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Nota di contenuto	Editors' preface -- Topics in real and complex number complexity theory -- 1. Introduction -- 2. A motivating example -- 3. The real number model by Blum, Shub, and Smale -- 4. Structural complexity -- 5. Probabilistically checkable proofs over a?? -- Acknowledgement -- References -- Polar, bipolar and copolar varieties: Real solving of algebraic varieties with intrinsic complexity -- 1. Introduction -- 2. Notations and statement of results -- 3. Polar varieties -- 4. The smooth case -- 5. Tools to handle the singular case -- 6. Bipolar varieties and real point finding in the singular case -- References -- The complexity and geometry of numerically solving polynomial systems. -- 1. The modern numerical approach to polynomial system solving -- 2. A technical description of the problem -- 3. Geometry and condition number -- 4. The complexity of following a homotopy path -- 5. The problem of good starting points -- 6. The condition Lipschitz-Riemannian structure -- 7. Condition geodesics and the geometry of \CW -- 8. The univariate case and elliptic Fekete points -- 9. The algebraic eigenvalue problem -- Appendix A. A model of computation for machines with round-off and input errors -- References -- Multiplicity hunting and approximating multiple roots of polynomial systems -- 1. Introduction -- 2. Multiplicity. Algebraic geometric point of view -- 3. Multiplicity. Numerical point of view --

4. Multiplicity and homotopy methods -- 5. Recovering the quadratic convergence -- 6. Deflating and kerneling -- 7. Examples -- 8. Conclusion and future work -- References -- On the intrinsic complexity of elimination problems in effective algebraic geometry -- 1. Introduction -- 2. Concepts and tools from algebraic geometry -- 3. Robust parameterized arithmetic circuits -- 4. A family of hard elimination polynomials -- 5. A computation model with robust parameterized arithmetic circuits -- 6. Applications to elimination theory -- References -- Newton iteration, conditioning and zero counting -- 1. Introduction -- Part 1. Newton Iteration and Alpha theory -- 2. Outline -- 3. The gamma invariant -- 4. The α -Theorems -- 5. Estimates from data at a point -- Part 2. Inclusion and exclusion -- 6. Eckart-Young theorem -- 7. The space of homogeneous polynomial systems -- 8. The condition number -- 9. The inclusion theorem -- 10. The exclusion lemma -- Part 3. The algorithm and its complexity -- 11. Convexity and geometry Lemmas -- 12. The counting algorithm -- 13. Complexity -- 14. Probabilistic and smoothed analysis -- 15. Conclusions -- References.
