

A Wireless Wearable Ecg Sensor For Long Term Applications

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Liquid Metal Biomaterials Jing Liu 2018-07-14 This is the first-ever book to illustrate the principles and applications of liquid metal biomaterials. Room-temperature liquid metal materials are rapidly emerging as next-generation functional materials that display many unconventional properties superior to those of conventional biomaterials. Their outstanding, unique versatility ("one material, diverse capabilities") opens many exciting opportunities for the medical sciences. The book reviews representative applications of liquid metal biomaterials from both therapeutic and diagnostic aspects. It also discusses related efforts to employ liquid metals to overcome today's biomedical challenges. It will provide readers with a comprehensive understanding of the technical advances and fundamental discoveries on the frontier, and thus equip them to investigate and utilize liquid metal biomaterials to tackle various critical problems.

Intelligent Computing, Information and Control Systems A. Pasumpon Pandian 2019-10-18 From past decades, Computational intelligence embraces a number of nature-inspired computational techniques which mainly encompasses fuzzy sets, genetic algorithms, artificial neural networks and hybrid neuro-fuzzy systems to address the computational complexities such as uncertainties, vagueness and stochastic nature of various computational problems practically. At the same time, Intelligent Control systems are emerging as an innovative methodology which is inspired by various computational intelligence process to promote a control over the systems without the use of any mathematical models. To address the effective use of intelligent control in Computational intelligence systems, International Conference on Intelligent Computing, Information and Control Systems (ICICCS 2019) is initiated to encompass the various research works that helps to develop and advance the next-generation intelligent computing and control systems. This book integrates the computational intelligence and intelligent control systems to provide a powerful methodology for a wide range of data analytics issues in industries and societal applications. The recent research advances in computational intelligence and control systems are addressed, which provide very promising results in various industry, business and societal studies. This book also presents the new algorithms and methodologies for promoting advances in common intelligent computing and control methodologies including evolutionary computation, artificial life, virtual infrastructures, fuzzy logic, artificial immune systems, neural networks and various neuro-hybrid methodologies. This book will be pragmatic for researchers, academicians and students dealing with mathematically intransigent problems. It is intended for both academicians and researchers in the field of Intelligent Computing, Information and Control Systems, along with the distinctive readers in the fields of computational and artificial intelligence to gain more knowledge on Intelligent computing and control systems and their real-world applications.

4th European Conference of the International Federation for Medical and Biological Engineering 23 - 27 November 2008, Antwerp, Belgium Jos van der Sloten 2009-02-04 The 4th European Congress of the International Federation for Medical and Biological Federation was held in Antwerp, November 2008. The scientific discussion on the conference and in this conference proceedings include the following issues: Signal & Image Processing ICT Clinical Engineering and Applications Biomechanics and Fluid Biomechanics Biomaterials and Tissue Repair Innovations and Nanotechnology Modeling and Simulation Education and Professional

Wearable Electronics Sensors Subhas C. Mukhopadhyay 2015-06-02 This edited book contains invited papers from renowned experts working in the field of Wearable Electronics Sensors. It includes 14 chapters describing recent advancements in the area of Wearable Sensors, Wireless Sensors and Sensor Networks, Protocols, Topologies, Instrumentation architectures, Measurement techniques, Energy harvesting and scavenging, Signal processing, Design and Prototyping. The book will be useful for engineers, scientist and post-graduate students as a reference book for their research on wearable sensors, devices and technologies which is experiencing a period of rapid growth driven by new applications such as heart rate monitors, smart watches, tracking devices and smart glasses.

Body Sensors and Electrocardiography Roman Trobec 2017-07-12 This monograph presents a comprehensive overview of the electrocardiography from the aspect of wireless and mobile monitoring and its potential for personalized health management. The topical focus is on the implementation and efficient application of user friendly m-Health systems. The target audience comprises biomedical engineers, medical doctors, students, industrial experts and health managers developing m-Health solutions.

Proceedings of the Multi-Conference 2011 Himanshu B. Soni 2011-06-06 The International Conference on Signals, Systems and Automation (ICSSA 2011) aims to spread awareness in the research and academic community regarding cutting-edge technological advancements revolutionizing the world. The main emphasis of this conference is on dissemination of information, experience, and research results on the current topics of interest through in-depth discussions and participation of researchers from all over the world. The objective is to provide a platform to scientists, research scholars, and industrialists for interacting and exchanging ideas in a number of research areas. This will facilitate communication among researchers in different fields of Electronics and Communication Engineering. The International Conference on Intelligent System and Data Processing (ICISD 2011) is organized to address various issues that will foster the creation of intelligent solutions in the future. The primary goal of the conference is to bring together worldwide leading researchers, developers, practitioners, and educators interested in advancing the state of the art in computational intelligence and data processing for exchanging knowledge that encompasses a broad range of disciplines among various distinct communities. Another goal is to promote scientific information interchange between researchers, developers, engineers, students, and practitioners working in India and abroad.

Designing Intelligent Healthcare Systems, Products, and Services Using Disruptive Technologies and Health Informatics Teena Bagga 2022-08-08 Disruptive technologies are gaining importance in healthcare systems and health informatics. By discussing computational intelligence, IoT, blockchain, cloud and big data analytics, this book provides support to researchers and other stakeholders involved in designing intelligent systems used in healthcare, its products, and its services. This book offers both theoretical and practical application-based chapters and presents novel technical studies on designing intelligent healthcare systems, products, and services. It offers conceptual and visionary content comprising hypothetical and speculative scenarios and will also include recently developed disruptive holistic techniques in healthcare and the monitoring of physiological data. Metaheuristic computational intelligence-based algorithms for analysis, diagnosis, and prevention of disease through disruptive technologies are also provided. Designing Intelligent Healthcare Systems, Products, and Services Using Disruptive Technologies and Health Informatics is written for researchers, academicians, and professionals to bring them up to speed on current research endeavours, as well as to introduce hypothetical and speculative scenarios.

Applications in Electronics Pervading Industry, Environment and Society Alessandro De Gloria 2018-07-12 This book provides a thorough overview of cutting-edge research on electronics applications relevant to industry, the environment, and society at large. It covers a broad spectrum of application domains, from automotive to space and from health to security, while devoting special attention to the use of embedded devices and sensors for imaging, communication and control. The book is based on the 2017 ApplePies Conference, held in Rome, Italy in September 2017, which brought together researchers and stakeholders to consider the most significant current trends in the field of applied electronics and to debate visions for the future. Areas addressed by the conference included information communication technology; biotechnology and biomedical imaging; space; secure, clean and efficient energy; the environment; and smart, green and integrated transport. As electronics technology continues to develop apace, constantly meeting previously unthinkable targets, further attention needs to be directed toward the electronics applications and the development of systems that facilitate human activities. This book, written by industrial and academic professionals, represents a valuable contribution in this endeavor.

Advances in Body Area Networks I Giancarlo Fortino 2018-12-29 This book presents the post-proceedings, including all revised versions of the accepted papers, of the 2017 European Alliance for Innovation (EAI) International Conference on Body Area Networks (BodyNets 2017). The goal of BodyNets 2017 was to provide a world-leading and unique forum, bringing together researchers and practitioners from diverse disciplines to plan, analyze, design, build, deploy and experiment with/on Body Area Networks (BANs).

Big Data Analytics for Intelligent Healthcare Management Nilanjan Dey 2019-04-15 Big Data Analytics for Intelligent Healthcare Management covers both the theory and application of hardware platforms and architectures, the development of software methods, techniques and tools, applications and governance, and adoption strategies for the use of big data in healthcare and clinical research. The book provides the latest research findings on the use of big data analytics with statistical and machine learning techniques that analyze huge amounts of real-time healthcare data. Examines the methodology and requirements for development of big data architecture, big data modeling, big data as a service, big data analytics, and more Discusses big data applications for intelligent healthcare management, such as revenue management and pricing, predictive analytics/forecasting, big data integration for medical data, algorithms and techniques, etc. Covers the development of big data tools, such as data, web and text mining, data mining, optimization, machine learning, cloud in big data with Hadoop, big data in IoT, and more

Electronic Devices, Circuits, and Systems for Biomedical Applications Suman Lata Tripathi 2021-04-25 Electronic Devices, Circuits, and Systems for Biomedical Applications: Challenges and Intelligent Approaches explains the latest information on the design of new technological solutions for low-power, high-speed efficient biomedical devices, circuits and systems. The book outlines new methods to enhance system performance, provides key parameters to explore the electronic devices and circuit biomedical applications, and discusses innovative materials that improve device performance, even for those with smaller dimensions and lower costs. This book is ideal for graduate students in biomedical engineering and medical informatics, biomedical engineers, medical device designers, and researchers in signal processing. Presents major design challenges and research potential in biomedical systems Walks readers through essential concepts in advanced biomedical system design Focuses on healthcare system design for low power-efficient and highly-secured biomedical electronics

Cardiovascular Imaging and Image Analysis Ayman El-Baz 2018-10-03 This book covers the state-of-the-art approaches for automated non-invasive systems for early cardiovascular disease diagnosis. It includes several prominent imaging modalities such as MRI, CT, and PET technologies. There is a special emphasis placed on automated imaging analysis techniques, which are important to biomedical imaging analysis of the cardiovascular system. Novel 4D based approach is a unique characteristic of this product. This is a comprehensive multi-contributed reference work that will detail the latest developments in spatial, temporal, and functional cardiac imaging. The main aim of this book is to help advance scientific research within the broad field of early detection of cardiovascular disease. This book focuses on major trends and challenges in this area, and it presents work aimed to identify new techniques and their use in biomedical image analysis. Key Features: Includes state-of-the art 4D cardiac image analysis Explores the aspect of automated segmentation of cardiac CT and MR images utilizing both 3D and 4D techniques Provides a novel procedure for improving full-cardiac strain estimation in 3D image appearance characteristics Includes extensive references at the end of each chapter to enhance further study Biomedical Engineering Applications for People with Disabilities and the Elderly in the COVID-19 Pandemic and Beyond Valentina Emilia Balas 2022-06-18 Biomedical Engineering Applications for People with Disabilities and the Elderly in the COVID-19 Pandemic and Beyond presents biomedical engineering applications used to manage people's disabilities and care for the elderly to improve their quality of life and extend life expectancy. This edited book covers all aspects of assistive technologies, including the Internet of Things (IoT), telemedicine, e-Health, m-Health, smart sensors, robotics, devices for rehabilitation, and "serious" games. This book will prove useful for bioengineers, computer science undergraduate and postgraduate students, researchers, practitioners, biomedical engineering students, healthcare workers, and medical doctors. This volume introduces recent advances in biomaterials, sensors, cellular engineering, biomedical devices, nanotechnology, and biomechanics applied in caring for the elderly and people with disabilities. The unique focus of this book is on the needs of this user base during emergency and disaster situations. The content includes risk reduction, emergency planning, response, disaster recovery, and needs assessment. This book offers readers multiple perspectives on a wide range of topics from a variety of disciplines. This book answers two key questions: What challenges will the elderly and people with disabilities face during a pandemic? How can new (or emerging) advances in biomedical engineering help with these challenges? Includes coverage of smart protective care tools, disinfectants, sterilization equipment and equipment for rapid and accurate COVID-19 diagnosis Focuses on the limitations and challenges faced by the elderly and people with disabilities in pandemic situations, such as limitations on leaving their homes and having caregivers and family visit their homes. How can technology help? Discusses tools, platforms and techniques for managing patients with COVID-19

Wearable Technologies: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2018-04-06 Advances in technology continue to alter the ways in which we conduct our lives, from the private sphere to how we interact with others in public. As these innovations become more integrated into modern society, their applications become

increasingly relevant in various facets of life. *Wearable Technologies: Concepts, Methodologies, Tools, and Applications* is a comprehensive reference source for the latest scholarly material on the development and implementation of wearables within various environments, emphasizing the valuable resources offered by these advances. Highlighting a range of pertinent topics, such as assistive technologies, data storage, and health and fitness applications, this multi-volume book is ideally designed for researchers, academics, professionals, students, and practitioners interested in the emerging applications of wearable technologies.

VLSI-SoC: Design for Reliability, Security, and Low Power Youngsoo Shin 2016-09-12 This book contains extended and revised versions of the best papers presented at the 23rd IFIP WG 10.5/IEEE International Conference on Very Large Scale Integration, VLSI-SoC 2015, held in Daejeon, Korea, in October 2015. The 10 papers included in the book were carefully reviewed and selected from the 44 full papers presented at the conference. The papers cover a wide range of topics in VLSI technology and advanced research. They address the current trend toward increasing chip integration and technology process advancements bringing about new challenges both at the physical and system-design levels, as well as in the test of these systems.

XII Mediterranean Conference on Medical and Biological Engineering and Computing 2010 Nicolas Pallikarakis 2010-05-28 Over the past three decades, the exploding number of new technologies and applications introduced in medical practice, often powered by advances in biosignal processing and biomedical imaging, created an amazing account of new possibilities for diagnosis and therapy, but also raised major questions of appropriateness and safety. The accelerated development in this field, alongside with the promotion of electronic health care solutions, is often on the basis of an uncontrolled diffusion and use of medical technology. The emergence and use of medical devices is multiplied rapidly and today there exist more than one million different products available on the world market. Despite the fact that the rising cost of health care, partly resulting from the new emerging technological applications, forms the most serious and urgent problem for many governments today, another important concern is that of patient safety and user protection, issues that should never be compromised and expelled from the Biomedical Engineering research practice agenda.

Principles and Applications of Ubiquitous Sensing Walteneus Dargie 2017-01-17 Applications which use wireless sensors are increasing in number. The emergence of wireless sensor networks has also motivated the integration of a large number of small and lightweight nodes which integrate sensors, processors, and wireless transceivers. Existing books on wireless sensor networks mainly focus on protocols and networks and pay little attention to the sensors themselves which the author believes is the main focus. Without adequate knowledge of sensors as well as how they can be designed, realized and used, books on wireless sensor networks become too theoretical and irrelevant. The purpose of this book is to intimately acquaint readers with the technique of sensing (resistive, capacitive, inductive, magnetic, inertial, etc.) and existing sensor technologies. It also discusses how the sensors are used in a wide application domain and how new sensors can be designed and used in a novel way.

Industrial Internet of Things Sudan Jha 2022-02-22 *Industrial Internet of Things: Technologies, Design, and Applications* addresses the complete functional framework workflow in IoT technology. It explores basic and high-level concepts, thus serving as a manual for those in the industry while also helping beginners. The book incorporates the working methodology of Industrial IoT works, is based on the latest technologies, and will cover the major challenges, issues, and advances while exploring data-based intelligent and automated systems and their implications to the real world. The book discusses data acquisition, security, learning, intelligent data analysis, and case studies related to Industrial IoT-based applications.

PHealth 2015 B. Blobel 2015-05-26 Smart mobile systems, smart textiles, smart implants and sensor controlled medical devices are among the recent developments which have become important enablers for telemedicine and next-generation health services. Social media and gamification have added yet another dimension to Personalized Health (pHealth). This book presents the proceedings of pHealth 2015, the 12th International Conference on Wearable Micro and Nano Technologies for Personalized Health, held in Västerås, Sweden, in June 2015. The conference addressed mobile technologies, knowledge-driven applications and computer-assisted decision support, as well as apps designed to support the elderly and those with chronic conditions in their daily lives. The 23 conference papers, three keynotes and two specially invited contributions included here address the fundamental scientific and methodological challenges of adaptive, autonomous and intelligent pHealth approaches. Participants at this truly interdisciplinary conference included representatives from all relevant stakeholder communities, and the topics covered will be of interest to all those whose work involves improving the quality of medical services, optimizing industrial competitiveness and managing healthcare costs.

The IoT Physical Layer Ibrahim (Abe) M. Elfadel 2018-09-03 This book documents some of the most recent advances on the physical layer of the Internet of Things (IoT), including sensors, circuits, and systems. The application area selected for illustrating these advances is that of autonomous, wearable systems for real-time medical diagnosis. The book is unique in that it adopts a holistic view of such systems and includes not only the sensor and processing subsystems, but also the power, communication, and security subsystems. Particular attention is paid to the integration of these IoT subsystems as well as the prototyping platforms needed for achieving such integration. Other unique features include the discussion of energy-harvesting subsystems to achieve full energy autonomy and the consideration of hardware security as a requirement for the integrity of the IoT physical layer. One unifying thread of the various designs considered in this book is that they have all been fabricated and tested in an advanced, low-power CMOS process, namely GLOBALFOUNDRIES 65nm CMOS LPe.

CMBEBIH 2017 Almir Badnjevic 2017-03-14 This volume presents the proceedings of the International Conference on Medical and Biological Engineering held from 16 to 18 March 2017 in Sarajevo, Bosnia and Herzegovina. Focusing on the theme of 'Pursuing innovation. Shaping the future', it highlights the latest advancements in Biomedical Engineering and also presents the latest findings, innovative solutions and emerging challenges in this field. Topics include: - Biomedical Signal Processing - Biomedical Imaging and Image Processing - Biosensors and Bioinstrumentation - Bio-Micro/Nano Technologies - Biomaterials - Biomechanics, Robotics and Minimally Invasive Surgery - Cardiovascular, Respiratory and Endocrine Systems Engineering - Neural and Rehabilitation Engineering - Molecular, Cellular and Tissue Engineering - Bioinformatics and Computational Biology - Clinical Engineering and Health Technology Assessment - Health Informatics, E-Health and Telemedicine - Biomedical Engineering Education - Pharmaceutical Engineering

Proceedings of the Fourth International Conference on Signal and Image Processing 2012 (ICSIP 2012) Mohan S 2013-01-11 The proceedings includes cutting-edge research articles from the Fourth International Conference on Signal and Image Processing (ICSIP), which is organised by Dr. N.G.P. Institute of Technology, Kalapatti, Coimbatore. The Conference provides academia and industry to discuss and present the latest technological advances and research results in the fields of theoretical, experimental, and application of signal, image and video processing. The book provides latest and most informative content from engineers and scientists in signal, image and video processing from around the world, which will benefit the future research community to work in a more cohesive and collaborative way.

Computational Science and Its Applications — ICCSA 2009 Osvaldo Gervasi 2009-07-09 The two-volume set LNCS 5592 and 5593 constitutes the refereed proceedings of the International Conference on Computational Science and Its Applications, ICCSA 2009, held in Seoul, Korea, in June/July, 2009. The two 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: computational methods, algorithms and scientific applications, high performance technical computing and networks, advanced and emerging applications, as well as information systems and information technologies. Moreover, submissions from more than 20 workshops and technical sessions contribute to this publication. These cover topics such as geographical analysis, urban modeling, spatial statistics, wireless and ad hoc networking, logical, scientific and computational aspects of pulse phenomena in transitions, high-performance computing and information visualization, sensor network and its applications, molecular simulations structures and processes, collective evolutionary systems, software engineering processes and applications, molecular simulations structures and processes, internet communication security, security and privacy in pervasive computing environments, and mobile communications.

Internet of Medical Things D. Jude Hemanth 2021-04-13 This book looks at the growing segment of Internet of Things technology (IoT) known as Internet of Medical Things (IoMT), an automated system that aids in bridging the gap between isolated and rural communities and the critical healthcare services that are available in more populated and urban areas. Many technological aspects of IoMT are still being researched and developed, with the objective of minimizing the cost and improving the performance of the overall healthcare system. This book focuses on innovative IoMT methods and solutions being developed for use in the application of healthcare services, including post-surgery care, virtual home assistance, smart real-time patient monitoring, implantable sensors and cameras, and diagnosis and treatment planning. It also examines critical issues around the technology, such as security vulnerabilities, IoMT machine learning approaches, and medical data compression for lossless data transmission and archiving. Internet of Medical Things is a valuable reference for researchers, students, and postgraduates working in biomedical, electronics, and communications engineering, as well as practicing healthcare professionals.

Health Care Delivery and Clinical Science: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2017-12-01 The development of better processes to provide proper healthcare has enhanced contemporary society. By implementing effective collaborative strategies, this ensures proper quality and instruction for both the patient and medical practitioners. *Health Care Delivery and Clinical Science: Concepts, Methodologies, Tools, and Applications* is a comprehensive reference source for the latest scholarly material on emerging strategies and methods for delivering optimal healthcare and examines the latest techniques and methods of clinical science. Highlighting a range of pertinent topics such as medication management, health literacy, and patient engagement, this multi-volume book is ideally designed for professionals, practitioners, researchers, academics, and graduate students interested in healthcare delivery and clinical science.

Green Technological Innovation for Sustainable Smart Societies Chinmay Chakraborty 2021-10-15 This book discusses the innovative and efficient technological solutions for sustainable smart societies in terms of alteration in industrial pollution levels, the effect of reduced carbon emissions, green power management, ecology, and biodiversity, the impact of minimal noise levels and air quality influences on human health. The book is focused on the smart society development using innovative low-cost advanced technology in different areas where the growth in employment and income are driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy, and resource efficiency and prevention of the loss of biodiversity and ecosystem services. The book also covers the paradigm shift in the sustainable development for the green environment in the post-pandemic era. It emphasizes and facilitates a greater understanding of existing available research i.e., theoretical, methodological, well-established and validated empirical work, associated with the environmental and climate change aspects.

Wireless Health Honggang Wang 2016-11-25 This book provides a candid assessment and practical knowledge about the current technological advancements of the wireless healthcare system. This book presents the competencies of modeling e-health framework, medical wireless body sensor networks, communication technologies for mobile health, nanotechnology innovations in medicine, security issues for medical records, personalized services in healthcare applications, and Big Data for wireless health. This book covers multiple research perspectives in order to address the strong need for interdisciplinary research in the area of wireless health, such as the interactive research among biomedical sensor technology, intelligent textiles and advanced wireless network technology. The interactions involve experts from multidisciplinary fields including medical, information technology and computing fields. Designed as a study tool for graduate students, researchers, and medical professionals, this book is also valuable for business managers, entrepreneurs, and investors within the medical and healthcare industries. It is useful for anyone who cares about the future opportunities in healthcare systems.

Wireless ECG System with Bluetooth Low Energy and Compressed Sensing Wanbo Li 2016 Electrocardiogram (ECG) is a noninvasive technology widely used in health care systems for diagnosis of heart diseases, and a wearable ECG sensor with long-term monitoring is necessary for real-time heart disease detection. However, the conventional ECG is restricted considering the physical size and power consumption of the system. In this thesis, we propose a Wireless ECG System with Bluetooth Low Energy (BLE) and Compressed Sensing (CS). The proposed Wireless ECG System includes an ECG sensor board based on a BLE chip, an Android application and a web service with a database. The ECG signal is first collected by the ECG Sensor Board and then transmitted to the Android application through BLE protocol. At last, the ECG signal is uploaded to the cloud database from the Android app. We also introduce Compressed Sensing into our system with a novel sparse sensing matrix, data compression and a modified Compressive Sampling Matching Pursuit (CoSaMP) reconstruction algorithm. Experiment results show that the amount of data transmitted is reduced by about 57% compared to not using Compressed Sensing, and reconstruction time is 64% less than using Orthogonal Matching Pursuit (OMP) or Iterative Re-weighted Least Squares (IRLS) algorithm.

Connected E-Health Sushruta Mishra 2022 With rise of smart medical sensors, cloud computing and the health care technologies, "connected health" is getting remarkable consideration everywhere. Recently, the Internet of Things (IoT) has brought the vision of a smarter world into reality. Cloud computing fits well in this scenario as it can provide high quality of clinical experience. Thus an IoT-cloud convergence can play a vital role in healthcare by offering better insight of heterogeneous healthcare content supporting quality care. It can also support powerful processing and storage facilities of huge data to provide automated decision making. This book aims to report quality research on recent advances towards IoT-Cloud convergence for smart healthcare, more specifically to the state-of-the-art approaches, design, development and innovative use of those convergence methods for providing insights into healthcare service demands. Students, researchers, and medical experts in the field of information technology, medicine, cloud computing, soft computing technologies, IoT and the related fields can benefit from this handbook in handling real-time challenges in healthcare. Current books are limited to focus either on soft computing algorithms or smart healthcare. Integration of smart and cloud computing

models in healthcare resulting in connected health is explored in detail in this book.

Wireless Computing in Medicine Mary Mehrnoosh Eshaghian-Wilner 2016-06-09 Provides a comprehensive overview of wireless computing in medicine, with technological, medical, and legal advances This book brings together the latest work of leading scientists in the disciplines of Computing, Medicine, and Law, in the field of Wireless Health. The book is organized into three main sections. The first section discusses the use of distributed computing in medicine. It concentrates on methods for treating chronic diseases and cognitive disabilities like Alzheimer's, Autism, etc. It also discusses how to improve portability and accuracy of monitoring instruments and reduce the redundancy of data. It emphasizes the privacy and security of using such devices. The role of mobile sensing, wireless power and Markov decision process in distributed computing is also examined. The second section covers nanomedicine and discusses how the drug delivery strategies for chronic diseases can be efficiently improved by Nanotechnology enabled materials and devices such as MENs and Nanorobots. The authors will also explain how to use DNA computation in medicine, model brain disorders and detect bio-markers using nanotechnology. The third section will focus on the legal and privacy issues, and how to implement these technologies in a way that is a safe and ethical. Defines the technologies of distributed wireless health, from software that runs cloud computing data centers, to the technologies that allow new sensors to work Explains the applications of nanotechnologies to prevent, diagnose and cure disease Includes case studies on how the technologies covered in the book are being implemented in the medical field, through both the creation of new medical applications and their integration into current systems Discusses pervasive computing's organizational benefits to hospitals and health care organizations, and their ethical and legal challenges **Wireless Computing in Medicine: From Nano to Cloud with Its Ethical and Legal Implications** is written as a reference for computer engineers working in wireless computing, as well as medical and legal professionals. The book will also serve students in the fields of advanced computing, nanomedicine, health informatics, and technology law.

Advanced Healthcare Systems Rohit Tanwar 2022-02-01 **ADVANCED HEALTHCARE SYSTEMS** This book offers a complete package involving the incubation of machine learning, AI, and IoT in healthcare that is beneficial for researchers, healthcare professionals, scientists, and technologists. The applications and challenges of machine learning and artificial intelligence in the Internet of Things (IoT) for healthcare applications are comprehensively covered in this book. IoT generates big data of varying data quality; intelligent processing and analysis of this big data are the keys to developing smart IoT applications, thereby making space for machine learning (ML) applications. Due to its computational tools that can substitute for human intelligence in the performance of certain tasks, artificial intelligence (AI) makes it possible for machines to learn from experience, adjust to new inputs and perform human-like tasks. Since IoT platforms provide an interface to gather data from various devices, they can easily be deployed into AI/ML systems. The value of AI in this context is its ability to quickly mesh insights from data and automatically identify patterns and detect anomalies in the data that smart sensors and devices generate—information such as temperature, pressure, humidity, air quality, vibration, and sound—that can be really helpful to rapid diagnosis. Audience This book will be of interest to researchers in artificial intelligence, the Internet of Things, machine learning as well as information technologists working in the healthcare sector.

Cardiovascular Computing—Methodologies and Clinical Applications Spyretta Golemati 2019-02-12 This book provides a comprehensive guide to the state-of-the-art in cardiovascular computing and highlights novel directions and challenges in this constantly evolving multidisciplinary field. The topics covered span a wide range of methods and clinical applications of cardiovascular computing, including advanced technologies for the acquisition and analysis of signals and images, cardiovascular informatics, and mathematical and computational modeling.

Principles and Practice of Multi-Agent Systems Matteo Baldoni 2016-11-29 This book constitutes the thoroughly refereed post-workshop proceedings of the 5th International Workshop on Empathic Computing, IWEC 2014, co-located with PRICAI 2014, held in Gold Coast, QLD, Australia, in December 2014, as well as the 6th International Workshop on Empathic Computing, IWEC 2015, and the 15th Workshop on Computational Models of Natural Argument, CMNA XV, both co-located with PRIMA 2015, held in Bertinoro, Italy, in October 2015. The 12 papers presented were carefully reviewed and selected from 32 initial submissions. The workshops are going alongside with the PRIMA 2015 Conference and are intended to facilitate active exchange, interaction and comparison of approaches, methods and various ideas in specific areas related to intelligent agent systems and multiagent systems.

The Internet of Things Ricardo Armentano 2017-10-16 This book provides a dual perspective on the Internet of Things and ubiquitous computing, along with their applications in healthcare and smart cities. It also covers other interdisciplinary aspects of the Internet of Things like big data, embedded Systems and wireless Sensor Networks. Detailed coverage of the underlying architecture, framework, and state-of-the-art methodologies form the core of the book.

Feature Engineering and Computational Intelligence in ECG Monitoring Chengyu Liu 2020-06-24 This book discusses feature engineering and computational intelligence solutions for ECG monitoring, with a particular focus on how these methods can be efficiently used to address the emerging challenges of dynamic, continuous & long-term individual ECG monitoring and real-time feedback. By doing so, it provides a "snapshot" of the current research at the interface between physiological signal analysis and machine learning. It also helps clarify a number of dilemmas and encourages further investigations in this field, to explore rational applications of feature engineering and computational intelligence in ECG monitoring. The book is intended for researchers and graduate students in the field of biomedical engineering, ECG signal processing, and intelligent healthcare.

Wearable Wireless Devices Qammer H. Abbasi 2020-03-18 With the growing interest in the use of technology in daily life, the potential for using wearable wireless devices across multiple segments, e.g., healthcare, sports, child monitoring, military, emergency, consumer electronics, etc., is rapidly increasing. Multibillion wearable sensors are predicted to be in use by 2025, with over 30% of them being new types of sensors that are only beginning to emerge. This book will focus on wireless wearable and implantable systems, flexible textile-based electronics, bio-electromagnetics, antennas and propagation, radio frequency (RF) circuits, sensors, security of wearables and implantable systems, nano-bio communication, and electromagnetic sensing

Distributed Computing and Monitoring Technologies for Older Patients Juris Klonovs 2016-01-21 This book summarizes various approaches for the automatic detection of health threats to older patients at home living alone. The text begins by briefly describing those who would most benefit from healthcare supervision. The book then summarizes possible scenarios for monitoring an older patient at home, deriving the common functional requirements for monitoring technology. Next, the work identifies the state of the art of technological monitoring approaches that are practically applicable to geriatric patients. A survey is presented on a range of such interdisciplinary fields as smart homes, telemonitoring, ambient intelligence, ambient assisted living, gerontechnology, and aging-in-place technology. The book discusses relevant experimental studies, highlighting the application of sensor fusion, signal processing and machine learning techniques. Finally, the text discusses future challenges, offering a number of suggestions for further research directions.

Internet of Things for Healthcare Technologies Chinmay Chakraborty 2020-06-08 This book focuses on recent advances in the Internet of Things (IoT) in biomedical and healthcare technologies, presenting theoretical, methodological, well-established, and validated empirical work in these fields. Artificial intelligence and IoT are set to revolutionize all industries, but perhaps none so much as health care. Both biomedicine and machine learning applications are capable of analyzing data stored in national health databases in order to identify potential health problems, complications and effective protocols, and a range of wearable devices for biomedical and healthcare applications far beyond tracking individuals' steps each day has emerged. These prosthetic technologies have made significant strides in recent decades with the advances in materials and development. As a result, more flexible, more mobile chip-enabled prosthetics or other robotic devices are on the horizon. For example, IoT-enabled wireless ECG sensors that reduce healthcare cost, and lead to better quality of life for cardiac patients. This book focuses on three current trends that are likely to have a significant impact on future healthcare: Advanced Medical Imaging and Signal Processing; Biomedical Sensors; and Biotechnological and Healthcare Advances. It also presents new methods of evaluating medical data, and diagnosing diseases in order to improve general quality of life.

Wearable Technology in Medicine and Health Care Raymond Tong 2018-08-08 **Wearable Technology in Medicine and Health Care** provides readers with the most current research and information on the clinical and biomedical applications of wearable technology. Wearable devices provide applicability and convenience beyond many other means of technical interface and can include varying applications, such as personal entertainment, social communications and personalized health and fitness. The book covers the rapidly expanding development of wearable systems, thus enabling clinical and medical applications, such as disease management and rehabilitation. Final chapters discuss the challenges inherent to these rapidly evolving technologies. Provides state-of-the-art coverage of the latest advances in wearable technology and devices in healthcare and medicine Presents the main applications and challenges in the biomedical implementation of wearable devices Includes examples of wearable sensor technology used for health monitoring, such as the use of wearables for continuous monitoring of human vital signs, e.g. heart rate, respiratory rate, energy expenditure, blood pressure and blood glucose, etc. Covers examples of wearables for early diagnosis of diseases, prevention of chronic conditions, improved clinical management of neurodegenerative conditions, and prompt response to emergency situations

Healthcare Data Analytics and Management Nilanjan Dey 2018-11-15 **Healthcare Data Analytics and Management** help readers disseminate cutting-edge research that delivers insights into the analytic tools, opportunities, novel strategies, techniques and challenges for handling big data, data analytics and management in healthcare. As the rapidly expanding and heterogeneous nature of healthcare data poses challenges for big data analytics, this book targets researchers and bioengineers from areas of machine learning, data mining, data management, and healthcare providers, along with clinical researchers and physicians who are interested in the management and analysis of healthcare data. Covers data analysis, management and security concepts and tools in the healthcare domain Highlights electronic medical health records and patient information records Discusses the different techniques to integrate Big data and Internet-of-Things in healthcare, including machine learning and data mining Includes multidisciplinary contributions in relation to healthcare applications and challenges