

Digital Signal Compression Principles And Practice

The industry "bible" is back and it's better than ever. The Art of Digital Video has served as the ultimate reference guide for those working with digital video for generations. Now this classic has been revised and re-written by international consultant and industry leader John Watkinson to include important technical updates on this ever-evolving topic. The format has also been improved to include optional sections that provide additional information that you can choose to skip or investigate further, depending on your interests and comfort level with the subject. As the worlds of film, digital imaging, and computing have converged, this book has evolved to remain current and relevant, while still remaining the classic that experts in the field have trusted for years. * Must-have updates throughout this must-have guide * Re-written by a widely acclaimed author and authority in the field * More information on emerging technologies.

Get a working knowledge of digital signal processing for computer science applications The field of digital signal processing (DSP) is rapidly exploding, yet most books on the subject do not reflect the real world of algorithm development, coding for applications, and software engineering. This important new work fills the gap in the field, providing computer professionals with a comprehensive introduction to those aspects of DSP essential for working on today's cutting-edge applications in speech compression and recognition and modem design. The author walks readers through a variety of advanced topics, clearly demonstrating how even such areas as spectral analysis, adaptive and nonlinear filtering, or communications and speech signal processing can be made readily accessible through clear presentations and a practical hands-on approach. In a light, reader-friendly style, Digital Signal Processing: A Computer Science Perspective provides: * A unified treatment of the theory and practice of DSP at a level sufficient for exploring the contemporary professional literature * Thorough coverage of the fundamental algorithms and structures needed for designing and coding DSP applications in a high level language * Detailed explanations of the principles of digital signal processors that will allow readers to investigate assembly languages of specific processors * A review of special algorithms used in several important areas of DSP, including speech compression/recognition and digital communications * More than 200 illustrations as well as an appendix containing the essential mathematical background

This book provides comprehensive, graduate-level treatment of analog and digital signal analysis suitable for course use and self-guided learning. This expert text guides the reader from the basics of signal theory through a range of application tools for use in acoustic analysis, geophysics, and data compression. Each concept is introduced and explained step by step, and the necessary mathematical formulae are integrated in an accessible and intuitive way. The first part of the book explores how analog systems and signals form the basics of signal analysis. This section covers Fourier series and integral transforms of analog signals, Laplace and Hilbert transforms, the main analog filter classes, and signal modulations. Part II covers digital signals, demonstrating their key advantages. It presents z and Fourier transforms, digital filtering, inverse filters, deconvolution, and parametric modeling for deterministic signals. Wavelet decomposition and reconstruction of non-stationary signals are also discussed. The third part of the book is devoted to random signals, including spectral estimation, parametric modeling, and Tikhonov regularization. It covers statistics of one and two random variables and the principles and methods of spectral analysis. Estimation of signal properties is discussed in the context of ergodicity conditions and parameter estimations, including the use of Wiener and Kalman filters. Two appendices cover the basics of integration in the complex plane and linear algebra. A third appendix presents a basic Matlab toolkit for computer signal analysis. This expert text provides both a solid theoretical understanding and tools for real-world applications.

The comprehensive Sandlin's Textbook of Hearing Aid Amplification, now in its third edition, provides the hearing health professional with an overview of the technological advances related to hearing aid devices. The authors give particular emphasis to the most current advances in clinical assessment techniques and hearing instrument technology, and provide a detailed analysis of the application of digital signal processing. Clinical insights into the psychology of hearing health are included to help professionals meet clients' emotional as well as acoustic needs. This is a valuable text for academic and clinical professionals involved in the selection and fitting of hearing aid devices for the acoustically impaired. New to the third edition: Updated chapters on earmold and earshell acoustics; principles and applications of high-fidelity amplitude compression; and microphone technology/Major revisions to chapters on digital signal processing; hearing aid selection, fitting, and verification; mathematical formulae for applying amplification; measures of validity and verification; and surgically-implanted hearing devices for unilateral hearing loss/Discussion of distribution methods; considerations for treating children; elements of design and implementation of DSP circuits; the evolution from analog to digital hearing aids; and future consideration for the field

Technical and Clinical Considerations, Third Edition

Wavelet Image Compression

Digital Signal Processing: DSP and Applications

Digital Image Processing with Application to Digital Cinema

Coding of Speech, Audio, Text, Image and Video

Digital Compression for Multimedia

The purpose of Transporting Compressed Digital Video is to introduce fundamental principles and important technologies used in design and analysis of video transport systems for many video applications in digital networks. In the past two decades, progress in digital video processing, transmission, and storage technologies, such as video compression, digital modulation, and digital storage disk, has proceeded at an astounding pace. Digital video compression is a field in which fundamental technologies were motivated and driven by practical applications so that they often lead to many useful advances. Especially, the digital video-compression standards, developed by the Moving Pictures Expert Group (MPEG) of the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC), have enabled many successful digital-video applications. These applications range from digital-video disk (DVD) and multimedia CDs on a desktop computer, interactive digital cable television, to digital satellite networks. MPEG has become the most recognized standard for digital video compression. MPEG video is now an integral part of most digital video transmission and storage systems. Nowadays, video compression technologies are being used in almost all modern digital video systems and networks. Not only is video compression equipment being implemented to increase the bandwidth efficiency of communication systems, but video compression also provides innovative solutions to many related vid-networking problems. The subject of Transporting Compressed Digital Video includes several important topics, in particular video buffering, packet scheduling, multiplexing and synchronization.

Here is a fully readable introduction to the basic technologies, infrastructures, costs, and applications for digital audio and video compression. Delivering a concise account of compression's terms, techniques, and tricks in an easy-to-read style, it covers the basic principles underlying digital signal processing and compression; how human beings see and hear; how audio and video are reproduced; all of the existing and emerging compression standards; video and audio compression techniques; and compression and reproduction requirements of different applications, including videoconferencing.

A self-contained approach to DSP techniques and applications in radar imaging The processing of radar images, in general, consists of three major fields: Digital Signal Processing (DSP); antenna and radar operation; and algorithms used to process the radar images. This book brings together material from these different areas to allow readers to gain a thorough understanding of how radar images are processed. The book is divided into three main parts and covers: * DSP principles and signal characteristics in both analog and digital domains, advanced signal sampling, and interpolation techniques * Antenna theory (Maxwell equation, radiation field from dipole, and linear phased array), radar fundamentals, radar modulation, and target-detection techniques (continuous wave, pulsed Linear Frequency Modulation, and stepped Frequency Modulation) * Properties of radar images, algorithms used for radar image processing, simulation examples, and results of satellite image files processed by Range-Doppler and Stolt interpolation algorithms The book fully utilizes the computing and graphical capability of MATLAB to display the signals at various processing stages in 3D and/or cross-sectional views. Additionally, the text is complemented with flowcharts and system block diagrams to aid in readers' comprehension. Digital Signal Processing Techniques and Applications in Radar Image Processing serves as an ideal textbook for graduate students and practicing engineers who wish to gain firsthand experience in applying DSP principles and technologies to radar imaging.

Covering DSP principles, applications, and hardware issues with an emphasis on applications, this book will enable electrical engineers and technicians in the fields of the biomedical, computer, and electronics

engineering to master the essential fundamentals of DSP principles and practice.

Transporting Compressed Digital Video

Digital Signal Processing Techniques and Applications in Radar Image Processing

Part II of Set Partition Coding and Image Wavelet Coding Systems

Principles and Applications

Matrix Designs and Methods for Secure and Efficient Compressed Sensing

Image Wavelet Coding Systems

Combining clear explanations of elementary principles, advanced topics and applications with step-by-step mathematical derivations, this textbook provides a comprehensive yet accessible introduction to digital signal processing. All the key topics are covered, including discrete-time Fourier transform, z -transform, discrete Fourier transform and FFT, A/D conversion, and FIR and IIR filtering algorithms, as well as more advanced topics such as multirate systems, the discrete cosine transform and spectral signal processing. Over 600 full-color illustrations, 200 fully worked examples, hundreds of end-of-chapter homework problems and detailed computational examples of DSP algorithms implemented in MATLAB® and C aid understanding, and help put knowledge into practice. A wealth of supplementary material accompanies the book online, including interactive programs for instructors, a full set of solutions and MATLAB® laboratory exercises, making this the ideal text for senior undergraduate and graduate courses on digital signal processing.

This book explains the stages necessary to create a wavelet compression system for images and describes state-of-the-art systems used in image compression standards and current research. It starts with a high level discussion of the properties of the wavelet transform, especially the decomposition into multi-resolution subbands. It continues with an exposition of the null-zone, uniform quantization used in most subband coding systems and the optimal allocation of bitrate to the different subbands. Then the image compression systems of the FBI Fingerprint Compression Standard and the JPEG2000 Standard are described in detail. Following that, the set partitioning coders SPECK and SPIHT, and EZW are explained in detail and compared via a fictitious wavelet transform in actions and number of bits coded in a single pass in the top bit plane. The presentation teaches that, besides producing efficient compression, these coding systems, except for the FBI Standard, are capable of writing bit streams that have attributes of rate scalability, resolution scalability, and random access decoding. Many diagrams and tables accompany the text to aid understanding. The book is generous in pointing out references and resources to help the reader who wishes to expand his knowledge, know the origins of the methods, or find resources for running the various algorithms or building his own coding system. Table of Contents: Introduction / Characteristics of the Wavelet Transform / Generic Wavelet-based Coding Systems / The FBI Fingerprint Image Compression Standard / Set Partition Embedded Block (SPECK) Coding / Tree-based Wavelet Transform Coding Systems / Rate Control for Embedded Block Coders / Conclusion

Covers all recognised coding algorithms

With the increasing interest in holography for 3D imaging applications, there is a need to develop and use hologram compression techniques for the efficient storage and transmission of holographic data. This book gives a broad overview of the state-of-the-art techniques for the efficient compression and representation of digital holographic data, addressing both still and moving data sequences. An Introduction to the principles of digital holography A critical analysis of the techniques that have been developed

Coverage of the most recent research results A summary of future research challenges

Spline and Spline Wavelet Methods with Applications to Signal and Image Processing

The Scientist and Engineer's Guide to Digital Signal Processing

Digital Signal Processing:Principles, Algorithms and Applications(International Edition) with Introduction to Wavelets and Wavelet Transforms: A Primer

Digital Signal Compression

Digital Compression of Still Images and Video

Sonography Principles and Instruments E-Book

Based on fundamental principles from mathematics, linear systems, and signal analysis, digital signal processing (DSP) algorithms are useful for extracting information from signals collected all around us. Combined with today's powerful computing capabilities, they can be used in a wide range of application areas, including engineering, communicati

Enhance your imaging skills with the latest sonographic technologies and prepare for the ARDMS SPI certification exam! Sonography: Principles and Instruments, 10th Edition explains how diagnostic ultrasound works and covers the essentials of ultrasound physics and instrumentation, including Doppler imaging, artifacts, safety, and quality assurance. More than 1,300 illustrations include ultrasound scans, helping to demonstrate imaging anatomy, motion, and flow. In simplifying complicated concepts, Dr. Kremkau succeeds where other texts do not. With the right blend of imaging fundamentals, current techniques, and exam practice questions, this book is ideal for both students and experienced practitioners. Emphasis on the fundamentals of physics and sonography prepares you for the ARDMS SPI (Sonography Principles & Instrumentation) certification exam. Coverage of current technology includes the progress made with contrast agents and 3D, along with the more general aspects of transducers and instruments. Straightforward explanations simplify complicated concepts. Over 120 ultrasound scans with a full-color design represent what you will encounter in the clinical setting. Learning objectives at the beginning of each chapter give you a measurable outcome to achieve. Key terms are listed at the beginning of each chapter and bolded in the text for fast and convenient lookup. Key Points are marked with an icon and special type, highlighting the most important information to help you study more efficiently. Bulleted review at the end of each chapter identifies key concepts. End-of-chapter exercises test your knowledge and understanding with a blend of multiple-choice, matching, and true/false questions. Glossary at the end of the book serves as a quick reference to key terms, letting you look up definitions without having to search through each chapter. Appendices offer convenient access to a list of symbols and equations, plus a mathematics review. Student resources on the Evolve companion website enhance learning with videos, a physics review, an image collection, and advanced concepts. NEW! Introduction of the new paradigm for understanding and applying sonographic principles explains how virtual beam-forming and high-speed postprocessing can be used to improve nearly every aspect of sonographic imaging. NEW! UPDATED content reflects questions on the latest American Registry for Diagnostic Medical Sonography (ARDMS) certification exam. NEW and EXPANDED coverage keeps you current with sonographic techniques including elastography, shear wave imaging, acoustic radiation force impulse imaging (ARFI), miniaturization and POCUS, and vector imaging in cardiac and vascular flow studies. NEW! The latest patient safety guidelines are included. Softcover format makes the book easier to carry around and facilitates note taking.

With crystal clarity, this book conveys the most current principles in digital image processing, providing both the background theory and the practical applications to various industries, such as digital cinema, video compression, and streaming media.

This comprehensive and engaging textbook introduces the basic principles and techniques of signal processing, from the fundamental ideas of signals and systems theory to real-world applications. Students are introduced to the powerful foundations of modern signal processing, including the basic geometry of Hilbert space, the mathematics of Fourier transforms, and essentials of sampling, interpolation, approximation and compression The authors discuss real-world issues and hurdles to using these tools, and ways of adapting them to overcome problems of finiteness and localization, the limitations of uncertainty, and computational costs. It includes over 160 homework problems and over 220 worked examples, specifically designed to test and expand students' understanding of the fundamentals of signal processing, and is accompanied by extensive online materials designed to aid learning, including Mathematica® resources and interactive demonstrations.

Digital Signal Processing with Examples in MATLAB®, Second Edition

Digital Video and Audio Compression

Principles and Practice

Digital Signal Processing Using MATLAB for Students and Researchers

Digital Signal Processing

Digital Signal Processing and Spectral Analysis for Scientists

In a field as rapidly expanding as digital signal processing, even the topics relevant to the basics change over time both in their nature and their relative importance. It is important, therefore, to have an up-to-date text that not only covers the fundamentals, but that also follows a logical development that leaves no gaps readers must somehow bridge by themselves. Digital Signal Processing with Examples in MATLAB® is just such a text. The presentation does not focus on DSP in isolation, but relates it to continuous signal processing and treats digital signals as samples of physical phenomena. The author also takes care to introduce important topics not usually addressed in signal processing texts, including the discrete cosine and wavelet transforms, multirate signal processing, signal coding and compression, least squares systems design, and adaptive signal processing. He also uses the industry-standard software MATLAB to provide examples of signal processing, system design, spectral analysis, filtering, coding and compression, and exercise solutions. All of the examples and functions used in the text are available online at www.crcpress.com. Designed for a one-semester upper-level course but also ideal for self-study and reference, Digital Signal Processing with Examples in MATLAB is complete, self-contained, and rigorous. For basic DSP, it is quite simply the only book you need.

Digital Signal CompressionPrinciples and PracticeCambridge University Press

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

There's a hidden science that affects every part of your life, a science so powerful that you would be hard-pressed to find a single human being on the planet unaffected by its achievements. It is the science behind computers, the machines which drive the supply and creation of power, food, medicine, money, communication, entertainment, and most goods our stores. It has transformed societies with the Internet, the digitization of information, mobile phone networks, and GPS technologies. Written in friendly and approachable language, Digitized provides a window into the mysterious field from which all computer technology originates, making the theory and practice of computation understandable to the general reader. This popular science book explains how and why computers were invented, how they work, and what will happen in the future. Written by a leading computer scientist, Peter J. Bentley, it tells this fascinating story using the voices of pioneers and leading experts interviewed for the book, in effect throwing open the doors of the most cutting-edge computer laboratories. Bentley explores how this young discipline grew from the early work by pioneers such as Turing, through its growth spurts in the Internet, its difficult adolescent stage where the promises of AI were never achieved and dot-com bubble burst, to its current stage as a semi-mature field, capable of remarkable achievements. Packed with real-world examples, Digitized is the only book to explain the origins and key advances in all areas of computing: theory, hardware, software, Internet, user interfaces, virtual reality, and artificial intelligence. If you have an interest in computers--whether you work with them, use them for fun, or are being taught about them in school--this book will provide an entertaining introduction to the science that's changing the world.

Analog and Digital Signal Analysis

Insights Into Mobile Multimedia Communications

Digital Signal Processing Handbook on CD-ROM

Digitized

Digital Holographic Data Representation and Compression

The Art of Digital Video: Introducing digital video ; Chapter 2 Video principles; Chapter 3 Conversion; Chapter 4 Digital video production; Chapter 5 Digital Signal Processing; Chapter 6 Video compression and MPEG; Chapter 7 Digital audio in video; Chapter 8 Digital recording principles; Chapter 9 Error correction; Chapter 10 Digital Communications; Chapter 11 Digital video tape; Chapter 12 Disks; Chapter 13 Digital television broadcasting; Glossary; Index

Quickly Engages in Applying Algorithmic Techniques to Solve Practical Signal Processing Problems With its active, hands-on learning approach, this text enables readers to master the underlying principles of digital signal processing and its many applications in industries such as digital television, mobile and broadband communications, and medical/scientific devices.

Carefully developed MATLAB® examples throughout the text illustrate the mathematical concepts and use of digital signal processing algorithms. Readers will develop a deeper understanding of

how to apply the algorithms by manipulating the codes in the examples to see their effect. Moreover, plenty of exercises help to put knowledge into practice solving real-world signal processing challenges. Following an introductory chapter, the text explores: Sampled signals and digital processing Random signals Representing signals and systems Temporal and spatial signal processing Frequency analysis of signals Discrete-time filters and recursive filters Each chapter begins with chapter objectives and an introduction. A summary at the end of each chapter ensures that one has mastered all the key concepts and techniques before progressing in the text. Lastly, appendices listing selected web resources, research papers, and related textbooks enable the investigation of individual topics in greater depth. Upon completion of this text, readers will understand how to apply key algorithmic techniques to address practical signal processing problems as well as develop their own signal processing algorithms. Moreover, the text provides a solid foundation for evaluating and applying new digital processing signal techniques as they are developed.

Each edition of Introduction to Data Compression has widely been considered the best introduction and reference text on the art and science of data compression, and the third edition continues in this tradition. Data compression techniques and technology are ever-evolving with new applications in image, speech, text, audio, and video. The third edition includes all the

cutting edge updates the reader will need during the work day and in class. Khalid Sayood provides an extensive introduction to the theory underlying today's compression techniques with detailed instruction for their applications using several examples to explain the concepts. Encompassing the entire field of data compression Introduction to Data Compression, includes lossless and lossy compression, Huffman coding, arithmetic coding, dictionary techniques, context based compression, scalar and vector quantization. Khalid Sayood provides a working knowledge of data compression, giving the reader the tools to develop a complete and concise compression package upon completion of his book. *New content added on the topic of audio compression including a description of the mp3 algorithm *New video coding standard and new facsimile standard explained *Completely explains established and emerging standards in depth including JPEG 2000, JPEG-LS, MPEG-2, Group 3 and 4 faxes, JBIG 2, ADPCM, LPC, CELP, and MELP *Source code provided via companion web site that gives readers the opportunity to build their own algorithms, choose and implement techniques in their own applications

Provides clear and easily understandable coverage of the fundamental concepts and coding methods, whilst retaining technical depth and rigor.

Digital Signal Processing: Principles, Algorithms and Applications: International Edition, 3/e Suitable for a one- or two-semester undergraduate-level electrical engineering, computer engineering, and computer science course in Discrete Systems and Digital Signal Processing. Assumes some prior knowledge of advanced calculus, linear systems for continuous-time signals, and Fourier series and transforms. Giving students a sound balance of theory and practical application, this no-nonsense text presents the fundamental concepts and techniques of modern digital signal processing with related algorithms and applications. Covering both time-domain and frequency- domain methods for the analysis of linear, discrete-time systems, the book offers cutting-edge coverage on such topics as sampling, digital filter design, filter realizations, deconvolution, interpolation, decimation, state-space methods, spectrum analysis, and more. Rigorous and challenging, it further prepares students with numerous examples, exercises, and experiments emphasizing software implementation of digital signal processing algorithms integrated throughout. Introduction to Wavelets and Wavelet Transforms: A Primer, 1/e Advanced undergraduate and beginning graduate students, faculty, researchers and practitioners in signal processing, telecommunications, and computer science, and applied mathematics. It assumes a background of Fourier series and transforms and of linear algebra and matrix methods. This primer presents a well balanced blend of the mathematical theory underlying wavelet techniques and a discussion that gives insight into why wavelets are successful in signal analysis, compression, dection, numerical analysis, and a wide variety of other theoretical and practical applications. It fills a gap in the existing wavelet literature with its unified view of expansions of signals into bases and frames, as well as the use of filter banks as descriptions and algorithms.

Principles and Standards

A Computer Science Perspective

Valuepack

Signal Compression

Fundamentals and Applications

A Laboratory-based Course

Digital signal processing (DSP) has been applied to a very wide range of applications. This includes voice processing, image processing, digital communications, the transfer of data over the internet, image and data compression, etc. Engineers who develop DSP applications today implementation issues including mapping algorithms to computational structures, computational efficiency, power dissipation, the effects of finite precision arithmetic, throughput and hardware implementation. It is not practical to cover all of these in a single text. However, the DSP algorithms as well as the fundamental theories and analytical procedures that form the basis for modern DSP applications. Digital Signal Processing: Principles, Algorithms and System Design provides an introduction to the principals of digital signal processing along with a algorithms and applications for digital signal processing. It is intended to serve as a suitable text for a one semester junior or senior level undergraduate course. It is also intended for use in a following one semester first-year graduate level course in digital signal processing. It involved in the design of embedded computer systems, application specific integrated circuits or special purpose computer systems for digital signal processing, multimedia, communications, or image processing. Covers fundamental theories and analytical procedures that form the implementation of DSP in software and hardware Includes Matlab for design and implementation of signal processing algorithms and related discrete time systems Bridges the gap between reference texts and the knowledge needed to implement DSP applications in software or This book presents various contributions of splines to signal and image processing from a unified perspective that is based on the Zak transform (ZT). It expands the methodology from periodic splines, which were presented in the first volume, to non-periodic splines. Together, by MATLAB software for manipulating polynomial and discrete splines, spline-based wavelets, wavelet packets and wavelet frames for signal/ image processing applications. In this volume, we see that the ZT provides an integral representation of discrete and polynomial splines, integral. The authors explore elements of spline theory and design, and consider different types of polynomial and discrete splines. They describe applications of spline-based wavelets to data compression. These splines are useful for real-time signal processing and, in particular, topics addressed in this volume include: "global" splines, such as interpolating, self-dual and smoothing, whose supports are infinite: the compactly supported quasi-interpolating and smoothing splines including quasi-interpolating splines on non-uniform grids; and cubic Hermite s multiwavelets and multiwavelet frames. Readers from various disciplines including engineering, computer science and mathematical information technology will find the descriptions of algorithms, applications and software in this book especially useful.

The six volume set of LNCS 12622-12627 constitutes the proceedings of the 15th Asian Conference on Computer Vision, ACCV 2020, held in Kyoto, Japan, in November/ December 2020.* The total of 254 contributions was carefully reviewed and selected from 768 submissions The papers focus on the following topics: Part I: 3D computer vision; segmentation and grouping Part II: low-level vision, image processing; motion and tracking Part III: recognition and detection; optimization, statistical methods, and learning; robot vision Part IV: deep learning fo computer vision Part V: face, pose, action, and gesture; video analysis and event recognition; biomedical image analysis Part VI: applications of computer vision; vision for X: datasets and performance analysis *The conference was held virtually.

A best-seller in its print version, this comprehensive CD-ROM reference contains unique, fully searchable coverage of all major topics in digital signal processing (DSP), establishing an invaluable, time-saving resource for the engineering community. Its unique and broad scope incl including: telecommunications, computer engineering, acoustics, seismic data analysis, DSP software and hardware, image and video processing, remote sensing, multimedia applications, medical technology, radar and sonar applications

The Science of Computers and how it Shapes Our World

From Basics to Applications

Sandlin's Textbook of Hearing Aid Amplification

Adapted Compressed Sensing for Effective Hardware Implementations

Concepts and Applications

Principles, Algorithms and System Design

Describes the state-of-the-art in digital multimedia communications. This text presents an integrated view of advanced radio systems, network architectures and source coding.

"Digital Compression for Multimedia" captures in a single reference the current standards for speech, audio, video, image, fax and file compression. It is intended for engineers and computer scientists designing and implementing compression techniques, system integrators, technical managers, and researchers. The essential ideas and motivation behind the various compression methods are presented and insight is provided into the evolution of the standards.

Describes various wavelet image coding systems that use set partitioning primarily, such as SBHP (Subband Block Hierarchical Partitioning), SPIHT, and EZBC (Embedded Zero-Block Coder).

The topic of the proposed book is signal compression. The compression (or low bit rate coding) of speech, audio, image and video signals is a key technology for rapidly emerging opportunities in multimedia products and services.The book contains chapters dedicated to the subtopics of data, speech, audio and visual signal coding, together with an introductory overview chapter on signal compression. The overview article summarizes current capabilities and future trends. The signal-specific chapters that follow focus on the latest technologies and coding standards, while including self-contained introductions to the respective signal domains. The authors of the book chapters are recognized experts in the field of signal processing, compression in particular.Signal compression dealing with both audio and visual signals technology has progressed very rapidly. The proposed book fills a clear void, and should prove to be a valuable reference, both to the practicing professional and to the relatively uninitiated student.

A Design Flow for Signal-Level Optimization of Compressed Sensing Stages

15th Asian Conference on Computer Vision, Kyoto, Japan, November 30 – December 4, 2020, Revised Selected Papers, Part IV

Starting Digital Signal Processing in Telecommunication Engineering

Krishna's Digital Signal Processing: (Principles and Applications)

Computer Vision - ACCV 2020

Foundations of Signal Processing

This book describes algorithmic methods and hardware implementations that aim to help realize the promise of Compressed Sensing (CS), namely the ability to reconstruct high-dimensional signals from a properly chosen low-dimensional "portrait". The authors describe a design flow and some low-resource physical realizations of sensing systems based on CS. They highlight the pros and cons of several design choices from a pragmatic point of view, and show how a lightweight and mild but effective form of adaptation to the target signals can be the key to consistent resource saving. The basic principle of the devised design flow can be applied to almost any CS-based sensing system, including analog-to-information converters, and has been proven to fit an extremely diverse set of applications. Many practical aspects required to put a CS-based sensing system to work are also addressed, including saturation, quantization, and leakage phenomena.

This hands-on, laboratory driven textbook helps readers understand principles of digital signal processing (DSP) and basics of software-based digital communication, particularly software-defined networks (SDN) and software-defined radio (SDR). In the book only the most important concepts are presented. Each book chapter is an introduction to computer laboratory and is accompanied by complete laboratory exercises and ready-to-go Matlab programs with figures and comments (available at the book webpage and running also in GNU Octave 5.2 with free software packages), showing all or most details of relevant algorithms. Students are tasked to understand programs, modify them, and apply presented concepts to recorded real RF signal or simulated received signals, with modelled transmission condition and hardware imperfections. Teaching is done by showing examples and their modifications to different real-world telecommunication-like applications. The book consists of three parts: introduction to DSP (spectral analysis and digital filtering), introduction to DSP advanced topics (multi-rate, adaptive, model-based and multimedia - speech, audio, video - signal analysis and processing) and introduction to software-defined modern telecommunication systems (SDR technology, analog and digital modulations, single- and multi-carrier systems, channel estimation and correction as well as synchronization issues). Many real signals are processed in the book, in the first part - mainly speech and audio, while in the second part - mainly RF recordings taken from RTL-SDR USB stick and ADALM-PLUTO module, for example captured IQ data of VOR avionics signal, classical FM radio with RDS, digital DAB/DAB+ radio and 4G-LTE digital telephony. Additionally, modelling and simulation of some transmission scenarios are tested in software in the book, in particular TETRA, ADSL and 5G signals. Provides an introduction to digital signal processing and software-based digital communication; Presents a transition from digital signal processing to software-defined telecommunication; Features a suite of pedagogical materials including a laboratory test-bed and computer exercises/experiments.

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

This book is a uniquely practical DSP text which places the emphasis on understanding the principles and applications of DSP with a minimum of mathematics. In one volume, it covers a broad area of digital signal processing systems such as A/D and D/A converters, adaptive filters, spectral estimation, neural networks, Kalman filters, fuzzy logic, data compression, error correction and DSP programming. Many courses will find that this book will replace several texts currently in use. The level is ideal for introductory university modules, and similar courses such as HNC/D. As DSP has come to be studied at a lower academic level over recent years this text meets a genuine need. It is also suitable for use on industrial training courses and ideal as a reference text for professionals. A readable introduction to the practical application of DSP Broad coverage of the subject means this will cover a typical undergraduate module in just one book Practical focus with maths treated as a practical tool - not an advanced maths text

Introduction to Data Compression

Digital Signal Processing with Examples in MATLAB

Volume II: Non-Periodic Splines

This book covers the basics of processing and spectral analysis of monovariate discrete-time signals. The approach is practical, the aim being to acquaint the reader with the indications for and drawbacks of the various methods and to highlight possible misuses. The book is rich in original ideas, visualized in new and illuminating ways, and is structured so that parts can be skipped without loss of continuity. Many examples are included, based on synthetic data and real measurements from the fields of physics, biology, medicine, macroeconomics etc., and a complete set of MATLAB exercises requiring no previous experience of programming is provided. Prior advanced mathematical skills are not needed in order to understand the contents: a good command of basic mathematical analysis is sufficient. Where more advanced mathematical tools are necessary, they are included in an Appendix and presented in an easy-to-follow way. With this book, digital signal processing leaves the domain of engineering to address the needs of scientists and scholars in traditionally less quantitative disciplines, now facing increasing amounts of data.