

Digital Signal Processing Spectral Computation And Filter

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HOGAN MACK

Digital Signal Processing John Wiley & Sons

Offers a fresh approach to digital signal processing (DSP), combining heuristic reasoning and physical appreciation with mathematical methods.

Digital Signal Processing and Spectral Analysis for Scientists CRC Press

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Solutions Manual for Digital Signal Processing CRC Press

FFT DFT - Efficient computation of DFT
 Properties of DFT - FFT algorithms - Radix-2 FFT algorithms - Decimation in time - Decimation in frequency algorithms - Use of FFT algorithms in linear filtering and correlation. Digital Filters Design Amplitude and phase responses of FIR filters - Linear phase filters - Windowing techniques for design of linear phase FIR filters - Rectangular, Hamming, Kaiser windows - Frequency sampling techniques - IIR filters - Magnitude response - Phase response - Group delay - Design of lowpass Butterworth filters (lowpass) - Bilinear transformation - Prewarping, Impulse invariant transformation. Finite Word Length Effects Quantization noise - Derivation for quantization noise power - Fixed point and binary floating point number representation - Comparison - Overflow error - Truncation error - Coefficient quantization error - Limit cycle oscillation - Signal scaling - Analytical model of sample and hold operations. Power Spectrum Estimation Computation of energy density spectrum - Auto correlation and power spectrum of random signals. Periodogram - Use of DFT in power spectrum estimation - Non parametric methods for power spectral estimation :

Bartlett and Welch methods - Blackman and Tukey method. Digital Signal Processors Introduction to DSP architecture - Harvard architecture - Dedicated MAC unit - Multiple ALUs, Advanced addressing modes, Pipelining, Overview of instruction set of TMS320C5X and C54X.

Essentials of Digital Signal Processing John Wiley & Sons

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 Processing Using MATLAB

CRC Press

A significant revision of a best-selling text for the introductory digital signal processing course. This book presents the fundamentals of discrete-time signals, systems, and modern digital processing and applications for students in electrical engineering, computer engineering, and computer science. The book is suitable for either a one-semester or a two-semester undergraduate level course in discrete systems and digital signal processing. It is also intended for use in a one-semester first-year graduate-level course in digital signal processing.

Advanced Digital Signal Processing

Cambridge University Press

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.

Digital Signal Processing with Examples in MATLAB®, Second Edition John Wiley & Sons

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 Processing CRC Press
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, communication

Digital Signal Processing Pearson Education

"An excellent introductory book" (Review of the First Edition in the International Journal of Electrical Engineering Education) "it will serve as a reference book in this area for a long time" (Review of Revised Edition in Zentralblatt für Mathematik (Germany)) Firmly established as the essential introductory Digital Signal Processing (DSP) text, this second edition reflects the growing importance of random digital signals and random DSP in the undergraduate syllabus by including two new chapters. The authors' practical, problem-solving approach to DSP continues in this new material, which is backed up by additional worked examples and computer programs. The book now features: * fundamentals of digital signals and systems * time and frequency domain analysis and processing, including digital convolution and the Discrete and Fast Fourier Transforms * design and practical application of digital filters * description

and processing of random signals, including correlation, filtering, and the detection of signals in noise Programs in C and equivalent PASCAL are listed in an Appendix. Typical results and graphic plots from all the programs are illustrated and discussed in the main text. The overall approach assumes no prior knowledge of electronics, computing, or DSP. An ideal text for undergraduate students in electrical, electronic and other branches of engineering, computer science, applied mathematics and physics. Practising engineers and scientists will also find this a highly accessible introduction to an increasingly important field.

Applications of Digital Signal Processing "O'Reilly Media, Inc."

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.

Digital Signal Processing BoD – Books on Demand

"Digital Signal Processing features careful definitions of all terminology and a wealth of examples and problems. All numerical examples and most end-of-chapter problems are simple enough to be solved analytically by hand; these results can then be compared with the computer-generated solutions. MATLAB is an integral part of the text."--Jacket.

MATLAB/Simulink for Digital Signal Processing CRC Press

Introductory, systematic treatment of the many interrelated aspects. Twenty-three contributions address the fundamentals, spectral estimation algorithms, image processing, land and ocean seismic data, telecommunications, 3-D object reconstructions. Alk. paper.

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Digital Signal Processing Courier
Dover Publications

An Introduction to Digital Signal Processing aims at undergraduate students who have basic knowledge in C programming, Circuit Theory, Systems and Simulations, and Spectral Analysis. The book is focused on basic concepts of digital signal processing, MATLAB simulation and implementation on selected DSP hardware in which the candidate is introduced to the basic concepts first before embarking to the practical part which comes in the later chapters. Initially Digital Signal Processing evolved as a postgraduate course which slowly filtered into the undergraduate curriculum as a simplified version of the latter. The goal was to study DSP concepts and to provide a foundation for further research where new and more efficient concepts and algorithms can be developed. Though this was very useful it did not arm the

student with all the necessary tools that many industries using DSP technology would require to develop applications. This book is an attempt to bridge the gap. It is focused on basic concepts of digital signal processing, MATLAB simulation and implementation on selected DSP hardware. The objective is to win the student to use a variety of development tools to develop applications. Contents• Introduction to Digital Signal processing. • The transform domain analysis: the Discrete-Time Fourier Transform• The transform domain analysis: the Discrete Fourier Transform• The transform domain analysis: the z-transform• Review of Analogue Filter• Digital filter design. • Digital Signal Processing Implementation Issues• Digital Signal Processing Hardware and Software• Examples of DSK Filter Implementation

Introductory Digital Signal Processing with Computer Applications Hutchinson Ross Publishing Company

Provides a detailed treatment of the concepts and applications of advanced digital signal processing.

Streamlining Digital Signal Processing Academic Press

Modern coverage of the fundamentals, implementation and applications of digital signal processing techniques from a practical point of view This successful textbook covers most aspects of DSP found in undergraduate electrical, electronic or communications engineering courses. Unlike many other texts, it also covers a number of DSP techniques which are of particular relevance to industry such as adaptive filtering and multirate processing. The emphasis throughout the book is on the practical aspects of DSP.

Applied Digital Signal Processing IET

Digital Spectral Analysis offers a broad perspective of spectral estimation techniques and their implementation. Coverage includes spectral estimation of discrete-time or discrete-space sequences derived by sampling continuous-time or continuous-space signals. The treatment emphasizes the behavior of each spectral estimator for short data records and provides over 40 techniques described and available as implemented MATLAB functions. In addition to summarizing classical spectral estimation, this text provides theoretical background and review material in linear systems, Fourier transforms, matrix algebra, random processes, and statistics. Topics include Prony's method, parametric methods, the minimum variance method, eigenanalysis-based estimators, multichannel methods, and two-dimensional methods. Suitable for advanced undergraduates and graduate students of electrical engineering — and for scientific use in the signal processing application community outside of universities — the treatment's prerequisites include some knowledge of discrete-time linear system and transform theory, introductory probability and statistics, and linear algebra. 1987 edition.

Digital Signal Processing Cambridge University Press

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.

Digital Signal Processing Won Y. Yang

This volume presents the fundamentals of data signal processing, ranging from data conversion to z-transforms and spectral analysis. In addition to presenting basic theory and describing the devices, the material is complemented by real examples in specific case studies.