

Sensor Technologies Healthcare Wellness And Environmental Applications Experts Voice In Networked Technologies

This book reviews existing sensor technologies that are now being coupled with computational intelligence for the remote monitoring of physical activity and ex vivo biosignatures. In today's frenetic world, consumers are becoming ever more demanding: they want to control every aspect of their lives and look for options specifically tailored to their individual needs. In many cases, suppliers are catering to these new demands; as a result, clothing, food, social media, fitness and banking services are all being democratised to the individual. Healthcare provision has finally caught up to this trend and is currently being rebooted to offer personalised solutions, while simultaneously creating a more effective, scalable and cost-effective system for all. The desire for personalisation, home monitoring and treatment, and provision of care in remote locations or in emerging and impoverished nations that lack a fixed infrastructure, is leading to the realisation that mobile technology might be the best candidate for achieving these goals. A combination of several technological, healthcare and financial factors are driving this trend to create a new healthcare model that stresses preventative 'health-care' rather than 'sick-care', and a shift from volume to value. Mobile healthcare (mhealth), which could also be termed the "internet of people", refers to the integration of sensors and smartphones to gather and interpret clinical data from patients in real-time. Most importantly, with an ageing population suffering multiple morbidities, mhealth could provide healthcare

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solutions to enhance chronically ill patients' quality of life.

This book presents a practical framework for the application of big data, cloud, and pervasive and complex systems to sustainable solutions for urban environmental challenges. It covers the technologies, potential, and possible and impact of big data on energy efficiency and the urban environment. The book first introduces key aspects of big data, cloud services, pervasive computing, and mobile technologies from a pragmatic design perspective, including sample open source firmware. Cloud services, mobile and embedded platforms, interfaces, operating system design methods, networking, and middleware are all considered. The authors then explore in detail the framework, design principles, architecture and key components of developing energy systems to support sustainable urban environments. The included case study provides a pathway to improve the eco-efficiency of urban transport, demonstrating how to design an energy efficient next generation urban navigation system by leveraging vast cloud data sets on user-behavior. Ultimately, this resource maps big data's pivotal intersection with rapid global urbanization along the path to a sustainable future.

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

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ideally designed for researchers, academics, professionals, students, and practitioners interested in the emerging applications of wearable technologies.

Several internal and external factors have been identified to estimate and control the psychological stress of training in order to optimize training responses and to avoid fatigue, overtraining and other undesirable health effects of an athlete. An increasing number of lightweight sensor-based wearable technologies (“wearables”) have entered the sports technology market. Non-invasive sensor-based wearable technologies could transmit physical, physiological and biological data to computing platform and may provide through human-machine interaction (smart watch, smartphone, tablet) bio-feedback of various parameters for training load management and health. However, in theory, several wearable technologies may assist to control training load but the assessment of accuracy, reliability, validity, usability and practical relevance of new upcoming technologies for the management of training load is paramount for optimal adaptation and health.

Biomedical scientists are the foundation of modern healthcare, from cancer screening to diagnosing HIV, from blood transfusion for surgery to food poisoning and infection control. Without biomedical scientists, the diagnosis of disease, the evaluation of the effectiveness of treatment, and research into the causes and cures of disease would not be possible. The Fundamentals of Biomedical Science series has been written to reflect the challenges of practicing biomedical science today. It draws together essential basic science with insights into laboratory practice to show how an understanding of the biology of disease is coupled to the analytical approaches that lead to diagnosis. Assuming only a minimum of prior knowledge, the series reviews the full range of disciplines to which a Biomedical Scientist may be exposed -

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from microbiology to cytopathology to transfusion science. A core text in the Fundamentals of Biomedical Science series, Biomedical Science Practice gives a comprehensive overview of the key laboratory techniques and professional skills that students need to master. The text is supported throughout with engaging clinical case studies, written to emphasize the link between theory and practice, providing a strong foundation for beginning biomedical science students.

Designing Healthcare That Works: A Sociotechnical Approach takes up the pragmatic, messy problems of designing and implementing sociotechnical solutions which integrate organizational and technical systems for the benefit of human health. The book helps practitioners apply principles of sociotechnical design in healthcare and consider the adoption of new theories of change. As practitioners need new processes and tools to create a more systematic alignment between technical mechanisms and social structures in healthcare, the book helps readers recognize the requirements of this alignment. The systematic understanding developed within the book's case studies includes new ways of designing and adopting sociotechnical systems in healthcare. For example, helping practitioners examine the role of exogenous factors, like CMS Systems in the U.S. Or, more globally, helping practitioners consider systems external to the boundaries drawn around a particular healthcare IT system is one key to understand the design challenge. Written by scholars in the realm of sociotechnical systems research, the book is a valuable source for medical informatics professionals, software designers and any healthcare providers who are interested in making changes in the design of the systems. Encompasses case studies focusing on specific projects and covering an entire lifecycle of sociotechnical design in healthcare Provides an in-depth

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view from established scholars in the realm of sociotechnical systems research and related domains Brings a systematic understanding that includes ways of designing and adopting sociotechnical systems in healthcare

This book gathers selected research papers presented at the International Conference on Recent Trends in Machine Learning, IOT, Smart Cities & Applications (ICMISC 2020), held on 29–30 March 2020 at CMR Institute of Technology, Hyderabad, Telangana, India. Discussing current trends in machine learning, Internet of things, and smart cities applications, with a focus on multi-disciplinary research in the area of artificial intelligence and cyber-physical systems, this book is a valuable resource for scientists, research scholars and PG students wanting formulate their research ideas and find the future directions in these areas. Further, it serves as a reference work anyone wishing to understand the latest technologies used by practicing engineers around the globe.

Addresses recent advances from both the clinical and technological perspectives to provide a comprehensive presentation of m-Health This book introduces the concept of m-Health, first coined by Robert S. H. Istepanian in 2003. The evolution of m-Health since then—how it was transformed from an academic concept to a global healthcare technology phenomenon—is discussed. Afterwards the authors describe in detail the basics of the three enabling scientific technological elements of m-Health (sensors, computing, and communications), and how each of these key ingredients has evolved and matured over the last decade. The book concludes with detailed discussion of the future of m-Health and presents future directions to potentially shape and transform healthcare services in the coming decades. In addition, this book:

Discusses the rapid evolution of m-Health in parallel with the maturing process of its enabling

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technologies, from bio-wearable sensors to the wireless and mobile communication technologies from IOT to 5G systems and beyond Includes clinical examples and current studies, particularly in acute and chronic disease management, to illustrate some of the relevant medical aspects and clinical applications of m-Health Describes current m-Health ecosystems and business models Covers successful applications and deployment examples of m-Health in various global health settings, particularly in developing countries

Health Care Paradigms in the Internet of Things Ecosystem brings all IoT-enabled health care related technologies into a single platform so that undergraduate and postgraduate students, researchers, academicians and industry leaders can easily understand IoT-based healthcare systems. The book uses data and network engineering and intelligent decision support system-by-design principles to design a reliable IoT-enabled health care ecosystem and to implement cyber-physical pervasive infrastructure solutions. It takes the reader on a journey that begins with understanding the healthcare monitoring paradigm in IoT-enabled technologies and how it can be applied in various aspects. In addition, the book walks readers through real-time challenges and presents a guide on how to build a safe infrastructure for IoT-based health care. It also helps researchers and practitioners understand the e-health care architecture through IoT and the state-of-the-art in IoT countermeasures. Readers will find this to be a

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comprehensive discussion on functional frameworks for IoT-based healthcare systems, intelligent medicine, RFID technology, HMI, Cognitive Interpretation, Brain-Computer Interface, Remote Health Monitoring systems, wearable sensors, WBAN, and security and privacy issues in IoT-based health care monitoring systems. Presents the complete functional framework workflow in IoT-enabled healthcare technologies Explains concepts of location-aware protocols and decisive mobility in IoT healthcare Provides complete coverage of intelligent data processing and wearable sensor technologies in IoT-enabled healthcare Explores the Human Machine Interface and its implications in patient-care systems in IoT healthcare Explores security and privacy issues and challenges related to data-intensive technologies in healthcare-based Internet of Things Ongoing advancements in modern technology have led to significant developments with smart technologies. With the numerous applications available, it becomes imperative to conduct research and make further progress in this field. Smart Technologies: Breakthroughs in Research and Practice provides comprehensive and interdisciplinary research on the most emerging areas of information science and technology. Including innovative studies on image and speech recognition, human-computer interface, and wireless technologies, this multi-volume book is an ideal source for researchers, academicians,

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practitioners, and students interested in advanced technological applications and developments.

Sensors for Health Monitoring discusses the characteristics of U-Healthcare systems in different domains, providing a foundation for working professionals and undergraduate and postgraduate students. The book provides information and advice on how to choose the best sensors for a U-Healthcare system, advises and guides readers on how to overcome challenges relating to data acquisition and signal processing, and presents comprehensive coverage of up-to-date requirements in hardware, communication and calculation for next-generation uHealth systems. It then compares new technological and technical trends and discusses how they address expected u-Health requirements. In addition, detailed information on system operations is presented and challenges in ubiquitous computing are highlighted. The book not only helps beginners with a holistic approach toward understanding u-Health systems, but also presents researchers with the technological trends and design challenges they may face when designing such systems. Presents an outstanding update on the use of U-Health data analysis and management tools in different applications, highlighting sensor systems Highlights Internet of Things enabled U-Healthcare Covers different data transmission techniques, applications and challenges with

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extensive case studies for U-Healthcare systems

The Environmental Noise Directive (END) requires that a five-year updating of noise maps is carried out to check and report on the changes that have occurred during the reference period. The updating process is usually achieved using a standardized approach consisting of collecting and processing information through acoustic models to produce the updated noise maps. This procedure is time consuming and costly, and has a significant impact on the financial statement of the authorities responsible for providing the maps. Furthermore, the END requires that easy-to-read noise maps are made available to the public to provide information on noise levels and the subsequent actions to be undertaken by local and central authorities to reduce noise impacts. In order to update the noise maps more easily and in a more effective way, it is convenient to design an integrated system incorporating real-time noise measurement and signal processing to identify and analyze the noise sources present in the mapping area (e.g., road traffic noise, leisure noise, etc.) as well as to automatically generate and present the corresponding noise maps. This wireless acoustic sensor network design requires transversal knowledge, from accurate hardware design for acoustic sensors to network structure design and management of the information with signal processing to identify the origin of the measured noise

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and graphical user interface application design to present the results to end users. This book is collection in which several views of methodology and technologies required for the development of an efficient wireless acoustic sensor network from the first stages of its design to the tests conducted during deployment, its final performance, and possible subsequent implications for authorities in terms of the definition of policies. Contributions include several LIFE and H2020 projects aimed at the design and implementation of intelligent acoustic sensor networks with a focus on the publication of good practices for the design and deployment of intelligent networks in other locations.

Understanding and modifying health behaviors plays an important part in healthcare. The need to change behaviors applies across a range of health contexts, from individual interventions to the clinically-delivered management of chronic diseases and rehabilitation. Telehealth or virtual care technology offers many possible advantages here, including cost-efficiency, scalability, personalization, and automated high volume data collection and analysis, but success will depend on the effectiveness of the design, implementation and deployment of IT-based methods. This book, which forms part of the Global Telehealth series, includes papers presented at Global Telehealth 2019 (GT2019), a National Symposium on the topic of IT-based Methods for Health

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Behaviours held in Adelaide, Australia on 5 July 2019. The 10 papers selected for inclusion here comprise only full-paper, blind peer-reviewed contributions received for the symposium and the subsequent call for further contributions. Topics range from the scientific theory of health behavior change, through technological approaches to active ageing and the implementation of the 10,000 steps project, to a discussion of digital infrastructure for the storing & sharing of internet of things, wearables and app-based research study data. The book will be of interest to all researchers, managers and healthcare practitioners working to bring about positive changes in health behavior.

This in-depth book addresses a key void in the literature surrounding the Internet of Things (IoT) and health. By systematically evaluating the benefits of mobile, wireless, and sensor-based IoT technologies when used in health and wellness contexts, the book sheds light on the next frontier for healthcare delivery. These technologies generate data with significant potential to enable superior care delivery, self-empowerment, and wellness management. Collecting valuable insights and recommendations in one accessible volume, chapter authors identify key areas in health and wellness where IoT can be used, highlighting the benefits, barriers, and facilitators of these technologies as well as suggesting areas for improvement in current policy and regulations. Four overarching

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themes provide a suitable setting to examine the critical insights presented in the 31 chapters: Mobile- and sensor-based solutions Opportunities to incorporate critical aspects of analytics to provide superior insights and thus support better decision-making Critical issues around aspects of IoT in healthcare contexts Applications of portals in healthcare contexts A comprehensive overview that introduces the critical issues regarding the role of IoT technologies for health, Delivering Superior Health and Wellness Management with IoT and Analytics paves the way for scholars, practitioners, students, and other stakeholders to understand how to substantially improve health and wellness management on a global scale.

Many wearable sensor technology (WST) devices on the market enable individuals and organizations to track and monitor personal health metrics in real time. These devices are worn by the user and contain sensors to capture various biomarkers. Although these technologies are not yet sufficiently developed for law enforcement purposes overall, WSTs continue to advance rapidly and offer the potential to equip law enforcement officers and agencies with data to improve officer safety, health, and wellness. The RAND Corporation and the Police Executive Research Forum, on behalf of the National Institute of Justice, organized a workshop of practitioners, researchers, and developers to discuss

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the current state of WST and how it might be applied by law enforcement organizations. Workshop participants discussed possible issues with acceptance of WST among members of law enforcement; new policies that will be necessary if and when WST is introduced in a law enforcement setting; and what data are gathered, how these data are collected, and how they are interpreted and used. Individuals with disabilities, chronic conditions, and functional impairments need a range of services and supports to keep living independently. However, there often is not a strong link between medical care provided in the home and the necessary social services and supports for independent living. Home health agencies and others are rising to the challenges of meeting the needs and demands of these populations to stay at home by exploring alternative models of care and payment approaches, the best use of their workforces, and technologies that can enhance independent living. All of these challenges and opportunities lead to the consideration of how home health care fits into the future health care system overall. On September 30 and October 1, 2014, the Institute of Medicine and the National Research Council convened a public workshop on the future of home health care. The workshop brought together a spectrum of public and private stakeholders and thought leaders to improve understanding of the current role of Medicare home health care in supporting

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aging in place and in helping high-risk, chronically ill, and disabled Americans receive health care in their communities. Through presentations and discussion, participants explored the evolving role of Medicare home health care in caring for Americans in the future, including how to integrate Medicare home health care into new models for the delivery of care and the future health care marketplace. The workshop also considered the key policy reforms and investments in workforces, technologies, and research needed to leverage the value of home health care to support older Americans, and research priorities that can help clarify the value of home health care. This summary captures important points raised by the individual speakers and workshop participants.

Providing quality research for the reader, this title encompasses all the recent developments in smart sensor technology for health monitoring in aerospace structures, providing a valuable introduction to damage detection techniques. Focussing on engineering applications, all chapters are written by smart structures and materials experts from aerospace manufacturers and research/academic institutions. This key reference: Discusses the most important aspects related to smart technologies for damage detection; this includes not only monitoring techniques but also aspects related to specifications, design parameters, assessment and qualification routes. Presents real case studies and

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applications; this includes in-flight tests; the work presented goes far beyond academic research applications. Displays a balance between theoretical developments and engineering applications

As individuals increasingly seek ways of accessing, understanding and sharing data about their own bodies, this book offers a critique of the popular claim that 'more information' equates to 'better health'. In a study that redefines the public, academic and policy related debates around health, bodies, information and data, the authors consider the ways in which the phenomenon of self-diagnosis has created alternative worlds of knowledge and practises which are often at odds with professional medical advice. With a focus on data that concerns significant life changes, this book explores the potential challenges related to people's changing relationships with traditional health systems as access to, and control over data shifts.

Written by industry experts, this book aims to provide you with an understanding of how to design and work with wearable sensors. Together these insights provide the first single source of information on wearable sensors that would be a valuable addition to the library of any engineer interested in this field. Wearable Sensors covers a wide variety of topics associated with the development and application of various wearable sensors. It also provides an overview and

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coherent summary of many aspects of current wearable sensor technology. Both industry professionals and academic researchers will benefit from this comprehensive reference which contains the most up-to-date information on the advancement of lightweight hardware, energy harvesting, signal processing, and wireless communications and networks. Practical problems with smart fabrics, biomonitoring and health informatics are all addressed, plus end user centric design, ethical and safety issues. Provides the first comprehensive resource of all currently used wearable devices in an accessible and structured manner. Helps engineers manufacture wearable devices with information on current technologies, with a focus on end user needs and recycling requirements. Combines the expertise of professionals and academics in one practical and applied source.

Emerging and currently available technologies offer great promise for helping older adults, even those without serious disabilities, to live healthy, comfortable, and productive lives. What technologies offer the most potential benefit? What challenges must be overcome, what problems must be solved, for this promise to be fulfilled? How can federal agencies like the National Institute on Aging best use their resources to support the translation from laboratory findings to useful, marketable products and services? Technology for Adaptive Aging is the product

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of a workshop that brought together distinguished experts in aging research and in technology to discuss applications of technology to communication, education and learning, employment, health, living environments, and transportation for older adults. It includes all of the workshop papers and the report of the committee that organized the workshop. The committee report synthesizes and evaluates the points made in the workshop papers and recommends priorities for federal support of translational research in technology for older adults.

This book introduces zero-effort technologies (ZETs), an emerging class of technologies that require little or no effort from the people who use them. ZETs use advanced computing techniques, such as computer vision, sensor fusion, decision-making and planning, machine learning, and the Internet of Things to autonomously perform the collection, analysis, and application of data about the user and/or his/her context. This book begins with an overview of ZETs, then presents concepts related to their development, including pervasive intelligent technologies and environments, design principles, and considerations regarding use. The book discusses select examples of the latest in ZET development before concluding with thoughts regarding future directions of the field.

Internet of Things (IoT) is a recent technology paradigm that creates a global network of machines and devices that are capable of communicating with each

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other. Security cameras, sensors, vehicles, buildings, and software are examples of devices that can exchange data between each other. IoT is recognized as one of the most important areas of future technologies and is gaining vast recognition in a wide range of applications and fields related to smart homes and cities, military, education, hospitals, homeland security systems, transportation and autonomous connected cars, agriculture, intelligent shopping systems, and other modern technologies. This book explores the most important IoT automated and smart applications to help the reader understand the principle of using IoT in such applications.

The last decade has witnessed a rapid surge of interest in new sensing and monitoring devices for wellbeing and healthcare. One key development in this area is wireless, wearable and implantable in vivo monitoring and intervention. A myriad of platforms are now available from both academic institutions and commercial organisations. They permit the management of patients with both acute and chronic symptoms, including diabetes, cardiovascular diseases, treatment of epilepsy and other debilitating neurological disorders. Despite extensive developments in sensing technologies, there are significant research issues related to system integration, sensor miniaturisation, low-power sensor interface, wireless telemetry and signal processing. In the 2nd edition of this

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popular and authoritative reference on Body Sensor Networks (BSN), major topics related to the latest technological developments and potential clinical applications are discussed, with contents covering. Biosensor Design, Interfacing and Nanotechnology Wireless Communication and Network Topologies Communication Protocols and Standards Energy Harvesting and Power Delivery Ultra-low Power Bio-inspired Processing Multi-sensor Fusion and Context Aware Sensing Autonomic Sensing Wearable, Ingestible Sensor Integration and Exemplar Applications System Integration and Wireless Sensor Microsystems The book also provides a comprehensive review of the current wireless sensor development platforms and a step-by-step guide to developing your own BSN applications through the use of the BSN development kit.

Sensor Technologies Healthcare, Wellness and Environmental Applications Apress

"Have you ever seen lights turn on automatically when you step into a restroom? This curricular, STEM-focused title will explore how robotic sensors can help save energy, keep people safe, and make life more convenient."--

This easy-to-understand book discusses applications of current technologies and the foundations for their extension into emerging areas in the future. It includes research presented at two conferences: 5th International IBM Cloud Academy Conference, 2017,

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held in Wrocław, Poland. 5th Asia-Pacific Conference on Computer Assisted and System Engineering, 2017, held in Guilin, China. These conferences focused on system and application engineering, including achievements in the interdisciplinary topics of cloud computing, big data, IoT and mobile communications. Featuring 19 chapters, the book has the potential to influence current and future research and applications combining the best attributes of computing, mathematics, artificial intelligence, biometrics and software engineering to create a comprehensive research application domain.

This open access book was prepared as a Final Publication of the COST Action IC1303 “Algorithms, Architectures and Platforms for Enhanced Living Environments (AAPELE)”. The concept of Enhanced Living Environments (ELE) refers to the area of Ambient Assisted Living (AAL) that is more related with Information and Communication Technologies (ICT). Effective ELE solutions require appropriate ICT algorithms, architectures, platforms, and systems, having in view the advance of science and technology in this area and the development of new and innovative solutions that can provide improvements in the quality of life for people in their homes and can reduce the financial burden on the budgets of the healthcare providers. The aim of this book is to become a state-of-the-art reference, discussing progress made, as well as prompting future directions on theories, practices, standards, and strategies related to the ELE area. The book contains 12 chapters and can serve as a valuable reference for

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undergraduate students, post-graduate students, educators, faculty members, researchers, engineers, medical doctors, healthcare organizations, insurance companies, and research strategists working in this area.

Health Professionals' Education in the Age of Clinical Information Systems, Mobile Computing and Social Networks addresses the challenges posed by information and communication technology to health professionals' education, and the lessons learned from field experiences and research. This book is divided in three parts: "the changing landscape of information and communication technology in health care", in which it discusses how information and communication technology is transforming health care and the implications of these changes for health professions education; "experiences from the field", with real-life examples of health professionals' education in and for the digital era; and "evaluation of students and programs", addressing the use of technology to assess learners as well as the complexity of evaluating programs to enhance competence in an information technology-rich health care world. Written by leading researchers from different parts of the world, the book is a valuable source for educators and professionals who are active or wish to be part of the health informatics field. Brings an in-depth understanding and background on the challenges for education of the health professions brought by information and communication technology. Provides real-life examples on how technology is used in healthcare and how it can be used in education. Presents valuable information in a visually appealing format with

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tables and figures

Digital Health: Mobile and Wearable Devices for Participatory Health Applications is a key reference for engineering and clinical professionals considering the development or implementation of mobile and wearable solutions in the healthcare domain. The book presents a comprehensive overview of devices and appropriateness for the respective applications. It also explores the ethical, privacy, and cybersecurity aspects inherent in networked and mobile technologies. It offers expert perspectives on various approaches to the implementation and integration of these devices and applications across all areas of healthcare. The book is designed with a multidisciplinary audience in mind; from software developers and biomedical engineers who are designing these devices to clinical professionals working with patients and engineers on device testing, human factors design, and user engagement/compliance.

- Presents an overview of important aspects of digital health, from patient privacy and data security to the development and implementation of networks, systems, and devices
- Provides a toolbox for stakeholders involved in the decision-making regarding the design, development, and implementation of mHealth solutions
- Offers case studies, key references, and insights from a wide range of global experts

A prevailing excitement can be discerned in the medical and public health literature and popular media concerning the apparent 'disruptive' or 'revolutionary' potential of digital health technologies. Most of the wider social implications are often ignored or

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glossed over in such accounts. Critical approaches from within the social sciences that take a more measured perspective are important – including those that focus on risk. The contributors to this volume examine various dimensions of risk in the context of digital health. They identify that digital health devices and software offer the ability to configure new forms of risk, in concert with novel responsibilities. The contributions emphasise the sheer volume of detail about very personal and private elements of people's lives, emotions and bodies that contemporary digital technologies can collect. They show that apps and other internet tools and forums provide opportunities for health and medical risks to be identified, publicised or managed, but also for unvalidated new therapies to be championed. Most of the authors identify the neoliberal 'soft' politics of digital health, in which lay people are encouraged ('nudged') to engage in practices of identifying and managing health risk in their own interests, and the victim-blaming that may be part of these discourses. This book was originally published as a special issue of *Health, Risk and Society*.

Mental health is a growing field, but one still limited by a lack of prior research and challenged by increased demand for new solutions and treatments. Mobile and web-based technologies have the potential to fill some of the gaps. *Advanced Technological Solutions for E-Health and Dementia Patient Monitoring* provides comprehensive coverage of issues in patient health and support from the perspectives of doctors, nurses, patients, and caregivers. With its focus on challenges and opportunities, as well

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as future research in the field, this book is a vital reference for researchers, scholars, advanced students, software developers, managers, and stakeholders working at the forefront of e-health systems.

The digital transformation of healthcare delivery is in full swing. Health monitoring is increasingly becoming more effective, efficient, and timely through mobile devices that are now widely available. This, as well as wireless technology, is essential to assessing, diagnosing, and treating medical ailments. However, systems and applications that boost wellness must be properly designed and regulated in order to protect the patient and provide the best care. *Optimizing Health Monitoring Systems With Wireless Technology* is an essential publication that focuses on critical issues related to the design, development, and deployment of wireless technology solutions for healthcare and wellness. Highlighting a broad range of topics including solution evaluation, privacy and security, and policy and regulation, this book is ideally designed for clinicians, hospital directors, hospital managers, consultants, health IT developers, healthcare providers, engineers, software developers, policymakers, researchers, academicians, and students.

This volume offers readers various perspectives and visions for cutting-edge research in ubiquitous healthcare. The topics emphasize large-scale architectures and high performance solutions for smart healthcare, healthcare monitoring using large-scale computing techniques, Internet of Things (IoT) and

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big data analytics for healthcare, Fog Computing, mobile health, large-scale medical data mining, advanced machine learning methods for mining multidimensional sensor data, smart homes, and resource allocation methods for the BANs. The book contains high quality chapters contributed by leading international researchers working in domains, such as e-Health, pervasive and context-aware computing, cloud, grid, cluster, and big-data computing. We are optimistic that the topics included in this book will provide a multidisciplinary research platform to the researchers, practitioners, and students from biomedical engineering, health informatics, computer science, and computer engineering. Smartphone usage has created a new means for detection, analysis, diagnosis and monitoring through the use of new apps and attachments. These breakthrough analytical methods offer ways to overcome the drawbacks of more conventional methods, such as the expensive instrumentation that is often needed, complex sample pre-treatment steps, or time-consuming procedures. Smartphone-Based Detection Devices: Emerging Trends in Analytical Techniques gathers these modern developments in smartphone analytical methods into one comprehensive source, covering recent advancements in analytical tools while paying special attention to the most accurate, highly efficient approaches. Serving as a guide not only to analytical chemists but also

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to environmentalists, biotechnologists, pharmacists, forensic scientists and toxicologists, Smartphone-Based Detection Devices: Emerging Trends in Analytical Techniques is an important source for researchers who require accurate analysis of their on- and off-site samples. Students in these fields at the graduate and post-graduate level will also benefit from this topical and comprehensive book. Provides an integrated approach for advanced analytical methods and techniques using smartphones Covers the usage of smartphones in sample prep, integration and detection stages of analytical chemistry Applicable for researchers of all levels, from graduate students to professionals

This book contains a collection of selected works stemming from the 2013 International Conference on Sensing Technology (ICST), which was held in Wellington, New Zealand. The purpose of the book is to distill the highlights of the conference, and therefore track the latest developments in sensing technologies. The book contents are broad, since sensors can be applied in many different areas. Therefore the book gives a broad overview of the latest developments, in addition to discussing the process through which researchers go through in order to develop sensors, or related systems, which will become more widespread in the future. The book is written for academic and industry professionals working in the field of sensing, instrumentation and related fields,

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and is positioned to give a snapshot of the current state of the art in sensing technology, particularly from the applied perspective.

Sensor Technologies: Healthcare, Wellness and Environmental Applications explores the key aspects of sensor technologies, covering wired, wireless, and discrete sensors for the specific application domains of healthcare, wellness and environmental sensing. It discusses the social, regulatory, and design considerations specific to these domains. The book provides an application-based approach using real-world examples to illustrate the application of sensor technologies in a practical and experiential manner. The book guides the reader from the formulation of the research question, through the design and validation process, to the deployment and management phase of sensor applications. The processes and examples used in the book are primarily based on research carried out by Intel or joint academic research programs. “**Sensor Technologies: Healthcare, Wellness and Environmental Applications** provides an extensive overview of sensing technologies and their applications in healthcare, wellness, and environmental monitoring. From sensor hardware to system applications and case studies, this book gives readers an in-depth understanding of the technologies and how they can be applied. I would highly recommend it to students or researchers who are interested in wireless sensing technologies and

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the associated applications.” Dr. Benny Lo Lecturer, The Hamlyn Centre, Imperial College of London “This timely addition to the literature on sensors covers the broad complexity of sensing, sensor types, and the vast range of existing and emerging applications in a very clearly written and accessible manner. It is particularly good at capturing the exciting possibilities that will occur as sensor networks merge with cloud-based ‘big data’ analytics to provide a host of new applications that will impact directly on the individual in ways we cannot fully predict at present. It really brings this home through the use of carefully chosen case studies that bring the overwhelming concept of 'big data' down to the personal level of individual life and health.” Dermot Diamond Director, National Centre for Sensor Research, Principal Investigator, CLARITY Centre for Sensor Web Technologies, Dublin City University "Sensor Technologies: Healthcare, Wellness and Environmental Applications takes the reader on an end-to-end journey of sensor technologies, covering the fundamentals from an engineering perspective, introducing how the data gleaned can be both processed and visualized, in addition to offering exemplar case studies in a number of application domains. It is a must-read for those studying any undergraduate course that involves sensor technologies. It also provides a thorough foundation for those involved in the research and development of

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applied sensor systems. I highly recommend it to any engineer who wishes to broaden their knowledge in this area!" Chris Nugent Professor of Biomedical Engineering, University of Ulster

To explore how mobile technology can be employed to enhance the lives of older adults, the Board on Behavioral, Cognitive, and Sensory Sciences of the National Academies of Sciences, Engineering, and Medicine commissioned 6 papers, which were presented at a workshop held on December 11 and 12, 2019. These papers review research on mobile technologies and aging, and highlight promising avenues for further research.

This book explores the use of techniques and technologies within ICT for the improvement of human quality of life -- encompassing patient monitoring, data analysis, and assistive services. Also discussed are the future challenges to developing effective and efficient healthcare and assistive systems for our current and future society. The book offers an interdisciplinary approach to the study of human monitoring, smart health and assisted living, under a unifying point of view to improve Quality of Life Technology (QoLT).

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