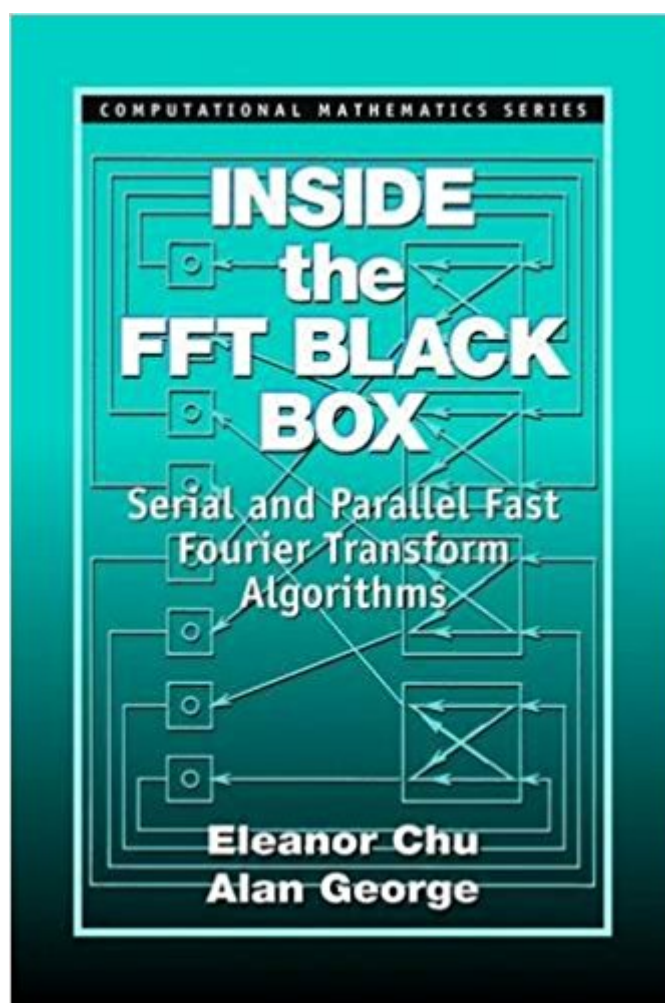The book was found

Inside The FFT Black Box: Serial And Parallel Fast Fourier Transform Algorithms (Computational Mathematics)

Synopsis

Are some areas of fast Fourier transforms still unclear to you? Do the notation and vocabulary seem inconsistent? Does your knowledge of their algorithmic aspects feel incomplete? The fast Fourier transform represents one of the most important advancements in scientific and engineering computing. Until now, however, treatments have been either brief, cryptic, intimidating, or not published in the open literature. Inside the FFT Black Box brings the numerous and varied ideas together in a common notational framework, clarifying vague FFT concepts.Examples and diagrams explain algorithms completely, with consistent notation. This approach connects the algorithms explicitly to the underlying mathematics. Reviews and explanations of FFT ideas taken from engineering, mathematics, and computer science journals teach the computational techniques relevant to FFT. Two appendices familiarize readers with the design and analysis of computer algorithms, as well.This volume employs a unified and systematic approach to FFT. It closes the gap between brief textbook introductions and intimidating treatments in the FFT literature. Inside the FFT Black Box provides an up-to-date, self-contained guide for learning the FFT and the multitude of ideas and computing techniques it employs.

Book Information

Series: Computational Mathematics
Hardcover: 336 pages
Publisher: CRC Press; 1 edition (November 11, 1999)
Language: English
ISBN-10: 0849371589
ISBN-13: 978-0849302701
ASIN: 0849302706
Product Dimensions: 7 x 0.8 x 10 inches
Shipping Weight: 1.9 pounds (View shipping rates and policies)
Average Customer Review: 3.6 out of 5 stars   3 customer reviews
Best Sellers Rank: #3,356,538 in Books (See Top 100 in Books)   #100 inÃ Â Books > Science & Math > Mathematics > Transformations   #554 inÃ Â Books > Science & Math > Mathematics > Number Systems   #1738 inÃ Â Books > Science & Math > Mathematics > Applied > Differential Equations

Customer Reviews

"this book will serve as a self-teaching guide for learning not only FFT, but also many widely

applicable techniques in algorithm design and analysis, efficient numerical computation, and scientific programming." --Mathematical Reviews Promo Copy

If you need this book, you already know it. You barely remember what the Fourier transform does, let alone how it works, and you need to implement it from scratch. This book is for you.Most programmers never need to use Fourier transforms. Most of the ones who do will get by quite nicely on black boxes from Mathematica, Matlab, or Numerical Recipes. Data goes in, answers come out, and "a miracle occurs" somewhere in between. There are those times, however, when you can't use the canned routines. You just have to write your own.This book isn't for the faint-hearted, but really does give everything a non-specialist needs for creating a competent implementation. There's no cut&paste code here, but this is for people with unique needs. It presents a number of basic variations, with clear illustrations and pseudocode. It even discusses 2D transforms, but most of that discussion centers on how to transpose the 2D matrix between 1D transforms.The discussion of parallel implementation was the only section I found weak. It's aimed at standard sorts of multiprocessors, with specific kinds of connection networks between processors. First, those networks are rare in commercial multiprocessors or are so deeply embedded that the topology is not accessible to the application writer. Second, those networks and architectures miss a lot of important computing environments completely - including the ones important to me.I don't wish it on anyone, but it might happen - you might have to implement a FFT for yourself. If it does happen, this book may be your most effective tool. It will probably take the non-specialist (like me) time to get past some of the notation, but the answers here are worth the effort.//wiredweird

While I'm positive that this book will serve engineers well, I cannot recommend it to practitioners of pure mathematics, videlicet those who are not comfortable with the bloodied abortion that is mathematics to the engineer. It blows my mind that we ever got a man on the moon! A good example can be found in the first line of page 7. $omega^l=omega^{(l+(2*n+1))}$. Keep in mind that n is an element of the set of positive integers, their claim not mine. Now, if you solve for n you'll find that this equation can only be satisfied for n=-1/2, clearly not an element of Z+! (Perhaps rational numbers are included in the set of "integers for engineers.") And yet they seem to indicate that it holds for all n in the aforementioned set! I pray that I've missed something and that someone will embarrass me by pointing out my mistake because as irate as I am right now, blood will likely shoot out of my nose in the next 5 minutes and they'll find me dead in my office at day's end.

Personally, I am satisfied with what I bought. I wrote an uninspired fast fourier transform from its mathematical formula and it took 30 seconds to execute. I knew I could do better. After buying the book I learn to play close attention to the bit reversal on the twiddles (trig functions). I also learned how to do the split-radix. I also learned that each calculation yields two terms. Also, I gained emough of a sense of how the fft works that I was able to successfully create threads and try parallel processing. All totalled, I reduced the run time from 30 seconds to 1 second.The book was not as well written as I would have liked. The formula for the split-radix was screwed up. Using the form of the formula and the suggestion of what it represented I was able to derive the formula. It would have been nice if they had written out each term of each iteration for a 64-term fft. That is what I did to see with my own eyes what was happening. The text is too abstract.All-in-all it was worth the $100.

Inside the FFT Black Box: Serial and Parallel Fast Fourier Transform Algorithms (Computational Mathematics) Fast Fourier Transform - Algorithms and Applications (Signals and Communication Technology) Daniel Fast: 50 Plant Based, Whole Foods Daniel Fast Recipes+Daniel Fast Food List And Breakthrough Secrets (Daniel Fast, Daniel Plan, Daniel Plan Cookbook, Whole Foods, Daniel Fast Cookbook) Serial Killers Rage and Horror: 8 Shocking True Crime Stories of Serial Killers and Killing Sprees (Serial Killers Anthology Book 1) The Big Book of Serial Killers: 150 Serial Killer Files of the World's Worst Murderers (An Encyclopedia of Serial Killers) The Serial Killer Books: 15 Famous Serial Killers True Crime Stories That Shocked The World (The Serial Killer Files) Serial Homicide Volume 3: Australian Serial Killers (Notorious Serial Killers) Serial Homicide 3 - Australian Serial Killers (Notorious Serial Killers) The Big Book of Serial Killers: An Encyclopedia of Serial Killers - 150 Serial Killer Files of the World's Worst Murderers Ideals, Varieties, and Algorithms: An Introduction to Computational Algebraic Geometry and Commutative Algebra (Undergraduate Texts in Mathematics) Computational Ergodic Theory (Algorithms and Computation in Mathematics, Vol. 13) Romeo and Juliet Parallel Text (Shakespeare Parallel Text Series Revised) Cable-Driven Parallel Robots: Proceedings of the Third International Conference on Cable-Driven Parallel Robots (Mechanisms and Machine Science) Learn German: Parallel Text - Easy, Funny Stories (German - English) - Bilingual (Learning German with Parallel Text Book 1) Learn German III: Parallel Text - Easy Stories (German - English) Bilingual - Dual Language (Learning German with Parallel Text 3) (German Edition) Learn German II: Parallel Text - Easy Stories (English - German), Dual Language - Bilingual (Learning German with Parallel Text Book 2) Learn German IV: Parallel Text - Easy Stories (English - German) (Learning German with Parallel Text Book 4) Learn Italian III: Parallel

Text - Short Stories (Italian - English) (Learn Italian with Parallel Text Book 3) Death March to the Parallel World Rhapsody, Vol. 3 (light novel) (Death March to the Parallel World Rhapsody (light novel)) Death March to the Parallel World Rhapsody, Vol. 1 (light novel) (Death March to the Parallel World Rhapsody (light novel))