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DSP First-James H. McClellan 1997

Signal Processing First-James H. McClellan 2003

Digital Signal Processing First, Global Edition-James H. McClellan 2016-08-11 For introductory courses (freshman and sophomore courses) in Digital Signal Processing and Signals and Systems. Text may be used before the student has taken a course in circuits. DSP First and its accompanying digital assets are the result of more than 20 years of work that originated from, and was guided by, the premise that signal processing is the best starting point for the study of electrical and computer engineering. The "DSP First" approach introduces the use of mathematics as the language for thinking about engineering problems, lays the groundwork for subsequent courses, and gives students hands-on experiences with MATLAB. The Second Edition features three new chapters on the Fourier Series, Discrete-Time Fourier Transform, and the The Discrete Fourier Transform as well as updated labs, visual demos, an update to the existing chapters, and hundreds of new homework problems and solutions.

Signal Processing First-James H. McClellan 2015-06-05 For introductory courses (freshman and sophomore courses) in Digital Signal Processing and Signals and Systems. Text may be used before the student has taken a course in circuits. DSP First and it's accompanying digital assets are the result of more than 20 years of work that originated from, and was guided by, the premise that signal processing is the best starting point for the study of electrical and computer engineering. The "DSP First" approach introduces the use of mathematics as the language for thinking about engineering problems, lays the groundwork for subsequent courses, and gives students hands-on experiences with MATLAB. The Second Edition features three new chapters on the Fourier Series, Discrete-Time Fourier Transform, and the The Discrete Fourier Transform as well as updated labs, visual demos, an update to the existing chapters, and hundreds of new homework problems and solutions.

Signal Processing for Communications-Paolo Prandoni 2008-06-17 With a novel, less classical approach to the subject, the authors have written a book with the conviction that signal processing should be taught to be fun. The treatment is therefore less focused on the mathematics and more on the conceptual aspects, the idea being to allow the readers to think about the subject at a higher conceptual level, thus building the foundations for more advanced topics. The book remains an engineering text, with the goal of helping students solve real-world problems. In this vein, the last chapter pulls together the individual topics as discussed throughout the book into an in-depth look at the development of an end-to-end communication system, namely, a modem for communicating digital information over an analog channel.

Applied Digital Signal Processing-Dimitris G. Manolakis 2011-11-21 Master the basic concepts and methodologies of digital signal processing with this systematic introduction, without the need for an extensive mathematical background. The authors lead the reader through the fundamental mathematical principles underlying the operation of key signal processing techniques, providing simple arguments and cases rather than detailed general proofs. Coverage of practical implementation, discussion of the limitations of particular methods and plentiful MATLAB illustrations allow readers to better connect theory and practice. A focus on algorithms that are of theoretical importance or useful in real-world applications ensures that students cover material relevant to engineering practice, and equips students and practitioners alike with the basic principles necessary to apply DSP techniques to a variety of applications. Chapters include worked examples, problems and computer experiments, helping students to absorb the material they have just read. Lecture slides for all figures and solutions to the numerous problems are available to instructors.

Discrete-Time Signal Processing-Oppenheim 1999

Understanding Digital Signal Processing-Richard G. Lyons 2010-11-01 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

Foundations of Signal Processing-Martin Vetterli 2014-09-04 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 Using MATLAB-Vinay K. Ingle 2007 This supplement to any standard DSP text is one of the first books to successfully integrate the use of MATLAB® in the study of DSP concepts. In this book, MATLAB® is used as a computing tool to explore traditional DSP topics, and solve problems to gain insight. This greatly expands the range and complexity of problems that students can effectively study in the course. Since DSP applications are primarily algorithms implemented on a DSP processor or software, a fair amount of programming is required. Using interactive software such as MATLAB® makes it possible to place more emphasis on learning new and difficult concepts than on programming algorithms. Interesting practical examples are discussed and useful problems are explored. This updated second edition includes new homework problems and revises the scripts in the book, available functions, and m-files to MATLAB® V7.

Real-time Digital Signal Processing-Sen-Maw Kuo 2003

BeagleBone Cookbook-Mark A. Yoder 2015-04-03 BeagleBone is an inexpensive web server, Linux desktop, and electronics hub that includes all the tools you need to create your own projects—whether it's robotics, gaming, drones, or software-defined radio. If you're new to BeagleBone Black, or want to explore more of its capabilities, this cookbook provides scores of recipes for connecting and talking to the physical world with this credit-card-sized computer. All you need is minimal familiarity with computer programming and electronics. Each recipe includes clear and simple wiring diagrams and example code to get you started. If you don't know what BeagleBone Black is, you might decide to get one after scanning these recipes. Learn how to use BeagleBone to interact with the physical world Connect force, light, and distance sensors Spin servo motors, stepper motors, and DC motors Flash single LEDs, strings of LEDs, and matrices of LEDs Manage real-time input/output (I/O) Work at the Linux I/O level with shell commands, Python, and C Compile and install Linux kernels Work at a high level with JavaScript and the BoneScript library Expand BeagleBone's functionality by adding capes Explore the Internet of Things

Digital Signal Processing-Lizhe Tan 2013-01-21 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

Signal and Linear System Analysis-Carlson

Electronics and Communications for Scientists and Engineers-Martin Plonus 2020-02-25 Electronics and Communications for Scientists and Engineers, Second Edition, offers a valuable and unique overview on the basics of electronic technology and the internet. Class-tested over many years with students at Northwestern University, this useful text covers the essential electronics and communications topics for students and practitioners in engineering, physics, chemistry, and other applied sciences. It describes the electronic underpinnings of the World Wide Web and explains the basics of digital technology, including computing and communications, circuits, analog and digital electronics, as well as special topics such as operational amplifiers, data compression, ultra high definition TV, artificial intelligence, and quantum computers. Incorporates comprehensive updates and expanded material in all chapters where appropriate Includes new problems added throughout the text Features an updated section on RLC circuits Presents revised and new content in Chapters 7, 8, and 9 on digital systems, showing the many changes and rapid progress in these areas since 2000

Analog Signals and Systems-Erhan Kudeki 2008-03-14 For courses in Signals and Systems offered in departments of Electrical Engineering. This book focuses on the mathematical analysis and design of analog signal processing using a just in time approach - new ideas and topics relevant to the narrative are introduced only when needed, and no chapters are stand alone. Topics are developed throughout the narrative, and individual ideas appear frequently as needed. Microelectronic Circuits-Adel S. Sedra 1998 Microelectronic Circuits, Fourth Edition is an extensive revision of the classic text by Adel S. Sedra and K. C. Smith. The primary objective of this text remains the development of the student's ability to analyze and design electronic circuits, both analog and digital, discrete and integrated. Fundamental developments in modern technology, particularly the increased emphasis on integrated circuits and the profusion of advances in digital electronics, require that engineers today be aptly equipped with knowledge of these concepts and techniques. In this edition, the authors present these concepts and techniques earlier on in the text and in greater detail than in previous editions. While the previous edition presented students with analog oriented concepts followed by digital, the fourth edition promotes learning these ideas side-by-side, as they often appear in the real world. Since most professors use Part 1 or the first 5 chapters of the text for a first course on basic devices, the new edition fully integrates the fundamental concepts of digital electronics into these critical chapters. The result is a clear and complete introduction to both the analog and digital concepts essential to building a solid foundation for a modern introductory course on electronic circuits. In order to help students fully comprehend the concepts presented, the amount of material in Part 1 on the physical operation of devices has been increased. Appreciation of these devices--how they are modeled using modern computer tools like SPICE, and the fact that most circuits designed today are integrated circuits--requires a firm grasp of device physics. To achieve this, the authors have increased the basic material on semiconductors and the PN Junction (Chapter 3), added additional material on Bipolar Junction Transistor operation (Chapter 4), and correspondingly increased coverage of MOSFET operation (Chapter 5). Instead of deliberately setting off this material into a separate chapter on device physics, the authors have integrated it into these chapters where appropriate. The result is a gradual introduction to these ideas within the context of their importance where they are needed. The material on digital electronics has been completely and thoroughly updated, expanded, and re-organized to reflect the tremendous advances in this area since the last edition. Since all electronics engineers need exposure to digital electronics early in their course work, a new section in Chapter 1 introduces the key element of digital electronics--the logic inverter--side by side with the fundamental element of analog electronics--the amplifier. This signifies the great importance of the emergence of digital electronics. More digital electronics has been added to Chapter 4 on the Bipolar Junction Transistor inverter as well as to a new section in Chapter 5 on the CMOS inverter. By including this expanded material early on in Part I, the student is exposed to the basics of analog and digital electronics in what is typically the first semester of the course (Part I, Chapters 1-5). MOS Digital Integrated Circuits (Chapter 13) has been completely rewritten and expanded to include more coverage of memory and an overview of digital circuit technologies, logic-circuit families and styles for digital system design. New topics have been added, including CMOS logic circuits and static and dynamic analysis, pseudo-NMOS logic, pass transistor logic, dynamic logic, dynamic techniques in flip-flop design, and ring oscillator. The MOSFET has become the most significant device in electronics today. The material on MOSFET (Chapter 5) has been entirely re-written to reflect the shift toward Integrated Circuit technology and the vast number of changes in MOS Integrated Circuit design. The amount of material devoted to JFET coverage has been substantially reduced. SPICE has been incorporated not only at the end of the appropriate device chapters (Chapters 3, 4, and 5), but also at the end of most chapters throughout the text, thereby increasing the flexibility to use this tool when desired. Emphasis is placed on models, when to use SPICE and what the benefits are. The placement of these SPICE SIMULATION EXAMPLES at the end of chapters allows the reader to use them optionally without interrupting the flow of the text. The authors have also included a short appendix on SPICE in the back of the book. For a complete introduction to SPICE, consult Roberts and Sedra's SPICE, Second Edition (0-19-510842-6). All examples are carefully chosen for their ability to illustrate the concepts of the chapter in a connected way. They demonstrate the power of SPICE and the potential advantages gained by using it. It should be carefully noted, however, that by-hand analysis is critical prior to employing SPICE. The Appendix on IC Fabrication has been thoroughly updated, and brief material on layout has been included. The hallmark end-of-chapter problem material has increased by offering nearly 30% more per chapter, providing well over 1300 homework problems. Many of the existing problems have been replaced or modified. See the ancillary information for additional problem material. Microelectronic Circuits, Fourth Edition, is intended for the core courses in electronic circuits taught to majors in electrical and computer engineering. All electrical and computer engineering students are required to take at least one semester of electronic circuits for which this text is intended. It should also prove useful to engineers and other professionals who wish to update their knowledge of fundamental electronic circuits. The text is supported extensively with ancillary materials.

Handbook of Digital Signal Processing-Douglas F. Elliott 2013-10-22 FROM THE PREFACE: Many new useful ideas are presented in this handbook, including new finite impulse response (FIR) filter design techniques, half-band and multiplierless FIR filters, interpolated FIR (IFIR) structures, and error spectrum shaping.

Practical Digital Signal Processing-Edmund Lai 2003-10-21 The aim of this book is to introduce the general area of Digital Signal Processing from a practical point of view with a working minimum of mathematics. The emphasis is placed on the practical applications of DSP: implementation issues, tricks and pitfalls. Intuitive explanations and appropriate examples are used to develop a fundamental understanding of DSP theory, laying a firm foundation for the reader to pursue the matter further. The reader will develop a clear understanding of DSP technology in a variety of fields from process control to communications. * Covers the use of DSP in different engineering sectors, from communications to process control * Ideal for a wide audience wanting to take advantage of the strong movement towards digital signal processing techniques in the engineering world * Includes numerous practical exercises and diagrams covering many of the fundamental aspects of digital signal processing

Digital Signal Processing Laboratory, Second Edition-B. Preetham Kumar 2016-04-19 Considering the rapid evolution of digital signal processing (DSP), those studying this field require an easily understandable text that complements practical software and hardware applications with sufficient coverage of theory. Designed to keep pace with advancements in the field and elucidate lab work, Digital Signal Processing Laboratory, Second Edition was developed using material and student input from courses taught by the author. Contains a new section on digital filter structure Honed over the past several years, the information presented here reflects the experience and insight the author gained on how to convey the subject of DSP to senior undergraduate and graduate students coming from varied subject backgrounds. Using feedback from those students and faculty involved in these courses, this book integrates simultaneous training in both theory and practical software/hardware aspects of DSP. The practical component of the DSP course curriculum has proven to greatly enhance understanding of the basic theory and principles. To this end, chapters in the text contain sections on: Theory—Explaining the underlying mathematics and principles Problem solving—Offering an ample amount of workable problems for the reader Computer laboratory—Featuring programming examples and exercises in MATLAB® and Simulink® Hardware laboratory—Containing exercises that employ test and measurement equipment, as well as the Texas Instruments TMS320C6711 DSP Starter Kit The text covers the progression of the Discrete and Fast Fourier transforms (DFT and FFT). It also addresses Linear Time-Invariant (LTI) discrete-time signals and systems, as well as the mathematical tools used to describe them. The author includes appendices that give detailed descriptions of hardware along with instructions on how to use the equipment featured in the book.

Notes on Digital Signal Processing-C. Britton Rorabaugh 2010-11-19 The Most Complete, Modern, and Useful Collection of DSP Recipes: More Than 50 Practical Solutions and More than 30 Summaries of Pertinent Mathematical Concepts for Working Engineers Notes on Digital Signal Processing is a comprehensive, easy-to-use collection of step-by-step procedures for designing and implementing modern DSP solutions. Leading DSP expert and IEEE Signal Processing Magazine associate editor C. Britton Rorabaugh goes far beyond the basic procedures found in other books while providing the supporting explanations and mathematical materials needed for a deeper understanding. Rorabaugh covers the full spectrum of challenges working engineers are likely to encounter and delves into crucial DSP nuances discussed nowhere else. Readers will find valuable, tested recipes for working with multiple sampling techniques; Fourier analysis and fast Fourier transforms; window functions; classical spectrum analysis; FIR and IIR filter design; analog prototype filters; z-transform analysis; multirate and statistical signal processing; bandpass and quadrature techniques; and much more. Notes on Digital Signal Processing begins with mapping diagrams that illuminate the relationships between all topics covered in the book. Many recipes include examples demonstrating actual applications, and most sections rely on widely used MATLAB tools. DSP fundamentals: ideal, natural, and instantaneous sampling; delta functions; physical signal reconstruction; and more Fourier Analysis: Fourier series and transforms; discrete-time and discrete Fourier transforms; signal truncation; DFT leakage and resolution Fast Fourier transforms: decimation in time and frequency; prime factor algorithms; and fast convolution Window techniques: sinusoidal analysis; window characteristics and choices; Kaiser windows; and more Classical spectrum analysis: unmodified and modified periodograms; Bartlett's and Welch's periodograms; and periodogram performance FIR filters: design options; linear-phase FIR filters; periodicities; basic and Kaiser window methods; and the Parks-McClellan algorithm Analog prototype filters: Laplace transforms; characterization; and Butterworth, Chebyshev, elliptic, and Bessel filters z-Transform analysis: computation and transforms using partial fraction expansion IIR filters: design options; impulse invariance methods; and bilinear transformation Multirate signal processing: decimation and interpolation fundamentals; multistage and polyphase decimators and interpolation Bandpass and quadrature techniques: bandpass sampling; wedge diagrams; complex and analytic signals; and advanced signal generation techniques Statistical signal processing: parametric modeling of discrete-time signals; autoregressive signal models; fitting AR and All-Pole models; and more

Practical Applications in Digital Signal Processing-Richard Newbold 2012-10-19 The Only DSP Book 100% Focused on Step-by-Step Design and Implementation of Real Devices and Systems in Hardware and Software Practical Applications in Digital Signal Processing is the first DSP title to address the area that even the excellent engineering textbooks of today tend to omit. This book fills a large portion of that omission by addressing circuits and system applications that most design engineers encounter in the modern signal processing industry. This book includes original work in the areas of Digital Data Locked Loops (DLLs), Digital Automatic Gain Control (dAGC), and the design of fast elastic store memory used for synchronizing independently clocked asynchronous data bit streams. It also contains detailed design discussions on Cascaded Integrator Comb (CIC) filters, including the seldom-covered topic of bit pruning. Other topics not extensively covered in other modern textbooks, but detailed here, include analog and digital signal tuning, complex-to-real conversion, the design of digital channelizers, and the techniques of digital frequency synthesis. This book also contains an appendix devoted to the techniques of writing mixed-language C++ Fortran programs. Finally, this book contains very extensive review material covering important engineering mathematical tools such as the Fourier series, the Fourier transform, the z transform, and complex variables. Features of this book include • Thorough coverage of the complex-to-real conversion of digital signals • A complete tutorial on digital frequency synthesis • Lengthy discussion of analog and digital tuning and signal translation • Detailed coverage of the design of elastic store memory • A comprehensive study of the design of digital data locked loops • Complete coverage of the design of digital channelizers • A detailed treatment on the design of digital automatic gain control • Detailed techniques for the design of digital and multirate filters • Extensive coverage of the CIC filter, including the topic of bit pruning • An extensive review of complex variables • An extensive review of the Fourier series, and continuous and discrete Fourier transforms • An extensive review of the z transform

Digital Signal Processing-Bernard Mulgrew 1999-11-11 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.

Computer-based Exercises for Signal Processing Using MATLAB 5-James H. McClellan 1998 For senior or introductory graduate-level courses in digital signal processing. Developed by a group of six eminent scholars and teachers, this book offers a rich collection of exercises and projects which guide students in the use of MATLAB v5 to explore major topical areas in digital signal processing.

Multirate Filtering for Digital Signal Processing: MATLAB Applications-Milic, Ljiljana 2009-01-31 "This book covers basic and the advanced approaches in the design and implementation of multirate filtering"--Provided by publisher.

Applications of Digital Signal Processing to Audio and Acoustics-Mark Kahrs 2006-04-18 Karlheinz Brandenburg and Mark Kahrs With the advent of multimedia, digital signal processing (DSP) of sound has emerged from the shadow of bandwidth limited speech processing. Today, the main applications of audio DSP are high quality audio coding and the digital generation and manipulation of music signals. They share common research topics including perceptual measurement techniques and analysis/synthesis methods. Smaller but nonetheless very important topics are hearing aids using signal processing technology and hardware architectures for digital signal processing of audio. In all these areas the last decade has seen a significant amount of application oriented research. The topics covered here coincide with the topics covered in the biannual work shop on "Applications of Signal Processing to Audio and Acoustics". This event is sponsored by the IEEE Signal Processing Society (Technical Committee on Audio and Electroacoustics) and takes place at Mohonk Mountain House in New Paltz, New York. A short overview of each chapter will illustrate the wide variety of technical material presented in the chapters of this book. John Beerends: Perceptual Measurement Techniques. The advent of perceptual measurement techniques is a byproduct of the advent of digital coding for both speech and high quality audio signals. Traditional measurement schemes are bad estimates for the subjective quality after digital coding/decoding. Listening tests are subject to statistical uncertainties and the basic question of repeatability in a different environment.

Applied Signal Processing-Thierry Dutoit 2010-06-10 Applied Signal Processing: A MATLAB-Based Proof of Concept benefits readers by including the teaching background of experts in various applied signal processing fields and presenting them in a project-oriented framework. Unlike many other MATLAB-based textbooks which only use MATLAB to illustrate theoretical aspects, this book provides fully commented MATLAB code for working proofs-of-concept. The MATLAB code provided on the accompanying online files is the very heart of the material. In addition each chapter offers a functional introduction to the theory required to understand the code as well as a formatted presentation of the contents and outputs of the MATLAB code. Each chapter exposes how digital signal processing is applied for solving a real engineering problem used in a consumer product. The chapters are organized with a description of the problem in its applicative context and a functional review of the theory related to its solution appearing first. Equations are only used for a precise description of the problem and its final solutions. Then a step-by-step MATLAB-based proof of concept, with full code, graphs, and comments follows. The solutions are simple enough for readers with general signal processing background to understand and they use state-of-the-art signal processing principles. Applied Signal Processing: A MATLAB-Based Proof of Concept is an ideal companion for most signal processing course books. It can be used for preparing student labs and projects.

Probability and Random Processes for Electrical and Computer Engineers-Charles Therrien 2018-09-03 With updates and enhancements to the incredibly successful first edition, Probability and Random Processes for Electrical and Computer Engineers, Second Edition retains the best aspects of the original but offers an even more potent introduction to probability and random variables and processes. Written in a clear, concise style that illustrates the subject's relevance to a wide range of areas in engineering and physical and computer sciences, this text is organized into two parts. The first focuses on the probability model, random variables and transformations, and inequalities and limit

theorems. The second deals with several types of random processes and queuing theory. New or Updated for the Second Edition: A short new chapter on random vectors that adds some advanced new material and supports topics associated with discrete random processes Reorganized chapters that further clarify topics such as random processes (including Markov and Poisson) and analysis in the time and frequency domain A large collection of new MATLAB®-based problems and computer projects/assignments Each Chapter Contains at Least Two Computer Assignments Maintaining the simplified, intuitive style that proved effective the first time, this edition integrates corrections and improvements based on feedback from students and teachers. Focused on strengthening the reader's grasp of underlying mathematical concepts, the book combines an abundance of practical applications, examples, and other tools to simplify unnecessarily difficult solutions to varying engineering problems in communications, signal processing, networks, and associated fields.

The Digital Signal Processing Handbook-VIJAY MADISSETTI 1997-12-29 The field of digital signal processing (DSP) has spurred developments from basic theory of discrete-time signals and processing tools to diverse applications in telecommunications, speech and acoustics, radar, and video. This volume provides an accessible reference, offering theoretical and practical information to the audience of DSP users. This immense compilation outlines both introductory and specialized aspects of information-bearing signals in digital form, creating a resource relevant to the expanding needs of the engineering community. It also explores the use of computers and special-purpose digital hardware in extracting information or transforming signals in advantageous ways. Impacted areas presented include: 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 This authoritative collaboration, written by the foremost researchers and practitioners in their fields, comprehensively presents the range of DSP: from theory to application, from algorithms to hardware.

Fast Algorithms for Signal Processing-Richard E. Blahut 2010-06-24 Efficient signal processing algorithms are important for embedded and power-limited applications since, by reducing the number of computations, power consumption can be reduced significantly. Similarly, efficient algorithms are also critical to very large scale applications such as video processing and four-dimensional medical imaging. This self-contained guide, the only one of its kind, enables engineers to find the optimum fast algorithm for a specific application. It presents a broad range of computationally-efficient algorithms, describes their structure and implementation, and compares their relative strengths for given problems. All the necessary background mathematics is included and theorems are rigorously proved, so all the information needed to learn and apply the techniques is provided in one convenient guide. With this practical reference, researchers and practitioners in electrical engineering, applied mathematics, and computer science can reduce power dissipation for low-end applications of signal processing, and extend the reach of high-end applications.

Digital Signal Processing for Communication Systems-Tadeusz Wysocki 2013-04-17 Digital Signal Processing for Communication Systems examines the plans for the future and the progress that has already been made, in the field of DSP and its applications to communication systems. The book pursues the progression from communication and information theory through to the implementation, evaluation and performance enhancing of practical communication systems using DSP technology. Digital Signal Processing for Communication Systems looks at various types of coding and modulation techniques, describing different applications of Turbo-Codes, BCH codes and general block codes, pulse modulations, and combined modulation and coding in order to improve the overall system performance. The book examines DSP applications in measurements performed for channel characterisation, pursues the use of DSP for design of effective channel simulators, and discusses equalization and detection of various signal formats for different channels. A number of system design issues are presented where digital signal processing is involved, reporting on the successful implementation of the system components using DSP technology, and including the problems involved with implementation of some DSP algorithms. Digital Signal Processing for Communication Systems serves as an excellent resource for professionals and researchers who deal with digital signal processing for communication systems, and may serve as a text for advanced courses on the subject.

Discover Signal Processing-Simon Braun 2008-04-15 Signal processing is now a multidisciplinary topic, and one that has applications in many fields including, but not limited to, science, engineering, medicine, finance and the behavioural sciences. Modern software libraries that include dedicated languages and packages designed to simplify the development and application of signal processing techniques are now readily available; however this ease of application means that an understanding of the various techniques is imperative. It is critical that the student or practitioner is able to choose an appropriate processing technique, be aware of potential errors involved and understand how to control them. Discover Signal Processing exploits the rationale of "learning by doing"; actually attempting and performing a task is the most effective way to remember and understand. It presents the reader with a diverse range of exercises; some intended to recall or practice simple concepts, others more complex & aimed at developing a real understanding of the issues involved. These are accompanied by step-by-step explanations of the tools and techniques required. Provides systematic, organized and accessible instruction in a complex and mathematical subject. Stresses the understanding, selection and application of available signal processing techniques, as well as identification and control of error mechanisms; Includes more than 60 exercises covering major aspects of signal processing tools & geared at performing or testing specific tasks; Uses MATLAB as a platform, utilizing its extensive GUI capabilities enabling exercises to be performed using graphical elements only. Discover Signal Processing provides an excellent & accessible guide to signal processing for mechanical, aeronautical, civil and electronic engineers in their senior/graduate year. It will also be of interest to those attending CPD courses as well as to practicing engineers.

Digital Signal Processing with Field Programmable Gate Arrays-Uwe Meyer-Baese 2013-03-09 Starts with an overview of today's FPGA technology, devices, and tools for designing state-of-the-art DSP systems. A case study in the first chapter is the basis for more than 30 design examples throughout. The following chapters deal with computer arithmetic concepts, theory and the implementation of FIR and IIR filters, multirate digital signal processing systems, DFT and FFT algorithms, and advanced algorithms with high future potential. Each chapter contains exercises. The VERILOG source code and a glossary are given in the appendices, while the accompanying CD-ROM contains the examples in VHDL and Verilog code as well as the newest Altera "Baseline" software. This edition has a new chapter on adaptive filters, new sections on division and floating point arithmetics, an up-date to the current Altera software, and some new exercises.

Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK-Rulph Chassaing 2011-09-20 Now in a new edition—the most comprehensive, hands-on introduction to digital signal processing The first edition of Digital Signal Processing and Applications with the TMS320C6713 and TMS320C6416 DSK is widely accepted as the most extensive text available on the hands-on teaching of Digital Signal Processing (DSP). Now, it has been fully updated in this valuable Second Edition to be compatible with the latest version (3.1) of Texas Instruments Code Composer Studio (CCS) development environment. Maintaining the original's comprehensive, hands-on approach that has made it an instructor's favorite, this new edition also features: Added program examples that illustrate DSP concepts in real-time and in the laboratory Expanded coverage of analog input and output New material on frame-based processing A revised chapter on IIR, which includes a number of floating-point example programs that explore IIR filters more comprehensively More extensive coverage of DSP/BIOS All programs listed in the text—plus additional applications—which are available on a companion CD-ROM No other book provides such an extensive or comprehensive set of program examples to aid instructors in teaching DSP in a laboratory using audio frequency signals—making this an ideal text for DSP courses at the senior undergraduate and postgraduate levels. It also serves as a valuable resource for researchers, DSP developers, business managers, and technology solution providers who are looking for an overview and examples of DSP algorithms implemented using the TMS320C6713 and TMS320C6416 DSK.

Digital Signal Processing Using MATLAB: A Problem Solving Companion-Vinay K. Ingle 2016-01-01 Learn to use MATLAB as a useful computing tool for exploring traditional Digital Signal Processing (DSP) topics and solving problems to gain insight. DIGITAL SIGNAL PROCESSING USING MATLAB: A PROBLEM SOLVING COMPANION, 4E greatly expands the range and complexity of problems that learners can effectively study. Since DSP applications are primarily algorithms implemented on a DSP processor or software, they typically require a significant amount of programming. Using interactive software, such as MATLAB, enables readers to focus on mastering new and challenging concepts rather than concentrating on programming algorithms. This edition discusses interesting, practical examples and explores useful problems to provide the groundwork for further study. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Introduction to Digital Signal Processing-Dick Blandford 2012-07 Discrete-Time Signal Processing covers the information that the electrical computing and engineering student needs to know about DSP.

Engineering Signals and Systems-Fawwaz Tayssir Ulaby 2012 Includes textbook CD-ROM "Engineering Signals and Systems Textbook Resources"

Digital Signal Processing and Applications with the C6713 and C6416 DSK-Rulph Chassaing 2004-12-20 This book is a tutorial on digital techniques for waveform generation, digital filters, and digital signal processing tools and techniques The typical chapter begins with some theoretical material followed by working examples and experiments using the TMS320C6713-based DSP Starter Kit (DSK) The C6713 DSK is TI's newest signal processor based on the C6x processor (replacing the C6711 DSK)

Digital Signal and Image Processing using MATLAB, Volume 3-Gérard Blanchet 2015-10-02 Volume 3 of the second edition of the fully revised and updated Digital Signal and Image Processing using MATLAB®, after first two volumes on

the “Fundamentals” and “Advances and Applications: The Deterministic Case”, focuses on the stochastic case. It will be of particular benefit to readers who already possess a good knowledge of MATLAB®, a command of the fundamental elements of digital signal processing and who are familiar with both the fundamentals of continuous-spectrum spectral analysis and who have a certain mathematical knowledge concerning Hilbert spaces. This volume is focused on applications, but it also provides a good presentation of the principles. A number of elements closer in nature to statistics than to signal processing itself are widely discussed. This choice comes from a current tendency of signal processing to use techniques from this field. More than 200 programs and functions are provided in the MATLAB® language, with useful comments and guidance, to enable numerical experiments to be carried out, thus allowing readers to develop a deeper understanding of both the theoretical and practical aspects of this subject.

Digital Signal Processing-Sanjit Kumar Mitra 2006-01 Digital Signal Processing: A Computer-Based Approach is intended for a two-semester course on digital signal processing for seniors or first-year graduate students. Based on user feedback, a number of new topics have been added to the third edition, while some excess topics from the second edition have been removed. The author has taken great care to organize the chapters more logically by reordering the sections within chapters. More worked-out examples have also been included. The book contains more than 500 problems and 150 MATLAB exercises. New topics in the third edition include: short-time characterization of discrete-time signals, expanded coverage of discrete-time Fourier transform and discrete Fourier transform, prime factor algorithm for DFT computation, sliding DFT, zoom FFT, chirp Fourier transform, expanded coverage of z-transform, group delay equalization of IIR digital filters, design of computationally efficient FIR digital filters, semi-symbolic analysis of digital filter structures, spline interpolation, spectral factorization, discrete wavelet transform.

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