Building Wireless Sensor Networks With Zigbee Xbee Arduino And Processing

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Electronic Design

Wireless Sensor Networks Damodar Reddy Edla 2020-11-24 Wireless Sensor Networks: Evolutionary Algorithms for Optimizing Performance provides an integrative overview of bio-inspired algorithms and their applications in the area of Wireless Sensor Networks (WSN). Along with the usage of the WSN, the number of risks and challenges occurs while deploying any WSN. Therefore, to defeat these challenges some of the bio-inspired algorithms are applied and discussed in this book. Discussion includes a broad, integrated perspective on various challenges and issues in WSN and also impact of bio-inspired algorithms on the lifetime of the WSN. It creates interdisciplinary theory, concepts, definitions, models and findings involved in WSN and Bio-inspired algorithms making it an essential guide and reference. It includes various WSN examples making the book accessible to a broader interdisciplinary readership. The book offers comprehensive coverage of the most essential topics, including: Evolutionary algorithms Swarm intelligence Hybrid algorithms Energy efficiency in WSN Load balancing of gateways Localization Clustering and routing Designing fitness functions according to the issues in WSN. The book explains about practices of shuffled complex evolution algorithm, shuffled frog leaping algorithm, particle swarm optimization and dolphin swarm optimization to defeat various challenges in WSN. The author elucidates how we must transform our thinking, illuminating the benefits and opportunities offered by bio-inspired approaches to innovation and learning in the area of WSN. This book serves as a reference book for scientific investigators who shows an interest in evolutionary computation and swarm intelligence as well as issues and challenges in WSN.

Building Wireless Sensor Networks Robert Faludi 2010-12-14 Get ready to create distributed sensor systems and intelligent interactive devices using the ZigBee wireless networking protocol and Series 2 XBee radios. By the time you're halfway through this fast-paced, hands-on guide, you'll have built a series of useful projects, including a complete ZigBee wireless network that delivers remotely sensed data. Radio networking is creating revolutions in volcano monitoring, performance art, clean energy, and consumer electronics. As you follow the examples in each chapter, you'll learn how to tackle inspiring projects of your own. This practical guide is ideal for inventors, hackers, crafters, students, hobbyists, and scientists. Investigate an assortment of practical and intriguing project ideas Prep your ZigBee toolbox with an extensive shopping list of parts and programs Create a simple, working ZigBee network with XBee radios in less than two hours -- for under $100 Use the Arduino open source electronics prototyping platform to build a series of increasingly complex projects Get familiar with XBee's API mode for creating sensor networks Build fully scalable sensing and actuation systems with inexpensive components Learn about power management, source routing, and other XBee technical nuances Make gateways that connect with neighboring networks, including the Internet

Design News 2008

Distributed Network Data Alasdair Allan 2013-02-26 Build your own distributed sensor network to collect, analyze, and visualize real-time data about our human environment—including noise level, temperature, and people flow. With this hands-on book, you'll learn how to turn your project idea into working hardware, using the easy-to-learn Arduino microcontroller and off-the-shelf sensors. Authors Alasdair Allan and Kipp Bradford walk you through the entire process, from prototyping a simple sensor node to performing real-time analysis on data captured by a deployed multi-sensor network. Demonstrated at recent O'Reilly Strata Conferences, the future of distributed data is already here. If you have programming experience, you can get started immediately. Wire up a circuit on a breadboard, and use the Arduino to read values from a sensor Add a microphone and infrared motion detector to your circuit Move from breadboard to prototype with Fritzing, a program that converts your circuit design into a graphical representation Simplify your design: learn use cases and limitations for using Arduino pins for power and grounding Build wireless networks with XBee radios and request data from multiple sensor platforms Visualize data from your sensor network with Processing or LabVIEW

Sensing and Monitoring Technologies for Mines and Hazardous Areas Swadesh Chaulya 2016-10-27 Sensing and Monitoring Technologies for Mines and Hazardous Areas: Monitoring and Prediction Technologies presents the fundamentals of mining related geotechnical risk and how the latest advances in sensing and data communication can be used both to prevent accidents and provide early warnings. Opencast mining operations involve huge quantities of overburden removal, dumping, and backfilling in excavated areas. Substantial increases in the rate of accumulation of waste dumps in recent years has resulted in greater height of dumps and also has given rise to the danger of dump failures as steeper open pit slopes are prone to failure. These failures lead to loss of valuable human lives and damage to mining machinery. This book presents the most recent advances in gas sensors, methane detectors, and power cut-off systems. It also introduces monitoring of the gas strata and environment, and an overview of the use of Internet of Things and cloud computing for mining sensing and surveillance purposes. Targeted at geotechnical and mining engineers, this volume covers the latest findings and technology to prevent mining accidents and mitigate the inherent risk of the activity. Presents complete details of a real-time slope stability monitoring system using wireless sensor networking and prediction technique based on multivariate statistical analysis of various parameters and analytical hierarchy process methods Discusses innovative ideas and new concepts of sensing technologies, mine transport surveillance, digital mining, and cloud computing to improve safety and productivity in mining industry Includes slope stability prediction software, downloadable through a companion website, which can be used for monitoring, analyzing, and storing different sensors and providing audio-visual, SMS, and email alerts Covers the latest findings and technology to prevent mining accidents and mitigate the inherent risk

Wellness Protocol for Smart Homes Hemant Ghayvat 2017-01-05 This book focuses on the development of wellness protocols for smart home monitoring, aiming to forecast the wellness of individuals living in ambient assisted living (AAL) environments. It describes in detail the design and implementation of heterogeneous wireless sensors and networks as applied to data mining and machine learning, which the protocols are based on. Further, it shows how these sensor and actuator nodes are deployed in the home environment, generating real-time data on object usage and other movements inside the home, and therefore demonstrates that the protocols have proven to offer a reliable, efficient, flexible, and economical solution for smart home systems. Documenting the approach from sensor to decision making and information generation, the book addresses various issues concerning interference mitigation, errors, security and large data handling. As such, it offers a valuable resource for researchers, students and practitioners interested in interdisciplinary studies at the intersection of wireless sensing processing, radio communication, the Internet of Things and machine learning, and in how they can be applied to smart home monitoring and assisted

living environments.

Beginning Sensor Networks with Arduino and Raspberry Pi Charles Bell 2014-01-23 Beginning Sensor Networks with Arduino and Raspberry Pi teaches you how to build sensor networks with Arduino, Raspberry Pi, and XBee radio modules, and even shows you how to turn your Raspberry Pi into a MySQL database server to store your sensor data! First you'll learn about the different types of sensors and sensor networks, including how to build a simple XBee network. Then you'll walk through building an Arduino-based temperature sensor and data collector, followed by building a Raspberry Pi-based sensor node. Next you'll learn different ways to store sensor data, including writing to an SD card, sending data to the cloud, and setting up a Raspberry Pi MySQL server to host your data. You even learn how to connect to and interact with a MySQL database server directly from an Arduino! Finally you'll learn how to put it all together by connecting your Arduino sensor node to your new Raspberry Pi database server. If you want to see how well Arduino and Raspberry Pi can get along, especially to create a sensor network, then Beginning Sensor Networks with Arduino and Raspberry Pi is just the book you need.

Making Things Talk Tom Igoe 2011-09-08 Make microcontrollers, PCs, servers, and smartphones talk to each other. Building electronic projects that interact with the physical world is good fun. But when the devices you've built start to talk to each other, things really get interesting. With 33 easy-to-build projects, Making Things Talk shows you how to get your gadgets to communicate with you and your environment. It’s perfect for people with little technical training but a lot of interest. Maybe you're a science teacher who wants to show students how to monitor the weather in several locations at once. Or a sculptor looking to stage a room of choreographed mechanical sculptures. In this expanded edition, you’ll learn how to form networks of smart devices that share data and respond to commands. Call your home thermostat with a smartphone and change the temperature. Create your own game controllers that communicate over a network. Use ZigBee, Bluetooth, Infrared, and plain old radio to transmit sensor data wirelessly. Work with Arduino 1.0, Processing, and PHP—three easy-to-use, open source environments. Write programs to send data across the Internet, based on physical activity in your home, office, or backyard. Whether you want to connect simple home sensors to the Internet, or create a device that can interact wirelessly with other gadgets, this book explains exactly what you need.

Mechanical Engineering, Materials and Energy II Sally Gao 2013-01-11 The volume contains selected, peer reviewed papers from the 2nd International Conference on Mechanical Engineering, Materials and Energy (ICMEME 2012), October 26-27, 2012, Dalian, China. Volume is indexed by Thomson Reuters CPCI-S (WoS). The papers are grouped as follows: Chapter 1: Mechatronics, Automation and Information Technologies; Chapter 2: Mechanical Engineering; Chapter 3: Material Science, Technology and Processing; Chapter 4: Energy Systems and Energy Saving; Chapter 5: Construction, Urban and Environment; Chapter 6: Economy and Engineering Management.

Journal of Scientific and Industrial Research 2012

Arduino Cookbook Michael Margolis 2011-03-24 Create your own toys, remote controllers, alarms, detectors, robots, and many other projects with the Arduino device. This simple microcontroller board lets artists and designers build a variety of amazing objects and prototypes that interact with the physical world. With this cookbook you can dive right in and experiment with more than a hundred tips and techniques, no matter what your skill level is. The recipes in this book provide solutions for most common problems and questions Arduino users have, including everything from programming fundamentals to working with sensors, motors, lights, and sound, or communicating over wired and wireless networks. You'll find the examples and advice you need to begin, expand, and enhance your projects right away. Get to know the Arduino development environment Understand the core elements of the Arduino programming language Use common output devices for light, motion, and sound Interact with almost any device that has a remote control Learn techniques for handling time delays and time measurement Use simple ways to transfer digital information from sensors to the Arduino device Create complex projects that incorporate shields and external modules Use and modify existing Arduino libraries, and learn how to create your own

Handbook of Research on Demand-Driven Web Services: Theory, Technologies, and Applications Sun, Zhaohao 2014-03-31 In the current technological world, Web services play an integral role in service computing and social networking services. This is also the case in the traditional FREG (foods, resources, energy, and goods) services because almost all traditional services are replaced fully or partially by Web services. Handbook of Research on Demand-Driven Web Services: Theory, Technologies, and Applications presents comprehensive and in-depth studies that reveal the cutting-edge theories, technologies, methodologies, and applications of demand-driven Web, mobile, and e-business services. This book provides critical perspectives for researchers and practitioners, lecturers and undergraduate/graduate students, and professionals in the fields of computing, business, service, management, and government, as well as a variety of readers from all the social strata.

Open Source Technology: Concepts, Methodologies, Tools, and Applications Management Association, Information Resources 2014-11-30 The pervasiveness of and universal access to modern Information and Communication Technologies has enabled a popular new paradigm in the dissemination of information, art, and ideas. Now, instead of relying on a finite number of content providers to control the flow of information, users can generate and disseminate their own content for a wider audience. Open Source Technology: Concepts, Methodologies, Tools, and Applications investigates examples and methodologies in user-generated and freely-accessible content available through electronic and online media. With applications in education, government, entertainment, and more, the technologies explored in these volumes will provide a comprehensive reference for web designers, software developers, and practitioners in a wide variety of fields and disciplines.

Een verhaal met een angel Dave Goulson 2014-07-23 Dave Goulson is van jongs af aan gefascineerd door de natuur. Op hartverwarmende wijze beschrijft hij zijn eerste en het moet gezegd vrij klungelige ontmoetingen met de dierenwereld: bij het schoonmaken van zijn aquarium elektrocuteert hij zijn lievelingsvissen en na een zomerse regenbui droogt hij zijn hommels en zet ze per ongeluk in brand. Hij doet alles om de natuur, en met name de wereld van de hommel, te doorgronden. Zijn jeugdige fascinatie zet hem aan tot jarenlang onderzoek naar deze `charismatische tijgers van de insectenwereld , die met uitsterven worden bedreigd. In Een verhaal met een angel laat Goulson zien hoe belangrijk de hommel voor ons is, en zijn fantastische anekdotes tonen hoe intrigerend dit beestje is. Na het lezen van Een verhaal met een angel zul je de hommel met heel andere ogen bekijken.

Roll Your Own Mark Frauenfelder 2011-04-15 MAKE Volume 26: Karts & WheelsGarage go-kart building is a time-honored hobby for do-it-yourselfers, and we'll show you how to build wheeled wonders that’ll have you and the kids racing around the neighborhood in DIY style. Build a longboard skateboard by bending plywood. Build a crazy go-kart driven by a pair of battery-powered drills. Put a mini gasoline engine on a bicycle. And construct an amazing wind-powered cart that can outrun a tailwind. Plus you’ll learn how to build the winning vehicle from our online Karts and Wheels contest! In addition to karts, you’ll find plenty of other projects that only MAKE could give you: A flaming tube that keeps time to music and makes sounds waves visible — in fire An aquarium tank to grow your own Spirulina algae superfood An electronic music looper that creates cool sounds and lets you build wild rhythm loops

Information Computing and Applications Yuhang Yang 2013-12-20 This two-volume set of CCIS 391 and CCIS 392 constitutes the refereed proceedings of the Fourth International Conference on Information Computing and Applications, ICICA 2013, held in Singapore, in August 2013. The 126 revised full papers presented in both volumes were carefully reviewed and selected from 665 submissions. The papers are organized in topical sections on Internet computing and applications; engineering management and applications; intelligent computing and applications; control engineering and applications; cloud and evolutionary computing; knowledge management and applications; computational statistics and applications.

Sensor Applications, Experimentation, and Logistics Nikos Komninos 2010-02-16 Wireless sensor networks (WSNs) are envisioned to enable a variety of applications including environmental monitoring, building and plant automation, homeland se- rity and healthcare. It has been argued that one of the key characteristics of sensor networks is that they are tightly coupled with the applications running on top of them. Although WSNs have been an active area of research for over a decade, real world sensor network deployments have not yet found their way to widespread adoption. The experience gained and lessons learned during the initial attempts to deploy WSNs and implement various sensor network applications are very valuable for the - vancement of this technology. Recognizing the need of a conference dedicated to practical aspects of WSN p- taining to their employment in a plethora of applications, ICST launched SENSAPPEAL as a yearly event

whose first edition took place in September 2009 at the Athens Information Technology campus in the outskirts of Athens, Greece.

Distributed Network Data Alasdair Allan 2013 Build your own distributed sensor network to collect, analyze, and visualize real-time data about our human environment—including noise level, temperature, and people flow. With this hands-on book, you'll learn how to turn your project idea into working hardware, using the easy-to-learn Arduino microcontroller and off-the-shelf sensors. Authors Alasdair Allan and Kipp Bradford walk you through the entire process, from prototyping a simple sensor node to performing real-time analysis on data captured by a deployed multi-sensor network. Demonstrated at recent O'Reilly Strata Conferences, the future of distributed data is already here. If you have programming experience, you can get started immediately. Wire up a circuit on a breadboard, and use the Arduino to read values from a sensor Add a microphone and infrared motion detector to your circuit Move from breadboard to prototype with Fritzing, a program that converts your circuit design into a graphical representation Simplify your design: learn use cases and limitations for using Arduino pins for power and grounding Build wireless networks with XBee radios and request data from multiple sensor platforms Visualize data from your sensor network with Processing or LabVIEW

Smart Computing with Open Source Platforms Amartya Mukherjee 2019-05-30 Focuses on the concept of open source prototyping and product development and designing sensor networks and covers IoT base applications This book will serves as a single source of introductory material and reference for programming smart computing and Internet of Things (IoT) devices using Arduino with the use of Python It covers number of comprehensive DIY experiments through which the reader can design various intelligent systems

Communication, Management and Information Technology Marcelo Sampaio de Alencar 2016-11-03 Communication, Management and Information Technology contains the contributions presented at the International Conference on Communication, Management and Information Technology (ICCMIT 2016, Cosenza, Italy, 26-29 April 2016, organized by the Universal Society of Applied Research (USAR). The book aims at researchers, scientists, engineers, and scholar students interested or involved in Computer Science and Systems, Communication, and Management.

IOS Sensor Apps with Arduino Alasdair Allan 2011-09-20 This book looks at how to integrate iOS devices into distributed sensors network, both to make use of its own on-board sensors in such networks, but also as a hub. Beyond the discussion of basic client-server architectures, and making use of the existing wireless capabilities, this book examines how to connect iOS devices to microcontroller platforms via serial connections.

New Contributions in Information Systems and Technologies Alvaro Rocha 2015-03-25 This book contains a selection of articles from The 2015 World Conference on Information Systems and Technologies (WorldCIST'15), held between the 1st and 3rd of April in Funchal, Madeira, Portugal, a global forum for researchers and practitioners to present and discuss recent results and innovations, current trends, professional experiences and challenges of modern Information Systems and Technologies research, technological development and applications. The main topics covered are: Information and Knowledge Management; Organizational Models and Information Systems; Intelligent and Decision Support Systems; Big Data Analytics and Applications; Software Systems, Architectures, Applications and Tools; Multimedia Systems and Applications; Computer Networks, Mobility and Pervasive Systems; Human-Computer Interaction; Health Informatics; Information Technologies in Education; Information Technologies in Radio communications.

Designing Self-Organization in the Physical Realm Heiko Hamann 2020-12-31

Proceedings of the International Colloquium on Sports Science, Exercise, Engineering and Technology 2014 (ICoSSEET 2014) Rahmat Adnan 2014-07-28 The proceeding is a collection of research papers presented at the International Colloquium on Sports Science, Exercise, Engineering and Technology (ICoSSEET2014), a conference dedicated to address the challenges in the areas of sports science, exercise, sports engineering and technology including other areas of sports, thereby presenting a consolidated view to the interested researchers in the aforesaid fields. The goal of this conference was to bring together researchers and practitioners from academia and industry to focus on the scope of the conference and establishing new collaborations in these areas. The topics of interest are as follows but are not limited to:1. Sports and Exercise Science • Sports Nutrition • Sports Biomechanics • Strength and Conditioning • Motor Learning and Control • Sports Psychology • Sports Coaching • Sports and Exercise Physiology • Sports Medicine and Athletic Trainer • Fitness and Wellness • Exercise Rehabilitation • Adapted Physical Activity / Disability Sport • Physical Education • Dance, Games and Play 2. Sports Engineering and Technology Application • Sports Equipment Mechanics • Athlete Analysis and Measurement • Instrumentation and Measurement in Sports • Fluid Dynamics in Sports • Computational Modeling in Sports 3. Sports Industry and Management • Sports Event • Sports Management • Sports Tourism • Sports Marketing • Sports Ethics and Law • Sports Sociology • Outdoor and Recreation Management • Inclusive Recreation • Leisure

Energy-Efficient Wireless Sensor Networks Vidushi Sharma 2017-07-28 The advances in low-power electronic devices integrated with wireless communication capabilities are one of recent areas of research in the field of Wireless Sensor Networks (WSNs). One of the major challenges in WSNs is uniform and least energy dissipation while increasing the lifetime of the network. This is the first book that introduces the energy efficient wireless sensor network techniques and protocols. The text covers the theoretical as well as the practical requirements to conduct and trigger new experiments and project ideas. The advanced techniques will help in industrial problem solving for energy-hungry wireless sensor network applications.

Lengtegraad Dava Sobel 1996

The Internet of Things: Do-It-Yourself at Home Projects for Arduino, Raspberry Pi and BeagleBone Black Donald Norris 2015-01-30 Build and program projects that tap into the Internet of Things (IoT) using Arduino, Raspberry Pi, and BeagleBone Black! This innovative guide gets you started right away working with the most popular processing platforms, wireless communication technologies, the Cloud, and a variety of sensors. You'll learn how to take advantage of the utility and versatility of the IoT and connect devices and systems to the Internet using sensors. Each project features a list of the tools and components, how-to explanations with photos and illustrations, and complete programming code. All projects can be modified and expanded, so you can build on your skills. The Internet of Things: DIY Projects with Arduino, Raspberry Pi, and BeagleBone Black Covers the basics of Java, C#, Python, JavaScript, and other programming languages used in the projects Shows you how to use IBM's Net Beans IDE and the Eclipse IDE Explains how to set up small-scale networks to connect the projects to the Internet Includes essential tips for setting up and using a MySQL database. The fun, DIY projects in the book include: Raspberry Pi home temperature measurements Raspberry Pi surveillance webcams Raspberry Pi home weather station Arduino garage door controller Arduino irrigation controller Arduino outdoor lighting controller Beaglebone message panel Beaglebone remote control SDR Machine-to-machine demonstration project

Internet Science Samira El Yacoubi 2019-11-25 This book constitutes the proceedings of the 6th International Conference on Internet Science held in Perpignan, France, in December 2019. The 30 revised full papers presented were carefully reviewed and selected from 45 submissions. The papers detail a multidisciplinary understanding of the development of the Internet as a societal and technological artefact which increasingly evolves with human societies.

Beginning Sensor Networks with XBee, Raspberry Pi, and Arduino Charles Bell 2020-06-25 Build sensor networks with Python and MicroPython using XBee radio modules, Raspberry Pi, and Arduino boards. This revised and updated edition will put all of these together to form a sensor network, and show you how to turn your Raspberry Pi into a MySQL database server to store your sensor data! You'll review the different types of sensors and sensor networks, along with new technology, including how to build a simple XBee network. You'll then walk through building an sensor nodes on the XBee, Raspberry Pi, and Arduino, and also learn how to collect data from multiple sensor nodes. The book also explores different ways to store sensor data, including writing to an SD card, sending data to the cloud, and setting up a Raspberry Pi MySQL server to host your data. You'll even learn how to connect to and interact with a MySQL database server directly from an Arduino! Finally you'll see how to put it all together by connecting your sensor nodes to your new Raspberry Pi database server. If you want to see how well XBee, Raspberry Pi, and Arduino can get along, especially to create a sensor network, then Beginning Sensor Networks with XBee, Raspberry Pi, and Arduino is just the book you need. What You'll LearnCode your sensor nodes with Python and MicroPython Work with new XBee 3 modulesHost your data on Raspberry PiGet started with MySQLCreate sophisticated sensor networks Who This Book Is For Those interested in building or experimenting with sensor networks and IoT

solutions, including those with little or no programming experience. A secondary target includes readers interested in using XBee modules with Raspberry Pi and Arduino, those interested in controlling XBee modules with MicroPython.

Standard & Poor's Stock Reports 2008-11

Building Wireless Sensor Networks Using Arduino Matthijs Kooijman 2015-10-19 Leverage the powerful Arduino and XBee platforms to monitor and control your surroundings About This Book Build your own low-power, wireless network using ready-made Arduino and XBee hardware Create a complex project using the Arduino prototyping platform A guide that explains the concepts and builds upon them with the help of examples to form projects Who This Book Is For This book is targeted at embedded system developers and hobbyists who have some working knowledge of Arduino and who wish to extend their projects using wireless connectivity. What You Will Learn Interact with XBee boards using the XCTU program on Windows, OS X, or Linux Make your Arduino boards communicate wirelessly, using XBee modules in the advanced API mode Centrally collect and store measured sensor data, in the cloud or your own database Connect the coordinator Arduino to the Internet and send data to web services Control your environment automatically, based on sensor input from your network Interact with off-the-shelf ZigBee Home Automation devices Make your devices battery-powered and let them sleep to get months or even years of battery life In Detail Arduino has been established as the de facto standard microcontroller programming platform, being used for one-off do-it-yourself projects as well as prototypes for actual products. By providing a myriad of libraries, the Arduino community has made it very easy to interact with pretty much any piece of hardware out there. XBee offers a great range of low-power wireless solutions that are easy to work with, by taking all of the complexity of wireless (mesh) networking out of your hands and letting you focus on what to send without worrying about the how. Building wireless sensor networks is cost-effective as well as efficient as it will be done with Arduino support. The book starts with a brief introduction to various wireless protocols, concepts, and the XBee hardware that enables their use. Then the book expands to explain the Arduino boards to you, letting them read and send sensor data, collect that data centrally, and then even control your home from the Internet. Moving further more advanced topics such as interacting through the standard Zigbee Home Automation protocol, or making your application power-efficient are covered. By the end of the book, you will have all the tools needed to build complete, real-world solutions. Style and approach A hands-on guide, featuring a single home automation project that can be built as described or with endless variations. Every step is illustrated with complete examples and screenshots, allowing you to build the examples swiftly.

Computer, Communication and Electrical Technology Debatosh Guha 2017-03-16 The First International Conference on Advancement of Computer, Communication and Electrical Technology focuses on key technologies and recent progress in computer vision, information technology applications, VLSI, signal processing, power electronics & drives, and application of sensors & transducers, etc. Topics in this conference include: Computer Science This conference encompassed relevant topics in computer science such as computer vision & intelligent system, networking theory, and application of information technology. Communication Engineering To enhance the theory & technology of communication engineering, ACCET 2016 highlighted the state-of the-art research work in the field of VLSI, optical communication, and signal processing of various data formatting. Research work in the field of microwave engineering, cognitive radio and networks are also included. Electrical Technology The state-of-the-art research topic in the field of electrical & instrumentation engineering is included in this conference such as power system stability & protection, non-conventional energy resources, electrical drives, and biomedical engineering. Research work in the area of optimization and application in control, measurement & instrumentation are included as well.

The Art of Wireless Sensor Networks Habib M. Ammari 2013-12-13 During the last one and a half decades, wireless sensor networks have witnessed significant growth and tremendous development in both academia and industry. “The Art of Wireless Sensor Networks: Volume 1: Fundamentals” focuses on the fundamentals concepts in the design, analysis, and implementation of wireless sensor networks. It covers the various layers of the lifecycle of this type of network from the physical layer up to the application layer. Its rationale is that the first volume covers contemporary design issues, tools, and protocols for radio-based two-dimensional terrestrial sensor networks. All the book chapters in this volume include up-to-date research work spanning various classic facets of the physical properties and functional behavior of wireless sensor networks, including physical layer, medium access control, data routing, topology management, mobility management, localization, task management, data management, data gathering, security, middleware, sensor technology, standards, and operating systems. This book will be an excellent source of information for both senior undergraduate and graduate students majoring in computer science, computer engineering, electrical engineering, or any related discipline. In addition, computer scientists, researchers, and practitioners in both academia and industry will find this book useful and interesting.

Handbook of Smart Cities Muthucumaru Maheswaran 2018-11-15 This handbook provides a glimpse of the research that is underway in smart cities, with an examination of the relevant issues. It describes software infrastructures for smart cities, the role of 5G and Internet of things in future smart cities scenarios, the use of clouds and sensor-based devices for monitoring and managing smart city facilities, a variety of issues in the emerging field of urban informatics, and various smart city applications. Handbook of Smart Cities includes fifteen chapters from renowned worldwide researchers working on various aspects of smart city scale cyber-physical systems. It is intended for researchers, developers of smart city technologies and advanced-level students in the fields of communication systems, computer science, and data science. This handbook is also designed for anyone wishing to find out more about the on-going research thrusts and deployment experiences in smart cities. It is meant to provide a snapshot of the state-of-the-art at the time of its writing in several software services and cyber infrastructures as pertinent to smart cities. This handbook presents application case studies in video surveillance, smart parking, and smart building management in the smart city context. Unique experiences in designing and implementing the applications or the issues involved in developing smart city level applications are described in these chapters. Integration of machine learning into several smart city application scenarios is also examined in some chapters of this handbook.

Fast and Effective Embedded Systems Design Rob Toulson 2016-10-08 Fast and Effective Embedded Systems Design is a fast-moving introduction to embedded systems design, applying the innovative ARM mbed and its web-based development environment. Each chapter introduces a major topic in embedded systems, and proceeds as a series of practical experiments, adopting a "learning through doing" strategy. Minimal background knowledge is needed to start. C/C++ programming is applied, with a step-by-step approach which allows you to get coding quickly. Once the basics are covered, the book progresses to some "hot" embedded issues – intelligent instrumentation, wireless and networked systems, digital audio and digital signal processing. In this new edition all examples and peripheral devices are updated to use the most recent libraries and peripheral devices, with increased technical depth, and introduction of the "mbed enabled" concept. Written by two experts in the field, this book reflects on the experimental results, develops and matches theory to practice, evaluates the strengths and weaknesses of the technology and techniques introduced, and considers applications in a wider context. New Chapters on: Bluetooth and ZigBee communication Internet communication and control, setting the scene for the ‘Internet of Things’ Digital Audio, with high-fidelity applications and use of the I2S bus Power supply, and very low power applications The development process of moving from prototyping to small-scale or mass manufacture, with a commercial case study. Updates all examples and peripheral devices to use the most recent libraries and peripheral products Includes examples with touch screen displays and includes high definition audio input/output with the I2S interface Covers the development process of moving from prototyping to small-scale or mass manufacture with commercial case studies Covers hot embedded issues such as intelligent instrumentation, networked systems, closed loop control, and digital signal processing

Programmable Microcontrollers: Applications on the MSP432 LaunchPad Cem Unsalan 2017-12-08 Develop and Deploy Powerful MSP432 Microcontroller Applications Bolster your electronics skills and learn to work with the cutting-edge MSP432 microcontroller using the practical information contained in this comprehensive guide. Programmable Microcontrollers: Applications on the MSP432 LaunchPad clearly explains each concept and features detailed illustrations, real-world examples, and DIY projects. Discover how to configure the MSP432, program custom functions, interface with external hardware, and communicate via WiFi. Ideal for practicing engineers and hobbyists alike, this hands-on guide empowers you to program all microcontrollers by thoroughly understanding the MSP432. Coverage includes: •MSP432 architecture •Code Composer Studio (CCS) •CCS Cloud and Energia •MSP432 programming with C and

Assembly •Digital I/O •Exceptions and interrupts •Power management and timing operations •Mixed signal systems •Digital and wireless communication •Flash memory, RAM, and direct memory access •Real-time operating system •Advanced applications

Designing Embedded Systems with Arduino Tianhong Pan 2017-05-16 In this DIY guide, you will learn how to use Arduino – the open-source hardware board for makers, hobbyists, and inventors. You will learn how to develop your own projects, create prototypes, and produce professional-quality embedded systems. A simple step-by-step demonstration system accompanies you from vision to reality – and just like riding a bike, you'll get better at it, the more you do it. Featuring a wealth of detailed diagrams and more than 50 fully functional examples, this book will help you get the most out of this versatile tool and bring your electronic inventions to life.

Zigbee Based Multilevel Parking Vacancy Monitoring System Dr. Narmada Alaparthi 2017-01-20 Looking for empty parking spaces in congested parking spaces can be painstaking and time consuming. The average time spent in parking bays cruising for vacant spaces approximately varies from 3.5–12 minutes. These cruising cars also add to the traffic and also to the pollution inside the bay. The present parking management system in the urban cities of growing economies like India lacks efficiency, often leaving the drivers frustrated. We are engaged in developing an automated parking management system employing Wireless Sensor Network (WSN) technology. The parking management system can detect the presence and/or absence of a vehicle in the respective parking spaces and automatically provide the location of the identified available spaces to prospective users in real-time. This paper describes the ultrasonic based vehicle detection system, ZigBee networks and presents the preliminary results