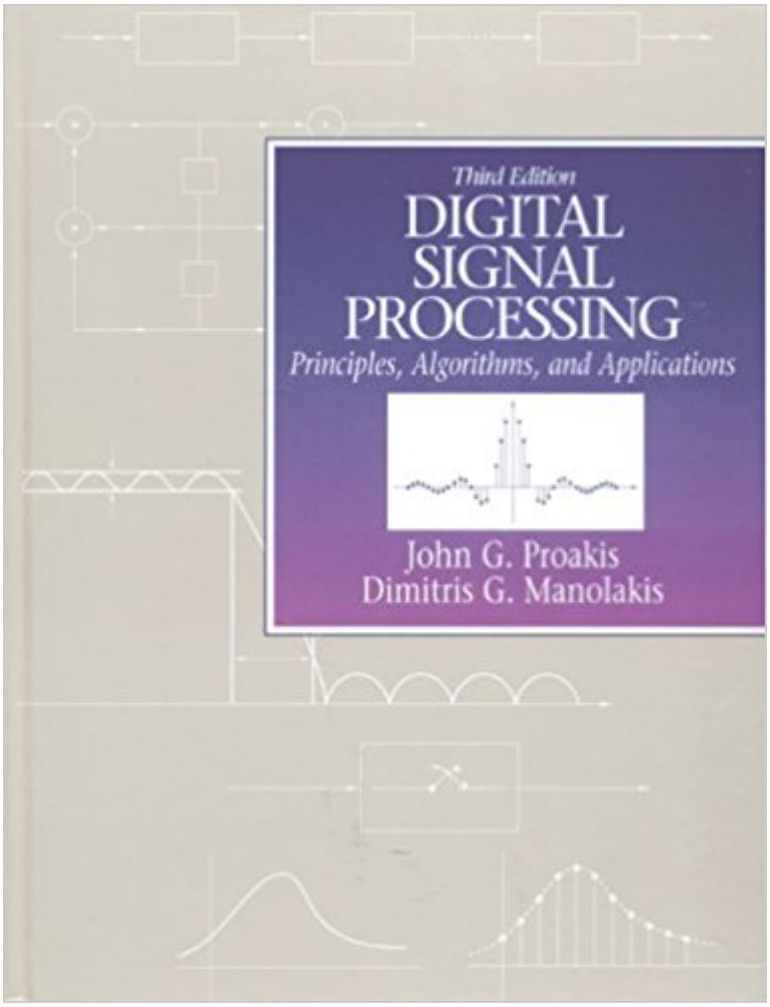
Digital Signal Processing: Principles, Algorithms And Applications (3rd Edition)



Synopsis

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.

Book Information

Hardcover: 1016 pages

Publisher: Prentice Hall; 3rd edition (October 5, 1995)

Language: English

ISBN-10: 0133737624

ISBN-13: 978-0133737622

Product Dimensions: 7.3 x 1.7 x 9.3 inches

Shipping Weight: 3.6 pounds (View shipping rates and policies)

Average Customer Review: 3.7 out of 5 stars 27 customer reviews

Best Sellers Rank: #402,905 in Books (See Top 100 in Books) #16 inÂ Books > Computers & Technology > Hardware & DIY > Microprocessors & System Design > DSPs #68 inÂ Books > Textbooks > Engineering > Electrical & Electronic Engineering #341 inÂ Books > Engineering & Transportation > Engineering > Electrical & Electronics > Circuits

Customer Reviews

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.

Giving the reader a sound balance of theory and practical application, this no-nonsense book 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 furthers the understanding with numerous examples, exercises, and experiments emphasizing software implementation of digital signal processing algorithms integrated throughout. FEATURES: NEW—reorganizes coverage of DFT and FFT algorithm for greater clarity—now introduces the DFT and describes its efficient computation immediately following the treatment of Fourier analysis. Describes the operations and techniques involved in the analog-to-digital conversion of analog signals. Studies the characterization and analysis of linear time-invariant discrete-time systems and discrete- time signals in the time domain. Considers both the bilateral and the unilateral z-transform, and describes methods for determining the inverse z-transform. Analyzes signals and systems in the frequency domain, and presents Fourier series and Fourier transform in both continuous-time and discrete-time signals. Treats the realization of IIR and FIR systems, including direct-form, cascade, parallel, lattice and lattice-ladder realizations. Looks at the basics of sampling rate conversion and presents systems for implementing multirate conversion. Offers a detailed examination of power spectrum estimation, with discussions on nonparametric and model-based methods, as well as eigen-decomposition- based methods, including MUSIC and ESPRIT. Includes many examples throughout the book and with approximately 500 workable problems.

I am currently taking an undergraduate intro to DSP class at Cal Poly Pomona. I have to say that I cannot put this book down!!. Mr Proakis does an excellent job presenting the material in a very readable format. I think this is a very good intro to Digital Signal Processing. The book has a nice flow and does a very good job in introducing the concepts. Another plus for the book are the examples provided. There are some very good problems at the end of each chapter. If you are getting this book I recommend the companion book "Digital Signal Processing with MATLAB" by Vinay K. Ingle and John G. Proakis. I highly recommend this book.

This book is the one that is quite accessible both to the beginner as well as the professional. If you had a strong background in Signals and Systems, Proakis will take you through a mathematical tour of DSP. With plenty of examples you would find this book a lot easier than Oppeinheim's. The best of the breed is Stanley's Digital Signal Processing. Since this book is now out of print , the one by Proakis will come a close second.A lot of examples make this bulkiest of the DSP books, however. For the new comer Richard Lyon's and Steve Smith's book will help them to understand this book well. And don't forget the Matlab series book authored by Proakis. it is the best to learn DSP through Matlab- no doubt about it.

I am a 3rd year Engineering student and I find this book to be absolutely horrible. The text is confusing and the examples are horrible. They do not do any numerical examples worth reading. One of the worst textbooks I have ever had to use. If you are forced to use it, I am sorry. This book focuses more on theory then on numerical examples, which is what most students are tested on.

This book is a great theoretical introduction to DSP. Although its size looks intimidating and there is a lot of math, this book is very good for a beginner because firstly, the size of the book is due to numerous examples as well as clear and detailed explanations for most of the concepts and secondly, it is possible to skip over much of the math if you are so inclined and take away the gist of the section. This is the case in some of the more advanced topics covered which may be suitable for a second reading.Some of the things I liked in this book are:- The organization of the material and lucidity of the writing and explanation- Consistency of notation- The concepts of frequency in continuous and discrete time signals in Chapter 1- The long introduction to discrete time systems and the concepts of linear time invariance in Chapter 2- The explanation of Fourier series and Fourier transforms of continuous time and discrete time signals (periodic and non periodic) in Chapter 4 is the best part of this book- Frequency domain characteristics of LTI systems in Chapter 4- The way the DFT was introduced and its relationship with the DTFT in Chapter 5- Sampling and reconstruction of signals in Chapter 9Some of the things I did not like in this book are:- The way the sampling theorem was derived in Chapter 4. In DSP you can derive the same thing in many ways but in many cases one method is more intuitive and simpler than the rest. There is an easier way to derive the sampling theorem- There are mistakes in some equations. Not a major issue though- There is no MATLAB or computer exercises or examples anywhere. This is a pity because you can learn so much and get a lot of insights with a few hours of DSP with MATLAB. Also there are some

things like filter design which are done only on a computer- I did not like the treatment of Multirate DSP in Chapter 10- There is no treatment of 2D processing anywhereOn the whole this is a great theoretical introduction to DSP with a few minor drawbacks. I would still recommend this book over the ones by Oppenheim and Mitra for a beginner. But I would wait for the fourth edition that comes out in Feb. 2006 before buying any DSP book.

This is a very large book covering many areas of digital signal processing. I bought a used copy of the third edition to replace an earlier one. Unfortunately, many of the errors - conceptual, not typographical - have remained. For example, the authors state in Sec. 8.3 that the frequency response of an elliptic (Cauer) filter is a rational function of a Jacobian elliptic function of frequency. An electrical engineer would know that a transfer function of a network of discrete components is a rational function of frequency, whereas the Jacobian elliptic is a transcendental function. The typographical error in the name of the mathematician Schur has finally been corrected attesting to the fact that neither author ever read the original paper. The presentation is extremely detailed in trivialities, with as many pictures, including a derivation of the sum of a geometric series as an exercise, a subject usually taught in high school. Finally, as another example, the solution's manual gives the wrong answer for Problem 2.9(a) stating, in effect, that a periodic function possesses a limit as its argument tends to infinity, showing complete ignorance of the notion of limit by the authors. Books such as this have little educational value, confusing the student with tons of irrelevant information, non-standard nomenclature - the Cauchy Residue Theorem in Sec. 3.1.2 is renamed to Cauchy Integral Theorem - and wrong answers. This book, if properly corrected, would be very useful.

Probability and Random Processes, Second Edition: With Applications to Signal Processing and Communications Image Sensors and Signal Processing for Digital Still Cameras (Optical Science and Engineering) Bundle of Algorithms in C++, Parts 1-5: Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms (3rd Edition) (Pts. 1-5) VLSI Digital Signal Processing Systems: Design and Implementation Applied Digital Signal Processing: Theory and Practice Essentials of Digital Signal Processing Digital Signal Processing Using MATLAB & Wavelets