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Matrix Representations of Algebraic Varieties (Paperback)

By Thang Luu Ba

Univ Europeenne, United States, 2011. Paperback. Condition: New. Aufl.. Language: French . Brand New Book. In this book, we introduce and study a new implicit representation of rational curves of arbitrary dimensions and propose an implicit representation of rational hypersurfaces. Then, we illustrate the advantages of this matrix representation by addressing several important problems of Computer Aided Geometric Design (CAGD): The curve/curve, curve/surface and surface/surface intersection problems, the point-on-curve and inversion problems, the computation of singularities of rational curves. We also develop some symbolic/numeric algorithms to manipulate these new representations for example: the algorithm for extracting the regular part of a non square pencil of univariate polynomial matrices and bivariate polynomial matrices. In the appendix of this book we present an implementation of these methods in the computer algebra systems Mathemagix and Maple. In the last chapter, we describe an algorithm which, given a set of univariate polynomials f_1, \dots, f_s returns a set of polynomials u_1, \dots, u_s with prescribed degree-bounds such that the degree of $\gcd(f_1 + u_1, \dots, f_s + u_s)$ is bounded below by a given degree assuming some genericity hypotheses.



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