

Book Reviews

Computer Arithmetic Algorithms by Israel Koren, Universities Press, 2003, 2nd edition, ISBN 81 7371 533 5, pp. xv + 281.

This book aims at the fundamental principles of algorithms for performing arithmetic operations in digital computers viz. basic arithmetic operations: addition, subtraction, multiplication, and division in fixed-point and floating-point numbers systems; and more complex operations such as square root extraction and evaluation of exponential, logarithmic, and trigonometric functions etc. It includes numerical examples to illustrate the working of the algorithms presented and explains the concepts behind the algorithms without relying on gate diagrams. The presentation is lucid which may help the reader to better understand the available algorithms, provides know how to select the most appropriate algorithm to match a given technology, and even be able to match new algorithms if the need arises. Each chapter has a list of relevant references and a set of exercises. A separate solution manual is available from the publisher upon request.

The book may be used as a textbook for a senior-level or graduate-level course in computer arithmetic as well as reference book for practicing engineers.

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Computer Algebra and Symbolic Computation: Elementary Algorithms by Joel S. Cohen, Universities Press, 2005, ISBN 81 7371 532 7, pp. xvii+323.

This book is devoted to the formulation of algorithms that solve symbolic mathematical problems and the implementation of these algorithms in terms of the operations and control structures available in computer algebra programming languages.

The book comprises of seven chapters concluded with extensive bibliography.

The first chapter 'Introduction to Computer Algebra' provides an introduction to the field of computer algebra. The second chapter 'Elementary Concepts of Computer Algebra' introduces an algorithmic language called *mathematical pseudo-language* (MPL) which is used thro'out the book to describe the concepts, examples, and algorithms of computer algebra. Chapter three 'Recursive Structure of Mathematical Expressions' is devoted to the internal tree structure of mathematical expressions. The fourth chapter 'Elementary Mathematical Algorithms' presents the basic programming structures in MPL and uses these structures to describe a number of elementary algorithms. The fifth chapter 'Recursive Algorithms' mainly describes recursion as a programming technique in computer algebra and gives numerous examples to illustrate its advantages and limitations. Sixth chapter deals with computational definitions of various classes of polynomials and rational expression based on the internal tree structure of expressions and includes algorithms that analyze and manipulate these. The last chapter 'Exponential and Trigonometric Transformations' deals with algorithms which manipulate such functions.

The book may be useful for undergraduate students and a few graduate students from mathematics, computer science, and engineering.

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