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★ **Méthodes matricielles: introduction à la complexité algébrique. (French)**

[**Matrix methods: introduction to algebraic complexity**]

Mathématiques & Applications (Berlin) [Mathematics & Applications], 42.

Springer-Verlag, Berlin, 2004. *xvi*+376 pp. \$109.00. ISBN 3-540-20247-1

The main purpose of this well-written book is to propose an introduction to the modern tools of algebraic complexity. To remain as simple as possible while providing meaningful examples, Jounaïdi and Lombardi chose to focus on effective linear algebra; this is certainly one of the best possible choices to give an idea of the main problems in algebraic complexity. The contents of the book are the following: classical results of linear algebra and basic algorithms in linear algebra, straight-line programs as a model of computation, with an emphasis on Strassen's method known as "elimination of divisions", a discussion on various notions of complexity, a presentation of the general algorithmic strategy "divide and conquer", a first important example: the fast multiplication of polynomials, the very heart of the book: the fast multiplication of matrices, with a discussion of derived fast algorithms for various problems of linear algebra. The particular case of the computation of the determinant is then discussed, and the last chapter deals with the difficult computation of the permanent (Valiant's conjecture). This book is certainly well-suited for an introduction to a fascinating subject at a reasonable level... for French-speaking people. *Jean Moulin Ollagnier*

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