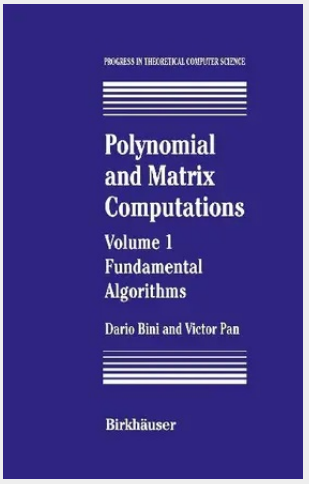
Bini / Pan

Polynomial and Matrix Computations

Fundamental Algorithms



Our Subjects and Objectives. This book is about algebraic and symbolic computation and numerical computing (with matrices and polynomials). It greatly extends the study of these topics presented in the celebrated books of the seventies, [AHU] and [BM] (these topics have been under-represented in [CLR], which is a highly successful extension and updating of [AHU] otherwise). Compared to [AHU] and [BM] our volume adds extensive material on parallel com putations with general matrices and polynomials, on the bit-complexity of arithmetic computations (including some recent techniques of data compres sion and the study of numerical approximation properties of polynomial and matrix algorithms), and on computations with Toeplitz matrices and other dense structured matrices. The latter subject should attract people working in numerous areas of application (in particular, coding, signal processing, control, algebraic computing and partial differential equations). The au thors' teaching experience at the Graduate Center of the City University of New York and at the University of Pisa suggests that the book may serve as a text for advanced graduate students in mathematics and computer science who have some knowledge of algorithm design and wish to enter the exciting area of algebraic and numerical computing. The potential readership may also include algorithm and software designers and researchers specializing in the design and analysis of algorithms, computational complexity, alge braic and symbolic computing, and numerical computation.

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