
A Wireless Wearable Ecg Sensor For Long Term Applications

Post Pandemic Era

Liquid Metal Biomaterials

Wireless Computing in Medicine

Intelligent Computing, Information and Control Systems

2nd International Conference on Signals, Systems & Automation (ICSSA 2011) & 1st International Conference on Intelligent Systems & Data Processing (ICISD 2011)

Concepts, Methodologies, Tools, and Applications

Cloud Manufacturing Based Embroidered Wearable Electronics For Daily ECG Monitoring

Volume 2

Medical Instrumentation

Cardiovascular Imaging and Image Analysis

Advances in Body Area Networks I

Post-Conference Proceedings of BodyNets 2017

International Workshops: IWECC 2014, Gold Coast, QLD, Australia, December 1-5, 2014, and CMNA XV and IWECC 2015, Bertinoro, Italy, October 26, 2015, Revised Selected Papers

Wearable Sensors

Feature Engineering and Computational Intelligence in ECG Monitoring

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ICICCS 2019

Big Data Analytics for Intelligent Healthcare Management
Wearable Technologies: Concepts, Methodologies, Tools, and Applications
Computational Science and Its Applications -- ICCSA 2009
Non-contact Biopotential Sensing
Application and Design: Solutions Manual
Internet of Medical Things
Health Care Delivery and Clinical Science: Concepts, Methodologies, Tools, and Applications
Proceedings of the International Conference on Medical and Biological Engineering 2017
23rd IFIP WG 10.5/IEEE International Conference on Very Large Scale Integration, VLSI-SoC 2015, Daejeon, Korea, October 5-7, 2015,
Revised Selected Papers
Advanced Healthcare Systems
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Wearable Wireless Devices
Fundamentals, Implementation and Applications
Wearable Technology in Medicine and Health Care
Wireless Health
Distributed Computing and Monitoring Technologies for Older Patients

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Sensor For Long Term
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CINDY GAEL

Post Pandemic Era Springer Nature
Wireless ECG System with Bluetooth Low
Energy and Compressed Sensing
Liquid Metal Biomaterials Wireless ECG

System with Bluetooth Low Energy and
Compressed Sensing 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. Wearable Wireless Devices

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.

Springer Science & Business Media
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 *Wireless Computing in Medicine* Springer 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

Intelligent Computing, Information and Control Systems John Wiley & Sons

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).

2nd International Conference on Signals, Systems & Automation (ICSSA 2011) & 1st International Conference on Intelligent Systems &

Data Processing (ICISD 2011) Springer

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.

Concepts, Methodologies, Tools, and Applications Springer Nature

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.

Cloud Manufacturing Based Embroidered Wearable Electronics For Daily ECG Monitoring Springer Nature

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.

Volume 2 Springer

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.

Medical Instrumentation John Wiley & Sons

In this book, the authors describe the fundamental concepts and practical aspects of wireless sensor networks. The book provides a comprehensive view to this rapidly evolving field, including its many novel applications, ranging from protecting civil infrastructure to pervasive health monitoring. Using detailed examples and illustrations, this book provides an inside track on the current state of the technology. The book is divided into three parts. In Part I, several node architectures, applications and operating systems are discussed. In Part II, the basic architectural frameworks, including the key building blocks required for constructing large-scale, energy-efficient sensor networks are presented. In Part III, the challenges and approaches pertaining to local and global management strategies are presented – this includes topics on power management, sensor node localization, time synchronization, and security. At the end of each chapter, the authors provide practical exercises to help students

strengthen their grip on the subject. There are more than 200 exercises altogether. Key Features: Offers a comprehensive introduction to the theoretical and practical concepts pertaining to wireless sensor networks Explains the constraints and challenges of wireless sensor network design; and discusses the most promising solutions Provides an in-depth treatment of the most critical technologies for sensor network communications, power management, security, and programming Reviews the latest research results in sensor network design, and demonstrates how the individual components fit together to build complex sensing systems for a variety of application scenarios Includes an accompanying website containing solutions to exercises (http://www.wiley.com/go/dargie_fundamentals) This book serves as an introductory text to the field of wireless sensor networks at both graduate and advanced undergraduate level, but it will also appeal to researchers and practitioners wishing to learn about sensor network technologies and their application areas, including environmental monitoring, protection of civil infrastructure, health care, precision

agriculture, traffic control, and homeland security.

Cardiovascular Imaging and Image Analysis IGI Global

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

Advances in Body Area Networks I

Academic Press

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.

Post-Conference Proceedings of BodyNets 2017 John Wiley & Sons

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.

International Workshops: IWECC 2014,

Gold Coast, QLD, Australia, December 1-5, 2014, and CMNA XV and IWECC 2015, Bertinoro, Italy, October 26, 2015, Revised Selected Papers

Springer

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

Wearable Sensors Springer Nature
Ubiquitous physiological monitoring will be a key driving force in the upcoming wireless health revolution. Cardiac and brain signals in the form of ECG and EEG are two critical health indicators that directly benefit from long-term monitoring. Despite advancements in wireless technology and electronics miniaturization, however, the use of wireless home ECG/EEG monitoring is still limited by the inconvenience and discomfort of wet, contact electrodes. This research focuses on the development of non-contact electrodes, which do not require direct electrical skin contact as a patient-friendly alternative and begins with a review of the field. Early attempts

at building non-contact sensors using off-the-shelf commercial components demonstrated the feasibility of building low-cost, wireless, wearable ECG and EEG monitoring systems. As part of this early work, it was discovered that the interface noise from the insulating medium between body and sensor was often dominant, contributing significant new knowledge in this field. Further research revealed that discrete amplifiers contained many limitations, especially regarding frequency response and noise that were difficult to surmount. Previous implementations known in the literature required extensive manual tuning and calibration in order to boost the input impedance of discrete amplifiers, an imperfect and tedious process. To overcome the challenges with using discrete components, a fully custom analog sensor front-end was developed, achieving input impedances and frequency responses far exceeding than what was previously possible, all completely without the need for manual adjustment. Validation of this sensor in ECG applications show that it easily meets medical grade frequency response specifications and attains closer signal

correlation to adhesive wet electrodes. Neural applications of this sensor were also explored and validated within an EEG (stead state visual evoked potential) brain-computer interface and benchmarked against dry and wet sensors. Successful real-time control of a computer, to a degree never before demonstrated with non-contact sensors, was achieved with the electrodes placed on top of hair, completely without gels or skin preparation. Additional sensor applications including EOG eye tracking and low-power integrated, focal-plane video compression are also discussed.

Feature Engineering and Computational Intelligence in ECG Monitoring IGI Global

Abstract : Wireless wearable body sensor networks are widely used in the continuous daily monitoring of vital parameters such as electrocardiography (ECG). The wireless wearable technology is a key enabling technology for out-hospital patient-centric healthcare which enables the improvement for the ability of prevention, diagnosis and patient life quality. However, as wireless transmission is power-demanding and the power supply

from battery is also limited, the energy efficiency issue impose a stringent constraint on the continuous vitals monitoring in wearable body sensor networks (BSN). Signal compression for biosignals provides a good solution to reduce the power consumption of data transmission by decreasing the transmitted data size of the biosignals. In this study, we develop the first scheme of applying empirical mode decomposition (EMD) on ECG signal for feature extraction and compression and further propose a new ECG signal compression framework based on EMD constructed feature dictionary for energy-efficient ECG sensing in wearable body sensor networks. Our method is validated with the ECG data from MIT-BIH arrhythmia database and compared with existing methods. Based on the simulations on the ECG signals from MIT-BIH, the results show that our method achieves the compression ratio (CR) up to 133 with RMSE of 5.58% and the average CR of 96.08 with RMSE 6.69% which is more than twice of the highest CR among other existing methods with similar recovering error rate of around 6%. For diagnostic distortion perspective, our

method achieves high QRS detection performance with the sensitivity (SE) of 99.8% and the specificity (SP) of 99.6%, which shows that our ECG compression method can preserve almost all the QRS features and have no impact on the diagnosis process. In addition, the energy consumption is only 30% of the energy consumption achieved by the other methods considering the ECG signals from MIT-BIH database. The excellent compressing performance and low energy consumption make it outperform the prior studies in ECG data compressing for wearable body sensor networks.

Proceedings of the Multi-Conference 2011 Springer

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.

CMBEBIH 2017 Academic Press

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

Principles and Applications MDPI

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.

VLSI-SoC: Design for Reliability,

Security, and Low Power Springer
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