Ifeachor Digital Signal Processing 2nd Edition Bing

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.

Digital filters, together with signal processing, are being employed in the new technologies and information systems, and are implemented in different areas and applications. Digital filters and signal processing are used with no costs and they can be adapted to different cases with great flexibility and reliability. This book presents advanced developments in digital filters and signal process methods covering different cases studies. They present the main essence of the subject, with the principal approaches to the most recent mathematical models that are being employed worldwide.

This book constitutes the joint refereed proceedings of the 20th International Conference on Next Generation Teletraffic and Wired/Wireless Advanced Networks and Systems, NEW2AN 2020, and the 13th Conference on Internet of Things and Smart Spaces, ruSMART 2020. The conference was held virtually due to the COVID-19 pandemic. The 79 revised full papers presented were carefully reviewed and selected from 225 submissions. The papers of NEW2AN address various aspects of next-generation data networks, with special attention to advanced wireless networking and applications. In particular, they deal with novel and innovative approaches to performance and efficiency analysis of 5G and beyond systems, employed game-theoretical formulations, advanced queuing theory, and stochastic geometry, while also covering the Internet of Things, cyber security, optics, signal processing, as well as business aspects. ruSMART 2020, provides a forum for academic and industrial researchers to discuss new ideas and trends in the emerging areas.

Now readers can focus on the development, implementation, and application of modern DSP techniques with the new DIGITAL SIGNAL PROCESSING USING MATLAB, 3E. Written using an engaging informal style, this edition inspires readers to become actively involved with each topic. Every chapter starts with a motivational section that highlights practical examples and challenges that readers can solve using techniques covered in the chapter. Each chapter concludes with a detailed case study example, chapter summary, and a generous selection of practical problems cross-referenced to sections within the chapter. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

This book attempts to improve algorithms by novel theories and complex data analysis in different scopes including object detection, remote sensing, data transmission, data fusion, gesture recognition, and edical image processing and analysis. The book is directed to the Ph.D. students, professors, researchers, and software developers working in the areas of digital video processing and computer vision technologies.

This book clearly explains digital signal processing principles and shows how they can be used to build DSP systems. The aim is to give enough insight and practical guidance to enable an engineer to construct DSP systems. The book's programs are written in C, the language used in DSP.

This book presents the refereed joint proceedings of seven workshops on evolutionary computing, EvoWorkshops 2006, held in Budapest in April 2006. 65 revised full papers and 13 revised short papers presented were carefully reviewed and selected from a total of 149 submissions. The book is organized in topical sections including evolutionary bioinformatics, evolutionary computation in communications, networks, and connected systems, and more.

A comprehensive introduction to Digital Signal Processing, a growing and important area for the aspiring electronics or communications engineer. The aim of the book is to provide an introduction to the fundamental DSP operations of filtering, estimation and analysis. The book will be supported with a website of MATLAB experiments. Lecturer support will also be available via an on-line Solutions Manual (available via a password). Hardcopy solutions also available.

Ground-penetrating radar (GPR) is a rapidly developing field that has seen tremendous progress over the past 15 years. The development of GPR spans aspects of geophysical science, technology, and a wide range of scientific and engineering applications. It is the breadth of applications that has made GPR such a valuable tool in the geophysical consulting and geotechnical engineering industries, has lead to its rapid development, and inspired new areas of research in academia. The topic of GPR has gone from not even being mentioned in geophysical texts ten years ago to being the focus of hundreds of research papers and special issues of journals dedicated to the topic. The explosion of primary literature devoted to GPR technology, theory and applications, has lead to a strong demand for an up-to-date synthesis and overview of this rapidly developing field. Because there are specifics in the utilization of GPR for different applications, a review of the current state of development of the applications along with the fundamental theory is required. This book will provide sufficient detail to allow both practitioners and newcomers to the area of GPR to use it as a handbook and primary research reference. *Review of GPR theory and applications by leaders in the field *Up-to-date information and references *Effective handbook and primary research reference for both experienced practitioners and newcomers

This intriguing and motivating book presents the basic ideas and understanding of control, signals and systems for readers interested in engineering and science. Through a series of examples, the book explores both the theory and the practice of control.

This new book by Ken Steigliz offers an informal and easy-to-understand introduction to digital signal processing, emphasizing digital audio and applications to computer music. A DSP Primer covers important topics such as phasors and tuning forks; the wave equation; sampling and quantizing; feedforward and feedback filters; comb and string filters; periodic sounds; transform methods; and filter design. Steiglitz uses an intuitive and qualitative approach to develop the mathematics critical to understanding DSP. A DSP Primer is written for a broad audience including: Students of DSP in Engineering and Computer Science courses. Composers of computer music and those who work with digital sound. WWW and Internet developers who work with multimedia. General readers interested in science that want an introduction to DSP. Features: Offers a simple and uncluttered step-by-step approach to DSP for first-time users, especially beginners in computer music.

Designed to provide a working knowledge and understanding of frequency domain methods, including FFT and digital filtering. Contains thought-provoking questions and suggested experiments that help the reader to understand and apply DSP theory and techniques.

As in many other fields, biomedical engineers benefit from the use of computational intelligence (CI) tools to solve complex and non-linear problems. The benefits could be even greater if there were scientific literature that specifically focused on the biomedical applications of computational intelligence techniques. The first comprehensive field-specific reference, Computational Intelligence in Biomedical Engineering provides a unique look at how techniques in CI can offer solutions in modelling, relationship pattern recognition, clustering, and other problems particular to the field. The authors begin with an overview of signal processing and machine learning approaches and continue on to introduce specific applications, which illustrate CI's importance in medical diagnosis and healthcare. They provide an extensive review of signal processing techniques commonly employed in the analysis of biomedical signals and in the improvement of signal to noise ratio. The text covers recent CI techniques for post processing ECG signals in the diagnosis of cardiovascular disease and as well as various studies with a particular focus on CI's potential as a tool for gait diagnostics. In addition to its detailed accounts of the most recent research, Computational Intelligence in Biomedical Engineering provides useful applications and information on the benefits of applying computation intelligence techniques to improve medical diagnostics.

Whilst other books cover a broad range of topics, Feature Extraction and Image Processing takes one of the prime targets of applied computer vision, feature extraction, and uses it to provide an essential guide to the implementation of image processing and computer vision techniques. Acting as both a source of reference and a student text, the book explains techniques and fundamentals in a clear and concise manner and helps readers to develop working techniques, with usable code provided throughout. The new edition is updated throughout in line with developments in the field, and is revised to focus on mathematical programming in Matlab. Essential reading for engineers and students working in this cutting edge field Ideal module text and background reference for courses in image processing and computer vision

In addition to its thorough coverage of DSP design and programming techniques, Smith also covers the operation and usage of DSP chips. He uses Analog Devices' popular DSP chip family as design examples. Covers all major DSP topics Full of insider information and shortcuts Basic techniques and algorithms explained without complex numbers

This book gathers papers presented in the main track of IITI 2019, the Fourth International Scientific Conference on Intelligent Information Technologies for Industry, held in Ostrava–Prague, Czech Republic on December 2–7, 2019. The conference was jointly organized by Rostov State Transport University (Russia) and VŠB – Technical University of Ostrava (Czech Republic) with the participation of the Russian Association for Artificial Intelligence (RAAI). IITI 2019 was devoted to practical models and industrial applications of intelligent information systems. Though chiefly intended to promote the implementation of advanced information technologies in various industries, topics such as the state of the art in intelligent systems and soft computing were also discussed.

The professional recording industry is rapidly moving from a hardware paradigm (big studios with expensive gear) to a software paradigm, in which lots of expensive hardware is replaced with a single computer loaded with software plug-ins. Complete albums are now being recorded and engineered "inside the box"-all within a computer without hardware processing or mixing gear. Audio effect plug-ins, which are small software modules that work within audio host applications, like Avid Pro Tools, Apple Logic, Ableton Live, and Steinberg Cubase, are big business. Designing Audio Effect Plug-Ins in C++ gives readers everything they need to know to create real-world, working plug-ins in the widely used C++ programming language. Beginning with the necessary theory behind audio signal processing, author Will Pirkle quickly gets into the heart of this implementation guide, with clearly-presented, previously unpublished algorithms, tons of example code, and practical advice. From the companion website, readers can download free software for the rapid development of the algorithms, many of which have never been revealed to the general public. The resulting plug-ins can be compiled to snap in to any of the above host applications. Readers will come away with the knowledge and tools to design and implement their own audio signal processing designs. Learn to build audio effect plug-ins in a widely used, implementable programming language-C++ Design plug-ins for a variety of platforms (Windows and Mac) and popular audio applications Companion site gives you fully worked-out code for all the examples used, free development software for download, video tutorials for the software, and examples of student plug-ins complete with theory and code

PSpice is a software package that provides robust, advanced circuit analysis tools to improve design performance, yield, and reliability. Its capabilities enable engineers to create virtual prototypes of designs and maximize circuit performance automatically. This book is the fifth of a five-part series of books covering PSpice 10.5 and all of its applications. This book examines linear time invariant systems starting with the difference equation and applying the z-transform to produce a range of filter type i.e. low-pass, high-pass, and bandpass. Convolution is examined, followed by digital oscillators, including quadrature carrier generation, are then examined. Several filter design methods are considered and include the bilinear transform, impulse invariant, and window techniques. A range of DSP applications are then considered and include the Hilbert transform, single sideband modulator using the Hilbert transform and quad oscillators, integrators and differentiators. Decimation and interpolation are simulated to demonstrate the usefulness of the multi-sampling environment. Decimation is also applied in a treatment on digital receivers. Lastly, we look at some musical applications for DSP such as reverberation/echo using real-world signals imported into PSpice using the program Wav2Ascii. The zero-forcing equalizer is dealt with in a simplistic manner and illustrates the effectiveness of equalizing signals in a receiver after transmission.Other books in the series:PSpice for Circuit Theory and Electronic Devices (9781598291568)PSpice for Filters and Transmission Lines (9781598291582)PSpice for Analog Communications Engineering (9781598291605)PSpice for Digital Communications Engineering (9781598291629)

Covering everything from signal processing algorithms to integrated circuit design, this complete guide to digital front-end is invaluable for professional engineers and researchers in the fields of signal processing, wireless communication and circuit design. Showing how theory is translated into practical technology, it covers all the relevant standards and gives readers the ideal design methodology to manage a rapidly increasing range of applications. Step-by-step information for designing practical systems is provided, with a systematic presentation of theory, principles, algorithms, standards and implementation. Design trade-offs are also included, as are practical implementation examples from real-world systems. A broad range of topics is covered, including digital pre-distortion (DPD), digital up-conversion (DUC), digital down-

conversion (DDC) and DC-offset calibration. Other important areas discussed are peak-to-average power ratio (PAPR) reduction, crest factor reduction (CFR), pulse-shaping, image rejection, digital mixing, delay/gain/imbalance compensation, error correction, noise-shaping, numerical controlled oscillator (NCO) and various diversity methods.

This book constitutes the thoroughly refereed post-proceedings of the 8th International Symposium on Computer Music Modeling and Retrieval, CMMR 2011 and the 20th International Symposium on Frontiers of Research in Speech and Music, FRSM 2011. This year the 2 conferences merged for the first time and were held in Bhubanes, India, in March 2011. The 17 revised full papers presented were specially reviewed and revised for inclusion in this proceedings volume. The book is divided in four main chapters which reflect the high quality of the sessions of CMMR 2011, the collaboration with FRSM 2011 and the Indian influence, in the topics of Indian Music, Music Information Retrieval, Sound analysis synthesis and perception and Speech processing of Indian languages.

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

All the design and development inspiration and direction an digital engineer needs in one blockbuster book! Kenton Williston, author, columnist, and editor of DSP DesignLine has selected the very best digital signal processing design material from the Newnes portfolio and has compiled it into this volume. The result is a book covering the gamut of DSP design'from design fundamentals to optimized multimedia techniques'with a strong pragmatic emphasis. In addition to specific design techniques and practices, this book also discusses various approaches to solving DSP design problems and how to successfully apply theory to actual design tasks. The material has been selected for its timelessness as well as for its relevance to contemporary embedded design issues. CONTENTS: Chapter 1 ADCs, DACs, and Sampling Theory Chapter 2 Digital Filters Chapter 3 Frequency Domain Processing Chapter 4 Audio Coding Chapter 5 Video Processing Chapter 6 Modulation Chapter 7 DSP Hardware Options Chapter 8 DSP Processors and Fixed-Point Arithmetic Chapter 9 Code Optimization and Resource Partitioning Chapter 10 Testing and Debugging DSP Systems *Hand-picked content selected by Kenton Williston, Editor of DSP DesignLine *Proven best design practices for image, audio, and video processing *Case histories and design examples get you off and running on your current project

The book is suitable to be used as a one-semester senior-level course for the undergraduate engineering technology program including electronics, computer, and biomedical engineering technologies. However, the book could also be useful as a reference for undergraduate engineering students, science students, and practicing engineers.

Digital Signal Processing, Second Edition enables electrical engineers and technicians in the fields of biomedical, computer, and electronics engineering to master the essential fundamentals of DSP principles and practice. Many instructive worked examples are used to illustrate the material, and the use of mathematics is minimized for easier grasp of concepts. As such, this title is also useful to undergraduates in electrical engineering, and as a reference for science students and practicing engineers. The book goes beyond DSP theory, to show 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, u-law, ADPCM, and multi-rate DSP and over-sampling ADC. New to this edition: MATLAB projects dealing with practical applications added throughout the book New chapter (chapter 13) covering sub-band coding and wavelet transforms, methods that have become popular in the DSP field New applications included in many chapters, including applications of DFT to seismic signals, electrocardiography data, and vibration signals All real-time C programs revised for the TMS320C6713 DSK Covers DSP principles with emphasis on communications and control applications Chapter objectives, worked examples, and end-of-chapter exercises aid the reader in grasping key concepts and solving related problems Website with MATLAB programs for simulation and C programs for real-time DSP

Digital Signal ProcessingA Practical ApproachPearson Education

Classical signal processing techniques are based primarily on the analog nature of all signals. However, the continuously improving performance of digital circuitry and processors has prompted a switch to digital signal processing techniques rather than the traditional analog ones. Applied Signal Processing recognizes the linkage between the two paradigms and presents a unified treatment of both subjects (analog and digital signal processing) in one authoritative volume. It introduces underlying principles, basic concepts, and definitions as well as classic and contemporary designs of signal processing systems. The author includes a detailed description of data converters, an interface between the real world of analog signals and the artificial world of digital signals. He provides a concise presentation of topics by limiting the number of complex equations and using lucid language. Numerous real-world application examples are featured within each chapter including architectures from Texas Instruments, Motorola, and Analog Devices. With its compounded coverage of both analog and digital signal processing techniques, this book provides engineers with the knowledge they need to understand the analog basis of modern digital signal processing techniques and construct architectures for modern systems.

"This book provides a clear understanding of the principles of signal processing of radiation detectors. It is designed to be a stand-alone book and no extensive pre-knowledge of electronics is assumed. To this end, the characteristics of pulses from various types of detectors are emphasized and an overview is given on the basic concepts required to understand detectors signal processing systems and pulse processing techniques. The author covers all important aspects of signal processing including energy spectroscopy, timing, position-sensing, pulse-shape discrimination and radiation intensity measurement. By reading this book, researchers, engineers, and graduate students working in disciplines such as nuclear physics and engineering, environmental and biomedical engineering, medical physics and radiological science will have the knowledge to optimize available systems or to setup their own experiments"--

This two-volume set (LNAI 11055 and LNAI 11056) constitutes the refereed proceedings of the 10th International Conference on Collective Intelligence, ICCCI 2018, held in Bristol, UK, in September 2018 The 98 full papers presented were carefully reviewed and selected from 240 submissions. The conference focuses on knowledge engineering and semantic web, social network analysis, recommendation methods and

recommender systems, agents and multi-agent systems, text processing and information retrieval, data mining methods and applications, decision support and control systems, sensor networks and internet of things, as well as computer vision techniques.

Window functions—otherwise known as weighting functions, tapering functions, or apodization functions—are mathematical functions that are zero-valued outside the chosen interval. They are well established as a vital part of digital signal processing. Window Functions and their Applications in Signal Processing presents an exhaustive and detailed account of window functions and their applications in signal processing, focusing on the areas of digital spectral analysis, design of FIR filters, pulse compression radar, and speech signal processing. Comprehensively reviewing previous research and recent developments, this book: Provides suggestions on how to choose a window function for particular applications Discusses Fourier analysis techniques and pitfalls in the computation of the DFT Introduces window functions in the continuous-time and discrete-time domains Considers two implementation strategies of window functions in the time- and frequency domain Explores well-known applications of window functions in the fields of radar, sonar, biomedical signal analysis, audio processing, and synthetic aperture radar

Intended as a text for three courses—Signals and Systems, Digital Signal Processing (DSP), and DSP Architecture—this comprehensive book now in its Third Edition, continues to provide a thorough understanding of digital signal processing, beginning from the fundamentals to the implementation of algorithms on a digital signal processor. This Edition includes Assembly, C and real time C programs for TMS 320C54XX and 320C6713 processor, which are useful to conduct a laboratory course in Digital Signal Processing. Besides, many existing chapters are modified substantially to widen the coverage of the book. Primarily designed for undergraduate students of Electronics and Communication Engineering, Electronics and Instrumentation Engineering, Electrical and Electronics Engineering, Instrumentation and Control Engineering, Computer Science and Information Science, this text will also be useful for advanced digital signal processing and real time digital signal processing courses of postgraduate programmes.

Optoelectronic devices transform electrical signals into optical signals (and vice versa) by utilizing the interaction of electrons and light. Advanced software tools for the design and analysis of such devices have been developed in recent years. However, the large variety of materials, devices, physical mechanisms, and modeling approaches often makes it difficult to select appropriate theoretical models or software packages. This book presents a review of devices and advanced simulation approaches written by leading researchers and software developers. It is intended for scientists and device engineers in optoelectronics who are interested in using advanced software tools. Each chapter includes the theoretical background as well as practical simulation results that help the reader to better understand internal device physics. Real-world devices such as edge-emitting or surface-emitting laser diodes, light-emitting diodes, solar cells, photodetectors, and integrated optoelectronic circuits are investigated. The software packages described in the book are available to the public, on a commercial or noncommercial basis, so that the interested reader is quickly able to perform similar simulations.

This textbook provides comprehensive coverage for courses in the basics of design and implementation of digital filters. The book assumes only basic knowledge in digital signal processing and covers state-of-the-art methods for digital filter design and provides a simple route for the readers to design their own filters. The advanced mathematics that is required for the filter design is minimized by providing an extensive MATLAB toolbox with over 300 files. The book presents over 200 design examples with MATLAB code and over 300 problems to be solved by the reader. The students can design and modify the code for their use. The book and the design examples cover almost all known design methods of frequency-selective digital filters as well as some of the authors' own, unique techniques.

This practically-oriented, all-inclusive guide covers all the major enabling techniques for current and next-generation cellular communications and wireless networking systems. Technologies covered include CDMA, OFDM, UWB, turbo and LDPC coding, smart antennas, wireless ad hoc and sensor networks, MIMO, and cognitive radios, providing readers with everything they need to master wireless systems design in a single volume. Uniquely, a detailed introduction to the properties, design, and selection of RF subsystems and antennas is provided, giving readers a clear overview of the whole wireless system. It is also the first textbook to include a complete introduction to speech coders and video coders used in wireless systems. Richly illustrated with over 400 figures, and with a unique emphasis on practical and state-of-the-art techniques in system design, rather than on the mathematical foundations, this book is ideal for graduate students and researchers in wireless communications, as well as for wireless and telecom engineers.

"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.

Would your company be prepared in the event of: * Computer-driven espionage * A devastating virus attack * A hacker's unauthorized access * A breach of data security? As the sophistication of computer technology has grown, so has therate of computer-related criminal activity. Subsequently, Americancorporations now lose billions of dollars a year to hacking,identity theft, and other computer attacks. More than ever,businesses and professionals responsible for the critical data ofcountless customers and employees need to anticipate and safeguardagainst computer intruders and attacks. The first book to successfully speak to the nontechnicalprofessional in the fields of business and law on the topic ofcomputer crime, Computer Forensics: An Essential Guide forAccountants, Lawyers, and Managers provides valuable advice on thehidden difficulties that can blindside companies and result indamaging costs. Written by industry expert Michael Sheetz, this important bookprovides readers with an honest look at the computer crimes thatcan annoy, interrupt--and devastate--a business. Readers areequipped not only with a solid understanding of how computersfacilitate fraud and financial crime, but also how computers can beused to investigate, prosecute, and prevent these crimes. If you want to know how to protect your company from computercrimes but have a limited technical background, this book is foryou. Get Computer Forensics: An Essential Guide for Accountants,Lawyers, and Managers and get prepared.

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