

Product Profile

THE ART OF SCIENTIFIC COMPUTATION A Problem Oriented Approach

Author: Richard Crandall

Title: The Art of Scientific Computation:
A Problem Oriented Approach

Electronic Component: DOS floppy disk

Estimated Price: \$42.95

ISBN: 0-387-97808-9

Projected Bound Book Date: December 15, 1992

Length: 400 pages

Trim Size: 6 1/8 x 9 1/4

Special Features:

- o Contains chapters on modern research subjects, including wavelets and fast Fourier transforms
- o Attractive chapter openings with halftones
- o End of chapter exercises
- o Class-tested
- o DOS floppy disk with interactive problems/examples
- o Author recognition

Primary Market:

Senior/Graduate level textbook adoption courses taught in sciences, computer

science, mathematics, possibly some engineering; interdisciplinary.

Book Information:

This book is based on a survey course taught in the Physics Department at Reed College by the author. The course is taken by advanced undergraduate students preparing to do further studies and research in the sciences, mathematics and engineering. The course-and the book-gives them the requisite mathematical and computer science tools and basic information they will need to do further computational work. There is more than enough material for a one-term course.

In addition to course use, this work will also find application as a ready reference, both as a review of essentials and as an introduction to exciting modern topics such as wavelets and fast Fourier transforms.

Author Information:

Richard Crandall is Chief Scientist for NeXT Computer, Inc. He held the distinguished Chair of the Howard Vollum Professor of Science at Reed College in Portland, Oregon. Crandall has previously authored two titles in the area of computer programming languages for John Wiley & Sons, before authoring the very successful *Mathematica for the Sciences* book published by Addison-Wesley in 1991. Crandall received the prestigious 1991 Computerworld Smithsonian Award in the Science category for a software program called "Zilla, the Community Supercomputer," which "recycles" the power of a community network of workstations by using only those computers whose users are out of the office or school setting.

Table of Contents:

Chapter 1: Numbers, Numbers Everywhere
Introduction to modern numerical methods

Chapter 2: Symbols as Signs of the Times
Symbolic computation

Chapter 3: The Realm of Huge Numbers

Chapter 4: The Ubiquitous FFT
Fast Fourier Transforms

Chapter 5: Wavelets: New Arrivals on the Computational Scene
Wavelet theory and wavelet transforms

Chapter 6: Complexity Lives Everywhere
Chaos, fractals

Chapter 7: Pixels, Images and All That
Image processing

Chapter 8: Real-World Signals
Sound and other signal processing

Chapter 9: The Science of Life
Computational problems from chemistry and biology

Chapter 10: Where Theory and Computation Meet
Computational physics