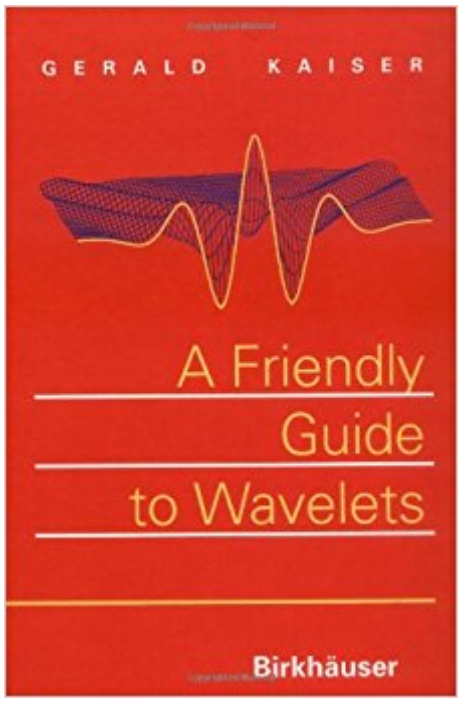
A Friendly Guide To Wavelets



Synopsis

This volume is designed as a textbook for an introductory course on wavelet analysis and time-frequency analysis aimed at graduate students or advanced undergraduates in science and engineering. It can also be used as a self-study or reference book by practicing researchers in signal analysis and related areas. Since the expected audience is not presumed to have a high level of mathematical background, much of the needed analytical machinery is developed from the beginning. The only prerequisites for the first eight chapters are matrix theory, Fourier series, and Fourier integral transforms. Each of these chapters ends with a set of straightforward exercises designed to drive home the concepts just covered, and the many graphics should further facilitate absorption.

Book Information

Hardcover: 300 pages

Publisher: BirkhÃƒÂ¤user Boston; 1 edition (August 1, 1994)

Language: English

ISBN-10: 0817637117

ISBN-13: 978-0817637118

Product Dimensions: 7 x 0.8 x 10 inches

Shipping Weight: 1.6 pounds (View shipping rates and policies)

Average Customer Review: 4.2 out of 5 stars 15 customer reviews

Best Sellers Rank: #1,316,785 in Books (See Top 100 in Books) #87 inÂ Books > Science & Math > Mathematics > Infinity #295 inÂ Books > Textbooks > Engineering > Electrical & Electronic Engineering #935 inÂ Books > Science & Math > Physics > Mathematical Physics

Customer Reviews

"I wholeheartedly recommend this book for a solid and friendly introduction to wavelets, for anyone who is comfortable with the mathematics required of undergraduate electrical engineers. The book's appeal is that it covers all the fundamental concepts of wavelets in an elegant, straightforward way. It offers truly enjoyable (friendly!) mathematical exposition that is rich in intuitive explanations, as well as clean, direct, and clear in its theoretical developments. I found Kaiser's straightforward end-of-chapter exercises excellent...Kaiser has written an excellent introduction to the fundamental concepts of wavelets. For a book of its length and purpose, I think it should be essentially unbeatable for a long time."â ”Proceedings of the IEEE"It is well produced and certainly readable...This material should present no difficulty for fourth-year undergraduates...It also will be

useful to advanced workers in that it presents a different approach to wavelet theory from the usual one."â ”Computing Reviews"I found this to be an excellent book. It is eminently more readable than the books...which might be considered the principal alternatives for textbooks on wavelets."â ”Physics Today"This volume is probably the most gentle introduction to wavelet theory on the market. As such, it responds to a significant need. The intended audience will profit from the motivation and common-sense explanations in the text. Ultimately, it may lead many readers, who may not otherwise have been able to do so, to go further into wavelet theory, Fourier analysis, and signal processing."â ”SIAM Review"The first half of the book is appropriately named. It is a well-written, nicely organized exposition...a welcome addition to the literature. The second part of the book introduces the concept of electromagnetic wavelets...This theory promises to have many other applications and could well lead to new ways of studying these topics. This book has a number of unique features which...makes it particularly valuable for newcomers to the field."â ”Mathematical Reviews"The book is indeed what its title promises: A friendly guide to wavelets...In short, Kaiser’s book is excellently written and can be considered as one of the best textbooks on this topic presently available...it will enjoy wide distribution among mathematicians and physicists interested in wavelet analysis."â ”Internationale Mathematische Nachrichten"I loved ’A Friendly Guide to Wavelets’.Â I advised it to my graduate students."â ”Yves Meyer, UniversitÃ© Paris-Dauphine

I wholeheartedly recommend this book for a solid and friendly introduction to wavelets, for anyone who is comfortable with the mathematics required of undergraduate electrical engineers. The book’s appeal is that it covers all the fundamental concepts of wavelets in an elegant, straightforward way. It offers truly enjoyable (friendly!) mathematical exposition that is rich in intuitive explanations, as well as clean, direct, and clear in its theoretical developments. I found Kaiser’s straightforward end-of-chapter exercises excellent...Kaiser has written an excellent introduction to the fundamental concepts of wavelets. For a book of its length and purpose, I think it should be essentially unbeatable for a long time.â ”Proceedings of the IEEEIt is well produced and certainly readable...This material should present no difficulty for fourth-year undergraduates...It also will be useful to advanced workers in that it presents a different approach to wavelet theory from the usual one.â ”Computing ReviewsI found this to be an excellent book. It is eminently more readable than the books...which might be considered the principal alternatives for textbooks on wavelets.â ”Physics Today This volume is probably the most gentle introduction to wavelet theory on the market. As such, it responds to a significant need. The intended audience will profit from the

motivation and common-sense explanations in the text. Ultimately, it may lead many readers, who may not otherwise have been able to do so, to go further into wavelet theory, Fourier analysis, and signal processing.â ”SIAM ReviewThe first half of the book is appropriately named. It is a well-written, nicely organized exposition...a welcome addition to the literature. The second part of the book introduces the concept of electromagnetic wavelets...This theory promises to have many other applications and could well lead to new ways of studying these topics. This book has a number of unique features which...makes it particularly valuable for newcomers to the field.â ”Mathematical ReviewsThe book is indeed what its title promises: A friendly guide to wavelets...In short, Kaiser’s book is excellently written and can be considered as one of the best textbooks on this topic presently available...it will enjoy wide distribution among mathematicians and physicists interested in wavelet analysis.â ”Internationale Mathematische NachrichtenFor additional review samples and related material, please visit the author’s website at www.wavelets.com.

It reads a little bit better than most wavelet books. It’s by far not perfect. If you want a good place to start to just understand what exactly a wavelet is and some applications this may be useful. I don’t think there will be a perfect wavelet book for a long time. From reading a ton of different books it seems they all have a copy and paste approach to things especially difficult topics. The more difficult the topic, the more bizarre the derivations and wording gets, and that’s with any wavelet book. It’s almost like the authors themselves are confused so they mask things with a ridiculous explanation. Overall this book will serve the purpose of introducing you to the very basics of wavelets to at least physically understand what is going on. If you can find the best way to actually implement these topics into your project or work then you should write a wavelet book.

I bought this book as a supplement to my copy of Daubechies’ bookÂ Ten Lectures on Wavelets (CBMS-NSF Regional Conference Series in Applied Mathematics). It has proved useful in that regard, especially in understanding Daubechies’ frequent qualification of mathematical equivalence as "almost everywhere" (frequently abbreviated as "a.e."). Kaiser provides an illuminating discussion of this concept in Chapter 1, pp.21-22; 34-38. As an example, the author considers a function q(t) which equals unity when t is rational, but equals zero when t is irrational. He then goes on to explain that because rational numbers are a "countable infinity" while irrational numbers are an "uncountable infinity" the function q(t) equals zero "almost everywhere"! Kaiser goes on to discuss the integration of the function q(t) as a way of explaining Lebesgue integrals, especially in contrast to Riemann integrals--a discussion which he also uses to introduce the concept of

"measure".Kaiser also provides a clear discussion of Daubechies wavelets in Chapter 8 (pp.176-199). I was very happy to see how the initial values of the scaling function are calculated for the N=2 wavelet, thereby providing the initial values for the recursive computation of that wavelet (p.190).As others have commented, this book is not the best place for most beginners to learn about wavelets. The level of Kaiser is at least at the level of Daubechies. In fact, I find Daubechies generally easier to read. Again, as others have pointed out, there are very few figures in Kaiser's book, making some concepts and functions difficult to visualize. For those looking for an introduction to wavelets written at a level appropriate for advanced undergraduates I would recommend the book by Burrus et al.Â Introduction to Wavelets and Wavelet Transforms: A Primer.

this review can also be viewed at:[...]There are several reasons why it's fundamentally important:1. a. It has an 'uncanny' parallel with modern quantum mechanics that is explained below. b. Modern quantum mechanics is based on axioms but are tenuous at best. c. The book is so formally developed as to actually give credence to the parallel field. d. If modern QM was presented this way, the field would actually be somewhat palatable.2. It provides the formal basis for wavelet analysis and theory.3. Wavelets are the 'thing' of the future.For those unfamiliar with modern quantum mechanics, it would be best to study first a primer or popular book on the subject - really digest the concepts/axioms QM is based on.. Then, go more formal: study an actual textbook on the subject.. This gives a real feel for the issues at hand.. Pay particular attention to 'caveats' such as renormalization..To prepare for this book (to be able to absorb it meaningfully), you should take courses or read textbooks covering:1. linear algebra2. Fourier series and integral transforms3. signals and systemsA course in linear systems theory would not 'hurt' as prerequisite.. Of course, the courses/textbooks mentioned above have their own prerequisites.. Finally, an analysis course Rudin-style and a course on complex variables certainly 'could not hurt either'.. One final note about preparation: you cannot underestimate the importance of a good physics/engineering teacher/course!Physics has its basis in reality (we hope;); math has its basis in formal structures. To combine the two effectively means we must choose what is appropriate from math to model apparent structures in physics/reality. Wavelets may be the thing physicists have been waiting for to 'tie it all together'.. Only time will tell.. Only time will tell..

The usefulness and success of a mathematics or otherwise technical book depends, more than on anything else, on it's level being tuned to the level of the reader. Whatever the subject one wants to learn, he must first go through a search of books on the subject to choose the ones that pick up

things from where he left them.Now, it is also true that, given a certain technical level, there are books of varying quality.If you have had a course on linear algebra and some contact with infinite series and Fourrier series at undergraduate level, than this book is the ideal introduction to wavelets for you. It will take you by the hand and smoothly guide you through generalizations such as Hilbert spaces and Fourrier transforms before entering the title subject. It is clear and profusely illustrated by examples. It also benefits from a (for what I've seen) flawless edition work.Highly recommended.

It is an excellent introduction to wavelets. Easy to read and to the point. Very clear intuitive explanation of the Lebegues integral and some basic concepts of Foouries series.

This book gives detailed explanations and derivations of wavelet transform. However, one tends to get lost on a vast number of formulations that are not really helpful for practical uses. If you just want to learn how to use wavelet transform to solve practical problems, this is not the book you should read.

Authoritative Guide to the Latest in Traditional and Complementar y Solutions Auditioning: An Actor-Friendly Guide