

Autonomous Sensor Networks Collective Sensing Strategies For Analytical Purposes Springer Series On Chemical Sensors And Biosensors

Distributed robotics is an interdisciplinary and rapidly growing area, combining research in computer science, communication and control systems, and electrical and mechanical engineering. Distributed robotic systems can autonomously solve complex problems while operating in highly unstructured real-world environments. They are expected to play a major role in addressing future societal needs, for example, by improving environmental impact assessment, food supply, transportation, manufacturing, security, and emergency and rescue services. The goal of the International Symposium on Distributed Autonomous Robotic Systems (DARS) is to provide a forum for scientific advances in the theory and practice of distributed autonomous robotic systems. This volume of proceedings include 47 original contributions presented at the 13th International Symposium on Distributed Autonomous Robotic Systems (DARS 2016), which was held at the Natural History Museum in London, UK, from November 7th to 9th, 2016. The selected papers in this volume are authored by leading researchers from around the world, thereby providing a broad coverage and perspective of the state-of-the-art technologies, algorithms, system architectures, and applications in distributed robotic systems. The book is organized into seven parts, representative of critical long-term and emerging research thrusts in the multi-robot community: Distributed Coverage and Exploration; Multi-Robot Control; Multi-Robot Estimation; Multi-Robot Planning; Modular Robots and Smart Materials; Swarm Robotics; and Multi-Robot Systems in Applications. "This book showcases the work many devoted wireless sensor network researchers all over world, and exhibits the up-to-date developments of WSNs from various perspectives"--Provided by publisher.

Swarm robotics can be defined as the study of how a swarm of relatively simple physically embodied agents can be constructed to collectively accomplish tasks that are beyond the capabilities of a single one. Unlike other studies on multi-robot systems, swarm robotics emphasizes self-organization and emergence, while keeping in mind the issues of scalability and robustness. These emphases promote the use of relatively simple robots, equipped with localized sensing ability, scalable communication mechanisms, and the exploration of decentralized control strategies. This state-of-the-art survey is the first book devoted to swarm robotics. It is based on the First International Workshop on Swarm Robotics held in Santa Monica, CA, USA in July 2004 as part of SAB 2004

Wireless Sensor Network Technologies for Information Explosion Era The amount and value of information available due to rapid spread of information technology is exploding. Typically, large enterprises have approximately a petabyte of operational data stored in hundreds of data repositories supporting thousands of applications. Data storage volumes grow in excess of 50% annually. This growth is expected to continue due to vast proliferation of existing information systems and the introduction of new data sources. Wireless Sensor Networks (WSNs) represent one of the most notable examples of such new data sources. In recent few years, various types of WSNs have been deployed and the amount of information generated by wireless sensors increases rapidly. The information explosion requires establishing novel data processing and communication techniques for WSNs. This volume aims to cover both theoretical and practical aspects related to this challenge, and it explores directions for future research to enable efficient utilization of WSNs in the information-explosion era. The book is organized in three main parts that consider (1) technical issues of WSNs, (2) the integration of multiple WSNs, and (3) the development of WSNs systems and testbeds for conducting

practical experiments. Each part consists of three chapters.

Studies on robotics applications have grown substantially in recent years, with swarm robotics being a relatively new area of research. Inspired by studies in swarm intelligence and robotics, swarm robotics facilitates interactions between robots as well as their interactions with the environment. The Handbook of Research on Design, Control, and Modeling of Swarm Robotics is a collection of the most important research achievements in swarm robotics thus far, covering the growing areas of design, control, and modeling of swarm robotics. This handbook serves as an essential resource for researchers, engineers, graduates, and senior undergraduates with interests in swarm robotics and its applications.

This volume presents the proceedings of the 7th International Conference on the Development of Biomedical Engineering in Vietnam which was held from June 27-29, 2018 in Ho Chi Minh City. The volume reflects the progress of Biomedical Engineering and discusses problems and solutions. It aims to identify new challenges, and shaping future directions for research in biomedical engineering fields including medical instrumentation, bioinformatics, biomechanics, medical imaging, drug delivery therapy, regenerative medicine and entrepreneurship in medical devices.

Guides readers in the new and growing research field of Ambient/Active Assisted Living to understand its multidisciplinary background.

Efficient mobile systems that allow for vital sign monitoring and disease diagnosis at the point of care can help combat issues such as rising healthcare costs, treatment delays in remote and resource-poor areas, and the global shortage of skilled medical personnel. Covering everything from sensors, systems, and software to integration, usability, and regulatory challenges, Mobile Point-of-Care Monitors and Diagnostic Device Design offers valuable insight into state-of-the-art technologies, research, and methods for designing personal diagnostic and ambulatory healthcare devices. Presenting the combined expertise of contributors from various fields, this multidisciplinary text: Gives an overview of the latest mobile health and point-of-care technologies Discusses portable diagnostics devices and sensors, including mobile-phone-based health systems Explores lab-on-chip systems as well as energy-efficient solutions for mobile point-of-care monitors Addresses computer vision and signal processing for real-time diagnostics Considers interface design for lay healthcare providers and home users Mobile Point-of-Care Monitors and Diagnostic Device Design provides important background information about the design process of mobile health and point-of-care devices, using practical examples to illustrate key aspects related to instrumentation, information processing, and implementation.

A crucial reference tool for the increasing number of scientists who depend upon sensor networks in a widening variety of ways. Coverage includes network design and modeling, network management, data management, security and applications. The topic covered in each chapter receives expository as well as scholarly treatment, covering its history, reviewing state-of-the-art thinking relative to the topic, and discussing currently unsolved problems of special interest.

The two-volume set LNAI 6922 and LNAI 6923 constitutes the refereed proceedings of the Third International Conference on Computational Collective Intelligence, ICCCI 2011, held in Gdynia, Poland, in September 2011. The 112 papers in this two volume set presented together with 3 keynote speeches were carefully reviewed and selected from 300 submissions. The papers are organized in topical sections on knowledge management, machine learning and applications, autonomous and collective decision-making, collective

computations and optimization, Web services and semantic Web, social networks and computational swarm intelligence and applications.

Modern defence forces rely mainly on intelligent information systems and high technology armour. This volume reflects the latest trends in military information systems research by bringing together international contributions that span from communications technology, through intelligent agents and large-scale modeling and simulation, to sociotechnical systems. Together, the articles represent a good cross section of contemporary information systems research. The book also shows the wealth of research on advanced information systems and on technologies developed for defence purposes. Some of the chapters may serve as a component of advanced defence training programs. They provide an important overview of crucial research, which has evolved over the last ten years.

Contents: Military Information Systems Security: Challenges and Vulnerabilities (M R Frater & M J Ryan); Teaming Human and Machine (P Urlings & L Jain); Computer Generated Forces in Distributed Simulation (M R Stytz & S B Banks); Using Automaton Models to Rapidly Illuminate Tactical Options (M K Lauren & R T Stephen); Multi-User Wireless Link for Real-Time Video Transfer for Defence Applications (W M Daniels et al.); Agents of Change: The Impact of Intelligent Agent Technology on the Analysis of Air Operations (C Heinze et al.); Agent-Enabled Sensor Network for Target Observation (R S Bowyer & R E Bogner); Military Applications of the Disciple Learning Agent (G Tecuci & M Boicu); A Parallel Associative Processing Bayesian Algorithm for IR Dim Point Target Detection (R C Warren); Intelligent Monitoring of Complex Systems (D L Hall).
Readership: Academics, researchers, and practising engineers working in defence and on security-related projects.

This book is devoted to mechatronic, chemical, bacteriological, biological, and hybrid systems, utilizing cooperative, networked, swarm, self-organizing, evolutionary and bio-inspired design principles and targeting underwater, ground, air, and space applications. It addresses issues such as open-ended evolution, self-replication, self-development, reliability, scalability, energy foraging, adaptivity, and artificial sociality. The book has been prepared by 52 authors from world-leading research groups in 14 countries. This book covers not only current but also future key technologies and is aimed at anyone who is interested in learning more about collective robotics and how it might affect our society.

This book provides a comprehensive overview of various aspects of the development of smart cities from a secure, trusted, and reliable data transmission perspective. It presents theoretical concepts and empirical studies, as well as examples of smart city programs and their capacity to create value for citizens. The contributions offer a panorama of the most important aspects of smart city evolution and implementation within various frameworks, such as healthcare, education, and transportation. Comparing current advanced applications and best practices, the book subsequently explores how smart environments and programs could help improve the quality of life in urban spaces and promote

cultural and economic development.

This monograph introduces novel methods for the control and navigation of mobile robots using multiple-1-d-view models obtained from omni-directional cameras. This approach overcomes field-of-view and robustness limitations, simultaneously enhancing accuracy and simplifying application on real platforms. The authors also address coordinated motion tasks for multiple robots, exploring different system architectures, particularly the use of multiple aerial cameras in driving robot formations on the ground. Again, this has benefits of simplicity, scalability and flexibility. Coverage includes details of: a method for visual robot homing based on a memory of omni-directional images; a novel vision-based pose stabilization methodology for non-holonomic ground robots based on sinusoidal-varying control inputs; an algorithm to recover a generic motion between two 1-d views and which does not require a third view; a novel multi-robot setup where multiple camera-carrying unmanned aerial vehicles are used to observe and control a formation of ground mobile robots; and three coordinate-free methods for decentralized mobile robot formation stabilization. The performance of the different methods is evaluated both in simulation and experimentally with real robotic platforms and vision sensors. *Control of Multiple Robots Using Vision Sensors* will serve both academic researchers studying visual control of single and multiple robots and robotics engineers seeking to design control systems based on visual sensors.

This book constitutes the refereed proceedings of the 5th International Workshop on Distributed Computing, IWDC 2003, held in Kolkata, India in December 2003. The 32 revised full papers presented together with five invited papers were carefully reviewed and selected from a total of 105 submissions. The papers are organized in topical sections on distributed algorithms, internetworking and web, parallel and distributed systems, wireless and mobile networking, ad-hoc and sensor networks, learning and optimization, and optical networking

The engineering problems of constructing autonomous networks of sensors and data processors that can provide alerts for dangerous situations provide a new context for debating the question whether man-made systems can emulate the cognitive capabilities of the mammalian brain. In this paper we consider the question whether a distributed network of sensors and data processors can form "perceptions" based on sensory data. Because sensory data can have exponentially many explanations, the use of a central data processor to analyze the outputs from a large ensemble of sensors will in general introduce unacceptable latencies for responding to dangerous situations. A better idea is to use a distributed "Helmholtz machine" architecture in which the sensors are connected to a network of simple processors, and the collective state of the network as a whole provides an explanation for the sensory data. In general communication within such a network will require time division multiplexing, which opens the door to the possibility that with certain refinements to the Helmholtz machine architecture it may be possible to build sensor networks that

exhibit a form of artificial consciousness.

This volume surveys recent research on autonomous sensor networks from the perspective of enabling technologies that support medical, environmental and military applications. State of the art, as well as emerging concepts in wireless sensor networks, body area networks and ambient assisted living introduce the reader to the field, while subsequent chapters deal in depth with established and related technologies, which render their implementation possible. These range from smart textiles and printed electronic devices to implanted devices and specialized packaging, including the most relevant technological features. The last four chapters are devoted to customization, implementation difficulties and outlook for these technologies in specific applications.

A number of application scenarios benefit from using wireless sensor networks for monitoring, tracking and event detection. Since sensor nodes are small and energy-constrained and possess severely limited computational capabilities and memory resources, sensor networks require the development of a new generation of algorithms targeted at large-scale networks, unpredictably changing environments and constantly changing network topologies. Structures result from self-organization of the nodes in the network and are defined in terms of the cooperation between individual nodes. Many sensor network systems require constructing structures in order to perform correctly. This work focuses on both the development and study of structuring algorithms. We present new algorithms for several problems covering the distinctive characteristics of sensor networks: cooperative sensing, communication and location awareness. The problems are energy-efficient routing, time-bounded and space-bounded sensing, range-free boundary recognition, and hierarchical partitioning of the network.

Distributed robotics is a rapidly growing, interdisciplinary research area lying at the intersection of computer science, communication and control systems, and electrical and mechanical engineering. The goal of the Symposium on Distributed Autonomous Robotic Systems (DARS) is to exchange and stimulate research ideas to realize advanced distributed robotic systems. This volume of proceedings includes 43 original contributions presented at the Tenth International Symposium on Distributed Autonomous Robotic Systems (DARS 2010), which was held in November 2010 at the École Polytechnique Fédérale de Lausanne (EPFL), Switzerland. The selected papers in this volume are authored by leading researchers from Asia, Europa, and the Americas, thereby providing a broad coverage and perspective of the state-of-the-art technologies, algorithms, system architectures, and applications in distributed robotic systems. The book is organized into four parts, each representing one critical and long-term research thrust in the multi-robot community: distributed sensing (Part I); localization, navigation, and formations (Part II); coordination algorithms and formal methods (Part III); modularity, distributed manipulation, and platforms (Part IV).

This book presents a broad range of deep-learning applications related to vision, natural language processing, gene expression, arbitrary object recognition, driverless cars, semantic image segmentation, deep visual residual abstraction, brain-computer interfaces, big data processing, hierarchical deep learning networks as game-playing artefacts using regret matching, and building GPU-accelerated deep learning frameworks. Deep learning, an advanced level of machine learning technique that

Read Book Autonomous Sensor Networks Collective Sensing Strategies For Analytical Purposes Springer Series On Chemical Sensors And Biosensors

combines class of learning algorithms with the use of many layers of nonlinear units, has gained considerable attention in recent times. Unlike other books on the market, this volume addresses the challenges of deep learning implementation, computation time, and the complexity of reasoning and modeling different type of data. As such, it is a valuable and comprehensive resource for engineers, researchers, graduate students and Ph.D. scholars.

This book constitutes the proceedings of the 18th International Conference on Tools and Algorithms for the Construction and Analysis of Systems, TACAS 2012, held as part of the joint European Conference on Theory and Practice of Software, ETAPS 2012, which took place in Tallinn, Estonia, in March/April 2012. The 25 research papers, 2 case study papers, 3 regular tool papers, and 6 tool demonstrations papers presented in this book were carefully reviewed and selected from a total of 147 submissions. The papers are organized in topical sections named: SAT and SMT based methods; automata; model checking; case studies; memory models and termination; internet protocol verification; stochastic model checking; synthesis; provers and analysis techniques; tool demonstrations; and competition on software verification. This publication represents the best thinking and solutions to amyriad of contemporary issues in wireless networks. Coverageincludes wireless LANs, multihop wireless networks, and sensornetworks. Readers are provided with insightful guidance in tacklingsuch issues as architecture, protocols, modeling, analysis, andsolutions. The book also highlights economic issues, market trends,emerging, cutting-edge applications, and new paradigms, such asmiddleware for RFID, smart home design, and "on-demand business" inthe context of pervasive computing. Mobile, Wireless, and Sensor Networks is divided into threedistinct parts: * Recent Advances in Wireless LANs and Multihop WirelessNetworks * Recent Advances and Research in Sensor Networks * Middleware, Applications, and New Paradigms In developing this collected work, the editors have emphasized twoobjectives: * Helping readers bridge the gap and understand the relationshipbetween practice and theory * Helping readers bridge the gap and understand the relationshipsand common links among different types of wireless networks Chapters are written by an international team of researchers andpractitioners who are experts and trendsetters in their fields.Contributions represent both industry and academia, including IBM,National University of Singapore, Panasonic, Intel, and SeoulNational University. Students, researchers, and practitioners who need to stay abreastof new research and take advantage of the latest techniques inwireless communications will find this publication indispensable.Mobile, Wireless, and Sensor Networks provides a clear sense ofwhere the industry is now, what challenges it faces, and where itis heading.

Issues in Technology Theory, Research, and Application: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Ocean Technology. The editors have built Issues in Technology Theory, Research, and Application: 2013 Edition on the vast information databases of ScholarlyNews.™ You can expect the information about Ocean Technology in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of Issues in Technology Theory, Research, and Application: 2013 Edition has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content

is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

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 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

The best-selling Distributed Sensor Networks became the definitive guide to understanding this far-reaching technology. Preserving the excellence and accessibility of its predecessor, Distributed Sensor Networks, Second Edition once again provides all the fundamentals and applications in one complete, self-contained source. Ideal as a tutorial for students or as research material for engineers, the book gives readers up-to-date, practical insight on all aspects of the field. Revised and expanded, this second edition incorporates contributions from many veterans of the DARPA ISO SENSIT program as well as new material from distinguished researchers in the field. Sensor Networking and Applications focuses on sensor deployment and networking, adaptive tasking, self-configuration, and system control. In the expanded applications section, the book draws on the insight of practitioners in the field. Readers of this book may also be interested in Distributed Sensor Networks, Second Edition: Image and Sensor Signal Processing (ISBN: 9781439862827).

"The main research objective of this thesis is to address distributed target tracking for mobile sensor networks. Based on real-life limitations, we are particularly interested in mobile sensors with Limited Sensing Range (LSR). There are three possible multi-target tracking scenarios for n mobile sensors tracking m targets: i) many sensors tracking few targets $n \gg m$ (e.g. tracking high-valued targets), ii) a few sensors track many targets $n \ll m$ (e.g. the sensor coverage problem and situational awareness in a crowded airport terminal), and iii) swarms of sensors tracking swarms of targets $n, m \gg 1$ (e.g. selflocalization of

autonomous vehicles in intelligent transportation systems). First, we show that all three problems can be posed as coupled distributed estimation and control problems for mobile sensor networks. To tackle this estimation and control problem, we propose a unified theoretical framework in which every mobile agent (or sensor) has a two-fold objective: a) maintaining a safe distance (or minimum separation) from neighboring mobile agents during target tracking and b) enhancing the quality of sensed information collectively by the team of sensors to improve the performance of distributed estimation. In many real-life applications, the quality of sensed data is a function of the proximity to the target. We propose an information-theoretic measure for quality of sensed data by each sensor called the information value as the trace of the Fisher Information Matrix (FIM). This metric of quality of sensed data plays a key role in all of our proposed distributed tracking and control algorithms. We show that objective a) of any mobile agent is fundamentally a "collision-avoidance" (or "separation") objective that is a byproduct of flocking behavior for multi-agent systems [48], while objective b) for LSR-type sensors requires solving an additional control problem to enhance the collective information value of the team of agents. We refer to the latter problem as the information-driven control problem. For distributed tracking on mobile networks, we apply Information Filter and Kalman-Consensus Filter (KCF) as effective algorithms for distributed multi-target tracking on networks. The other problem of interest is the formal stability analysis of the coupled distributed estimation and flocking-based mobility-control and self-deployment algorithms for problems i) and ii). We prove that the error dynamics of the KCF and the structural dynamics of the flock of sensors form a cascade nonlinear system and provide a Lyapunov-based stability analysis of case i). We present additional theoretical results on analysis of information-driven control and tracking algorithms for problems i) and ii) together with successful experimental results. In addition, we identify the key questions regarding problem iii) that remains the subject of ongoing and future research."

This book presents a comprehensive overview of wireless sensor networks (WSNs) with an emphasis on security, coverage, and localization. It offers a structural treatment of WSN building blocks including hardware and protocol architectures and also provides a systems-level view of how WSNs operate. These building blocks will allow readers to program specialized applications and conduct research in advanced topics. A brief introductory chapter covers common applications and communication protocols for WSNs. Next, the authors review basic mathematical models such as Voroni diagrams and Delaunay triangulations. Sensor principles, hardware structure, and medium access protocols are examined. Security challenges ranging from defense strategies to network robustness are explored, along with quality of service measures. Finally, this book discusses recent developments and future directions in WSN platforms. Each chapter concludes with classroom-tested exercises that reinforce key concepts. This book is suitable for researchers and for practitioners in industry.

Advanced-level students in electrical engineering and computer science will also find the content helpful as a textbook or reference.

The new edition of this popular book has been transformed into a hands-on textbook, focusing on the principles of wireless sensor networks (WSNs), their applications, their protocols and standards, and their analysis and test tools; a meticulous care has been accorded to the definitions and terminology. To make WSNs felt and seen, the adopted technologies as well as their manufacturers are presented in detail. In introductory computer networking books, chapters sequencing follows the bottom up or top down architecture of the seven layers protocol. This book starts some steps later, with chapters ordered based on a topic's significance to the elaboration of wireless sensor networks (WSNs) concepts and issues. With such a depth, this book is intended for a wide audience, it is meant to be a helper and motivator, for both the senior undergraduates, postgraduates, researchers, and practitioners; concepts and WSNs related applications are laid out, research and practical issues are backed by appropriate literature, and new trends are put under focus. For senior undergraduate students, it familiarizes readers with conceptual foundations, applications, and practical project implementations. For graduate students and researchers, transport layer protocols and cross-layering protocols are presented and testbeds and simulators provide a must follow emphasis on the analysis methods and tools for WSNs. For practitioners, besides applications and deployment, the manufacturers and components of WSNs at several platforms and testbeds are fully explored.

The implementation of wireless sensor networks has wide-ranging applications for monitoring various physical and environmental settings. However, certain limitations with these technologies must be addressed in order to effectively utilize them. The Handbook of Research on Advanced Wireless Sensor Network Applications, Protocols, and Architectures is a pivotal reference source for the latest research on recent innovations and developments in the field of wireless sensors. Examining the advantages and challenges presented by the application of these networks in various areas, this book is ideally designed for academics, researchers, students, and IT developers.

In recent years, there has been growing interest in industrial systems, especially in robotic manipulators and mobile robot systems. As the cost of robots goes down and become more compact, the number of industrial applications of robotic systems increases. Moreover, there is need to design industrial systems with intelligence, autonomous decision making capabilities, and self-diagnosing properties. Intelligent Industrial Systems: Modeling, Automation and Adaptive Behavior analyzes current trends in industrial systems design, such as intelligent, industrial, and mobile robotics, complex electromechanical systems, fault diagnosis and avoidance of critical conditions, optimization, and adaptive behavior. This book discusses examples from major areas of research for engineers and researchers, providing an extensive background on robotics and

industrial systems with intelligence, autonomy, and adaptive behavior giving emphasis to industrial systems design.

This in-depth technical guide is an essential resource for anyone involved in the development of “smart mobile wireless technology, including devices, infrastructure, and applications. Written by researchers active in both academic and industry settings, it offers both a big-picture introduction to the topic and detailed insights into the technical details underlying all of the key trends. Smart Phone and Next-Generation Mobile Computing shows you how the field has evolved, its real and potential current capabilities, and the issues affecting its future direction. It lays a solid foundation for the decisions you face in your work, whether you’re a manager, engineer, designer, or entrepreneur. Covers the convergence of phone and PDA functionality on the terminal side, and the integration of different network types on the infrastructure side Compares existing and anticipated wireless technologies, focusing on 3G cellular networks and wireless LANs Evaluates terminal-side operating systems/programming environments, including Microsoft Windows Mobile, Palm OS, Symbian, J2ME, and Linux Considers the limitations of existing terminal designs and several pressing application design issues Explores challenges and possible solutions relating to the next phase of smart phone development, as it relates to services, devices, and networks Surveys a collection of promising applications, in areas ranging from gaming to law enforcement to financial processing

The book focuses on Social Collective Intelligence, a term used to denote a class of socio-technical systems that combine, in a coordinated way, the strengths of humans, machines and collectives in terms of competences, knowledge and problem solving capabilities with the communication, computing and storage capabilities of advanced ICT. Social Collective Intelligence opens a number of challenges for researchers in both computer science and social sciences; at the same time it provides an innovative approach to solve challenges in diverse application domains, ranging from health to education and organization of work. The book will provide a cohesive and holistic treatment of Social Collective Intelligence, including challenges emerging in various disciplines (computer science, sociology, ethics) and opportunities for innovating in various application areas. By going through the book the reader will gauge insight and knowledge into the challenges and opportunities provided by this new, exciting, field of investigation. Benefits for scientists will be in terms of accessing a comprehensive treatment of the open research challenges in a multidisciplinary perspective. Benefits for practitioners and applied researchers will be in terms of access to novel approaches to tackle relevant problems in their field. Benefits for policy-makers and public bodies representatives will be in terms of understanding how technological advances can support them in supporting the progress of society and economy.

Wireless sensor networks have gained significant attention industrially and academically due to their wide range of uses in various fields. Because of their vast amount of applications, wireless sensor networks are vulnerable to a variety of security attacks. The protection of wireless sensor networks remains a challenge due to their resource-constrained nature, which is why researchers have begun applying several branches of artificial intelligence to advance the security of these networks. Research is needed on the development of security practices in wireless sensor networks by using smart technologies.

Deep Learning Strategies for Security Enhancement in Wireless Sensor Networks provides emerging research exploring the theoretical and practical advancements of security protocols in wireless sensor networks using artificial intelligence-based techniques. Featuring coverage on a broad range of topics such as clustering protocols, intrusion detection, and energy harvesting, this book is ideally designed for researchers, developers, IT professionals, educators, policymakers, practitioners, scientists, theorists, engineers, academicians, and students seeking current research on integrating intelligent techniques into sensor networks for more reliable security practices.

Recent progress in the synthesis of nanomaterials and our fundamental understanding of their properties has led to significant advances in nanomaterial-based gas, chemical and biological sensors. Leading experts around the world highlight the latest findings on a wide range of nanomaterials including nanoparticles, quantum dots, carbon nanotubes, molecularly imprinted nanostructures or plastibodies, nanometals, DNA-based structures, smart nanomaterials, nanoprobes, magnetic nanomaterials, organic molecules like phthalocyanines and porphyrins, and the most amazing novel nanomaterial, called graphene. Various sensing techniques such as nanoscaled electrochemical detection, functional nanomaterial-amplified optical assays, colorimetry, fluorescence and electrochemiluminescence, as well as biomedical diagnosis applications, e.g. for cancer and bone disease, are thoroughly reviewed and explained in detail. This volume will provide an invaluable source of information for scientists working in the field of nanomaterial-based technology as well as for advanced students in analytical chemistry, biochemistry, electrochemistry, material science, micro- and nanotechnology.

Wireless Networking Complete is a compilation of critical content from key Morgan Kaufmann titles published in recent years on wireless networking and communications. Individual chapters are organized into one complete reference giving a 360-degree view from our bestselling authors. From wireless application protocols, to Mesh Networks and Ad Hoc Sensor Networks, to security and survivability of wireless systems – all of the elements of wireless networking are united in a single volume. The book covers both methods of analysis and problem-solving techniques, enhancing the reader's grasp of the material and ability to implement practical solutions. This book is essential for anyone interested in new and developing aspects of wireless network technology. Chapters contributed by recognized experts in the field cover theory and practice of wireless network technology, allowing the reader to develop a new level of knowledge and technical expertise Up-to-date coverage of wireless networking issues facilitates

learning and lets the reader remain current and fully informed from multiple viewpoints
Presents methods of analysis and problem-solving techniques, enhancing the reader's grasp of the material and ability to implement practical solutions

Collective intelligence has become one of major research issues studied by today's and future computer science. Computational collective intelligence is understood as this form of group intellectual activity that emerges from collaboration and competition of many artificial individuals. Robotics, artificial intelligence, artificial cognition and group working try to create efficient models for collective intelligence in which it emerges from sets of actions carried out by more or less intelligent individuals. The major methodological, theoretical and practical aspects underlying computational collective intelligence are group decision making, collective action coordination, collective competition and knowledge description, transfer and integration. Obviously, the application of multiple computational technologies such as fuzzy systems, evolutionary computation, neural systems, consensus theory, knowledge representation etc. is necessary to create new forms of computational collective intelligence and support existing ones. Three subfields of application of computational technologies to support forms of collective intelligence are of special attention to us. The first one is semantic web treated as an advanced tool that increases the collective intelligence in networking environments. The second one covers social networks modeling and analysis, where social networks are this area of in which various forms of computational collective intelligence emerges in a natural way. The third subfield relates us to agent and multi-agent systems understood as this computational and modeling paradigm which is especially tailored to capture the nature of computational collective intelligence in populations of autonomous individuals.

This book constitutes the refereed proceedings of the Second International Conference on Autonomous and Intelligent Systems, AIS 2011, held in Burnaby, BC, Canada, in June 2011, colocated with the International Conference on Image Analysis and Recognition, IACIAR 2011. The 40 revised full papers presented were carefully reviewed and selected from 62 submissions. The papers are organized in topical sections on autonomous and intelligent systems, intelligent and advanced control systems, intelligent sensing and data analysis, human-machine interaction, and intelligent circuit analysis and signal processing.

This book constitutes the refereed proceedings of the 15th IFIP WG 5.5 Working Conference on Virtual Enterprises, PRO-VE 2014, held in Amsterdam, The Netherlands, in October 2014. The 73 revised papers were carefully selected from 190 submissions. They provide a comprehensive overview of identified challenges and recent advances in various collaborative network (CN) domains and their applications, with a particular focus on the following areas in support of smart networked environments: behavior and coordination; product-service systems; service orientation in collaborative networks; engineering and implementation of collaborative networks; cyber-physical systems; business strategies alignment; innovation networks; sustainability and trust; reference and conceptual models; collaboration platforms; virtual reality and simulation; interoperability and integration; performance management frameworks; performance management systems; risk analysis; optimization in collaborative networks; knowledge management in networks; health and care networks; and mobility and logistics.

Read Book Autonomous Sensor Networks Collective Sensing Strategies For Analytical Purposes Springer Series On Chemical Sensors And Biosensors

This volume, which addresses various basic sensor principles, covers micro gravimetric sensors, semiconducting and nano tube sensors, calorimetric sensors and optical sensors. Furthermore, the authors discuss recent developments in the related sensitive layers including new properties of nano structured metal oxide layers. They provide in-depth insights into the unique chemistry and signal generation of copper oxide in percolating sensors and present a variety of applications of functional polymers made possible by proper imprinting. Highlights of the subjects covered include: • requirements for high-temperature sensors • carbon nano tube sensors • new sensing model for nanostructured In_2O_3 • bio mimetic approach for semiconductor sensor-based systems • optical readout for inorganic and organic semiconductor sensors • concept of virtual multisensors to improve specificity and selectivity • calorimetric sensors for hydrogen peroxide detection • percolation effect-based sensors to implement dosimeters • imprinted polymer layers for bulk and surface acoustic wave sensors

"Environmental Monitoring" is a book designed by InTech - Open Access Publisher in collaboration with scientists and researchers from all over the world. The book is designed to present recent research advances and developments in the field of environmental monitoring to a global audience of scientists, researchers, environmental educators, administrators, managers, technicians, students, environmental enthusiasts and the general public. The book consists of a series of sections and chapters addressing topics like the monitoring of heavy metal contaminants in varied environments, biological monitoring/ecotoxicological studies; and the use of wireless sensor networks/Geosensor webs in environmental monitoring.

[Copyright: d9fbf72b68bd49d2797106f6e62f6597](https://www.intechopen.com/copyright-protection)