the 11th International

Conference on Software Process Improvement and Capability Determination, SPICE 2011, held in Dublin, Ireland, in May/June 2011. The 15 revised full papers presented and 15 short papers were carefully reviewed and selected from numerous submissions. The papers are organized in topical sections on process modelling and assessment, safety and security, medi SPICE, high maturity, implementation and improvement.

Advances in Biomedical Sensing, Measurements, Instrumentation and Systems - Aimé Lay-Ekuakille 2009-12-24

Advances in technological devices unveil new architectures for instrumentation and improvements in measurement techniques. Sensing technology, related to biomedical aspects, plays a key role in nowadays applications; it promotes different advantages for: healthcare, solving difficulties for elderly persons, clinical analysis, microbiological characterizations, etc.. This book intends to illustrate and to collect recent advances in biomedical measurements and sensing instrumentation, not as an encyclopedia but as clever support for scientists, students and researchers in other to stimulate exchange and discussions for further developments.

XIII Mediterranean Conference on Medical and Biological Engineering and Computing 2013 - Laura M. Roa Romero 2013-10-01

The general theme of MEDICON 2013 is "Research and Development of Technology for Sustainable Healthcare". This decade is being characterized by the appearance and use of emergent technologies under development. This situation has produced a tremendous impact on Medicine and Biology from which it is expected an unparalleled evolution in these disciplines towards novel concept and practices. The consequence will be a significant improvement in health care and well-fare, i.e. the shift from a reactive medicine to a preventive medicine. This shift implies that the citizen will play an important role in the healthcare delivery process, what requires a comprehensive and personalized assistance. In this context, society will meet emerging media, incorporated to all objects, capable of providing a seamless, adaptive, anticipatory, unobtrusive and pervasive assistance. The challenge will be to remove current barriers related to the lack of knowledge required to produce new opportunities for all the society, while new paradigms are created for this inclusive society to be socially and economically sustainable, and respectful with the environment. In this way, these proceedings focus on the convergence of biomedical engineering topics ranging from formalized theory through experimental science and technological development to practical clinical applications.

Health and Social Care Systems of the Future: Demographic Changes, Digital Age and Human Factors - Teresa Patrone Cotrim 2019-06-25

This book discusses how digital technology and demographic changes are transforming the patient experience, services, provision, and planning of health and social care. It presents innovative ergonomics research and human factors approaches to improving safety, working conditions and quality of life for both patients and healthcare workers. Personalized medicine, mobile and wearable technologies, and the greater availability of health data are discussed, together with challenges and evidence-based practice. Based on the Healthcare Ergonomics and Patient Safety conference, HEPS2019, held on July 3-5, 2019, in Lisbon, Portugal, this book offers a timely resource for graduate students and researchers, as well as for healthcare professionals managing service provision, planners and designers for healthcare buildings and environments, and international healthcare organizations.

Advances in Ergonomics Modeling, Usability & Special Populations - Marcelo Soares 2016-07-26

This book focuses on emerging issues in ergonomics, with a special emphasis on modeling, usability engineering, human computer interaction and innovative design concepts. It presents advanced theories in human factors, cutting-edge applications aimed at understanding and improving human interaction with products and systems, and discusses important usability issues. The book covers a wealth of topics, including devices and user interfaces, virtual reality and digital environments, user and product evaluation, and limits and capabilities of special populations, particularly the elderly population. It

presents both new research methods and user-centered evaluation approaches. Based on the AHFE 2016 International Conference on Ergonomics Modeling, Usability and Special Populations, held on July 27-31, 2016, in Walt Disney World®, Florida, USA, the book addresses professionals, researchers, and students dealing with visual and haptic interfaces, user-centered design, and design for special populations, particularly the elderly.

Medical Device Regulatory Practices - Val Theisz 2015-08-03

This book is intended to serve as a reference for professionals in the medical device industry, particularly those seeking to learn from practical examples and case studies. Medical devices, like pharmaceuticals, are highly regulated, and the bar is raised constantly as patients and consumers expect the best-quality healthcare and safe and effective medical technologies. Obtaining marketing authorization is the first major hurdle that med techs need to overcome in their pursuit of commercial success. Most books on regulatory affairs present regulations in each jurisdiction separately: European Union, USA, Australia, Canada, and Japan. This book proposes practical solutions for a coherent, one-size-fits-all (or most) set of systems and processes in compliance with regulations in all key markets, throughout the life cycle of a medical device. It also contains key information about international harmonization efforts and recent regulatory trends in emerging markets; important terminology needed to understand the regulators' language; and examples, case studies, and practical recommendations that bridge the gap between regulatory theory and practice.

The Biomedical Engineering Handbook - Joseph D. Bronzino 2018-10-03

The definitive "bible" for the field of biomedical engineering, this collection of volumes is a major reference for all practicing biomedical engineers and students. Now in its fourth edition, this work presents a substantial revision, with all sections updated to offer the latest research findings. New sections address drugs and devices, personali

Safety Risk Management for Medical Devices - Bijan Elahi 2021-11-11

Safety Risk Management for Medical Devices, Second Edition teaches the essential safety risk management methodologies for medical devices compliant with the requirements of ISO 14971:2019. Focusing exclusively on safety risk assessment practices required in the MedTech sector, the book outlines sensible, easily comprehensible, state-of the-art methodologies that are rooted in current industry best practices, addressing safety risk management of medical devices, thus making it useful for those in the MedTech sector who are responsible for safety risk management or need to understand risk management, including design engineers, product engineers, development engineers, software engineers, Quality assurance and regulatory affairs. Graduate-level engineering students with an interest in medical devices will also benefit from this book. The new edition has been fully updated to reflect the state-of-the-art in this fast changing field. It offers guidance on developing and commercializing medical devices in line with the most current international standards and regulations. Includes new coverage of ISO 14971:2019, ISO/TR 24971 Presents the latest information on the history of risk management, lifetime of a medical device, risk management review, production and post production activities, post market risk management Provides practical, easy-to-understand and state-of the-art methodologies that meet the requirements of international regulation

Better EHR - Jiajie Zhang (Professor of biomedical informatics) 2014-10-01

Electronic Health Records (EHR) offer great potential to increase healthcare efficiency, improve patient safety, and reduce health costs. The adoption of EHRs among office-based physicians in the US has increased from 20% ten years ago to over 80% in 2014. Among acute care hospitals in US, the adoption rate today is approaching 100%. Finding relevant patient information in electronic health records' (EHRs) large datasets is difficult, especially when organized only by data type and time. Automated clinical summarization creates condition-specific displays, promising improved clinician efficiency. However, automated summarization requires new kinds of clinical knowledge (e.g., problem-medication relationships).

Interventionelle Neurophysiologie - Joseph Claßen 2012-12-12

Zusammenhängende Darstellung der Techniken - Überblick über Grundlagen und erste klinische Anwendungen - Einheitliche Darstellung der verschiedenen Verfahren - Gut strukturierte Aufbereitung der Inhalte durch analogen Kapitelaufbau - Übersichtliche und anschauliche Abbildungen, zusammenfassende Bewertungen und prägnante Merksätze am Ende der Kapitel Aus dem Inhalt - Einführung und Grundlagen - Stimulationstechniken - Modulatorische Neurostimulation: Motorik, Epilepsie, Schmerz, Psychiatrie und Kognition - Prothetische Neurostimulation: Sensorik, Motorik und Sphinkterkontrolle - ökonomische und regulatorische Aspekte - Lebensqualität und Ethik

Handbook of Human Factors and Ergonomics in Health Care and Patient Safety, Second Edition - Pascale Carayon 2016-04-19

The first edition of Handbook of Human Factors and Ergonomics in Health Care and Patient Safety took the medical and ergonomics communities by storm with in-depth coverage of human factors and ergonomics research, concepts, theories, models, methods, and interventions and how they can be applied in health care. Other books focus on particular human factors and ergonomics issues such as human error or design of medical devices or a specific application such as emergency medicine. This book draws on both areas to provide a compendium of human factors and ergonomics issues relevant to health care and patient safety. The second edition takes a more practical approach with coverage of methods, interventions, and applications and a greater range of domains such as medication safety, surgery, anesthesia, and infection prevention. New topics include: work schedules error recovery telemedicine workflow analysis simulation health information technology development and design patient safety management Reflecting developments and advances in the five years since the first edition, the book explores medical technology and telemedicine and puts a special emphasis on the contributions of human factors and ergonomics to the improvement of patient safety and quality of care. In order to take patient safety to the next level, collaboration between human factors professionals and health care providers must occur. This book brings both groups closer to achieving that goal.

Clinical Neurophysiology - Jasper R. Daube 2009-05-22

Clinical Neurophysiology, Third Edition will continue the tradition of the previous two volumes by providing a didactic, yet accessible, presentation of electrophysiology in three sections that is of use to both the clinician and the researcher. The first section describes the analysis of electrophysiological waveforms. Section two describes the various methods and techniques of electrophysiological testing. The third section, although short in appearance, has recommendations of symptom complexes and disease entities using electroencephalography, evoked potentials, and nerve conduction studies.

Clinical Neurophysiology - Devon I. Rubin 2021

"Clinical neurophysiology is the neurology subspecialty that focuses on the electrical activity within the nervous system. In all realms and types of testing performed in the practice of clinical neurophysiology, electrical signals that are spontaneously or intrinsically generated or induced by external stimulation are recorded and analyzed to determine the integrity and function of the central and peripheral systems. The underlying basis of all signals ultimately reflects the function of the neurons at a cellular level. Thus, while the clinical neurophysiologist focuses on the interpretation of these signals during testing in the laboratory, hospital, or operating room, a solid understanding of the function of each of the contributing cellular structures from which the signals are generated is necessary. This chapter reviews the basic principles underlying the activity of excitable cells as they apply to the basic neurophysiology of neurons and myocytes"--

BIOMEDICAL DEVICE TECHNOLOGY - Anthony Y. K. Chan 2016-03-28

This book provides a comprehensive approach to studying the principles and design of biomedical devices as well as their applications in medicine. It is written for engineers and technologists who are interested in understanding the principles, design and applications of medical device technology. The book is also intended to be used as a textbook or reference for biomedical device technology courses in universities and colleges. It focuses on the functions and principles of medical devices

(which are the invariant components) and uses specific designs and constructions to illustrate the concepts where appropriate. This book selectively covers diagnostic and therapeutic devices that are either commonly used or that their principles and design represent typical applications of the technology. In this second edition, almost every chapter has been revised—some with minor updates and some with significant changes and additions. For those who would like to know more, a collection of relevant published papers and book references is added at the end of each chapter. Based on feedback, a section on "Common Problems and Hazards" has been included for each medical device. In addition, more information is provided on the indications of use and clinical applications. Two new areas of medical device technology have been added in the two new chapters on "Cardiopulmonary Bypass Units" and "Audiology Equipment."