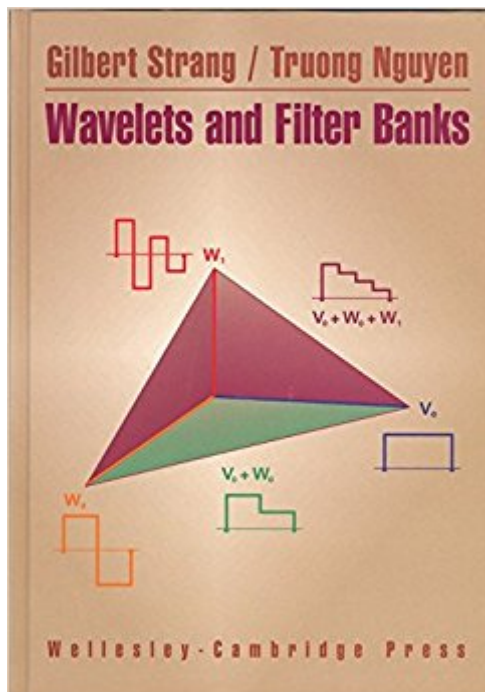


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# Wavelets And Filter Banks



## Synopsis

This text has had an overwhelming response from readers. Lauded by some as a marriage between math and engineering, the text features useful and balanced explanations of wavelets for both engineers and mathematicians. The explanations of difficult topics are informal and very approachable, yet rigor is not sacrificed in the process. Also included in Wavelets and Filter Banks are many examples from the MATLAB Wavelet® Toolbox.

## Book Information

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## Customer Reviews

This book explains wavelets to both engineers and mathematicians. It approaches the subject with a major emphasis on the filter structures attached to wavelets. The book is ideal as an introduction to the principles of wavelets and as a reference for the analysis and applications.

Gilbert Strang is a Professor of Mathematics at Massachusetts Institute of Technology and an Honorary Fellow of Balliol College, of the University of Oxford, UK. His current research interests include linear algebra, wavelets and filter banks, applied mathematics, and engineering mathematics. He is the author or co-author of six textbooks and has published a monograph with George Fix titled "An Analysis of the Finite Element Method." Professor Strang served as SIAM's president from 1999-2000, chaired the US National Committee on Mathematics from 2003-2004, and won the Neumann Medal of the US Association of Computational Mechanics in 2005. He is a fellow of the American Academy of Arts and Sciences.

A unique (?) book on all manner of statistical filters. Written in lecture-note style, not as smooth as some texts. Authoritative. The filter-bank interpretation of wavelet methods is particularly useful.

Pretty thick stuff, but for what I want, it's pretty good.

I have this book for a wavelet course. I find this book cryptic and not very easy to learn about wavelets.

I have taken several courses on DSP. I found that this text takes topics that were presented, expanded them in great detail. It took some of the mystery out of my previous presentations. Anyone working with DSP should have this on their shelf!

Ok. I am divulging a secret here. This book is a hidden Gem, who never actually realized its potential, it seems. It packs so much crucial / critical information about DSP, multirate techniques, filter design, multirate system optimization that its simply incredible !!! I however agree with the reviews which rate its difficulty high, and a reviewer claiming that it has been written in bouts of inspiration. I can associate with him, and yet, associate more with the authors, when they set about writing on this topic. Its a huge undertaking for one. The literature was/is exploding all the time. To give a composite picture, they are freaking hard pressed. No wonder, people find it tiring, and give up before they could realize what a gem of a creation it is. Gilbert strang, is really at his best here. He is plunging left , right and center, grasping concepts in his solid hands, and massaging them for palatability. I found the book intimidating too, at first, but looked at other texts. The gaps that others would always leave, this book would come in and fill them, not only fill them, but solidify them, re-enforce them with pure concrete. Since I said I will be divulging , here is my advice on people starting out with it. Dont take the progression of book too seriously. Its not that its flawed, its just that one cannot appreciate its beauty at the outset. So , do not cover the material as it presents itself. Atleast not the whole of it. And there can be different points of emphasis for people approaching from different directions, but generally, try to glean important DSP details, and leave the multiresolution stuff for a later date. One should keep coming back to it every now and then, and you would see it makes more sense. Chapter three, four and five. And most expecially FOUR. Thats the meat of the book, and truly striking. But to get struck, you have to be listening closely to him in Chapter 2. Chapter 3 is a meticulous, nowhere ever to be found treatment of sampling with  $z$

operators. Pay very close attention. Once you hit Chapter 4 then, you will be able to appreciate the perfect reconstruction framework. Chapter 4 then trails off, and emphasized alias cancellation a little too much. Again no fault of authors, just the way things stand in literature. Kind of misses the perfect reconstruction condition, and finishes off introducing polyphase notation. You have to keep in mind that perfect reconstruction conditions still need to be satisfied and hence all the later chapters. Keep coming back to three and two whenever you feel you are getting lost. I suggest Vitterli's subband coding and Fred Harris multirate communications are very helpful texts to go with it, for people implementing with a practical flavor in mind. Esp Fred Harris gives a totally striking transceiver view of the whole theory. Can help tie things together more beautifully. In short, the reviews don't quite do justice to this momentous text. It's truly striking. It's truly a work of love. And absolutely dead instructive. Instruction doesn't get any better.

I think the book is very good compared to other texts that I have perused on the subject. I am presently teaching myself the material so as to use wavelets for my research project. It is one of the most readable texts that I have encountered. I was looking for a very applied book and this seems a good one. There are some proofs but the text is not flooded with functional analysis theorems. There is one thing that I found disappointing. I found that in order to understand some things I had to jump to sections further into the book. Ideas are introduced and are not fully explained until later in the book. This leaves the reader puzzled and sometimes very confused when given the first exposure to a topic. (It is easy to get the wrong idea when you are given a superficial development). I think the development of ideas could have been more cohesive. Other than that, it is a good book.

I am presently full time staff and part-time teacher electronics lab and doing research in image processing. I need a new way or new material so as to use wavelets for my research project. It is one of the most readable texts that I have encountered. I was looking for a very applied book and this seems a good one. There is one thing that I found disappointing. I found that in order to understand some things I had to jump to sections further into the book. Ideas are introduced and are not fully explained until later in the book. This leaves the reader puzzled and sometimes very confused when given the first exposure to a topic. I think the development of ideas could have been more cohesive. All in all, it's not a bad book as a reference

My first reaction to Professor Strang's superficially friendly, "just us folks", "you're gonna love this result" style was positive until I realized I wasn't absorbing anything. Could it be me? Well, yes, it is.

I just am not a brilliant co-worker who can grasp Strang's giant leaps of intuition and say, "Wow, Gil, I see what you are saying, that really is neat!" This book is written in bursts of enthusiasm with little emphasis on details (like indices on summation operators) and little continuity. It appears to have a layered structure where Strang breezes through an introduction dropping all sorts of sophisticated concepts along with "don't worry, it will all become clear later". Unfortunately at the next layer Strang does not connect up with previous droppings but simply drops more. I am amazed that Matlab would attach this book to their wavelet toolbox, which by the way has a beautiful user's manual. An alternative to this book, "Wavelet and Wavelet Transforms" by Sidney Burrus and friends, is written in a clear step-by-step manner with attention to details (and with a reasonable step size). Upon reading Burrus's book I could go back to Strang's and figure out some of the things he was so pleased with (other than himself).

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