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Digital Signal Processing: A Practical Guide For Engineers And Scientists

Digital Signal Processing

A Practical Guide for Engineers and Scientists

Steven W. Smith

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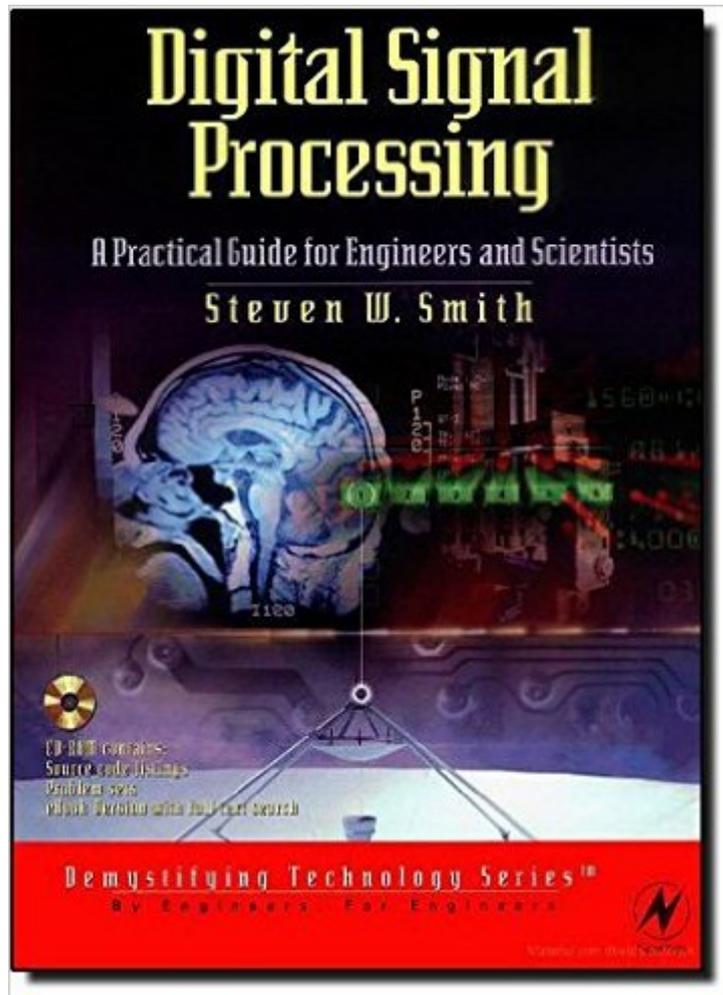
Synopsis

In addition to its thorough coverage of DSP design and programming techniques, Smith also covers the operation and usage of DSP chips. He uses Analog Devices' popular DSP chip family as design examples. Also included on the companion website is technical info on DSP processors from the four major manufacturers (Analog Devices, Texas Instruments, Motorola, and Lucent) and other DSP software. *Covers all major DSP topics*Full of insider information and shortcuts*Basic techniques and algorithms explained without complex numbers

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Customer Reviews

As a graduate student in DSP, I highly recommend this book to anybody who would like to get an overview of digital signal processing. However, you should know what you're buying. Download the free version from the website first to check it out. This is not a textbook for a DSP course. Treat it as you would an encyclopedia -- you don't use the encyclopedia to do major research, you use it to get an introduction to the topic and get ideas on what you want to pursue. Some mathematically-inclined people are able to understand what the equations are saying right away, but others may need to learn through different ways. This book offers that alternative way, by explaining in understandable English what's going on. To grasp the real beauty and applications of DSP, you'll still need to eventually use the equations, but this book is a good start to gaining insight in what those equations mean.

This book gives you all the neccessary tools to understand the fundamental principles that drive DSP. One example would be the chapter on the Laplace Transform. He takes a topic that most other DSP books give a cursory glance, treats it with great care, trying to let you grasp the fundamentals of Laplace transform so that you would'nt have trouble in understanding the significance of poles and zeros.And Steve gives you many ways to look at a DSP topic :- Through carefully selected figures that mesh well with the topic - Through less maths -Third and the most important, simple to understand programs written in Basic to enable you to visualize the algorithm though programs.His style is steeped with practical wisdom and with painstaking attention to details. It is no wonder that this would be one of the most important books for the beginner in DSP that would equally rank with that of Richard Lyons.Where ever the Steve uses maths, you almost always expect him to explain its physical interpretation and its practical significance.I loved his convolution Machine analogy. I hope you will find many more gems in this wonderful book on DSP.

Even though I already have the predecessor to this book described on [...] I purchased this 2003 version to stay current. What makes this book great are how clear the explanations are to a number of core DSP areas that are often poorly explained like overlap-add fast convolution while still covering some unusual things that are rarely discussed (neural net filter design?!) along with practical cookbook techniques. And all this with charts, graphs, and clear-as-ice examples in BASIC, hoorah! Steven is egoless in terms of presenting the useful stuff - he's not trying to show off his math, he's just trying to help you understand. :D

Coming to DSP from a non-mathematical back ground I wanted a DSP guide that would allow me to 'do something' useful, quickly for a biomedical signal processing applicition- but I initally had difficulty finding a good textbook.I painfully struggled through Lathi's "Signal Processing and Linear Systems" with little to show for it. Lyons' "Understanding Digital Signal Processing" was very good at explanation (I recommend it) but somewhat lacked a practical focus. In the end "DSP a Practical Guide" turned out to be even clearer and easier to read than Lyons while being more complete and having a more practical focus.The book is punctuated with practical examples- sonar, audio processing, code optimisation and accompanying BASIC. After literally a few hours of reading I applied some provided algorithms to clean up an EKG signal (with considerable success).I found the chapter on neural networks to be so clear and enthralling it became a 'toilet read'- certainly a first for a book of this genre :) - the sections on image processing, audio processing and data

compression are likewise accessible.The only caveat with this book is that those seeking a rigorous 'first principles' mathematical analysis of DSP (Lathi style) may be disappointed by the conceptual focus- a lot of the 'harder' items like Laplace and complex fourier come towards the latter half of the book.Purchasers should also note that there seem to be differences in the composition of the similar hardback versions of the book (I have the softcover).

Steven W. Smith has updated his previous book, "Scientist and Engineer's Guide to DSP", with a bit more material, better typesetting, and an added section with program listings and also a software CD.I went to the technical section of the best bookstore in my area, and looked through several books on this topic. Without a doubt, this one was the most clearly written and informative.My technical background is that I have a bachelor's degree in mechanical engineering, my native language is English, and I have never taken a course on DSP's. I have read a bit about digital signal processors, and used some electronic equipment (lock-in amplifier) that was DSP-based. I am interested in learning about processing video image arrays, and audio and real time instrumentation signals. (I am including this information so that you can get an idea of whether your impression will be similar to mine.)

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