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<<小波导论>>

图书基本信息

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前言

Fourier analysis is an established subject in the core of pure and applied mathematical analysis. Not only are the techniques in this subject of fundamental importance in all areas of science and technology, but both the integral Fourier transform and the Fourier series also have significant physical interpretations. In addition, the computational aspects of the Fourier series are especially attractive, mainly because of the orthogonality property of the seties and of its simple expression in terms of only two functions： sin z andCOS X. Recently, the subject of "vavelet analysis" has drawn much attention from both mathematicians and engineers Mike. Analogous to Fourier analysis, there are also two important mathematical entities in wavelet analysis： the "integral wavelet transform" and the "vavelet series". The integral wavelet transform is defined to be the convolution with respect to the dilation of the reflection of some function, called a "basic wavelet", while the wavelet series is expressed in terms of a single function, called an "：R-wavelet" （or simply, a wavelet） by means of two very simple operations： binary dilations and integral translations. However., unlike Fourier analysis, the integral wavelet transform with a basic wavelet and the wavelet series in terms of a wavelet are intimately related. In fact, if is chosen to be the "dual" of , then the coefficients of the wavelet series of any square-integrable function f are precisely the values of the integral wavelet transform, evaluated at the dyadic positions in the corresponding binary dilated scale levels. Since the integral wavelet transform of f simultaneously localizes f and its Fourier transform f with the zoom-in and zoom-out capability, and since there are real-time algorithms for obtaining the coefficient sequences of the wavelet series, and for recovering f from these sequences, the list of applications of wavelet analysis seems to be endless. On the other hand, polynomial spline functions are among the simplest functions for both computational and implementational purposes. Hence, they are most attractive for analyzing and constructing wavelets.

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内容概要

本书是一本小波分析的入门书，着重于样条小波和时频分析。
书中基本内容有Fourier分析、小波变换、尺度函数、基数样条分析、基数样条小波、小波级数、正交小波和小波包。
本书内容安排由浅入深，算法推导详细，既有理论，又有应用背景。
　　本书自成体系，只要求读者具有函数论和实分析的一些基础知识，适合作为高等院校理工科小波分析的入门教材，也适合科技工作者用作学习小波的指导读物。

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作者简介

崔锦泰（Charles K.Chui），国际著名的小波分析专家，IEEE会士，密苏里大学路易分校数学与计算机科学系讲座教授，该校计算调和分析研究所所长，斯坦福大学顾部教授。
曾担任数个国际著名期刊和丛书的主编或编委。
他在调和分析应用、逼近及其应用等领域也做出了杰出的贡献，首创将样条应用于小波中。

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章节摘录

An Overview "Wavelets" has been a very popular topic of conversations in many scientific and engineering gatherings these days. Some view wavelets as a new basis for representing functions, some consider it as a technique for time-frequency analysis, and others think of it as a new mathematical subject. Of course, all of them are right, since "wavelets" is a versatile tool with very rich mathematical content and great potential for applications. However, as this subject is still in the midst of rapid development, it is definitely too early to give a unified presentation. The objective of this book is very modest: it is intended to be used as a textbook for an introductory one-semester course on "wavelet analysis" for upper-division undergraduate or beginning graduate mathematics and engineering students, and is also written for both mathematicians and engineers who wish to learn about the subject. For the specialists, this volume is suitable as complementary reading to the more advanced monographs, such as the two volumes of Ondelettes et Operateurs by Yves Meyer, the edited volume of Wavelets-A Tutorial in Theory and Applications in this series, and the forthcoming CBMS volume by Ingrid Danbechies. Since wavelet analysis is a relatively new subject and the approach and organization in this book are somewhat different from that in the others, the goal of this chapter is to convey a general idea of what wavelet analysis is about and to describe what this book aims to cover. 1.1. From Fourier analysis to wavelet analysis

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编辑推荐

《小波导论(英文版)》是小波分析方面奠基性的经典著作，已被翻译为多种语言，产生了深远影响。

《小波导论(英文版)》着重讲述样条小波和时频分析，内容安排由浅入深，算法推导详细，既有理论，又有应用背景。

书中内容只要求读者具有函数论和实分析的一些基础知识，既适合初学者以及工程、技术方面人员学习，也是研究人员不可或缺的参考书。

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