



Conceptual Wavelets in Digital Signal Processing

By D. Lee Fugal

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HOW (AND WHY) THIS BOOK IS DIFFERENT

Wavelets are incredibly powerful, but if you can't understand them, you can't use them or worse, blissfully misuse them!

CONCEPTUAL WAVELETS is unique as a complete, in-depth treatment of the subject but from an intuitive, conceptual point of view. In this book we stress informed use of wavelets and leave the mathematically rigorous proofs to other texts. We do look at some key equations (at a high-school algebra level)--but only after the concepts are demonstrated so you can see the wavelets (and their associated equations) in action.

FEATURES

--More than 400 illustrations, figures, graphics, tables, visual comparisons, etc. are provided to simplify and clarify the concepts. All of these visual aids are explained in detail using familiar language and terminology.

--Specific properties and suggested applications of the various wavelets and wavelet transforms are clearly shown using step-by-step walk-throughs, demonstrations, case studies, examples, and short tutorials.

--Numerous Jargon Alerts and other Plain English explanations bring you up to speed with the current wavelet nomenclature.

--References to some of the best traditional (and non-traditional) texts, papers, and websites are given for further application-specific study. We also familiarize

you with wavelet software and show you how to read the results of their various displays.

--Both the strengths and the weaknesses of the various wavelet transforms are revealed to help you avoid common traps and pitfalls (such as loss of alias cancellation).

--This book clearly explains how to add (literally) another dimension to your signal processing capability by using wavelets to simultaneously determine the frequency, the time, and even the general shape of events and/or anomalies in your data.

The last acknowledgment is to you, the reader, for having the courage to embark on a journey that you probably have heard was difficult but that has the promise of rich rewards as you add the power of wavelet processing to your professional repertoire.

John A. Shedd in 1928 wrote A ship in harbor is safe but that is not what ships are built for . As you leave the safe harbor of conventional Digital Signal Processing to sail upon the wavelets, may you find the treasures you seek. Welcome Aboard!

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Editorial Review

Review

C H O I C E (CURRENT REVIEWS FOR ACADEMIC LIBRARIES)--October 2009 Vol. 47 No. 02.
Science and Technology (Mathematics)

This book provides a gentle introduction to wavelets, a subject that is traditionally viewed as a very complex and highly mathematical research topic. There are many works already published on wavelets, each highlighting different approaches to the subject matter and written with sophisticated mathematics. However, Fugal (founder and president, Space & Signals Technologies LLC) has chosen to provide readers with an intuitive approach to the subject with plenty of discussions and ample examples. The contents originally formed the bulk of materials the author used in a professional workshop introducing wavelets. The book illustrates concepts of different wavelets, filtering operations, and practical usages with figures and simple MATLAB numerical examples to provide the reader with insight into the underlying behavior. Technical terms are often defined when first used. A special section at the end of the text shows a sampling of other wavelet tutorial materials available in books and articles and on the Web. This work is ideal for readers who would like to have a high-level understanding of wavelets without getting bogged down by heavy mathematics.

SUMMING UP: HIGHLY RECOMMENDED -- J. Y. Cheung, emeritus, University of Oklahoma

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COMMENTS FROM READERS AND ATTENDEES (Book is based primarily on Fugal s courses and seminars)

I was very pleased with your efforts - - the responses we received from the participants were very positive -
V. John Mathews, Professor and Chairman, Department of Electrical and Computer Engineering, University of Utah.

The course and notes were not only interesting but great for generating useful new ideas Paul K. Kuhn, Lead Engineer, General Electric.

You explain it in a very simple way so that people can understand it. You have pointed out several issues

which are critical in applications like denoising which are hard to find in any book. I am very familiar with the equations, but your presentation gave me some new perspectives on Wavelets Dr. Kumari, L. Fernando, Post-Doctoral Research Assistant

COMMENTS FROM OTHER READERS AND COURSE ATTENDEES INCLUDE:

Clear, Concise, Robust and Solid

Excellent Introduction to the Subject

Easy to follow. Very useable

Great clarity in presentation

Excellent knowledge of the subject.

Provided good physical understanding of Wavelet transforms and Applications without unnecessary complexity

Your clear explanations starting with the big picture immediately contextualized the material allowing us to drill a little deeper with a fuller understanding

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About the Author

D. LEE FUGAL is founder and president of Space & Signals Technologies, LLC, a technical consulting firm doing business with corporations of all sizes, government, military, and academia since 1991.

In addition to his 35 years of industry experience, he has taught upper-division university courses in DSP and in Satellite Communications. Most recently he has presented his 3-day short course Wavelets: A Conceptual, Practical Approach (the basis for this book) at universities, corporations, government agencies, and various other venues from coast to coast.

He holds a Masters in Applied Physics (DSP) from the University of Utah, is a Senior Member of IEEE, is Chairman of the IEEE Signal Processing Society San Diego Chapter, and is a recipient of the IEEE Third Millennium Medal.

Users Review

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