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Nota di contenuto	1 Introduction to ShApes, Geometry, and Algebra: Tor Dokken and Georg Muntingh -- Part I Change of Representation: 2 Numerical methods for implicitisation and their applications: Oliver J. D. Barrowclough -- 3 Sparse implicitization via interpolation: Ioannis Z. Emiris, Tatjana Kalinka, and Christos Konaxis -- 4 The intersection problems of parametric curves and surfaces by means of matrix-based implicit representations: Thang Luu Ba -- Part II Geometric Computing – Algebraic Tools: 5 Singular Zeros of Polynomial Systems: Angelos Mantzaflaris and Bernard Mourrain -- 6 Plane mixed discriminants and toric jacobians: Alicia Dickenstein, Ioannis Z. Emiris and Anna Karasoulou -- 7 Topology of the intersection of two parameterized

surfaces, using computations in 4D space: Stéphane Chau and André Galligo -- 8 Rational Bézier Formulas with Quaternion and Clifford Algebra Weights: Rimvydas Krasauskas and Severinas Zubé -- Part III Algebraic Geometry for CAD Applications: 9 Algebraic spline geometry – some remarks: Ragni Piene -- 10 On the dimension of spline spaces on triangulations: Nelly Villamizar and Bernard Mourrain -- 11 Polynomial Interpolation Problems in Projective Spaces and Products of Projective Lines: Elisa Postinghel -- 12 Rational parametrizations of edge and corner blends for isogeometric analysis: Heidi E. I. Dahl -- Part IV Practical Industrial Problems: 13 Bisectors and Vorono¨ diagram of a family of parallel half-lines: I. Adamou, M. Fioravanti, L. Gonzalez-Vega, and B. Mourrain -- 14 Generating an approximate trivariate spline representation for contractible domains: Thien T. Nguyen -- 15 Isogeometric analysis of Navier-Stokes flow using locally refinable B-splines: Peter Nørtoft and Tor Dokken.

Sommario/riassunto

This book summarizes research carried out in workshops of the SAGA project, an Initial Training Network exploring the interplay of Shapes, Algebra, Geometry and Algorithms. Written by a combination of young and experienced researchers, the book introduces new ideas in an established context. Among the central topics are approximate and sparse implicitization and surface parametrization; algebraic tools for geometric computing; algebraic geometry for computer aided design applications and problems with industrial applications. Readers will encounter new methods for the (approximate) transition between the implicit and parametric representation; new algebraic tools for geometric computing; new applications of isogeometric analysis, and will gain insight into the emerging research field situated between algebraic geometry and computer aided geometric design.