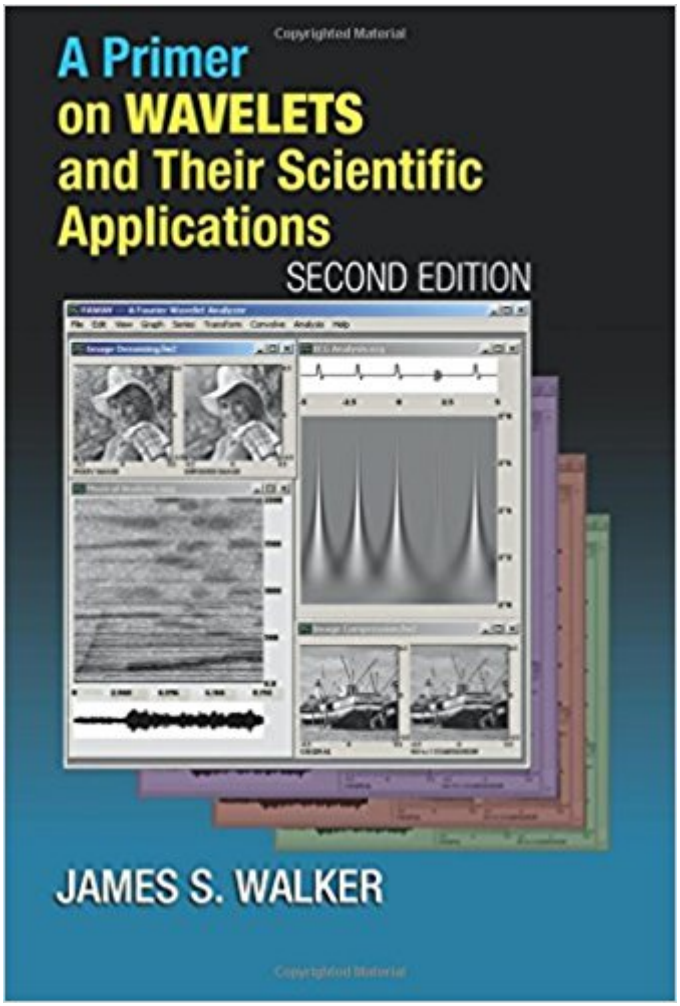
A Primer On Wavelets And Their Scientific Applications, Second Edition (Studies In Advanced Mathematics)



Synopsis

In the first edition of his seminal introduction to wavelets, James S. Walker informed us that the potential applications for wavelets were virtually unlimited. Since that time thousands of published papers have proven him true, while also necessitating the creation of a new edition of his bestselling primer. Updated and fully revised to include the latest developments, this second edition of A Primer on Wavelets and Their Scientific Applications guides readers through the main ideas of wavelet analysis in order to develop a thorough appreciation of wavelet applications. Ingeniously relying on elementary algebra and just a smidgen of calculus, Professor Walker demonstrates how the underlying ideas behind wavelet analysis can be applied to solve significant problems in audio and image processing, as well in biology and medicine. Nearly twice as long as the original, this new edition provides Â Â Â Â Â Â 104 worked examples and 222 exercises, constituting a veritable book of review material Â Â Â Â Â Â Â Â Â Â Two sections on biorthogonal wavelets Â Â Â Â Â Â Â Â Â Â A mini-course on image compression, including a tutorial on arithmetic compression Â Â Â Â Â Â Â Â Â Â Extensive material on image denoising, featuring a rarely covered technique for removing isolated, randomly positioned clutter Â Â Â Â Â Â Â Â Â Â Concise yet complete coverage of the fundamentals of time-frequency analysis, showcasing its application to audio denoising, and musical theory and synthesis Â Â Â Â Â Â Â Â Â Â An introduction to the multiresolution principle, a new mathematical concept in musical theory Â Â Â Â Â Â Â Â Â Â Expanded suggestions for research projects Â Â Â Â Â Â Â Â Â Â An enhanced list of references Â Â Â Â Â Â Â Â Â Â FAWAV: software designed by the author, which allows readers to duplicate described applications and experiment with other ideas. To keep the book current, Professor Walker has created a supplementary website. This online repository includes ready-to-download software, and sound and image files, as well as access to many of the most important papers in the field.

Book Information

Series: Studies in Advanced Mathematics
Paperback: 320 pages
Publisher: Chapman and Hall/CRC; 2 edition (January 31, 2008)
Language: English
ISBN-10: 1584887451
ISBN-13: 978-1584887454
Product Dimensions: 6.1 x 0.7 x 9.1 inches
Shipping Weight: 1.1 pounds (View shipping rates and policies)

Average Customer Review: 3.7 out of 5 stars 8 customer reviews

Best Sellers Rank: #796,006 in Books (See Top 100 in Books) #54 inÂ Books > Science & Math > Mathematics > Infinity #462 inÂ Books > Science & Math > Mathematics > Applied > Differential Equations #670 inÂ Books > Science & Math > Mathematics > Mathematical Analysis

Customer Reviews

It is a primer; easy to read if you know just a little calculus. It was what I wanted, so am very satisfied.

The software dowload page returns 404 error. Thanks James but your university server will not allow a log on for the software.

Very example-based which makes it way easier to follow than a theoretical introduction. This is the best intro that I have found.

Very good approach for wavelet analysis beginning with very well descripted, low complexity math and evolving to a more complex math and deep explanations in the medium to last part of the book. The first chapters get you tied to the arguments and evidences that will be explained more in detail in subsequent chapters.Educationally, I consider this book a perfect introductory graduate level textbook with a good coverage of basic concepts that excites you to get more deep explanations.

well written, good explanation of the topic. Good coverage of basic math. with short cuts. Readable

... as advertised. It’s a "primer" after all. I appreciate its emphasis on basic analytic techniques, and general avoidance of abstruse notation.At the same time, I’m an absolute noob to wavelets. I came in the door with just about no knowledge of them at all, except a guess that they might be applicable to a problem my job threw at me. Through this, I’ve gotten some feel for how the techniques work and how they ease compression, noise reduction, and lots of other useful work.But I didn’t get the sharper insights I hoped to - not that I even know they exist to be had. And I could have followed some slightly more advanced presentations. I’m looking elsewhere for them now, hoping for a bit stronger grasp on some of the internals.And that’s the real ambiguity in my impression of this book. I came in knowing nearly nothing. I came out with some knowledge, but not at all what I expected or can apply to my problem. I really can’t say whether that’s the fault of the material here, or of my lack

of preparation (which was why I wanted a "primer" in the first place).So, the plus is that it works at the level it promised to, choosing algebra over calculus and sacrificing depth for breadth. The minus is that I didn't come away with the grasp of subject I hoped for. There will be a second book on my shelf, and soon. After I've read that one, my estimation of this could well change. Watch this space.-- wiredweird

This book does not require you to be familiar with signal processing, much less the Fourier transtorm, even if it's very likely you will have gleaned some knowledge of these topics before you read. The mathematics is presented mainly by way of examples first in a learn as you need basis.The Haar transform and wavelets are explained in great detail first because they are the easiest to describe. They are used in practice by the way, so this is not just for pedagogical purposes. Many excercises are provided with solutions explained in detail. When you have assimilated this it's time to move to Daubechies wavelets, which are more modern, and give better results. The mathematics is never particularly difficult here.The book then moves on to 2D wavelets and image processing. Here again the author explains everything you need to know along the way, deals with JPEG and JPEG2000, but not to the point where you are a master of these subjects.The next chapter Frequency Analysis is where the author compares wavelets and Gabor transforms to Fourier analysis, and he provides a compact introduction to the subject.All in all this is a great primer that allows you to begin to read more advanced books. Its focus is on practical matters rather than theory.If the theory is what interests you I would recommend reading David Walnut's "An Introduction to Wavelet Analysis"

This book is really good and is a great reference for understanding what Wavelet Transforms are and their valuable uses. Be prepared for quite a bit of college level math, and knowledge of frequency analysis and transform that would also be helpful. If you find this book difficult to grasp the following online tutorial is also wonderfully helpful[...]Once you are able to go through it, this book is more accessible.

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