

Streamlining Digital Signal Processing A Tricks Of The Trade Guidebook By Unknown Wiley Ieee Press 2012 Paperback 2nd Edition Paperback

An introduction to technical details related to the Physical Layer of the LTE standard with MATLAB® The LTE (Long Term Evolution) and LTE-Advanced are among the latest mobile communications standards, designed to realize the dream of a truly global, fast, all-IP-based, secure broadband mobile access technology. This book examines the Physical Layer (PHY) of the LTE standard by incorporating three conceptual elements: an overview of the theory behind key enabling technologies; a concise discussion regarding standard specifications; and the MATLAB® algorithms needed to simulate the standard. The use of MATLAB®, a widely used technical computing language, is one of the distinguishing features of this book. Through a series of MATLAB® programs, the author explores each of the enabling technologies, pedagogically synthesizes an LTE PHY system model, and evaluates system performance at each stage. Following this step-by-step process, readers will achieve a deeper understanding of LTE concepts and specifications through simulations. Key Features: • Accessible, intuitive, and progressive; one of the few books to focus primarily on the modeling, simulation, and implementation of the LTE PHY standard • Includes case studies and test benches in MATLAB®, which build knowledge gradually and incrementally until a functional specification for the LTE PHY is attained • Accompanying Web site includes all MATLAB® programs, together with PowerPoint slides and other illustrative examples Dr Houman Zarrinkoub has served as a development manager and now as a senior product manager with MathWorks, based in Massachusetts, USA. Within his 12 years at MathWorks, he has been responsible for multiple signal processing and communications software tools. Prior to MathWorks, he was a research scientist in the Wireless Group at Nortel Networks, where he contributed to multiple standardization projects for 3G mobile technologies. He has been awarded multiple patents on topics related to computer simulations. He holds a BSc degree in Electrical Engineering from McGill University and MSc and PhD degrees in Telecommunications from the Institut Nationale de la Recherche Scientifique, in Canada. <http://www.wiley.com/go/zarrinkoub>

Digital Signal Processing: Fundamentals and Applications, Third Edition, not only introduces students to the fundamental principles of DSP, it also provides a working knowledge that they take with them into their engineering careers. Many instructive, worked examples are used to illustrate the material, and the use of mathematics is minimized for an easier grasp of concepts. As such, this title is also useful as a reference for non-engineering students and practicing engineers. The book goes beyond DSP theory, showing the implementation of algorithms in hardware and software. Additional topics covered include adaptive filtering with noise reduction and echo cancellations, speech compression, signal sampling, digital filter realizations, filter design, multimedia applications, over-sampling, etc. More advanced topics are also covered, such as adaptive filters, speech compression such as PCM, μ -law, ADPCM, and multi-rate DSP, over-sampling ADC subband coding, and wavelet transform. Covers DSP principles with an emphasis on communications and control applications Includes chapter objectives, worked examples, and end-of-chapter exercises that aid the reader in grasping key concepts and solving related problems Provides an accompanying website with MATLAB programs for simulation and C programs for real-time DSP Presents new problems of varying types and difficulties

The book provides a comprehensive exposition of all major topics in digital signal processing (DSP). With numerous illustrative examples for easy understanding of the topics, it also includes MATLAB-based examples with codes in order to encourage the readers to become more confident of the fundamentals and to gain insights into DSP. Further, it presents real-world signal processing design problems using MATLAB and programmable DSP processors. In addition to problems that require analytical solutions, it discusses problems that require solutions using MATLAB at the end of each chapter. Divided into 13 chapters, it addresses many emerging topics, which are not typically found in advanced texts on DSP. It includes a chapter on adaptive digital filters used in the signal processing problems for faster acceptable results in the presence of changing environments and changing system requirements. Moreover, it offers an overview of wavelets, enabling readers to easily understand the basics and applications of this powerful mathematical tool for signal and image processing. The final chapter explores DSP processors, which is an area of growing interest for researchers. A valuable resource for undergraduate and graduate students, it can also be used for self-study by researchers, practicing engineers and scientists in electronics, communications, and computer engineering as well as for teaching one- to two-semester courses.

This first volume, edited and authored by world leading experts, gives a review of the principles, methods and techniques of important and emerging research topics and technologies in machine learning and advanced signal processing theory. With this reference source you will: Quickly grasp a new area of research Understand the underlying principles of a topic and its application Ascertain how a topic relates to other areas and learn of the research issues yet to be resolved Quick tutorial reviews of important and emerging topics of research in machine learning Presents core principles in signal processing theory and shows their applications Reference content on core principles, technologies, algorithms and applications Comprehensive references to journal articles and other literature on which to build further, more specific and detailed knowledge Edited by leading people in the field who, through their reputation, have been able to commission experts to write on a particular topic

The U.S. space program is rapidly changing from an activity driven by federal government launches to one driven by commercial launches. In 1997, for the first time commercial launches outnumbered government launches at the Eastern Range (ER), located at Cape Canaveral Air Station, Florida. Commercial activity is also increasing at the Western Range (WR), located at Vandenberg Air Force Base, California. The government itself is emulating commercial customers, shifting from direct management of launch programs to the purchase of space launch services from U.S. commercial launch companies in an open, competitive market. The fundamental goal of the U.S. space program is to ensure safe, reliable, and affordable access to space. Despite the inherent danger of space launches, the U.S. space program has demonstrated its ability to protect the public. No launch site worker or member of the general public has been killed or seriously injured in any of the 4,600 launches conducted at the ER and WR during the entire 50-year history of the space age. Streamlining Space Launch Range Safety discusses whether range safety processes can be made more efficient and less costly without compromising public safety. This report presents six primary recommendations, which address risk management, Africa gates, roles and responsibilities, range safety documentation [EWR 127-1]), global positioning system (GPS) receiver tracking systems, and risk standards for aircraft and ships.

LabVIEW Digital Signal Processing teaches engineers how to use the graphical programming language to create virtual instruments to handle the most sophisticated DSP applications. From basic filters to complex sampling mechanisms to signal generators, LabVIEW virtual instruments (VIs) can make DSP work faster and much less expensive – a particular boon to the many engineers working on cutting edge communications systems.

Although programming in memory-restricted environments is never easy, this holds especially true for digital signal processing (DSP). The data-rich, computation-intensive nature of DSP makes memory management a chief and challenging concern for designers. Memory Management for Synthesis of DSP Software focuses on minimizing memory requirements during the synthesis of DSP software from dataflow representations. Dataflow representations are used in many popular DSP design tools, and the methods of this book can be applied in that context, as well as other contexts where dataflow is used.

This book systematically reviews research conducted by the authors on memory minimization techniques for compiling synchronous dataflow (SDF) specifications. Beginning with an overview of the foundations of software synthesis techniques from SDF descriptions, it examines aggressive buffer-sharing techniques that take advantage of specific and quantifiable tradeoffs between code size and buffer size to achieve high levels of buffer memory optimization. The authors outline coarse-level strategies using lifetime analysis and dynamic storage allocation (DSA) for efficient buffer sharing as one approach and demonstrate the role of the CBP (consumed-before-produced) parameter at a finer level using a merging framework for buffer sharing. They present two powerful algorithms for combining these sharing techniques and then introduce techniques that are not restricted to the single appearance scheduling space of the other techniques. Extensively illustrated to clarify the mathematical concepts, Memory Management for Synthesis of DSP Software presents a comprehensive survey of state-of-the-art research in DSP software synthesis.

This updated edition gives readers hands-on experience in real-time DSP using a practical, step-by-step framework that also incorporates demonstrations, exercises, and problems, coupled with brief overviews of applicable theory and MATLAB applications. Organized in three sections that cover enduring fundamentals and present practical projects and invaluable appendices, this new edition provides support for the most recent and powerful of the inexpensive DSP development boards currently available from Texas Instruments: the OMAP-L138 LCDK. It includes two new real-time DSP projects, as well as three new appendices: an introduction to the Code Generation tools available with MATLAB, a guide on how to turn the LCDK into a portable battery-operated device, and a comparison of the three DSP boards directly supported by this edition.

The manufacturing industry will reap significant benefits from encouraging the development of digital manufacturing science and technology. Digital Manufacturing Science uses theorems, illustrations and tables to introduce the definition, theory architecture, main content, and key technologies of digital manufacturing science. Readers will be able to develop an in-depth understanding of the emergence and the development, the theoretical background, and the techniques and methods of digital manufacturing science. Furthermore, they will also be able to use the basic theories and key technologies described in Digital Manufacturing Science to solve practical engineering problems in modern manufacturing processes. Digital Manufacturing Science is aimed at advanced undergraduate and postgraduate students, academic researchers and researchers in the manufacturing industry. It allows readers to integrate the theories and technologies described with their own research works, and to propose new ideas and new methods to improve the theory and application of digital manufacturing science.

The aim of this book is to become a major reference text for gravitational-wave physics, covering in detail both the experimental and the theoretical aspects. The book brings the reader to the forefront of present-day research, and assumes no previous knowledge of gravitational-wave physics.

Compact, fluff-free, full-color guide to getting the most out of Apple's Aperture digital photography software This handy Portable Genius guide is designed to help you avoid hassle, save time, and quickly learn what you need to know to use Apple's Aperture digital photography software effectively—and have fun while you're doing it! In a trim size that fits in your laptop bag, this practical guide gives you tips, tricks, and savvy advice on everything from navigating Aperture's user interface to advanced RAW image processing, publishing albums on the Web, and how to create your own photo book. Provides tips and techniques for the new or most useful features of Apple's Aperture 3 digital photography and digital manipulation program Includes savvy advice and plenty of no-nonsense content in a hip way that is easy to access Covers key tools and topics, including keyboard shortcuts, how to streamline workflows, advanced RAW image processing, and more Features Genius icons throughout the book—smart or innovative ways to handle tasks and save yourself time Learn Aperture in a fun way and get even more out of your Apple digital lifestyle with Aperture 3 Portable Genius.

This book presents recent advances in DSP to simplify, or increase the computational speed of, common signal processing operations. The topics describe clever DSP tricks of the trade not covered in conventional DSP textbooks. This material is practical, real-world, DSP tips and tricks as opposed to the traditional highly-specialized, math-intensive, research subjects directed at industry researchers and university professors. This book goes well beyond the standard DSP fundamentals textbook and presents new, but tried-and-true, clever implementations of digital filter design, spectrum analysis, signal generation, high-speed function approximation, and various other DSP functions.

Intelligent readers who want to build their own embedded computer systems-- installed in everything from cell phones to cars to handheld organizers to refrigerators-- will find this book to be the most in-depth, practical, and up-to-date guide on the market. Designing Embedded Hardware carefully steers between the practical and philosophical aspects, so developers can both create their own devices and gadgets and customize and extend off-the-shelf systems. There are hundreds of books to choose from if you need to learn programming, but only a few are available if you want to learn to create hardware. Designing Embedded Hardware provides software and hardware engineers with no prior experience in embedded systems with the necessary conceptual and design building blocks to understand the architectures of embedded systems. Written to provide the depth of coverage and real-world examples developers need, Designing Embedded Hardware also provides a road-map to the pitfalls and traps to avoid in designing embedded systems. Designing Embedded Hardware covers such essential topics as: The principles of developing computer hardware Core hardware designs Assembly language concepts Parallel I/O Analog-digital conversion Timers (internal and external) UART Serial Peripheral Interface Inter-Integrated Circuit Bus Controller Area Network (CAN) Data Converter Interface (DCI) Low-power operation This invaluable and eminently useful book gives you the practical tools and skills to develop, build, and program your own application-specific computers.

This book describes the basic principles underlying the generation, coding, transmission and enhancement of speech and audio signals, including advanced statistical and machine learning techniques for speech and speaker recognition with an overview of the key innovations in these areas. Key research undertaken in speech coding, speech enhancement, speech recognition, emotion recognition and speaker diarization are also presented, along with recent advances and new paradigms in these areas.

"This set of books represents a detailed compendium of authoritative, research-based entries that define the contemporary state of knowledge on technology"--Provided by publisher.

One of the strengths of this book is the author's ability to motivate the use of Bayesian methods through simple yet effective examples. - Katie St. Clair MAA Reviews.

Introduction to Sports Biomechanics has been developed to introduce you to the core topics covered in the first two years of your degree. It will give you a sound grounding in both the theoretical and practical aspects of the subject. Part One covers the anatomical and mechanical foundations of biomechanics and Part Two concentrates on the measuring techniques which sports biomechanists use to study the movements of the sports performer. In addition, the book is highly illustrated with line drawings and photographs which help to reinforce explanations

and examples.

This Book Provides The Communications Engineer Involved In The Physical Layer Of Communications Systems, The Signal Processing Techniques And Design Tools Needed To Develop Efficient Algorithms For The Design Of Various Systems. These Systems Include Satellite Modems, Cable Modems, Wire-Line Modems, Cell-Phones, Various Radios, Multi-Channel Receivers, Audio Encoders, Surveillance Receivers, Laboratory Instruments, And Various Sonar And Radar Systems. The Emphasis Woven Through The Book Material Is That Of Intuitive Understanding Obtained By The Liberal Use Of Figures And Examples. The Book Contains Examples Of All These Types Of Systems. The Book Also Will Contain Matlab Script Files That Implement The Examples As Well As Design Tools For Filters Similar To The Examples.

Explains digital and analog signals and DSP applications using everyday examples and simple diagrams, including digital signal collection, filtering, analysis, and how digital signal processing works in modern electronic devices.

For courses on digital design in an Electrical Engineering, Computer Engineering, or Computer Science department. Digital Design, fifth edition is a modern update of the classic authoritative text on digital design. This book teaches the basic concepts of digital design in a clear, accessible manner. The book presents the basic tools for the design of digital circuits and provides procedures suitable for a variety of digital applications.

The managed flow of goods and information from raw material to final sale also known as a "supply chain" affects everything--from the U.S. gross domestic product to where you can buy your jeans. The nature of a company's supply chain has a significant effect on its success or failure--as in the success of Dell Computer's make-to-order system and the failure of General Motor's vertical integration during the 1998 United Auto Workers strike. Supply Chain Integration looks at this crucial component of business at a time when product design, manufacture, and delivery are changing radically and globally. This book explores the benefits of continuously improving the relationship between the firm, its suppliers, and its customers to ensure the highest added value. This book identifies the state-of-the-art developments that contribute to the success of vertical tiers of suppliers and relates these developments to the capabilities that small and medium-sized manufacturers must have to be viable participants in this system. Strategies for attaining these capabilities through manufacturing extension centers and other technical assistance providers at the national, state, and local level are suggested. This book identifies action steps for small and medium-sized manufacturers--the "seed corn" of business start-up and development--to improve supply chain management. The book examines supply chain models from consultant firms, universities, manufacturers, and associations. Topics include the roles of suppliers and other supply chain participants, the rise of outsourcing, the importance of information management, the natural tension between buyer and seller, sources of assistance to small and medium-sized firms, and a host of other issues. Supply Chain Integration will be of interest to industry policymakers, economists, researchers, business leaders, and forward-thinking executives.

This work looks under the hood of all robotic projects, stimulating teachers, students, and hobbyists to learn more about the gamut of areas associated with control systems and robotics. It offers a unique presentation in providing both theory and philosophy in a technical yet entertaining way.

This new, fully-revised edition covers all the major topics of digital signal processing (DSP) design and analysis in a single, all-inclusive volume, interweaving theory with real-world examples and design trade-offs. Building on the success of the original, this edition includes new material on random signal processing, a new chapter on spectral estimation, greatly expanded coverage of filter banks and wavelets, and new material on the solution of difference equations. Additional steps in mathematical derivations make them easier to follow, and an important new feature is the do-it-yourself section at the end of each chapter, where readers get hands-on experience of solving practical signal processing problems in a range of MATLAB experiments. With 120 worked examples, 20 case studies, and almost 400 homework exercises, the book is essential reading for anyone taking DSP courses. Its unique blend of theory and real-world practical examples also makes it an ideal reference for practitioners.

From the Foreword: "...There are many good textbooks today to teach digital signal processing, but most of them are content to teach the theory, and perhaps some MATLAB® simulations. This book has taken a bold step forward. It not only presents the theory, it reinforces it with simulations, and then it shows us how to actually use the results in real-time applications. This last step is not a trivial step, and that is why so many books, and courses, present only theory and simulations. With the combined expertise of the three authors of this text...the reader can step into the real-time world of applications with a text that presents an accessible path..." —Delores M. Etter, Texas Instruments Distinguished Chair in Electrical Engineering and Executive Director, Caruth Institute for Engineering Education, Southern Methodist University, Dallas, Texas, USA Mastering practical application of real-time digital signal processing (DSP) remains one of the most challenging and time-consuming pursuits in the field. It is even more difficult without a resource to bridge the gap between theory and practice. Filling that void, Real-Time Digital Signal Processing from MATLAB® to C with the TMS320C6x DSPs, Second Edition is organized in three sections that cover enduring fundamentals and present practical projects and invaluable appendices. This updated edition gives readers hands-on experience in real-time DSP using a practical, step-by-step framework that also incorporates demonstrations, exercises, and problems, coupled with brief overviews of applicable theory and MATLAB® application. Engineers, educators, and students rely on this book for precise, simplified instruction on use of real-time DSP applications. The book's software supports the latest high-performance hardware, including the powerful, inexpensive, and versatile OMAP-L138 Experimenter Kit and other development boards. Incorporating readers' valuable feedback and suggestions, this installment covers additional topics (such as PN sequences) and more advanced real-time DSP projects (including higher-order digital communications projects), making it even more valuable as a learning tool.

Graduate-level text extends studies of signal processing, particularly regarding communication systems and digital filtering theory. Topics include filtering, linear systems, and estimation; discrete-time Kalman filter; time-invariant filters; more. 1979 edition.

World-renowned economist Klaus Schwab, Founder and Executive Chairman of the World Economic Forum, explains that we have an opportunity to shape the fourth industrial revolution, which will fundamentally alter how we live and work. Schwab argues that this revolution is different in scale, scope and complexity from any that have come before.

Characterized by a range of new technologies that are fusing the physical, digital and biological worlds, the developments are affecting all disciplines, economies, industries and governments, and even challenging ideas about what it means to be human. Artificial intelligence is already all around us, from supercomputers, drones and virtual assistants to 3D printing, DNA sequencing, smart thermostats, wearable sensors and microchips smaller than a grain of sand. But this is just the beginning: nanomaterials 200 times stronger than steel and a million times thinner than a strand of hair and the first transplant of a 3D printed liver are already in development. Imagine "smart factories" in which global systems of manufacturing are coordinated virtually, or implantable mobile phones made of biosynthetic materials. The fourth industrial revolution, says Schwab, is more significant, and its ramifications more profound, than in any prior period of human history. He outlines the key technologies driving this revolution and discusses the major impacts expected on government, business, civil society and individuals. Schwab also offers bold ideas on how to harness these changes and shape a better future--one in which technology empowers people rather than replaces them; progress serves society rather than disrupts it; and in which innovators respect moral and ethical boundaries rather than cross them. We all have the opportunity to contribute to developing new frameworks that advance progress.

Based on the popular Artech House classic, Digital Communication Systems Engineering with Software-Defined Radio, this book provides a practical approach to quickly learning the software-defined radio (SDR) concepts needed for work in the field. This up-to-date volume guides readers on how to quickly prototype wireless designs using SDR for real-world testing and experimentation. This book explores advanced wireless communication techniques such as OFDM, LTE, WLA, and hardware targeting. Readers will gain an understanding of the core concepts behind wireless hardware, such as the radio frequency front-end, analog-to-digital and digital-to-analog converters, as well as various processing technologies. Moreover, this volume includes chapters on timing estimation, matched filtering, frame synchronization message decoding, and source coding. The orthogonal frequency division multiplexing is explained and details about HDL code generation and deployment are provided. The book concludes with coverage of the WLAN toolbox with OFDM beacon reception and the LTE toolbox with downlink reception. Multiple case studies are provided throughout the book. Both MATLAB and Simulink source code are included to assist readers with their projects in the field.

Streamlining Digital Signal Processing A Tricks of the Trade Guidebook John Wiley & Sons

Amazon.com's Top-Selling DSP Book for Seven Straight Years—Now Fully Updated! Understanding Digital Signal Processing, Third Edition, is quite simply the best resource for engineers and other technical professionals who want to master and apply today's latest DSP techniques. Richard G. Lyons has updated and expanded his best-selling second edition to reflect the newest technologies, building on the exceptionally readable coverage that made it the favorite of DSP professionals worldwide. He has also added hands-on problems to every chapter, giving students even more of the practical experience they need to succeed. Comprehensive in scope and clear in approach, this book achieves the perfect balance between theory and practice, keeps math at a tolerable level, and makes DSP exceptionally accessible to beginners without ever oversimplifying it. Readers can thoroughly grasp the basics and quickly move on to more sophisticated techniques. This edition adds extensive new coverage of FIR and IIR filter analysis techniques, digital differentiators, integrators, and matched filters. Lyons has significantly updated and expanded his discussions of multirate processing techniques, which are crucial to modern wireless and satellite communications. He also presents nearly twice as many DSP Tricks as in the second edition—including techniques even seasoned DSP professionals may have overlooked. Coverage includes New homework problems that deepen your understanding and help you apply what you've learned Practical, day-to-day DSP implementations and problem-solving throughout Useful new guidance on generalized digital networks, including discrete differentiators, integrators, and matched filters Clear descriptions of statistical measures of signals, variance reduction by averaging, and real-world signal-to-noise ratio (SNR) computation A significantly expanded chapter on sample rate conversion (multirate systems) and associated filtering techniques New guidance on implementing fast convolution, IIR filter scaling, and more Enhanced coverage of analyzing digital filter behavior and performance for diverse communications and biomedical applications Discrete sequences/systems, periodic sampling, DFT, FFT, finite/infinite impulse response filters, quadrature (I/Q) processing, discrete Hilbert transforms, binary number formats, and much more

Praise for the first edition: "This excellent text will be useful to every system engineer (SE) regardless of the domain. It covers ALL relevant SE material and does so in a very clear, methodical fashion. The breadth and depth of the author's presentation of SE principles and practices is outstanding." —Philip Allen This textbook presents a comprehensive, step-by-step guide to System Engineering analysis, design, and development via an integrated set of concepts, principles, practices, and methodologies. The methods presented in this text apply to any type of human system -- small, medium, and large organizational systems and system development projects delivering engineered systems or services across multiple business sectors such as medical, transportation, financial, educational, governmental, aerospace and defense, utilities, political, and charity, among others. Provides a common focal point for "bridging the gap" between and unifying System Users, System Acquirers, multi-discipline System Engineering, and Project, Functional, and Executive Management education, knowledge, and decision-making for developing systems, products, or services Each chapter provides definitions of key terms, guiding principles, examples, author's notes, real-world examples, and exercises, which highlight and reinforce key SE&D concepts and practices Addresses concepts employed in Model-Based Systems Engineering (MBSE), Model-Driven Design (MDD), Unified Modeling Language (UMLTM) / Systems Modeling Language (SysMLTM), and Agile/Spiral/V-Model Development such as user needs, stories, and use cases analysis; specification development; system architecture development; User-Centric System Design (UCSD); interface definition & control; system integration & test; and Verification & Validation (V&V) Highlights/introduces a new 21st Century Systems Engineering & Development (SE&D) paradigm

that is easy to understand and implement. Provides practices that are critical staging points for technical decision making such as Technical Strategy Development; Life Cycle requirements; Phases, Modes, & States; SE Process; Requirements Derivation; System Architecture Development, User-Centric System Design (UCSD); Engineering Standards, Coordinate Systems, and Conventions; et al. Thoroughly illustrated, with end-of-chapter exercises and numerous case studies and examples, Systems Engineering Analysis, Design, and Development, Second Edition is a primary textbook for multi-discipline, engineering, system analysis, and project management undergraduate/graduate level students and a valuable reference for professionals.

Ten Strategies of a World-Class Cyber Security Operations Center conveys MITRE's accumulated expertise on enterprise-grade computer network defense. It covers ten key qualities of leading Cyber Security Operations Centers (CSOCs), ranging from their structure and organization, to processes that best enable smooth operations, to approaches that extract maximum value from key CSOC technology investments. This book offers perspective and context for key decision points in structuring a CSOC, such as what capabilities to offer, how to architect large-scale data collection and analysis, and how to prepare the CSOC team for agile, threat-based response. If you manage, work in, or are standing up a CSOC, this book is for you. It is also available on MITRE's website, www.mitre.org.

Digital signal processing is an area of science and engineering that has been developed rapidly over the past years. This rapid development is the result of the significant advances in digital computer technology and integrated circuits fabrication. Many of the signal processing tasks conventionally performed by analog means are realized today by less expensive and often more reliable digital hardware. Multirate Systems: Design and Applications addresses the rapid development of multirate digital signal processing and how it is complemented by the emergence of new applications.

Problems demanding globally optimal solutions are ubiquitous, yet many are intractable when they involve constrained functions having many local optima and interacting, mixed-type variables. The differential evolution (DE) algorithm is a practical approach to global numerical optimization which is easy to understand, simple to implement, reliable, and fast. Packed with illustrations, computer code, new insights, and practical advice, this volume explores DE in both principle and practice. It is a valuable resource for professionals needing a proven optimizer and for students wanting an evolutionary perspective on global numerical optimization.

Consumer health websites have garnered considerable media attention, but only begin to scratch the surface of the more pervasive transformations the Internet could bring to health and health care. Networking Health examines ways in which the Internet may become a routine part of health care delivery and payment, public health, health education, and biomedical research. Building upon a series of site visits, this book: Weighs the role of the Internet versus private networks in uses ranging from the transfer of medical images to providing video-based medical consultations at a distance. Reviews technical challenges in the areas of quality of service, security, reliability, and access, and looks at the potential utility of the next generation of online technologies. Discusses ways health care organizations can use the Internet to support their strategic interests and explores barriers to a broader deployment of the Internet. Recommends steps that private and public sector entities can take to enhance the capabilities of the Internet for health purposes and to prepare health care organizations to adopt new Internet-based applications.

Can blockchain solve your biggest business problem? While the world is transfixed by bitcoin mania, your competitors are tuning out the noise and making strategic bets on blockchain. Your rivals are effortlessly tracking every last link in their supply chains. They're making bureaucratic paper trails obsolete while keeping their customers' data safer and discovering new ways to use this next foundational technology to sustain their competitive advantage. What should you be doing with blockchain now to ensure that your business is poised for success? "Blockchain: The Insights You Need from Harvard Business Review" brings you today's most essential thinking on blockchain, explains how to get the right initiatives started at your company, and prepares you to seize the opportunity of the coming blockchain wave. Business is changing. Will you adapt or be left behind? Get up to speed and deepen your understanding of the topics that are shaping your company's future with the Insights You Need from Harvard Business Review series. Featuring HBR's smartest thinking on fast-moving issues--blockchain, cybersecurity, AI, and more--each book provides the foundational introduction and practical case studies your organization needs to compete today and collects the best research, interviews, and analysis to get it ready for tomorrow. You can't afford to ignore how these issues will transform the landscape of business and society. The Insights You Need series will help you grasp these critical ideas--and prepare you and your company for the future.

This book is a printed edition of the Special Issue "Spatial Audio" that was published in Applied Sciences

Infrastructure for Homeland Security Environments Wireless Sensor Networks helps readers discover the emerging field of low-cost standards-based sensors that promise a high order of spatial and temporal resolution and accuracy in an ever-increasing universe of applications. It shares the latest advances in science and engineering paving the way towards a large plethora of new applications in such areas as infrastructure protection and security, healthcare, energy, food safety, RFID, ZigBee, and processing. Unlike other books on wireless sensor networks that focus on limited topics in the field, this book is a broad introduction that covers all the major technology, standards, and application topics. It contains everything readers need to know to enter this burgeoning field, including current applications and promising research and development; communication and networking protocols; middleware architecture for wireless sensor networks; and security and management. The straightforward and engaging writing style of this book makes even complex concepts and processes easy to follow and understand. In addition, it offers several features that help readers grasp the material and then apply their knowledge in designing their own wireless sensor network systems: * Examples illustrate how concepts are applied to the development and application of * wireless sensor networks * Detailed case studies set forth all the steps of design and implementation needed to solve real-world problems * Chapter conclusions that serve as an excellent review by stressing the chapter's key concepts * References in each chapter guide readers to in-depth discussions of individual topics This book is ideal for networking designers and engineers who want to fully exploit this new technology and for government employees who are concerned about homeland security. With its examples, it is

appropriate for use as a coursebook for upper-level undergraduates and graduate students.

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