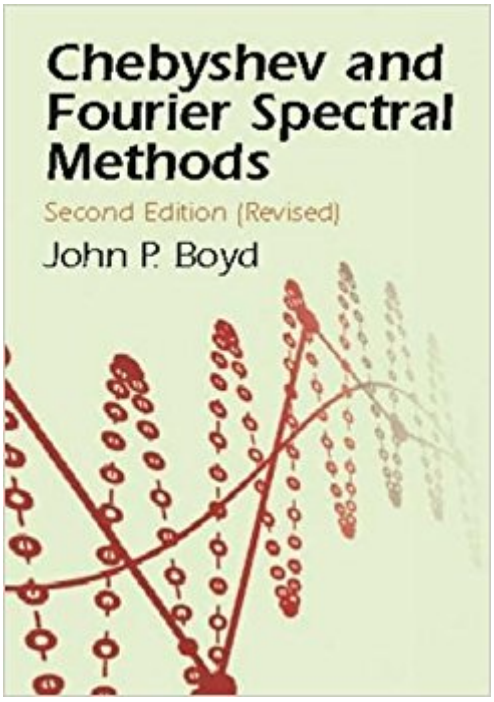
Chebyshev And Fourier Spectral Methods: Second Revised Edition (Dover Books On Mathematics)



Synopsis

Completely revised text focuses on use of spectral methods to solve boundary value, eigenvalue, and time-dependent problems, but also covers Hermite, Laguerre, rational Chebyshev, sinc, and spherical harmonic functions, as well as cardinal functions, linear eigenvalue problems, matrix-solving methods, coordinate transformations, methods for unbounded intervals, spherical and cylindrical geometry, and much more. 7 Appendices. Glossary. Bibliography. Index. Over 160 text figures.

Book Information

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Customer Reviews

Incredibly clear. This book is great at getting you to understand spectral methods. It uses many examples and Boyd is a master of explaining things in very easy-to-understand ways. I have some background in numerical methods, so I found this book to be incredibly enlightening, even when talking of concepts I'm familiar with.He also has a great voice, and adds some levity to the book with quotations and fun to quote passages. This never detracts, but, in fact, improves the book. I can't resist some quotes to give you a flavor of Boyd's wit, "These three examples should chill the blood of any aspiring computational scientist. Albert Einstein noted ÃƒÂ¢Ã â ¬Ã Å“Subtle is the LordÃƒÂ¢Ã â ¬Ã Â•, which is the great manÃƒÂ¢Ã â ¬Ã â„¢s way of saying that your computer program is always trying to kill you. Fear is a very good thing for a numerical analyst. One may wish mournfully for faster silicon, but the only absolutely fatal disease to a scientist is a deficiency of

thinking." or "Unfortunately, the resulting system of ODEs in time is a disaster wrapped in a catastrophe: all time-marching schemes for the system are unstable."You can actually just read through this math book, rather than just jumping around (although it is remarkably self-contained, so that you can jump around). The only "negative" I can think of is that sometimes the proofs are omitted as references to other works, but these are done only when the proof wouldn't add anything enlightening to the situation (so unless you are worried as a mathematician about the specific proof, this may be considered a feature). I'd still prefer to see the proofs, but the references to where the proofs are, are far better than some other books (I'll leave unnamed) where it would simply be omitted or called "trivial."The bottom line is that this is a wonderful book for learning about Spectral methods, and numerical solving in general. It is full of good examples and explanations and completely worth a read for those interested in spectral methods.

Spectral methods, as presented by Boyd, are techniques for numerically solving differential equations. His book is a collection of A LOT of practical information presented mostly through a mathematical frame work. Practical means different things to different people; in Boyd's case, he discusses the details of what happens in putting the mathematics to use (the pitfalls), and when each technique should be used. Supporting numerical methods, such as matrix techniques, are discussed where needed. Example computer code is scarce. Worked examples are inconsistently used, and sometimes abstract.As a novice to the field, I found the level of presentation a notch too high to be able to put it to use. It was more abstract than applied. I'm not saying it is not informative, only that this is not a good first book on the topic. I might get this as a second or third book.I give it 4 starts due to two complaints. There are not a lot of illustrations, and moreover those that are included are often too simple or need more annotation. A little more thought should go into them, and there should be a more of them for some of the more abstract topics. Additional thought should go into the organization too. Information at different levels of expertise are scattered throughout so you either (a) need to know the answers already, (b) skip ahead several chapters, or (c) go on an aside in another text.

This book is not just an excellent book on spectral methods, but it is simply one of the best numerical methods books ever! The author explains many of the conceptual aspects very well. The material discussed in the book gives a very good perspective to anyone who is interested in applied numerical methods for differential equations. Different aspects of numerical methods are discussed much more deeply than any other numerical book. Although the book is mainly a spectral methods

book, it can be valuable to anyone who wants to know numerical techniques more deeply.

I’m from a different field but wanted to use some of these techniques to perform calculations for my project. It was easy to pick up and is written from a practical perspective. Seems like it will be a great resource for the future as well!

Look great. Just as described. does a great job,and maybe a lot more The quality of this product is very good,product packaging is very delicate, very fast delivery, customer service is also very good. I often recommend friends to buy Came as advertised-no complaints definitely a good product Good value.

Prof. Boyd’s book is god-sent,I discovered it during a self-embarked journey in the blooming world of spectral methods. Unfortunately,these very potent and promising techniques have only recentlyescaped the confines of the field of Applied Mathematics wherethey were first developed. Thus, most existing literature is toomathematically oriented and rather opaque to the engineer andapplied scientist, as it does not offer them the basicoperational knowledge that they would require. This book isone of the first to overcome this chasm. It providesa survey of all the necessary fundamentals for the applicationof spectral methods to various disciplines of computationalengineering but also delves deep into various advanced topics.At the same time it provides one with sufficient ammunitionto explore, otherwise intimidating, more theoretically-orientedtexts. The text, reflecting the author’s extensive knowledgeon the subject, has an unusually flowing writing style to itand throughout it are interspersed some quite entertainingsnippets of the author’s humor.I recommend this book to all students of spectral methods, regardlessof level of expertise.

Edition (Textbooks in Mathematics) Spectral Graph Theory (CBMS Regional Conference Series in Mathematics, No. 92) An Introduction to Laplace Transforms and Fourier Series (Springer Undergraduate Mathematics Series) Inside the FFT Black Box: Serial and Parallel Fast Fourier Transform Algorithms (Computational Mathematics) Random Fourier Series with Applications to Harmonic Analysis. (AM-101), Volume 101 (Annals of Mathematics Studies) Classical Fourier Analysis (Graduate Texts in Mathematics) Modern Fourier Analysis (Graduate Texts in Mathematics) Fourier Analysis (Graduate Studies in Mathematics) Splines and Variational Methods (Dover Books on Mathematics) Numerical Methods for Scientists and Engineers (Dover Books on Mathematics) Mathematical Methods in the Theory of Queuing (Dover Books on Mathematics) Hilbert Space Methods in Partial Differential Equations (Dover Books on Mathematics)