

Wearable Sensors By Edward Sazonov

This volume presents the proceedings of the CLAIB 2016, held in Bucaramanga, Santander, Colombia, 26, 27 & 28 October 2016. The proceedings, presented by the Regional Council of Biomedical Engineering for Latin America (CORAL), offer research findings, experiences and activities between institutions and universities to develop Bioengineering, Biomedical Engineering and related sciences. The conferences of the American Congress of Biomedical Engineering are sponsored by the International Federation for Medical and Biological Engineering (IFMBE), Society for Engineering in Biology and Medicine (EMBS) and the Pan American Health Organization (PAHO), among other organizations and international agencies to bring together scientists, academics and biomedical engineers in Latin America and other continents in an environment conducive to exchange and professional growth.

Using a hands-on, student-friendly approach, **Android Programming Concepts** provides a comprehensive foundation for the development of mobile applications for devices and tablets powered by Android. This text explores Android Java and the Android SDK, the implementation of interactivity using touchscreen gesture detection and sensors, and current concepts and techniques for constructing mobile apps that take advantage of the latest Android features. Each chapter features a collection of well-designed and classroom tested labs that provide clear guidance of Android concepts. Each lab is geared toward one or two specific Android concepts, which eliminated distractions and gives the reader better focus on the concepts at hand.

Thompson sampling is an algorithm for online decision problems where actions are taken sequentially in a manner that must balance between exploiting what is known to maximize immediate performance and investing to accumulate new information that may improve future performance. The algorithm addresses a broad range of problems in a computationally efficient manner and is therefore enjoying wide use. A Tutorial on Thompson Sampling covers the algorithm and its application, illustrating concepts through a range of examples, including Bernoulli bandit problems, shortest path problems, product recommendation, assortment, active learning with neural networks, and reinforcement learning in Markov decision processes. Most of these problems involve complex information structures, where information revealed by taking an action informs beliefs about other actions. It also discusses when and why Thompson sampling is or is not effective and relations to alternative algorithms.

IECBES is a series of bi annual conference since 2010 The conference will provide excellent platform for knowledge exchange between researchers, scientists, academicians and engineers working in the areas of biomedical engineering It is open for local and international participants

Materials, Devices and Integrations

Smart Structures and Materials

Wearable Technologies and Wireless Body Sensor Networks for Healthcare

Wearable Electronics and Embedded Computing Systems for Biomedical Applications

A resource guide to method selection and application in low resource settings

Indoor Positioning and Navigation

Constraint-Induced Movement therapy (CI therapy) is a behavioral approach to neurorehabilitation based on a program of neuroscience experiments conducted with monkeys. Evidence has accumulated to support the efficacy of CI therapy for rehabilitating hemiparetic arm use in individuals with chronic stroke. This book addresses the related topics.

This book is a printed edition of the Special Issue "Wearable Electronics and Embedded Computing Systems for Biomedical Applications" that was published in Electronics

Explore this indispensable guide covering the fundamentals of IOT and wearable devices from a leading voice in the field Fundamentals of IoT and Wearable Technology Design delivers a comprehensive exploration of the foundations of the Internet of Things (IoT) and wearable technology. Throughout the textbook, the focus is on IoT and wearable technology and their applications, including mobile health, environment, home automation, and smart living. Readers will learn about the most recent developments in the design and prototyping of these devices. This interdisciplinary work combines technical concepts from electrical, mechanical, biomedical, computer, and industrial engineering, all of which are used in the design and manufacture of IoT and wearable devices. Fundamentals of IoT and Wearable Technology Design thoroughly investigates the foundational characteristics, architectural aspects, and practical considerations, while offering readers detailed and systematic design and prototyping processes of typical use cases representing IoT and wearable technology. Later chapters discuss crucial issues, including PCB design, cloud and edge topologies, privacy and health concerns, and regulatory policies. Readers will also benefit from the inclusion of: A thorough introduction to the applications of IoT and wearable technology, including biomedicine and healthcare, fitness and wellbeing, sports, home automation, and more Discussions of wearable components and technologies, including microcontrollers and microprocessors, sensors, actuators and communication modules An exploration of the characteristics and basics of the communication protocols and technologies used in IoT and wearable devices An overview of the most important security challenges, threats, attacks and vulnerabilities faced by IoT and wearable devices along with potential solutions Perfect for research and development scientists working in the wearable technology and Internet of Things spaces, Fundamentals of IoT and Wearable Technology Design will also earn a place in the libraries of undergraduate and graduate students studying wearable technology and IoT, as well as professors and practicing technologists in the area.

In recent years, rapid development in robotics, mobile, and communication technologies has encouraged many studies in the field of localization and navigation in indoor environments. An accurate localization system that can operate in an indoor environment has considerable practical value, because it can be built into autonomous mobile systems or a personal navigation system on a smartphone for guiding people through airports, shopping malls, museums and other public institutions, etc. Such a system would be particularly useful for blind people. Modern smartphones are equipped with numerous sensors (such as inertial sensors, cameras, and barometers) and communication modules (such as WiFi, Bluetooth, NFC, LTE/5G, and UWB capabilities), which enable the implementation of various localization algorithms, namely, visual localization, inertial navigation system, and radio localization. For the mapping of indoor environments and localization of autonomous mobile systems, LIDAR sensors are also frequently used in addition to smartphone sensors. Visual localization and inertial navigation systems are sensitive to external disturbances; therefore, sensor fusion approaches can be used for the implementation of robust localization algorithms. These have to be optimized in order to be computationally efficient, which is essential for realtime processing and low energy consumption on a smartphone or robot.

Fundamentals and Applications of Chemical Sensors

Sleep Disorders and Sleep Deprivation

Introduction to Airborne Radar

Applications, Design and Implementation

Sensor Technologies

Wearables, Implantables, Embeddables, Ingestibles

Diet is a major factor in health and disease. Controlled, long-term studies in humans are impractical, and investigators have utilized long-term epidemiological investigations to study the contributions of diet to the human condition. Such studies, while valuable, have often been limited by contradictory findings; a limitation secondary to systematic errors in traditional self-reported dietary assessment tools that limit the percentage of variances in diseases explained by diet. New approaches are available to help overcome these limitations, and Advances in the Assessment of Dietary Intake is focused on these advances in an effort to provide more accurate dietary data to understand human health. Chapters cover the benefits and limitations of traditional self-report tools; strategies for improving the validity of dietary recall and food recording methods; objective methods to assess food and nutrient intake; assessment of timing and meal patterns using glucose sensors; and physical activity patterns using validated accelerometers. Advances in the Assessment of Dietary Intake describes new avenues to investigate the role of diet in human health and serves as the most up-to-date reference and teaching tool for these methods that will improve the accuracy of dietary assessment and lay the ground work for future studies.

An introduction to the subject for non-specialists: engineers, technicians, pilots, and aerospace industry marketing, public relations, and customer support personnel. Also a reference for specialists in the field. The completely rewritten and revised Second Edition updates the original published by the Hughes Aircraft Company.

Wearable SensorsFundamentals, Implementation and ApplicationsAcademic Press

Practitioners and scholars explore ethical, social, and conceptual issues arising in relation to such devices as fitness monitors, neural implants, and a toe-controlled computer mouse. Body-centered computing now goes beyond the "wearable" to encompass implants, bionic technology, and ingestible sensors"technologies that point to hybrid bodies and blurred boundaries between human, computer, and artificial intelligence platforms. Such technologies promise to reconfigure the relationship between bodies and their environment, enabling new kinds of physiological interfacing, embodiment, and productivity. Using the term embodied computing to describe these devices, this book offers essays by practitioners and scholars from a variety of disciplines that explore the accompanying ethical, social, and conceptual issues. The contributors examine technologies that range from fitness monitors to neural implants to a toe-controlled mouse. They discuss topics that include the policy implications of ingestibles; the invasive potential of body area networks, which transmit data from bodily devices to the internet; cyborg experiments, linking a human brain directly to a computer; the evolution of the ankle monitor and other intrusive electronic monitoring devices; fashiontech, which offers users an aura of "cool" in exchange for their data; and the "final frontier" of technosupremacism: technologies that seek to read our minds. Taken together, the essays show the importance of considering embodied technologies in their social and political contexts rather than in isolated subjectivity or in purely quantitative terms. Contributors Roba Abbas, Andrew Iliadis, Gary Genosko, Suneel Jethani, Deborah Lupton, Katina Michael, M. G. Michael, Marcel O’Gorman, Maggie Orth, Isabel Pedersen, Christine Perakslis, Kevin Warwick, Elizabeth Wissinger

Constraint-induced Movement Therapy

Epigenetics in Human Disease

Using Wearable Sensors and Smartphones

Human Activity Recognition

Sensors in the Age of the Internet of Things

Healthcare, Wellness and Environmental Applications

Learn How to Design and Implement HAR Systems The pervasiveness and range of capabilities of today’s mobile devices have enabled a wide spectrum of mobile applications that are transforming our daily lives, from smartphones equipped with GPS to integrated mobile sensors that acquire physiological data. Human Activity Recognition: Using Wearable Sensors and Smartphones focuses on the automatic identification of human activities from pervasive wearable sensors—a crucial component for health monitoring and also applicable to other areas, such as entertainment and tactical operations. Developed from the authors’ nearly four years of rigorous research in the field, the book covers the theory, fundamentals, and applications of human activity recognition (HAR). The authors examine how machine learning and pattern recognition tools help determine a user’s activity during a certain period of time. They propose two systems for performing HAR: Centinela, an offline server-oriented HAR system, and Vigilante, a completely mobile real-time activity recognition system. The book also provides a practical guide to the development of activity recognition applications in the Android framework.

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 extensive case studies for U-Healthcare systems

Presents the first comprehensive collection of articles on the fundamentals and applications of a wide variety of chemical sensors. Discusses a range of topics from the development of new sensor concepts to improvement in sensors that have been mass produced for several years. Specific types of sensors discussed include oxygen, electrochemical, microbial, drug, and glucose sensors.

This text is a lucid presentation of the principles of working of all types of sensors and transducers which form the prime components of the instrumentation systems. The characteristics of the sensors and transducers and the operating principles of transducer technologies have been discussed in considerable detail. Besides covering conventional sensors such as electromechanical, thermal, magnetic, radiation, and electroanalytical, the recent advances in sensor technologies including smart and intelligent sensors used in automated systems are also comprehensively described. The application aspects of sensors used in several fields such as automobiles, manufacturing, medical, and environment are fully illustrated. With a straightforward approach the text is aimed at building a sound understanding of the fundamentals, and inculcating analytical skills needed for design and operation. Numerous schematic representations, examples, and review questions help transcend underlying basics to automation and instrumentation. The book with incisive explanations and all the pedagogic attributes is designed to serve the needs of the engineering students of instrumentation, chemical, mechanical, and electrical disciplines. It will also be a useful text for the students of applied sciences.

An Unmet Public Health Problem

Technologies and Applications

Make: Wearable Electronics

Android Programming Concepts

Wireless Sensor Networks for Infrastructure Monitoring

Problem Solving for Wireless Sensor Networks

This handbook is the first comprehensive text on positive psychology and disability. Emphasizing paradigmatic changes in understanding disability, the text covers traditional disciplines in positive psychology; and applications of positive psychology to domains like education or work.

Wearable Sensors: Fundamentals, Implementation and Applications has been written by a collection of experts in their field, who each 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 fantastic addition to the library of any engineers working in this field. Wearable Sensors covers a wide variety of topics associated with development and applications of wearable sensors. It also provides an overview and a coherent summary of many aspects of wearable sensor technology. Both professionals in industries and academic researchers need this package of information in order to learn the overview and each specific technology at the same time. This book includes the most current knowledge on the advancement of light-weight 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. The new edition is completely reviewed by key figures in the field, who offer authoritative and comprehensive information on the various topics. A new feature for the second edition is the incorporation of key background information on topics to allow the less advanced user access to the field and to make the title more of an auto-didactic book for undergraduates. Provides a full revision of the first edition, providing a comprehensive and up-to-date 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 This book provides a fully updated overview of the many aspects of wearable sensor technology in one single volume, enabling engineers and researchers to fully comprehend the field and to identify opportunities

A wireless sensor network was implemented in a secondary road bridge to monitor bridge stresses. The application of wireless sensor networks in infrastructure monitoring is feasible and effective.

A description of the inertial technology used for guidance, control, and navigation, discussing in detail the principles, operation, and design of sensors, gyroscopes, and accelerometers, as well as the advantages and disadvantages of particular systems. An engineer with long practical experience in the field, the author elucidates such recent developments as fibre-optic gyroscopes, solid-state accelerometers, and the global positioning system. This will be of interest to researchers and practising engineers involved in systems engineering, aeronautics, space research, and navigation on both land and sea.

2020 IEEE EMBS Conference on Biomedical Engineering and Sciences (IECBES)

Functional Tactile Sensors

Advances in the Assessment of Dietary Intake.

Machine Learning and Data Mining in Pattern Recognition

Innovative Technologies and Services for Smart Cities

Dietary assessment

Epigenetics is one of the fastest growing fields of sciences, illuminating studies of human diseases by looking beyond genetic make-up and acknowledging that outside factors play a role in gene expression. The goal of this volume is to highlight those diseases or conditions for which we have advanced knowledge of epigenetic factors such as cancer, autoimmune disorders and aging as well as those that are yielding exciting breakthroughs in epigenetics such as diabetes, neurobiological disorders and cardiovascular disease. Where applicable, attempts are made to not only detail the role of epigenetics in the etiology, progression, diagnosis and prognosis of these diseases, but also novel epigenetic approaches to the treatment of these diseases. Chapters are also presented on human imprinting disorders, respiratory diseases, infectious diseases and gynecological and reproductive diseases. Since epigenetics plays a major role in the aging process, advances in the epigenetics of aging are highly relevant to many age-related human diseases. Therefore, this volume closes with chapters on aging epigenetics and breakthroughs that have been made to delay the aging process

through epigenetic approaches. With its translational focus, this book will serve as valuable reference for both basic scientists and clinicians alike. Comprehensive coverage of fundamental and emergent science and clinical usage Side-by-side coverage of the basis of epigenetic diseases and their treatments Evaluation of recent epigenetic clinical breakthroughs

A new edition to the bestselling Wipe Clean Workbooks series, packed with early learning exercises.This book has wipe-clean pages, and comes with a wipe-clean pen, so the activities inside can be completed, wiped away and repeated time and time again.

FAO provides countries with technical support to conduct nutrition assessments, in particular to build the evidence base required for countries to achieve commitments made at the Second International Conference on Nutrition (ICN2) and under the 2016-2025 UN Decade of Action on Nutrition. Such concrete evidence can only derive from precise and valid measures of what people eat and drink. There is a wide range of dietary assessment methods available to measure food and nutrient intakes (expressed as energy insufficiency, diet quality and food patterns etc.) in diet and nutrition surveys, in impact surveys, and in monitoring and evaluation. Differenct indicators can be selected according to a study's objectives, sample population, costs and required precision. In low capacity settings, a number of other issues should be considered (e.g. availability of food composition tables, cultural and community specific issues, such as intra-household distribution of foods and eating from shared plates, etc.). This manual aims to signpost for the users the best way to measure food and nutrient intakes and to enhance their understanding of the key features, strengths and limitations of various methods. It also highlights a number of common methodological considerations involved in the selection process. Target audience comprises of individuals (policy-makers, programme managers, educators, health professionals including dietitians and nutritionists, field workers and researchers) involved in national surveys, programme planning and monitoring and evaluation in low capacity settings, as well as those in charge of knowledge brokering for policy-making.

The IoT is the inter-networking of connected and smart devices, buildings, vehicles and other items which are embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. A sensor is a detection device that measures, records, or responds to a physical property. Sensors represent the front end of information processing.

Progress in communication technologies is part of the multi-factorial advances in electronics, sensors, embedded computing, signal processing and machine learning methods that has led to the development of new capabilities in the IoT. This edited book focuses on the technologies constituting the IoT from a sensor perspective, for an audience of researchers, scientists, engineers and graduate students with an interest in the field. Applications covered include connected sensors for smart cities, energy infrastructure, emergency management, and smart ports.

SENSORS AND TRANSDUCERS

VII Latin American Congress on Biomedical Engineering CLAIB 2016, Bucaramanga, Santander, Colombia, October 26th -28th, 2016

Design, prototype, and wear your own interactive garments

Wearable/Personal Monitoring Devices Present to Future

Nutritional Assessment of Athletes

Sight Words

Functional Tactile Sensors: Materials, Devices and Integrations focuses on the subject of novel materials design and device integration of tactile sensors for functional applications. The book addresses the design, materials characteristics, device operation principles, specialized device application and mechanisms of the latest reported tactile sensors. The emphasis of the book lies in the materials science aspects of tactile sensors—understanding the relationship between material properties and device performance. It will be an ideal resource for researchers working in materials science, engineering and physics. Includes the latest advances and recent developments in tactile sensors for artificial intelligence applications Reviews the relationship between materials properties and device performance Addresses materials and device design strategies for targeted sensing applications

Clinical practice related to sleep problems and sleep disorders has been expanding rapidly in the last few years, but scientific research is not keeping pace. Sleep apnea, insomnia, and restless legs syndrome are three examples of very common disorders for which we have little biological information. This new book cuts across a variety of medical disciplines such as neurology, pulmonology, pediatrics, internal medicine, psychiatry, psychology, otolaryngology, and nursing, as well as other medical practices with an interest in the management of sleep pathology. This area of research is not limited to very young and old patients—sleep disorders reach across all ages and ethnicities. Sleep Disorders and Sleep Deprivation presents a structured analysis that explores the following: Improving awareness among the general public and health care professionals. Increasing investment in interdisciplinary somnology and sleep medicine research training and mentoring activities. Validating and developing new and existing technologies for diagnosis and treatment. This book will be of interest to those looking to learn more about the enormous public health burden of sleep disorders and sleep deprivation and the strikingly limited capacity of the health care enterprise to identify and treat the majority of individuals suffering from sleep problems.

Continuous advances in wearables, sensors and smart Wireless Body Area Network technologies have precipitated the development of new applications for on-, in- and body-to-body wearable communications for healthcare and sport monitoring. Progress in this cross-disciplinary field is further influenced by developments in radio communication, protocols, synchronization aspects, energy harvesting and storage solutions, and efficient processing techniques for smart antennas.

This book covers various scenarios and solutions using sensor devices and systems for activity recognition and their applications, including wearable communication, smart sensing, RF propagation, and measurement. The authors illustrate conceptual aspects and applications, and provide a new vision in characterising wearable technologies and the need for interoperability. Energy harvesting within wearable solutions is a key issue addressed here as it helps increase energy efficiency and reliability in wearable antennas and sensor devices.

This book introduces the enabling concepts that make up the so-called smart structure and presents a number of brief case studies to illustrate the applications of these concepts. It examines the domains of the individual technologies and defines the challenges faced by the integrator. The book is particularly effective for the potential system user who needs a good technical general background on the subject and is also useful for students and researchers in contributory technologies who want to better understand the context of their work. Consultants in civil and structural engineering will also find it of interest.

Wearable Sensors

Biomedical Signal Processing

Fundamentals of IoT and Wearable Technology Design

Human Activity Sensing

A Tutorial on Thompson Sampling

Sensors for Health Monitoring

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 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.

Sophisticated techniques for signal processing are now available to the biomedical specialist! Written in an easy-to-read, straightforward style, Biomedical Signal Processing presents techniques to eliminate background noise, enhance signal detection, and analyze computer data, making results easy to comprehend and apply. In addition to examining techniques for electrical signal analysis, filtering, and transforms, the author supplies an extensive appendix with several computer programs that demonstrate techniques presented in the text.

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 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.

Activity recognition has emerged as a challenging and high-impact research field, as over the past years smaller and more powerful sensors have been introduced in wide-spread consumer devices. Validation of techniques and algorithms requires large-scale human activity corpuses and improved methods to recognize activities and the contexts in which they occur. This book deals with the challenges of designing valid and reproducible experiments, running large-scale dataset collection campaigns, designing activity and context recognition methods that are robust and adaptive, and evaluating activity recognition systems in the real world with real users.

The Oxford Handbook of Positive Psychology and Disability

Body Sensor Networks

Corpus and Applications

Modern Inertial Technology

2021 IEEE International Biomedical Instrumentation and Technology Conference (IBITeC).

What if your clothing could change color to complement your skin tone, respond to your racing heartbeat, or connect you with a loved one from afar? Welcome to the world of shoes that can dynamically shift your height, jackets that display when the next bus is coming, and neckties that can nudge your business partner from across the room. Whether it be for fashion, function, or human connectedness, wearable electronics can be used to design interactive systems that are intimate and engaging. Make: Wearable Electronics is intended for those with an interest in physical computing who are looking to create interfaces or systems that live on the body. Perfect for makers new to wearable tech, this book introduces you to the tools, materials, and techniques for creating interactive electronic circuits and embedding them in clothing and other things you can wear. Each chapter features experiments to get you comfortable with the technology and then invites you to build upon that knowledge with your own projects. Fully illustrated with step-by-step instructions and images of amazing creations made by artists and professional designers, this book offers a concrete understanding of electronic circuits and how you can use them to bring your wearable projects from concept to prototype.

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 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 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

This book discusses recent advances in wearable technologies and personal monitoring devices, covering topics such as skin contact-based wearables (electrodes), non-contact wearables, the Internet of things (IoT), and signal processing for wearable devices. Although it chiefly focuses on wearable devices and provides comprehensive descriptions of all the core principles of personal monitoring devices, the book also features a section on devices that are embedded in smart appliances/furniture, e.g. chairs, which, despite their limitations, have taken the concept of unobtrusiveness to the next level. Wearable and personal devices are the key to precision medicine, and the medical community is finally exploring the opportunities offered by long-term monitoring of physiological parameters that are collected during day-to-day life without the bias imposed by the clinical environment. Such data offers a prime view of individuals physical condition, as well as the efficacy of therapy and occurrence of events. Offering an in-depth analysis of the latest advances in smart and pervasive wearable devices, particularly those that are unobtrusive and invisible, and addressing topics not covered elsewhere, the book will appeal to medical practitioners and engineers alike.

Problem Solving for Wireless Sensor Networks delivers a comprehensive review of the state of the art in the most important technological issues related to Wireless Sensor Networks (WSN). It covers topics such as hardware platforms, radio technologies, software technologies (including middleware), and network and deployment aspects. This book discusses the main open issues inside each of these categories and identifies innovations considered most interesting for future research. Features: - Hardware Platforms in WSN, - Software Technologies in SWN, - Network Aspects and Deployment in WSN, - Standards and Safety Regulation for WSN, - European Projects Related to WSN, - WSN Application Scenarios at both utility and technical levels. Complete, cutting-edge and resulting from the work of many recognized researchers, Problem Solving for Wireless Sensor Networks is an invaluable reference for graduates and researchers, as well as practitioners.

Navigation, Guidance, and Control

Embodied Computing

Fundamentals, Implementation and Applications

9th International Conference, MLDM 2013, New York, NY, USA, July 19-25, 2013, Proceedings

A smart city is a modern technology-driven urban area which uses sensing devices, information, and communication technology connected to the internet of things (IoTs) for the optimum and efficient utilization of infrastructures and services with the goal of improving the living conditions of citizens. Increasing populations, lower budgets, limited resources, and compatibility of the upgraded technologies are some of the few problems affecting the implementation of smart cities. Hence, there is continuous advancement regarding technologies for the implementation of smart cities. The aim of this Special Issue is to report on the design and development of integrated/smart sensors, a universal interfacing platform, along with the IoT framework, extending it to next-generation communication networks for monitoring parameters of interest with the goal of achieving smart cities. The proposed universal interfacing platform with the IoT framework will solve many challenging issues and significantly boost the growth of IoT-related applications, not just in the environmental monitoring domain but in the other key areas, such as smart home, assistive technology for the elderly care, smart city with smart waste management, smart E-metering, smart water supply, intelligent traffic control, smart grid, remote healthcare applications, etc., signifying benefits for all countries.

Evaluating dietary intake, determining energy metabolism, and conducting other nutritional assessments are essential in understanding the relationships between diet, exercise, health, and physical performance, especially in athletes. The first comprehensive source on the subject, Nutritional Assessment of Athletes thoroughly examines these methods,